Washington's College Bound Scholarship Program and its Effect on College Entry, Persistence, and Completion

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Contents

Acknowledgments

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Abstract

Indiana, Oklahoma, and Washington have programs designed to address college enrollment and completion gaps by offering a promise of state-based college financial aid to low-income middle school students in exchange for making a pledge to do well in high school, be a good citizen, not be convicted of a felony, and apply for financial aid to college. Using a triple-difference specification, we find that Washington's College Bound Scholarship shifted enrollment from out-of-state to in-state colleges at which the scholarship could be used. While we find suggestive evidence that the program increased the likelihood of attending a postsecondary institution and attaining a bachelor's degree within five years of high school, we discuss why the program might be more successful if it did not require students to sign a pledge.

1.   Introduction

Despite significant increases in recent decades in the proportion of U.S. students enrolling and graduating from college (Ryan and Bauman, 2016), there remain substantial gaps between low- and high-income students in educational attainment (Ziol-Guest and Lee, 2016; Duncan, Kalil, and Ziol-Guest, 2017). States have attempted to close this gap through "early commitment pledge programs" that provide low-income students an early promise of funding for college in exchange for making a pledge to do reasonably well in high school and stay out of trouble. A central idea behind this early commitment is that while college scholarship funding will help make college more affordable for disadvantaged students, the early promise of funds, and the pledge designed to get students to think about college-going, is important to set students on the right path in terms of college preparation. Yet there is surprisingly little rigorous evidence about whether these programs accomplish their central goal of helping to increase post-secondary education attainment.

The College Bound Scholarship (CBS) program operating in Washington State since 2007 is an example of one of several state programs that are utilizing an early commitment strategy to increase college-going. The legislative intent of the state in establishing the College Bound Scholarship (CBS) is quite clear:

> *The legislature intends to inspire and encourage all Washington students to dream big by creating a guaranteed four-year tuition scholarship program for students from low-income families. The legislature finds that, too often, financial barriers prevent many of the brightest students from considering college as a future possibility. Often the cost of tuition coupled with the complexity of finding and applying for financial aid is enough to prevent a student from even applying to college. Many students become disconnected*

1

from the education system early on and may give up or drop out before graduation. It is the intent of the legislature to alert students early in their educational career to the options and opportunities available beyond high school (Washington State Legislature, 2007).[1]

In the analysis described here, we assess whether the CBS program has met the above legislative intent. Using rich state administrative data, and a novel triple-difference specification, we estimate the causal effect of the program on college matriculation, persistence, and graduation. In particular, students are eligible to participate only if they are economically disadvantaged and they sign the CBS pledge in 7th or 8th grade (or 9th for the first cohort). Our triple-difference specification involves a comparison of changes across the period of policy implementation in the outcomes of (a) pledge-eligible students, (b) non-eligible, non-economically disadvantaged students, and (c) students who were not eligible, but were just slightly less economically disadvantaged than those who were eligible to sign the pledge.

Our estimates suggest positive, but statistically insignificant, impacts of the program on postsecondary enrollment and bachelor's degree attainment. We find stronger evidence that the program shifted enrollment from out-of-state institutions towards in-state institutions. Given the legislature's broader "long-term goal of a better trained and educated workforce" (Washington State Legislature, 2007), this result may be of value to the legislature assuming that such students remain in-state after college (Sjoquist and Winters, 2014). In the next section, we place the CBS

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[1] This intent is reinforced by the Washington Student Achievement Council, (WSAC, 2019):

The College Bound Scholarship is designed to inspire and encourage Washington middle school students from low-income families to prepare for and pursue postsecondary education. The early commitment of state funding for tuition is intended to alleviate the financial barriers preventing students from considering college as a possibility.

program within the broader literature on place-based ("promise") programs that offer an early commitment of financial aid and pledge programs that require middle school students to make an affirmative statement to become program eligible.

2.   Background

2a.   Early Commitment Pledge Programs and College Outcomes

Place-based early commitment scholarship programs are designed to provide students in a given region with a clear, early commitment of financial aid for college, potentially changing students' perceptions about what might be possible for them after high school. The Kalamazoo Promise Program, which was announced in 2005, is one of the best known of such "promise" programs in the United States. State and locally funded early commitment programs have become much more common in recent decades (LeGower and Walsh, 2017). The effects of these programs on college outcomes have been extensively studied (e.g. Bartik, Hershbein, &Lachowka, 2017; Carruthers & Özek, 2016; Page, Iriti, Lowry, & Anthony, 2018; Perna & Leigh, 2017). Most studies tend to find positive effects for in-state college matriculation and credit accumulation.

Early commitment *pledge* programs are similar to early commitment scholarship programs in that they offer aid for use at in-state colleges for students achieving specified academic thresholds.[2] But they differ from other promise programs in that they require students

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[2] These early college financial aid programs have a long history. The genesis of the first was a 1981 pledge by Eugene M. Lang to pay for the college education of 61 6th graders, so long as they graduated high school and attended college (Indiana's 21st Century Scholars Program, 2019). This relatively small intervention inspired the first statewide early commitment pledge program: Indiana's 21st Century Scholars program. The 21st Century Scholars program was established in 1990, and a similar program, the Oklahoma Promise, was initiated in 1996. Washington College Bound Scholarship (CBS) was established 11 years later in 2007. The CBS was modeled after these two programs. For a side by side comparison of these three programs please see Appendix Table 1.

to sign an early commitment pledge in order to be eligible to receive a scholarship, and, unlike some commitment programs, are targeted toward disadvantaged (e.g. low-income) students. The pledge requirement is thought to be important in making students acutely aware of the availability of scholarship funds, so as to change their expectations about college and create a strong incentive for them to do well in high school and fulfill pledge (typically to do reasonably well academically in high school and stay out of trouble) requirements.

Many prior studies of early commitment pledge programs (e.g. Mendoza et al., 2009, 2012; St. Johns et al., 2001, 2003, 2004, 2005, 2008) find positive effects on college enrollment and persistence, but are limited in their ability to identify treatment effects as they lack data necessary to establish suitable comparison groups for pledge-eligible students. As an example, the studies by St. John and colleagues investigate the impact of Indiana's Twenty-first Century Scholars Program, an early commitment pledge program similar to the CBS, but they lack data on cohorts of students prior to the implementation of the pledge program, and thus compare students who signed the pledge, to students who may or may not have been eligible. The positive associations they find between completion of the pledge in Indiana and the likelihood that students enroll in both two- and four-year colleges are not terribly surprising given the likelihood that students who sign the pledge have unobserved attributes associated with a college-going orientation (as evidenced by signing the pledge).

Toutkoushian et al. (2015) attempt to address the potential problem of confounding unobservables by estimating models that adjust for self-selection into the program through instrumental variables approaches. As an instrument they use the distance between students' homes and centers that provide a range of college support services (such as tutoring, mentoring, and help in preparing for college) for pledge-signing students. They find positive effects of the

Indiana program, but the results are also puzzling in that the estimated treatment effects were found to be much larger in the models that are intended to correct for sample selection. This suggests that the location of the support centers (the instrument) is likely to be endogenous, which would make the results suspect.[3] For example, if the centers are located near college campuses, it would not be surprising to see both higher rates of pledge signing and college enrollment near these centers, even with no effect of pledge signing on enrollment.

Most closely related to our study are two reports by the Washington State Institute for Public Policy (WSIPP) (Fumia, Bitney, & Hirsch, 2018, 2019).[4] These reports also provide evidence on the effects of Washington's CBS program on college-going, persistence, and graduation utilizing a difference-in-difference estimator with propensity score weighting. They find that eligibility for the scholarship has little to no effect on these outcomes. However, Fumia et al. (2019) do find suggestive evidence that the CBS increased enrollment at in-state, public, 4-year institutions. As we describe below, we utilize similar data to Fumia et al., but have an additional year of college outcomes, which allows us to consider the effects of the CBS for an additional cohort of students on college outcomes observed 2 years after high school graduation. Moreover, as we elaborate below in section 3b we utilize a different identification strategy for identifying the effects of the CBS program.[5]

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[3] The authors test for this, and indeed find that they could only reject the null hypothesis that the treatment variable was exogenous (at the 10% level) in 10 of 18 models they estimate.

[4] Their reports were commissioned by the Washington State Legislature and they were required to conduct "an evaluation of the college bound scholarship program" (p. 2) that would "complement studies on the college bound scholarship program conducted at the University of Washington" (Second Substitute Senate Bill 5851, Chapter 244, Laws of 2015) – i.e., to complement the research that we present in this paper.

[5] There are additional differences from Fumia et al. (2019). Our data includes nearly the full sample of in-state private college enrollment, which Fumia et al. lack. Our analysis defines pseudo eligibility (defined in the data section 3a) for pre-policy students differently (e.g., Fumia et al. base pseudo eligibility on free or reduced-price lunch status in 7th or 8th grade, while we based it on free or reduced-price lunch status in 8th or 9th grade). Additionally, we handle missing data using multiple imputations while Fumia et al. use listwise deletion, and we define cohorts using a student's first entrance into 7th or 8th grade compared with Fumia et al. using their last observation in 7th or 8th grade.

