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*Pledging to Do "Good": An  
Early Commitment Pledge  
Program, College  
Scholarships, and High  
School Outcomes in  
Washington State*

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# **Pledging to Do "Good": An Early Commitment Pledge Program, College Scholarships, and High School Outcomes in Washington State**

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## **Abstract**

Indiana, Oklahoma, and Washington each have programs designed to address college enrollment 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 estimate the effects of Washington's College Bound Scholarship program on students' high school grades, high school graduation, juvenile detention and rehabilitation, and incarceration in state prison during high school or early adulthood. We find insignificant and substantively small or negative effects on these outcomes. These results call into question the rationale for such early commitment programs.

## Early Commitment Pledge Programs

The past eight decades have witnessed significant increases in the proportion of U.S. students enrolling and graduating from college (Ryan and Bauman, 2016). Despite this progress, substantial educational attainment gaps still exist between low- and high-income students (Ziol-Guest and Lee, 2016; Duncan, Kalil, and Ziol-Guest, 2017). Aud et al. (2011), for instance, report a 29-percentage-point gap between students from low- and high-income families in the share attending either a two- or four-year college in the fall immediately after completing high school, and Kena et al. (2015) report a 45-percentage-point gap in graduation from college.

Empirical research has identified a variety of factors that contribute to the persistence of college enrollment gaps, but perhaps the most important is that disadvantaged students often lack the academic preparation necessary to succeed in college (Rosenbaum, 2001; Kirst, Venezia, & Antonio 2004; Jacob & Linkow, 2011). There are also disparities in the probability of involvement in criminal activity, which has been found to have clear negative effects on the probability of college enrollment (Apel & Sweeten, 2009; Kirk & Sampson, 2013) and completion (Tanner, Davies, & O'Grady, 1999). Fumia (2013) finds that incarceration by age 18 reduces the probability of high school degree receipt by 22-percentage points and bachelor's degree receipt by 4-percentage points.

States have attempted to improve college readiness, of low-income youth, in particular, through a variety of initiatives<sup>1</sup>. Three states are addressing college attainment gaps using state-based financial aid programs that offer low-income students an early promise of funding for college in exchange for their making a pledge. Pledges, made during 7th-9th grades, have students promise to do well in high school, be a good citizen (e.g., by not committing a felony),

and complete a FAFSA. These “early commitment pledge programs” are hypothesized to directly help low-income students by making college more affordable and, importantly, the early promise of funding is thought to set them on the right path by creating a strong incentive for them to do well in high school, avoid criminal activity, and fulfill pledge requirements. Understanding whether these types of programs increase student achievement and college readiness is immensely important, but much of the existing evidence of such programs is weak, primarily because prior studies have lacked data necessary to establish suitable control groups.

Washington State’s “College Bound Scholarship Program” (henceforth the “CBS”) is an early commitment need-based scholarship program designed to encourage economically disadvantaged middle school students to “choose a path that will lead to educational success after high school.” The goal of this paper is to evaluate whether this policy has met the legislative intent to improve the antecedent conditions required for low-income youth to successfully enter college. We estimate the effects of eligibility for the CBS on: high school grades; high school graduation; the probability that students remain enrolled in Washington state public high schools; whether students are in juvenile detention or rehabilitation centers in 10<sup>th</sup> and 12<sup>th</sup> grades; and the likelihood of incarceration during high school or early adulthood.

Using a difference-in-differences-in-differences identification strategy – incorporating differences between eligible, nearly eligible, and ineligible students before and after the availability of the CBS program – we find substantively small and statistically insignificant and/or negative effects on the academic outcomes. There is some suggestive evidence that eligibility reduces the likelihood of incarceration, but the estimates are not statistically significant and sensitive to model specification.

## **The CBS Program and Evidence on Other Early Commitment Pledge Programs**

### **The Washington CBS Program**

The CBS was created by the Washington legislature in 2007 and was patterned on similar programs in Indiana (21<sup>st</sup> Century Scholars program initiated in 1990) and Oklahoma (Oklahoma's Promise initiated in 1996), but as we describe below, the Washington program has some features that differentiate it from similar early commitment pledge programs.

Early commitment pledge programs are similar to merit scholarship programs that are available in many states (Georgia's HOPE Scholarship Program is particularly well-known), in that they require students to earn a certain high school GPA to be eligible for receipt of the funds, but they differ from merit scholarship programs in that they are income-contingent (i.e., available only to low-income students) and require the signing of a pledge in the early high school or middle school grades. The outcomes of non-early commitment (i.e. different from the one we focus on here) scholarship programs have been investigated widely. These programs tend to have positive impacts on in-state college matriculation and an increase in credit attainment (e.g. Bartik, Hershbein, and Lachowka, 2017; Carruthers and Özek, 2016; Page, Iriti, Lowry, & Anthony, 2018; Scott-Clayton, 2011; Cornwell et al., 2006; Perna and Leigh, 2017; Sjoquist and Winters, 2014).

Early commitment pledge programs are similar to other place based "Promise-style" programs that guarantee college financial aid to students who graduate from particular high schools (e.g., those from a single school district) and have resided in the district for some number of years. These programs are modeled on the Kalamazoo Promise program, which began in 2005. Literature on the effects of local (municipal or county level) promise programs, like the Kalamazoo Promise, is mixed. On the one hand, evidence from the Kalamazoo Promise and The



Knox Archive (the predecessor to the Tennessee Promise) suggest that place-based promise programs increase the likelihood of college enrollment among eligible students (Bartik, Hershbein, Lachowska, 2017; Carruthers & Fox, 2016). But a randomized controlled trial in Milwaukee public schools (Harris et al., 2018) finds no effect on college enrollment (Harris et al., 2018). These mixed findings may reflect localized differences in student populations, program requirements, or local college availability. For more information about the types of scholarship programs throughout the country including those discussed here, see LeGower and