2b. *Washington's College Bound Scholarship (CBS) Program*

Modeled after similar programs in Oklahoma and Indiana[6], the Washington College Bound Scholarship (CBS) was created by the Washington legislature in 2007 and works as follows. Students may be eligible to sign the CBS pledge during 7th or 8th grade (or 9th grade for the first eligible cohort during 2008-09). However, to target the program to economically disadvantaged youth, not all students are eligible to sign the pledge. Students whose family received Temporary Assistance for Needy Families (TANF), whose family income was lower than 185% of the poverty line, who were enrolled in foster care, or were eligible for free or reduced-price lunch (FRPL) are eligible to sign the CBS pledge.[7]

If a student meets these eligibility requirements during 7th or 8th grade (or 9th for the first post-policy cohort) they are encouraged to sign a pledge to: 1) do well in middle and high school; 2) be a good citizen and not be convicted of a felony; and 3) apply for financial aid to college.[8, 9] If they satisfy these requirements and their family income remains below 65% of the state's median income during 12th grade, students are promised a scholarship that covers tuition and some fees, and a small textbook allowance that are not covered by other state financial aid awards (WHECB, 2012).

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[6] For a side-by-side comparison of these three programs please see Appendix Table 1.

[7] In 2008, the first cohort's eligibly year, 185% of the poverty line for a family of four was $39,220. A family income lower than 185% of the poverty line would also qualify the student for FRPL. One concern with using FRPL indicators for determining student CBS eligibility is that the Community Eligibility Provision program allows schools where 40% of students are "categorically eligible" to apply and provide FRPL to all students at eligible schools. This is not a concern for our study as we utilize data on FRPL eligibility that pre-dates the 2015 implementation of the Community Eligibility Provision in Washington State (Ruffini, 2018).

[8] For a detailed list of the ways in which program administers encourage program up-take please see Goldhaber et al. (2019a).

[9] The pledge is as follows: "Yes, I am college bound! I pledge that I will:
  - Do well in middle school and high school, and graduate with a cumulative high school grade point average of 2.0 or higher on a 4.0 scale.
  - Be a good citizen in my school and my community and not commit a felony.
  - Apply for financial aid by submitting the Free Application for Federal Student Aid (FAFSA) in a timely manner during my senior year of high school."

Students are able to use these funds at two- or four-year Washington State higher education institutions. The funds may be applied to both public and private post-secondary colleges, however, for private institutions the CBS guarantees financial coverage of up to the amount provided to students at a comparable public institution. For reference, the highest available award in 2014-15 was $12,404. Nevertheless, the CBS program is a last dollar scholarship program, meaning other financial aid is used before funds from the CBS kick in. As such, the typical award, while significant, is notably below this ceiling. For the first three cohorts of eligible students who attended a post-secondary institution the average annual award was $2,033 (WSAC, 2017).

Recall that a key motivation of the early commitment pledge is that it will change the college-going expectations of students and their academic preparation for college.[10] However, there is little empirical evidence that this occurred for early cohorts eligible for the CBS. Using a triple-difference-in-difference design Goldhaber et al., (2019b) investigate the effect of the CBS on pledge eligible youth's cumulative high school GPA, the likelihood of remaining in Washington public schools, the likelihood of graduating high school on-time, and the likelihood of CBS eligible youth being involved with the criminal justice system. The authors conclude that there is little evidence that the CBS is altering the academic trajectories of CBS eligible youth.[11]

Given the null findings on high school outcomes, it is reasonable then to consider that the CBS effects may be more similar to other traditional financial aid programs that offer aid later on

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[10] Unquestionably, students' education expectations are influenced by many factors; for instance, a parent's level of education, the desire for professional employment, socioeconomic status, parental assumptions of continued education, and teacher expectations (Goyette, 2008; Sewell, Haller, & Ohlendorf, 1970; Conklin, & Dailey, 1981; Rosenthal, & Jacobson, 1968). Early commitment programs are designed to be another important influence on students' academic expectations.

[11] Goldhaber et al. (2019b) find somewhat surprisingly that the CBS reduced cumulative GPA for pledge eligible 12th graders. They speculate that this may be evidence of pledge eligible youth taking more advanced coursework in preparation for college, which results in a corresponding reduction in GPA. However, due to data limitations the authors are not able to fully investigate this hypothesis.

in a student's academic career. But, as we noted above, there is no peer-reviewed published work on whether the CBS program is in fact affecting the college outcomes of students in Washington State.

3.   Data and Analytic Approach

3a.   Data

We exploit data for our analyses that are maintained by Washington State's Education Research & Data Center (ERDC).[12] This data includes individual student-level K-12 records for all Washington State public-schools. Data on students who have signed the CBS pledge is maintained by the Washington Student Achievement Council and is linked to K-12 and post-secondary data by ERDC.

The K-12 and postsecondary records we utilize cover two cohorts of students prior to the implementation of the CBS program, and four cohorts of students after the start of the program. As described above and in more detail in Goldhaber et al. (2019a), participation in the program and receipt of a CBS college scholarship requires students to sign the CBS pledge while in middle school (or 9th grade for the first CBS eligible cohort) and remain income eligible in 12th grade. We define our cohorts based on when they entered 8th grade since 8th grade defines eligibility for all six cohorts: those students who were enrolled in 8th grade in 2005-06 ("Cohort 1") and 2006-07 ("Cohort 2") pre-dated the implementation of the CBS program and were thus ineligible, but students in 8th grade in 2007-08 ("Cohort 3"), in 2008-09 ("Cohort 4"), in 2009-10

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[12] ERDC requires us to note that the research presented here utilizes confidential data from the Education Research and Data Center, located within the Washington Office of Financial Management (OFM). ERDC uses data from the Office of the Superintendent of Instruction, i.e. K-12 data, and links it to post-secondary outcomes to create a longitudinal data system. For more information about ERDC, please see https://erdc.wa.gov/about-us-0. The views expressed here are those of the author(s) and do not necessarily represent those of the OFM or other data contributors.

("Cohort 5"), and in 2010-11 ("Cohort 6") could have been eligible to participate given the other requirements described above in Section 2b.

These six cohorts include 514,266 individual student records, but we remove students with missing ID codes, students with irreconcilable birthdates, and students who were not identified in a school in 8th grade. As such, our analytic dataset contains 489,161 students, including 168,031 in the pre-policy Cohorts 1 and 2, and 321,130 in the post-policy Cohorts 3, 4, 5, and 6.[13] Close to half of the students in the post-policy cohorts, 151,291, were clearly eligible for the CBS program as a result of being FRPL eligible in 8th or 9th grade (Cohort 3) or 7th or 8th grade (Cohorts 4, 5, and 6). From now on, we refer to these students as "CBS-Eligible" students. Additionally, close to half of the students in the pre-policy cohorts, 74,008, were FRPL eligible in 8th or 9th grade – however, these youth were ineligible for the CBS scholarship because it had not yet been implemented. As such, these students would have been eligible to apply for the CBS scholarship had the CBS been implemented we refer to these students as "CBS Pseudo-Eligible" students.[14]

In addition to data on K-12 students, we received postsecondary data from ERDC that were compiled from four sources: Washington State's Public Centralized Higher Education Enrollment System (PCHEES), Washington State's State Board of Community and Technical Colleges (SBCTC) data system, data from the Independent Colleges of Washington (ICW), and data from the National Student Clearinghouse (NSC). We merged these data with information on

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[13] We note that for when data is not missing for these 25,000 students, they tend to be academically disadvantaged e.g. scoring on average -0.16 standard deviations below the mean on their 7th grade math tests. This may reduce the generalizability of the effects of the CBS for these students.

[14] Given that the grades used in determining CBS eligibility changed between the first post-policy cohort, cohort 3, and the subsequent cohorts, 4, 5, and 6, using FRPL status in grades 8 and 9 to determine CBS pseudo eligibility is consistent with cohort 3, but not the later post-policy cohorts. As such, we also define CBS pseudo eligibility using FRPL status in grades 7 and 8 and conduct our main models presented in section 3b using this alternate definition of CBS pseudo eligibility. We find qualitatively similar findings and results are available upon request.

college selectivity (Barron's Educational Series, Inc., 2008) based on Integrated Postsecondary Education Data System (IPEDS) ID codes.

The PCHEES data contains information on students' enrollment and graduations in-state, four-year, public universities. Similarly, the SBCTC data system maintains enrollment and graduation data on all in-state, public, *two-year* colleges. The ICW are a consortium of ten large, private, four-year universities in the state of Washington. Collectively the ICW enroll over 40,000 students annually and, in any given year, account for 21% of all bachelor's and advanced degrees in the State of Washington (ICW, 2019).[15] Lastly, the NSC data contains student level information on both enrollment and graduation for all types of postsecondary institutions i.e. public/private, two year/four year, and in-state/out-of-state.

The NSC data were obtained in order to conduct the legislatively mandated study of the CBS conducted by the Washington State Institute for Public Policy in conjunction with our own study (see footnote 4). Due to financial constraints, NSC data was obtained for a sample of the full set of students. WSIPP selected a random subsample of students in Cohorts 1-4 from a pool of students with non-missing 7th grade characteristics.[16] This random sample consists of 138,000, of which 5,833 had their records masked by the NSC either at the student's request or by their college's request. This brings the final sample of students with NSC data to 132,167.[17,]

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[15] ICW provided data on 8 of their 10 affiliate institutions. These 8 universities represented 90.3% of ICW's 2017 Fall undergraduate enrollments (NCES, 2019).

[16] 7th grade characteristics include sex, ethnicity, race, whether the student was a migrant, their age, whether the student was an English language learner, an indicators for whether the student's primary and home language was English, disability status, whether the student received services for gifted students, and an indicator for academic assistance. Student also had to have non-missing 8th grade math and English test scores.

[17] Note that students identified in the random sample who were observed both entering and graduating from in-state, four-year, public institutions were not submitted to the random sample NSC query, as we observe their college outcomes in the PCHEES data. It is possible that some of these students transfer to out-of-state institutions and then transfer back to Washington institutions. We are unable to capture this subsample of students' out-of-state post-secondary enrollments.

From the above data sources, we construct measures of college enrollment, persistent enrollment, and graduation.[18] On-time-enrollment is defined as postsecondary enrollment within one year of a student's expected "on-time" high school graduation year.[19] To construct this measure, we exclude college-high school dual enrollments, i.e., we restrict our on-time-enrollment measures by only considering college enrollment occurring after high school. Furthermore, we restrict our in-state public enrollment outcomes by excluding students who were only enrolled in basic, developmental, or remedial courses. Lastly, we restrict our in-state enrollment measures to students enrolled in a bachelor's or an associate's degree program.

In addition to any college enrollment, we construct measures of enrollment in in-state, out-of-state, 2-year, 4-year, in-state 4-year, out-of-state 4-year, and very competitive 4-year postsecondary institutions, where "very competitive" is defined as any college whose selectivity is rated as "very competitive" or higher by Barron's data.

We create indicators of whether the student has been persistently enrolled in a postsecondary institution in each of the t academic years after on-time high school graduation, where t is set equal to 2, 3, 4, and 5. Additionally, we set this indicator equal to 1 if the student earned a bachelor's degree during or before year t. Thus, for example, this indicator for persistent enrollment through t=5 would be equal to one if either the student was enrolled in any

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[18] We take the following approach to account for missing out-of-state data. First, we note that we have missing data on out-of-state enrollment, persistence, and graduation outcomes for 351,161 students who are not in our random sample submitted to the NSC. For outcomes constructed only from out-of-state data, we impute these out-of-state outcome variables for these 351,161 students based on the 132,167 we observe. We use chained multiple imputations models and create 10 imputed datasets for these outcomes. After imputing these values, we are able to construct our composite college outcomes measures e.g. any college enrollment, from our non-imputed in-state outcomes and the out-of-state outcomes from the 10 imputed datasets (van Buuren, Boshuizen, and Knook, 1999). We evaluate impacts by combining results from these ten datasets following Rubin (1987). This process also fills in values for missing covariates, including those shown in Table 1.

[19] Expected on-time high school graduation dates were determined from the cohort to which a student belongs assuming normal grade progression.

11

postsecondary institution in each of the years 1, 2, 3, 4, and 5 after high school or had earned a bachelor's degree during any of these years.

For our postsecondary degree attainment measures, we construct four measures: graduating with an associate's degree within 2 and 3 years of a student's on-time high school graduation, and graduating with a bachelor's degree within 4 and 5 years of a student's on-time high school graduation.

For our triple-difference models (described below in Section 3b), we compare the experiences of CBS-Eligible students to a group of students whom we call "CBS Border-Eligible". CBS Border-Eligible students were eligible for FRPL in grades just before or just after, *but* not during the grades used to determine CBS eligibility (or CBS Pseudo-Eligibility). These students are, for the purposes of determining CBS-Eligibility, economically disadvantaged in the wrong grades to be eligible. For instance, for students in cohort 3 (the first post-policy cohort), a CBS Border-Eligible student was either FRPL eligible in 7th grade, 10th grade, or both 7th and 10th grade, but not in 8th or 9th grade. Being FRPL eligible in 8th or 9th grade would have made them eligible for the CBS. If a student is neither CBS Border-Eligible, CBS Eligible, or CBS Pseudo-Eligible, we label them henceforth, "Ineligible" students. These definitions are graphically depicted by Figure 1.

Students may be income eligible for CBS and yet do not receive benefits from the Supplemental Nutrition Assistance Program (SNAP), TANF, the Food Distribution Program on Indian Reservations (FDPIR), or FRPL.[20] As such, for constructing our definition of CBS

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[20] Washington State began direct certification of children in TANF households as eligible for free meals in 2003-04 (Neuberger, 2006) and, as of 2007-08, 76 percent of Washington's children in SNAP households were directly certified for free school meals (Ranalli et al., 2008). By 2008-09, all school districts in the U.S. were required by the 2004 Child Nutrition and WIC Reauthorization Act to directly certify recipients of SNAP and FDPIR as eligible for

eligibility these students are missed by our existing administrative data. Of the students who are truly eligible for the CBS, we estimate that our definition of "Eligible" misses approximately 13.4 percent of these students.[21]

It is difficult to know how misclassifying these students might affect our findings. Bias could be introduced if the college enrollment outcomes of income-eligible-only students in either the eligible or border-eligible group responded to the CBS implementation, but only if one group responded and not the other. However, the direction (and magnitude) of any potential bias associated with CBS implementation is uncertain. Classifying students as ineligible who are actually eligible for the program would lead to a downward bias in the estimation of the program effect if the program had a beneficial impact on them. But, on the other hand, this is a group of students who are seemingly unresponsive to other needs based federal programs i.e., being eligible for other federal assistance programs based on income, but not applying for them, suggesting they might also be unresponsive to the CBS program. In this case, misclassifying this treated group as untreated could introduce a positive bias on the estimation of the program's effect, as the true treatment effect would be a weighted average of the more positive effect included in our estimate and the less positive effect for the treated group who is misclassified.[22]

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free meals under the National School Lunch Program. Thus, all TANF and nearly all SNAP and FDPIR recipients should be coded as a FRPL-eligible in our administrative data.

[21] This calculation is based on our analysis of 3,245 youth aged 12-14 in families included in the first three waves of the 2008 Survey of Income and Program Participation (SIPP). If we restrict the analysis to Washington youth (only 93 observations), we find a comparable rate of youth eligible for CBS based solely on family income (17.7 percent), which is not significantly different than the full sample given the small sample size. [Recipients of the Food Distribution Program on Indian Reservations (FDPIR) are directly certified as eligible for free lunches, but SIPP does not collect data on FDPIR participation. Since we capture these youth as FRPL-eligible from school administrative data, our estimate of the fraction that we miss, 13.4 percent, is an upper-bound estimate. Using data in Usher, Shanklin, and Wildfire (1990), Snyder and Dillow (2011), and USDA (2012), we estimate that 0.05 (0.10) percent of U.S. (Washington) 8th grade students participate in FDPIR.]

[22] If the income-eligible-only students are *completely* unresponsive to CBS, then our difference-in-differences method described below would generate intent-to-treat effects that are overestimated by a factor of 1/(1-13.4%).

Panel A of Table 1 provides descriptive statistics for student outcomes. Notably, we see sizable increases in college enrollment of CBS-Eligible youth during the first year after high school, rising from 31.5% pre-policy to 36.5% post-policy. Our analytic methods will seek to establish whether this rise in college enrollment should be attributed to the effect of the CBS policy versus secular events that would have increased enrollment of CBS-Eligible students in the absence of the policy.

Among youth in the pre-policy cohorts, CBS Pseudo-Eligible students were substantially less likely to attend a postsecondary institution immediately after high school than ineligible students (31.5% versus 61.1%). There were also substantial gaps in attending a very competitive 4-year college after high school (4.5% versus 18.3%), persisting to the fifth year after high school (10.9% versus 31.5%), and attaining a bachelor's degree within five years (6.7% versus 24.5%).

As shown in the last column of Table 1, during the pre-policy period, CBS Border-Eligible students were also much less likely to enroll in college, persist, and graduate than the average ineligible student. Based on their low rates of collegiate success, Border-Eligible students were almost as disadvantaged as CBS-Eligible students and thus form a reasonable counterfactual. However, we should add a note of caution in this assertion. Recall that Border-Eligible students are eligible for FRPL in one or two grades during early high school and middle school. However, they are *also* ineligible for FRPL in at least two other grades between middle school and early high school and thus they are not consistently enrolled in FRPL. Their level of economic disadvantage is "transitory" in comparison to students who are persistently eligible for FRPL. In light of this, the group of Pseudo-Eligible/Eligible students are slightly more economically disadvantaged than Border-Eligible students, because this group consists of both

14

students who were eligible for FRPL for one or two of the right grades (right for CBS eligibility) and those students who were persistently eligible for FRPL.

Panel B of Table 2 shows descriptive statistics for student characteristics that are used as control variables in our subsequent regressions. Eligible students are far more likely than Ineligible students to be migrants, homeless, from a household where English is not the primary language, Hispanic or African American, and from Eastern Washington. Eligible students have lower 7th grade test scores, but these disparities narrowed somewhat, with the reading test score disparity narrowing from -0.68 s.d. pre-policy to -0.63 s.d. post-policy.

3b.   *Analytic Approach*

Our beginning analytic strategy is to utilize a difference-in-differences (henceforth, "DnD") analysis to compare differences in outcomes of those who meet the CBS eligibility requirements in cohorts before (Cohorts 1 and 2 i.e. Pseudo-Eligible students) and after (Cohorts 3, 4, 5, and 6 i.e. Eligible students) the introduction of the implementation of the CBS program (the first difference), and compare this to cross-cohort differences in outcomes for students who do not meet the eligibility requirements (the second difference), i.e. Border-Eligible and Ineligible students. By comparing Eligible students to Border-Eligible and Ineligible students in our DnD approach, rather than CBS pledge signers, our models are designed within an Intent-to-Treat (ITT) framework. [23] This DnD analysis is expressed in Equation 1:

(1) $Y_{imt} = \beta_m + \beta_1 CBS\_Eligible_i \times Post_t + \beta_2 CBS\_Eligible_i + \beta_3 Post_t + \beta_4 FRPL_i + \beta_5 X_i + \varepsilon_{imt}$

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[23]As we noted above, earlier studies (e.g. St. Johns et al.) of early commitment programs often compared students who signed the pledge to non-pledge signers, but pledge signers are likely to be different from non-pledge signers in unobservable ways that are likely to be positively correlated to college going; consequently, models that compare pledge signers to non-pledge signers would likely result in positively biased estimates of the program effect. The analytic approach we employ avoids this potential problem.

Y_{imt} is the outcome for student i attending middle school m in cohort t. β_m are middle school

fixed effects based on the student's enrollment during the fall of 8th grade. $Post_t$ is an indicator

that equals one if the student is in post-policy Cohorts 3, 4, 5, or 6. $CBS\_Eligible_i$ is an indicator

for being Eligible (or Pseudo-Eligible) for the CBS program as described above. $FRPL_i$ is a

vector containing the full set of possible patterns of FRPL eligibility during grades 6, 7, 8, 9, and

10 (i.e., just 6th, just 7th, just 8th, just 9th, just 10th, 6th & 7th, 6th & 8th, …., and eligibility in all five

grades). X_i is a vector of individual student characteristics as listed in Table 1. ε_{imt} is the error

term.[24,25]

We include 8th grade middle school effects to account for unobserved middle school

factors that might influence both the identification of student eligibility for the CBS program and

a student's academic trajectory.[26] The inclusion of $FRPL_i$ as a set of control variables will

capture the pattern of the student's disadvantage which is likely to have strong effects on student

outcomes (Michelmore & Dynarski, 2016).[27]

The key policy variable upon which we focus is $CBS\_Eligible_i \times Post_t$. As with all

difference-in-differences analyses, the internal validity of the estimate as revealing the true

causal effect of the policy relies on the parallel trends assumption. The identifying assumption

for our DnD design is that changes in outcomes across cohorts for those who were ineligible for

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[24] For all models, we use a linear probability model. Using a linear probability model is preferred in this context (over a logit or probit specification) given the fact that the central part of Equation 1, reflected in the first four terms, is essentially a comparison of conditional means.

[25] For statistical inference, we use robust standard errors that are clustered at the middle school level.

[26] See Goldhaber et al. (2019a) for more on the factors that might influence whether students' sign-up for the CBS program. School culture is important in influencing student outcomes. A number of studies, for instance, finds that the high schools play and important role in influencing graduation (Dobbie & Fryer, 2009), and in explaining both the quality of the college in which postsecondary students enroll (Darolia & Koedel, 2017) and performance in college (Black, Lincove, Cullinane, & Veron, 2015; Fletcher & Tienda, 2010; Long, Iatarola, & Conger, 2009).

[27] Given the inclusion of the $FRPL_i$ vector, the coefficient on $CBS\_Eligible_i$ is barely identified and is based on the shift in grades during which students in Cohorts 3, 4, 5, and 6 were able to sign-up for CBS (see Figure 1). As such, the coefficient on $CBS\_Eligible_i$ is not particularly interesting and is omitted in the subsequent Tables 2-4, which shows estimated parameters.

the CBS (including both Ineligible and Border-Eligible students), which is identified by the third term of Equation 1 ($\beta_3 Post_t$), are a reasonable proxy for changes in outcomes that would have been observed for the CBS-Eligible population in the absence of the program. For this counterfactual assumption to be valid there must be no factors that influence student outcomes that shift concurrently with the implementation of the CBS program and that differentially affect students who do or do not meet the eligibility requirements.

One concern with this DnD identification strategy is that the unemployment rate in Washington had been falling during the period when these students would be making college enrollment decisions (from 10.2 percent in September 2009, to 9.8 percent (2010), 9.2 percent (2011), 7.8 percent (2012), 6.9 percent (2013), and 6.0 percent (2014)).[28] Moreover, Federal Pell grants for low-income students were increased during the Great Recession, making it is reasonable to believe that this improving labor market and shifting financial aid environment might differentially affect the college enrollment prospects of traditionally disadvantaged youth (Barr & Turner, 2013). Potentially offsetting any positive effect of the improving economy, state funding for higher education fell dramatically during this same period, falling 25.5 percent between the state's 2007-09 and 2011-13 biennium budgets, and these changes are likely to have disproportionate negative impacts on the enrollment decision of low-income students (WHECB, 2012).

Finally, we note that the first post-policy cohort entered 8th grade in 2007, in other words, at the beginning of the Great Recession. The concern here is that FRPL is relatively blunt measure of poverty, and that the Great Recession could have lowered family income in ways that are not well reflected by this poverty measure, therefore changing the composition of various

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[28] Seasonally adjusted data retrieved on June 26, 2019 from the Bureau of Labor Statistics, Local Area Unemployment Statistics, https://www.bls.gov/lau/data.htm.

comparison groups. For instance, some students might just slip below the income threshold to become CBS eligible who, in the absence of the Great Recession, would not have been. We have no particular reason to believe that the Great Recession would cause differential compositional effects across the different comparison groups (see the DnDnD discussion below), but to address this concern, we include in X_i the county unemployment rate by cohort and grade as an additional control, as there is evidence that the impact of the Great Recession varied significantly across regions (e.g. counties with large populations of historically disadvantaged racial groups experienced disproportion increases in unemployment (Thiede & Monnat, 2016).

To further capture these potential secular trends, we use a difference-in-differences-in-differences ("DnDnD") specification. This specification tests whether students that are nearly as disadvantaged as CBS-Eligible students (i.e., Border-Eligible students) appear to have similar gains to those students who are eligible for the CBS program. This specification was motivated by the recent evidence (Michelmore & Dynarski, 2016) from Michigan which shows that there is considerable intertemporal volatility in students' FRPL status. We find this is also true in Washington State; for instance, 16% of students are FRPL eligible at least once between grades 6 and 9 were also ineligible in at least one of these grades. Moreover, as described in the discussion of the descriptive statistics, this population of students is observably more similar to the CBS Eligible/Pseudo-Eligible student populations.

In this DnDnD specification, we assess whether Border-Eligible students have better relative outcomes after the implementation of the CBS program, which would indicate a secular trend improving outcomes for disadvantaged youth. Specifically, we estimate a model that includes an indicator for Border-Eligible students interacted with the post-policy indicator as shown in Equation 2.

$$(2)\ Y_{imt} = \beta_m + \beta_1 CBS\_Eligible_i \times Post_t + \beta_2 CBS\_Eligible_i + \beta_3 Post_t + \beta_4 FRPL_i + \beta_5 X_i + \\ \beta_6 Border\_Eligible_i \times Post_t + \beta_7 Border\_Eligible_i + \varepsilon_{imt}.$$

If the estimated values of β_1 and β_6 in Equation 2 are similar it would suggest a secular time trend affecting disadvantaged youth rather than an effect of the CBS program *per se*. The effect of the CBS policy is captured by the difference between β_1 and β_6. The identifying assumption for our triple-difference design is that changes in outcomes across cohorts of Border-Eligible students, relative to the Ineligible students, are a reasonable proxy for changes in outcomes that would have been observed for the CBS-eligible population in the absence of the program. Put differently, we assume that the differences in outcomes between the Eligible/Pseudo-Eligible and Ineligible students, as compared to the differences between Border Eligible and Ineligible students are not correlated with confounding variables across the time period of CBS implementation.

The main threat to validity of the DnDnD specification is the possibility that Border-Eligible students respond differently to secular influences across time than CBS-Eligible students. As noted previously, by definition, students who are Border-Eligible are not chronically FRPL eligible (because we know they are not eligible in the CBS program-qualifying grades). Hence, the Border-Eligible students are slightly less disadvantaged than the CBS Eligible/Pseudo-Eligible students. Thus, the threat to validity in using this DnDnD specification to capture the policy effect is that poorer students (again, likely CBS-qualifying) may respond differently to secular time trends than students who are slightly less poor.

Before we discuss the effects, we remind the reader that our method yields intent-to-treat estimates. As shown in Goldhaber et al. (2019a), only 39% of students who are clearly eligible to sign-up for the pledge did so in the first three post-policy cohorts. To obtain the effects of the treatment on the treated students, TOT (i.e., the estimated effect of the CBS on pledge signers),

19

would entail multiplying our ITT point estimates by roughly two-and-a-half (i.e., 1/0.39).

Finally, note that a goal of the CBS is to change the college-going culture in schools. If this occurs and the benefits of this change spillover to students who are ineligible to receive the CBS, then our estimates may be downwardly biased.

4. Results

Table 2 shows the estimated effects of the CBS on postsecondary enrollment during the first years after the student should have graduated from high school given normal progression. The first column of this table shows the estimates for the effects on enrollment in any postsecondary institution and clearly shows the advantage of our preferred triple-difference specification. As shown in Panel A, using the difference-in-differences specification, we estimate that the CBS raised enrollment in any postsecondary institution during the first post-high school year by 1.7 percentage points (as shown by the bolded row). However, as shown in Panel B, this apparent increase is likely the result of a broader secular shift that improved the postsecondary enrollment of low-income youth. Note that in this specification, we find similar increases by the CBS-eligible youth (up 1.8 percentage points) and the Border-Eligible youth (up 1.7 percentage points). The difference between these groups, 0.1 percentage points, is shown in the bolded row at the bottom of the table, and this triple-difference estimate is not statistically significant. Thus, we conclude that there is no evidence that the CBS raised postsecondary enrollment during this first year after high school.

However, the subsequent columns of Table 2 suggest that the CBS caused a shift in where that initial postsecondary enrollment took place. Focusing on the triple-difference results (Panel B), we find an increase in in-state postsecondary enrollment of 1.4 percentage points (p-

20

value = 0.11) and a corresponding decrease in out-of-state postsecondary enrollment of 1.4 percentage points (p-value = 0.04). This is a large effect; only 4.9% of CBS Pseudo-Eligible students attended an out-of-state postsecondary institution, thus our results suggest a nearly 30% drop in this rate (i.e., -1.4/4.9). This shift appears to be mostly due to a shift in enrollment in 4-year institutions; we estimate that the CBS caused an increase in in-state 4-year postsecondary enrollment by 1.5 percentage points (p-value = 0.02) and a decrease in out-of-state 4-year postsecondary enrollment of 0.8 percentage points (p-value = 0.23). We find an insignificant effect on the likelihood that the student attends a very competitive 4-year institution. Although not statistically significant, the results suggest a shift from 2-year institutions (down 0.5 percentage points) to 4-year institutions (up 0.7 percentage points).

In Panel A of Appendix Table 2, we repeat the triple-difference specification, but we restrict the analysis to the 416,975 students who were enrolled in 12th grade in Washington public schools. Goldhaber et al. (2019b) found that the CBS caused a reduction in the likelihood of a student attending a Washington public school in 10th grade by 0.9 percentage points (p-value = 0.07) and lowered the likelihood of a student attending a Washington public school in 12th grade, conditional on 10th grade attendance, by 0.8 percentage points (p-value = 0.18). The authors speculate that failure to sign the pledge in middle school "may create a discouragement effect for these students during high school as they may become aware of their ineligibility to receive this source of need-based financial aid" (p. 21). The results in Panel A of Appendix Table 2 thus show the impacts for those students who persisted to 12th grade. These results are similar in direction but are modestly more positive. Again, these results show a strong and significant shift from out-of-state to in-state institutions and, while not statistically significant, the results suggest a modest increase in any post-secondary enrollment (up 0.7 percentage

points), and a shift from 2-year institutions (down 0.1 percentage points) to 4-year institutions (up 0.9 percentage points).

Table 3 repeats the analysis, but now estimates the effects on enrollment during any point within the first five years after on-time high school graduation. The triple-difference results are generally insignificant. Focusing on Panel B, the strongest results suggest a 1.6 percentage point increase in the likelihood of attending any postsecondary institution (p-value = 0.21), a 1.9 percentage point increase in the likelihood of attending a 2-year postsecondary institution (p-value = 0.10), and a 2.2 percentage point increase in the likelihood of attending an in-state postsecondary institution (p-value = 0.07) during these 5 years.

Table 4 presents the estimated effects on persistent enrollment and associate's and bachelor's degree attainment. Again, the triple difference results in Panel B are generally insignificant. We find some evidence that is consistent with the findings in Table 2 that suggested a shift in *initial* postsecondary enrollment from 2-year institutions to 4-year institutions – in Table 4, we estimate a slight decrease in the likelihood of attaining an associate's degree within 2 years (-0.8 percentage points, p-value = 0.06) and a slight increase in the likelihood of attaining a bachelor's degree within 5 years (+0.7 percentage points, p-value = 0.36). Given the baseline rate of attaining a bachelor's degree within 5 years for CBS Pseudo-Eligible students, which was just 8.1%, our point estimate suggests a 9% increase in this rate (i.e., 0.7/8.1).[29]

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[29] To investigate whether the impacts of the policy were increasing or decreasing in magnitude during the first four years of implementation, we modified Equations (1) and (2) by replacing $Post_t$ with a set of indicators for $Cohort3_t$, $Cohort4_t$, $Cohort5_t$, and $Cohort6_t$ and added interactions of these variables with $CBS\_Eligible_i$ and $Border\_Eligible_i$. Using these modified specifications, we did not find any clearly evident pattern of change in the impacts.

5. Discussion and Conclusions

From the perspective of state legislators who sought to reduce barriers to college entry and thus facilitate higher educational attainment for low-income youth, these results would likely be seen as somewhat disappointing. Our top-line findings are a 0.1 percentage-point increase in the likelihood of attending any postsecondary institution within one year of expected high school graduation, a 1.6 percentage-point increase in the likelihood of attending any postsecondary institution within five years, and a 0.7 percentage-point increase in the likelihood of earning a bachelor's degree within five years, with each of these estimated effects being statistically insignificant (p-values = 0.92, 0.21, and 0.36, respectively).[30] These findings, however, should not be surprising since Goldhaber et al. (2019b) found little evidence that the CBS program (and the early commitment element in particular) improved the trajectory of high school outcomes.

Yet, CBS eligible students are significantly more likely to enroll in an in-state college, relative to out-of-state colleges. This result is consistent with evidence from other state aid programs, e.g., Cornwell et al.'s (2006) analysis of the Georgia HOPE scholarship. This shift aligns with the programmatic design of the CBS, as scholarship money can only be used at in-state institutions. This shifting of students from out-of-state to in-state institutions may well be of value to Washington given concerns about the education level of the Washington State workforce.

Washington's College Bound Scholarship is estimated to have smaller effects than those found for some place-based early promise scholarship programs. For example, Page et al. (2018) conclude, "as a result of Promise eligibility, Pittsburgh Public School graduates are approximately 5 percentage points more likely to enroll in college, particularly four-year

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[30] Given our standard errors, we would have power to identify these effects as statistically significant if the point estimates had been above 1.8, 2.4, and 1.5 percentage points, respectively.

institutions; 10 percentage points more likely to select a Pennsylvania institution; and 4 to 7 percentage points more likely to enroll and persist into a second year of postsecondary education" (p. 2).

There are a couple plausible reasons explaining why Washington's pledge program is found to be less impactful than place-based early promise programs. The pledge requirement will certainly cause the program to fail to impact some disadvantaged students who do everything but satisfy the signing of the pledge in middle school and are thus ineligible to receive CBS funding. Indeed, it is possible that this causes discouragement amongst some of the eligible students as those who fail to sign the pledge may become aware of the significant missed opportunity to receive college funding as they near college age, causing them to be less attached to the idea of pursuing continued schooling. This is consistent with earlier findings (Goldhaber et al., 2019b) that CBS eligible students are less likely to remain enrolled though the 12th grade, and the slightly more positive findings for college enrollment for those eligible students who remain enrolled in Washington schools in the 12th grade.

Combining the possibility of discouragement with the lack of evidence that the CBS improves educational trajectories in high school suggests that the CBS program could be designed or implemented differently in order to more effectively accomplish the goal of increasing post-secondary educational attainment. In particular, we argue that more ought to be done to ensure that the possibility of going to college is made more salient to pledge signers and that they receive more specific guidance about college preparation while in high school.

We encourage state legislators to consider making the "promise" of funding more certain. The State of Washington recently took a step in this direction with regard to its older financial aid program. Legislators passed the Washington College Grant as part of its Workforce

Education Investment Act in spring 2019. This act converted the state's traditional college

financial aid program, the State Need Grant, which was underfunded in many years, into an

entitlement program (Long, 2019; Zumeta, 2019). On the surface, this guarantee of financial aid

for needy students seems as if it will lessen the importance of the College Bound Scholarship.

However, note this new entitlement has eligibility determined when the student is a high school

senior after completing the Free Application for Federal Student Aid (FAFSA). As such, this

new source of aid will remain an uncertain prospect for low-income *middle school* students given

uncertainty in their parent's future income. That is, this new program does not replace the CBS's

early commitment of funding for low-income students. We contend than an early commitment

promise program would yield the benefits of changing needy students' expectations and

behaviors in ways that are more effective than the state's current programs.

Additionally, we argue that the State should do away with the pledge as a requirement for

CBS receipt, thus converting CBS from an early commitment *pledge* program to an early

commitment *promise* program. To the extent that the pledge requirement itself is not beneficial

in leading to better high school preparation, then there are clearly benefits to making the CBS

funding available to income-eligible students who fail to sign the pledge. Surely some of those

who fail to sign the pledge are students who have the capacity to do well in college but develop

strong college aspirations after middle school and thus after the closing of the pledge signing

window.

We acknowledge the issue that if a promise of funding was made to all low-income

middle school students, some of those students might not remain low-income late into high

school. Such fortunate students whose parent's income rises during these years may not be as

worthy of need-based financial aid. However, this group is unlikely to be large and making this

promise guaranteed would create more clarity for all low-income middle school students, the vast majority of whom stay low-income into high school. Finally, note that by eliminating the requirement that the family's income remain low through to FAFSA completion (i.e., below 65% of the state's median income), would remove any disincentive for growth in parental income.

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Figure 1: Definition of CBS Eligible, Pseudo-Eligible, and Border Eligible

	Cohort	Year Entering 8th Grade	6	7	8	9	10
					Grade		
Pre-Policy	1	2005-06		Border	Pseudo-Eligible		Border
Pre-Policy	2	2006-07		Border	Pseudo-Eligible		Border
Post-Policy	3	2007-08		Border	--- CBS Eligible ---		Border
Post-Policy	4	2008-09	Border	--- CBS Eligible ---		Border	
Post-Policy	5	2009-10	Border	--- CBS Eligible ---		Border	
Post-Policy	6	2010-11	Border	--- CBS Eligible ---		Border	

Notes: "CBS-Eligible" includes post-policy cohort students who were enrolled in foster care or eligible for free or reduced-price lunch in a grade that would have made the student eligible to sign the CBS pledge. "Pseudo-Eligible" includes pre-policy cohort students who were enrolled in foster care or eligible for free or reduced-price lunch in 8th or 9th grade. "Border-Eligible" includes post-policy cohort students who are ineligible but who were enrolled in foster care or eligible for free or reduced-price lunch in a grade that is adjacent to the grades in would have made the student eligible (or pseudo-eligible) to sign the CBS pledge. For example, a border-eligible student from cohort 3 may be eligible for free or reduced-price lunch in 7th or 10th grade, but not in 8 or 9th grade. "Ineligible students" are neither border-eligible or eligible/pseudo-eligible.

Table 1: Descriptive Statistics for Student Outcomes and Characteristics by Eligibility Status, Pre- and Post-Policy

		(1)	(2)	(3)	(4)	(5)	(6)
			Eligible Students		Ineligible Students		
	Variable	All Students	Pre-Policy (Pseudo-Eligible)	Post-Policy	Pre-Policy	Post-Policy	Pre-Policy, Border Eligible
Panel A: Student Outcomes	Enrolled at any:						
	PSE Inst. Within 1 Year of On-Time HS Graduation Date	0.502	0.315	0.365	0.611	0.646	0.417
	2-Year PSE Inst. Within 1 Year of On-Time HS Graduation Date	0.269	0.217	0.245	0.287	0.302	0.237
	4-Year PSE Inst. Within 1 Year of On-Time HS Graduation Date	0.272	0.129	0.143	0.379	0.392	0.214
	In-State PSE Inst. Within 1 Year of On-Time HS Graduation Date	0.393	0.268	0.293	0.486	0.483	0.319
	Out-of-State PSE Inst. Within 1 Year of On-Time HS Graduation Date	0.119	0.049	0.077	0.135	0.180	0.103
	In-State 4-Year PSE Inst. Within 1 Year of On-Time HS Graduation Date	0.193	0.099	0.113	0.265	0.265	0.136
	Out-of-State 4-Year PSE Inst. Within 1 Year of On-Time HS Graduation Date	0.081	0.030	0.030	0.116	0.130	0.078
	Very Competitive 4-Year PSE Inst. Within 1 Year of On-Time HS Graduation Date	0.130	0.045	0.056	0.183	0.204	0.087
	PSE Inst. Within 5 Years of On-Time HS Graduation Date †	0.621	0.474	0.481	0.735	0.737	0.564
	2-Year PSE Inst. Within 5 Years of On-Time HS Graduation Date †	0.418	0.375	0.366	0.457	0.439	0.394
	4-Year PSE Inst. Within 5 Years of On-Time HS Graduation Date †	0.386	0.220	0.245	0.506	0.530	0.324
	In-State PSE Inst. Within 5 Years of On-Time HS Graduation Date †	0.514	0.401	0.406	0.601	0.595	0.437
	Out-of-State PSE Inst. Within 5 Years of On-Time HS Graduation Date †	0.164	0.107	0.107	0.209	0.216	0.179
	In-State 4-Year PSE Inst. Within 5 Years of On-Time HS Graduation Date †	0.271	0.152	0.176	0.354	0.372	0.193
	Out-of-State 4-Year PSE Inst. Within 5 Years of On-Time HS Graduation Date †	0.135	0.076	0.077	0.181	0.190	0.146
	Very Competitive 4-Year PSE Inst. Within 5 Years of On-Time HS Graduation Date †	0.168	0.070	0.077	0.240	0.258	0.134
	Persistently Enrolled Through:						
	Second Year after On-Time HS Graduation Date	0.407	0.234	0.261	0.518	0.552	0.325
	Third Year after On-Time HS Graduation Date ⬧	0.343	0.181	0.203	0.452	0.481	0.268
	Fourth Year after On-Time HS Graduation Date ‡	0.297	0.145	0.158	0.408	0.425	0.223
	Fifth Year after On-Time HS Graduation Date †	0.275	0.131	0.140	0.386	0.396	0.214
	Earned an Associate's Degree by End of:						
	Second Year after On-Time HS Graduation Date	0.065	0.033	0.040	0.080	0.089	0.051
	Third Year after On-Time HS Graduation Date	0.084	0.050	0.055	0.106	0.112	0.068
	Earned a Bachelor's Degree by End of:						
	Fourth Year after On-Time HS Graduation Date‡	0.148	0.054	0.050	0.235	0.217	0.116
	Fifth Year after On-Time HS Graduation Date†	0.200	0.081	0.079	0.300	0.292	0.152

(Table 1 is continued on the next page.)

		(1)	(2)	(3)	(4)	(5)	(6)
				Eligible Students		Ineligible Students	
	Variable	All Students	Pre-Policy (Pseudo-Eligible)	Post-Policy	Pre-Policy	Post-Policy	Pre-Policy, Border Eligible
Panel B:	Age in 8th Grade	14.35	14.40	14.39	14.30	14.31	14.35
Student	(st. dev.)	(0.46)	(0.60)	(0.46)	(0.44)	(0.39)	(0.44)
Characteristics	Female	0.485	0.483	0.484	0.481	0.490	0.479
	Migrant	0.031	0.063	0.067	0.001	0.001	0.004
	Bilingual	0.068	0.142	0.129	0.013	0.012	0.036
	Homeless	0.063	0.091	0.132	0.013	0.017	0.050
	Disabled	0.154	0.217	0.200	0.114	0.108	0.173
	Home Language not English	0.158	0.240	0.294	0.040	0.068	0.084
	Hispanic	0.170	0.269	0.310	0.051	0.067	0.104
	African American	0.044	0.073	0.064	0.026	0.022	0.036
	Asian	0.064	0.058	0.055	0.068	0.073	0.059
	Pacific Islander	0.003	0.002	0.006	0.001	0.002	0.001
	Native American	0.015	0.029	0.020	0.011	0.007	0.022
	Multi-racial	0.088	0.086	0.101	0.069	0.087	0.090
	Other Race	0.106	0.117	0.127	0.081	0.096	0.113
	Free or Reduced-Price Lunch in 6th Grade	0.433	0.838	0.865	0.083	0.054	0.501
	Free or Reduced-Price Lunch in 7th Grade	0.430	0.866	0.906	0.056	0.010	0.620
	Free or Reduced-Price Lunch in 8th Grade	0.427	0.908	0.907	0	0	0
	Free or Reduced-Price Lunch in 9th Grade	0.428	0.906	0.882	0	0.041	0
	Free or Reduced-Price Lunch in 10th Grade	0.422	0.832	0.835	0.042	0.076	0.455
	Free or Reduced-Price Lunch in 11th Grade	0.420	0.769	0.809	0.075	0.100	0.398
	Free or Reduced-Price Lunch in 12th Grade	0.417	0.739	0.778	0.106	0.117	0.373
	7th Grade Math (WASL) Test	-0.02	-0.45	-0.39	0.29	0.33	-0.05
	(st. dev.)	(0.98)	(0.91)	(0.89)	(0.91)	(0.92)	(0.91)
	7th Grade Reading (WASL) Test	-0.02	-0.42	-0.35	0.26	0.28	-0.05
	(st. dev.)	(0.98)	(0.93)	(0.97)	(0.91)	(0.89)	(0.91)
	Took Modified Version of the WASL (7th Grade)	0.0098	0.0063	0.0176	0.0031	0.0081	0.0053
	High School in Western Washington (Excl. Puget Sound Region)	0.166	0.155	0.167	0.166	0.169	0.169
	High School in Eastern Washington	0.206	0.238	0.257	0.166	0.169	0.211
	County's Unemployment Rate in 7th Grade	6.60	5.97	7.34	5.49	6.81	5.60
	(st. dev.)	(2.41)	(1.35)	(2.68)	(1.20)	(2.70)	(1.32)
	County's Unemployment Rate in 8th Grade	7.22	5.55	8.49	5.02	8.04	5.28
	(st. dev.)	(2.68)	(1.42)	(2.57)	(1.26)	(2.64)	(1.28)
	County's Unemployment Rate in 9th Grade	7.80	5.45	9.37	4.89	9.04	5.17
	(st. dev.)	(2.62)	(1.51)	(1.90)	(1.39)	(1.89)	(1.46)
	County's Unemployment Rate in 10th Grade	8.25	6.65	9.39	6.21	9.06	6.54
	(st. dev.)	(2.34)	(1.90)	(1.90)	(1.97)	(1.91)	(1.98)
	County's Unemployment Rate in 11th Grade	8.53	9.01	8.54	8.83	8.13	8.93
	(st. dev.)	(2.00)	(2.04)	(1.93)	(2.10)	(1.91)	(2.09)
	County's Unemployment Rate in 12th Grade	8.25	9.92	7.61	9.87	7.17	9.71
	(st. dev.)	(2.16)	(1.68)	(1.89)	(1.59)	(1.84)	(1.71)
Number of Students (Cohorts 1-6)		489,161	74,008	151,291	94,023	169,839	7,298

Notes:

† Available for cohorts 1-3.

‡ Available for cohorts 1-4.

⁎ Available for cohorts 1-5.

WASL = Washington Assessment of Student Learning, standardized within grade and cohort. When 7th grade math or reading scores are missing, we have imputed them using multiple imputations. The summary statistics provided here have been combined via Rubin's rule.

Puget Sound Region includes King, Pierce, Kitsap, Thurston, and Snohomish counties. Western and Eastern Washington divided by the Cascade Mountains.

Table 2: Estimated Effects of Washington's College Bound Scholarship Program on Postsecondary Enrollment Within 1 Year of On-Time High School Graduation

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Enrolled in Any Postsecondary Institution	Enrolled in a 2-Year Postsecondary Institution	Enrolled in a 4-Year Postsecondary Institution	Enrolled in an In-State Postsecondary Institution	Enrolled in an Out-of-State Postsecondary Institution	Enrolled in an In-State 4-Year Postsecondary Institution	Enrolled in an Out-of-State 4-Year Postsecondary Institution	Enrolled in a Very Competitive 4-Yr. Postsec. Institution
Panel A: Difference-in-Differences	**CBS-Eligible × Post-Policy**	**0.017** ***	**0.010** ***	**0.006**	**0.021** ***	**-0.009** **	**0.013** ***	**-0.008** ***	**-0.007** **
		(0.004)	**(0.003)**	**(0.004)**	**(0.003)**	**(0.003)**	**(0.003)**	**(0.003)**	**(0.003)**
	Post-Policy	0.015 ***	0.006	0.011 **	0.009 **	0.010 **	0.007 *	0.005	0.011 ***
		(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
	Observations	489,161	489,161	489,161	489,161	489,161	489,161	489,161	489,161
Panel B: Difference-in-Differences-in-Differences	CBS-Eligible × Post-Policy	0.018 ***	0.011 ***	0.006	0.021 ***	-0.008 **	0.013 ***	-0.008 ***	-0.007 **
		(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	Border-Eligible × Post-Policy	0.017 *	0.016 *	-0.001	0.007	0.006	-0.002	0.000	-0.009 *
		(0.009)	(0.009)	(0.008)	(0.009)	(0.006)	(0.007)	(0.006)	(0.006)
	Post-Policy	0.013 ***	0.005	0.011 **	0.009 **	0.009 **	0.007 *	0.005	0.011 ***
		(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
	(CBS-Eligible × Post-Policy) - (Border-Eligible × Post-Policy)	**0.001**	**-0.005**	**0.007**	**0.014**	**-0.014** **	**0.015** **	**-0.008**	**0.002**
		(0.009)	**(0.008)**	**(0.008)**	**(0.009)**	**(0.007)**	**(0.006)**	**(0.007)**	**(0.005)**
	Observations	489,161	489,161	489,161	489,161	489,161	489,161	489,161	489,161

Notes:

Evaluated using data from cohorts 1-6.

p-values from two-sided t-test: *$p \leq 0.10$, **$p \leq 0.05$, ***$p \leq 0.01$.

Additional controls include 7th grade reading and math scores, female, race/ethnicity indicators, age in 8th grade, high school region, county unemployment rate in grades 7 through 12, modified test status, bilingualism, disability status, housing status, migrant status, English Language Learning status, full set of possible patterns of FRPL eligibility during grades 6, 7, 8, 9, and 10 (i.e., just 6th, just 7th, just 8th, just 9th, just 10th, 6th & 7th, 6th & 8th, …., and eligibility in all five grades), FRPL Eligible in 11th and 12th grade, CBS-Eligible, Border-Eligible (for Panel B), and middle school fixed effects. Full regression results are available from the authors. Standard errors are clustered at the middle school level.

Table 3: Estimated Effects of Washington's College Bound Scholarship Program on Postsecondary Enrollment Within 5 Years of On-Time High School Graduation

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Enrolled in Any Postsecondary Institution	Enrolled in a 2-Year Postsecondary Institution	Enrolled in a 4-Year Postsecondary Institution	Enrolled in an In-State Postsecondary Institution	Enrolled in an Out-of-State Postsecondary Institution	Enrolled in an In-State 4-Year Postsecondary Institution	Enrolled in an Out-of-State 4-Year Postsecondary Institution	Enrolled in a Very Competitive 4-Yr. Postsec. Institution
Panel A: Difference-in-Differences	**CBS-Eligible × Post-Policy**	**0.008** *	**0.009** *	**0.006**	**0.011** **	**-0.004**	**0.009** **	**-0.004**	**-0.008** **
		(0.005)	**(0.005)**	**(0.004)**	**(0.005)**	**(0.004)**	**(0.004)**	**(0.003)**	**(0.003)**
	Post-Policy	0.014 **	0.001	0.018 ***	0.013 **	0.002	0.020 ***	0.000	0.014 ***
		(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.004)
	Observations	248,683	248,683	248,683	248,683	248,683	248,683	248,683	248,683
Panel B: Difference-in-Differences-in-Differences	CBS-Eligible × Post-Policy	0.007	0.008	0.006	0.010 **	-0.003	0.009 **	-0.004	-0.008 **
		(0.005)	(0.005)	(0.004)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)
	Border-Eligible × Post-Policy	-0.009 **	-0.012	0.002	-0.011	0.002	-0.001	0.004	-0.005
		(0.012)	(0.012)	(0.011)	(0.012)	(0.010)	(0.009)	(0.009)	(0.007)
	Post-Policy	0.015 **	0.002	0.018 ***	0.014 **	0.001	0.020 ***	0.000	0.014 ***
		(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.004)
	(CBS-Eligible × Post-Policy) - (Border-Eligible × Post-Policy)	**0.016**	**0.019** *	**0.004**	**0.022** *	**-0.006**	**0.011**	**-0.008**	**-0.004**
		(0.012)	**(0.012)**	**(0.011)**	**(0.012)**	**(0.010)**	**(0.009)**	**(0.009)**	**(0.007)**
	Observations	248,683	248,683	248,683	248,683	248,683	248,683	248,683	248,683

Notes:

Evaluated using data from cohorts 1-3.

p-values from two-sided t-test: *p<=0.10, **p<=0.05, ***p<=0.01.

Additional controls include 7th grade reading and math scores, female, race/ethnicity indicators, age in 8th grade, high school region, county unemployment rate in grades 7 through 12, modified test status, bilingualism, disability status, housing status, migrant status, English Language Learning status, full set of possible patterns of FRPL eligibility during grades 6, 7, 8, 9, and 10 (i.e., just 6th, just 7th, just 8th, just 9th, just 10th, 6th & 7th, 6th & 8th, ..., and eligibility in all five grades), FRPL Eligible in 11th and 12th grade, CBS-Eligible, Border-Eligible (for Panel B), and middle school fixed effects. Full regression results are available from the authors. Standard errors are clustered at the middle school level.

Table 4: Estimated Effects of Washington's College Bound Scholarship Program on Postsecondary Persistence and Degree Attainment

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Persistently Enrolled† Through:				Earned an Associate's Degree by End of:		Earned an Bachelor's Degree by End of:	
		Second Year after On-Time HS Graduation Date	Third Year after On-Time HS Graduation Date ‡	Fourth Year after On-Time HS Graduation Date ‡	Fifth Year after On-Time HS Graduation Date ‡	Second Year after On-Time HS Graduation Date	Third Year after On-Time HS Graduation Date ‡	Fourth Year after On-Time HS Graduation Date ‡	Fifth Year after On-Time HS Graduation Date ‡
Panel A: Difference-in-Differences	**CBS-Eligible × Post-Policy**	-0.004 (0.003)	-0.005 (0.003)	-0.001 (0.003)	0.003 (0.004)	-0.007 *** (0.002)	-0.003 (0.002)	0.015 *** (0.002)	0.009 *** (0.003)
	Post-Policy	0.024 *** (0.004)	0.023 *** (0.004)	0.022 *** (0.005)	0.012 ** (0.005)	0.008 *** (0.002)	0.008 *** (0.002)	-0.006 (0.004)	-0.002 (0.004)
	Observations	489,161	408,632	330,147	248,683	489,161	408,632	330,147	248,683
Panel B: Difference-in-Differences-in-Differences	CBS-Eligible × Post-Policy	-0.004 (0.003)	-0.005 (0.003)	-0.001 (0.003)	0.003 (0.004)	-0.007 *** (0.002)	-0.003 (0.002)	0.016 *** (0.002)	0.009 *** (0.003)
	Border-Eligible × Post-Policy	-0.003 (0.009)	-0.002 (0.008)	-0.003 (0.008)	-0.007 (0.010)	0.001 (0.004)	0.004 (0.005)	0.010 (0.007)	0.002 (0.008)
	Post-Policy	0.024 *** (0.004)	0.024 *** (0.004)	0.022 *** (0.005)	0.013 ** (0.005)	0.008 *** (0.002)	0.007 *** (0.003)	-0.006 * (0.004)	-0.002 (0.005)
	(CBS-Eligible × Post-Policy) - (Border-Eligible × Post-Policy)	**-0.001 (0.009)**	**-0.003 (0.007)**	**0.001 (0.008)**	**0.009 (0.009)**	**-0.008 * (0.004)**	**-0.007 (0.005)**	**0.006 (0.006)**	**0.007 (0.008)**
	Observations	489,161	408,632	330,147	248,683	489,161	408,632	330,147	248,683

Notes:
† Persistently Enrolled is defined as enrolled in each academic year through year *t* or received a bachelors degree by year *t*.
‡ Data for third, fourth, and fifth year after on-time high school graduation is available for cohorts 1-5, 1-4, and 1-3, respectively.
p-values from two-sided t-test: *p<=0.10, **p<=0.05, ***p<=0.01.
Additional controls include 7th grade reading and math scores, female, race/ethnicity indicators, age in 8th grade, high school region, county unemployment rate in grades 7 through 12, modified test status, out-of-grade level test status, bilingualism, disability status, housing status, migrant status, English Language Learning status, full set of possible patterns of FRPL eligibility during grades 6, 7, 8, 9, and 10 (i.e., just 6th, just 7th, just 8th, just 9th, just 10th, 6th & 7th, 6th & 8th, …., and eligibility in all five grades), CBS-Eligible, Border-Eligible (for Panel B), and middle school fixed effects. Full regression results are available from the authors. Standard errors are clustered at

Appendix Table 1: Washington State's Program and Other State Programs

	Indiana 21st Century Scholars Program	Oklahoma Promise	Washington College Bound Scholarship
Year Started	1990	1992	2007
When the Student Signs the Pledge			
Time of commitment	6th, 7th or 8th grade	8th, 9th and 10th grade	7th, 8th grade
Income Requirement When the Pledge is Signed?	No (Foster care); otherwise, Yes (Varies by household size, equivalent to eligibility for FRPL).	Yes (Family income of $50,000 or less at commitment. Special income provisions apply to children adopted from certain court-ordered custody and children in the custody of court-appointed legal guardians)	No (Identified by state as eligible for FRPL, family receives basic food/TANF benefits, or currently in foster care or a dependent of the state); otherwise, Yes (Varies by household size, equivalent to eligibility for FRPL).
When the Student Goes to College			
Income Requirement to Qualify for Scholarship?	No (Class of 2015 and Earlier); Yes (Class of 2018 and Later); Depends on when enrolled in the program (Class of 2016, 2017)	No (prior to 2012-2013); Yes (starting in 2012-2013 and Later), family income of $100,000 or less at the time the student begins college.	Yes, less than 65% of the state's Median Family Income ($53,000 for a family of four in 2012-13)
GPA Threshold	2.0 (Class of 2014 and earlier); 2.5 (Class of 2015 and later)	2.5	2
College-bound coursework requirement?	Yes	Yes	No
Requires the student to earn a specific type of diploma?	No (Class of 2016 and Earlier); Yes, a "Core 40" diploma (Class of 2017 and Later)	No	No
Other Curricular Requirements	No (Class of 2016 and Earlier); Yes -- Completion of "Scholar Success Program" (Class of 2017 and Later)	No	No
Guaranteed full tuition?	Yes (Class of 2015 and Earlier); No (Class of 2018 and Later); Depends on when enrolled in the program (Class of 2016, 2017)	Yes, full tuition at public institutions and a portion of tuition at private institutions.	Yes, plus a book allowance.
Prior Studies	(Toutkoushian et al., 2015; St. John and colleagues, 2003; 2004; 2005; 2008)	(Mendoza et al., 2009; Mendoza et al., 2012)	(Fumia et al., 2018, 2019; Goldhaber et al., 2019a, 2019b)

Sources: Harnisch (2009), Heller (2006), Indiana Division of Student Financial Aid (2013a, 2013b, 2013c), Oklahoma State Regents for Higher Education (2013a, 2013b), and Washington Student Achievement Council (2013)

Appendix Table 2: Estimated Effects of Washington's College Bound Scholarship Program Conditional on 12th Grade Enrollment

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Enrolled in Any Postsecondary Institution	Enrolled in a 2-Year Postsecondary Institution	Enrolled in a 4-Year Postsecondary Institution	Enrolled in an In-State Postsecondary Institution	Enrolled in an Out-of-State Postsecondary Institution	Enrolled in an In-State 4-Year Postsecondary Institution	Enrolled in an Out-of-State 4-Year Postsecondary Institution	Enrolled in a Very Competitive 4-Yr. Postsec. Institution
Panel A; Effects on Postsecondary Enrollment Within 1 Year of On-Time High School Graduation	CBS-Eligible × Post-Policy	0.023 ***	0.012 ***	0.010 **	0.031 ***	-0.012 **	0.020 ***	-0.011 ***	-0.006 *
		(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)
	Border-Eligible × Post-Policy	0.017 *	0.013	0.001	0.009	0.004	0.001	-0.001	-0.009
		(0.010)	(0.010)	(0.009)	(0.010)	(0.005)	(0.008)	(0.005)	(0.006)
	Post-Policy	0.017 ***	0.010 *	0.010 *	0.008	0.014 **	0.003	0.007 **	0.010 ***
		(0.005)	(0.006)	(0.006)	(0.005)	(0.004)	(0.005)	(0.003)	(0.004)
	(CBS-Eligible × Post-Policy) - (Border-Eligible × Post-Policy)	**0.007**	**-0.001**	**0.009**	**0.021 ** **	**-0.016 *** **	**0.019 *** **	**-0.010**	**0.003**
		(0.010)	**(0.010)**	**(0.009)**	**(0.010)**	**(0.006)**	**(0.007)**	**(0.006)**	**(0.006)**
	Observations	416,975	416,975	416,975	416,975	416,975	416,975	416,975	416,975
		Enrolled in Any Postsecondary Institution	Enrolled in a 2-Year Postsecondary Institution	Enrolled in a 4-Year Postsecondary Institution	Enrolled in an In-State Postsecondary Institution	Enrolled in an Out-of-State Postsecondary Institution	Enrolled in an In-State 4-Year Postsecondary Institution	Enrolled in an Out-of-State 4-Year Postsecondary Institution	Enrolled in a Very Competitive 4-Yr. Postsec. Institution
Panel B: Effects on Postsecondary Enrollment Within 5 Years of On-Time High School Graduation	CBS-Eligible × Post-Policy	0.012 **	0.011 **	0.010 **	0.019 ***	-0.007 *	0.016 ***	-0.007 *	-0.006
		(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
	Border-Eligible × Post-Policy	-0.007	-0.012	0.002	-0.009	0.001	0.000	0.003	-0.004
		(0.012)	(0.013)	(0.012)	(0.012)	(0.010)	(0.010)	(0.010)	(0.008)
	Post-Policy	0.022 ***	0.004	0.026 ***	0.019 **	0.005	0.025 ***	0.004	0.015 ***
		(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.006)	(0.005)
	(CBS-Eligible × Post-Policy) - (Border-Eligible × Post-Policy)	**0.020**	**0.023 ** *	**0.008**	**0.028 ** **	**-0.008**	**0.016**	**-0.009**	**-0.002**
		(0.013)	**(0.013)**	**(0.012)**	**(0.013)**	**(0.010)**	**(0.010)**	**(0.010)**	**(0.008)**
	Observations	209,680	209,680	209,680	209,680	209,680	209,680	209,680	209,680

		Persistently Enrolled† Through:				Earned an Associate's Degree by End of:		Earned an Bachelor's Degree by End of:	
		Second Year after On-Time HS Graduation Date	Third Year after On-Time HS Graduation Date ‡	Fourth Year after On-Time HS Graduation Date ‡	Fifth Year after On-Time HS Graduation Date ‡	Second Year after On-Time HS Graduation Date	Third Year after On-Time HS Graduation Date ‡	Fourth Year after On-Time HS Graduation Date ‡	Fifth Year after On-Time HS Graduation Date ‡
Panel C: Effects on Postsecondary Persistence and Degree Attainment	CBS-Eligible × Post-Policy	0.000	-0.001	0.002	0.005	-0.005 ***	-0.002	0.017 ***	0.010 **
		(0.004)	(0.003)	(0.004)	(0.004)	(0.002)	(0.002)	(0.003)	(0.004)
	Border-Eligible × Post-Policy	-0.003	-0.001	-0.002	-0.008	0.003	0.006	0.010	0.002
		(0.009)	(0.009)	(0.009)	(0.011)	(0.005)	(0.006)	(0.007)	(0.009)
	Post-Policy	0.026 ***	0.029 ***	0.024 ***	0.016 **	0.007 **	0.008 **	-0.008 *	-0.002
		(0.005)	(0.005)	(0.006)	(0.007)	(0.003)	(0.003)	(0.004)	(0.006)
	(CBS-Eligible × Post-Policy) - (Border-Eligible × Post-Policy)	**0.002**	**0.000**	**0.005**	**0.013**	**-0.009 ** *	**-0.008**	**0.006**	**0.008**
		(0.009)	**(0.009)**	**(0.009)**	**(0.011)**	**(0.005)**	**(0.006)**	**(0.006)**	**(0.009)**
	Observations	416,975	347,208	279,644	209,680	416,975	347,208	279,644	209,680

Notes:

Panel A is evaluated using data from cohorts 1-6.

Panel B is evaluated using data from cohorts 1-3.

† Persistently Enrolled is defined as enrolled in each academic year through year t or received a bachelors degree by year t.

‡ Data for third, fourth, and fifth year after on-time high school graduation is available for cohorts 1-5, 1-4, and 1-3, respectively.

p-values from two-sided t-test: *p<=0.10, **p<=0.05, ***p<=0.01.

Additional controls include 7th grade reading and math scores, female, race/ethnicity indicators, age in 8th grade, high school region, county unemployment rate in grades 7 through 12, modified test status, bilingualism, disability status, housing status, migrant status, English Language Learning status, full set of possible patterns of FRPL eligibility during grades 6, 7, 8, 9, and 10 (i.e., just 6th, just 7th, just 8th, just 9th, just 10th, 6th & 7th, 6th & 8th, …., and eligibility in all five grades), FRPL Eligible in 11th and 12th grade, CBS-Eligible, Border-Eligible (for Panel B), and middle school fixed effects. Full regression results are available from the authors. Standard errors are clustered at the middle school level.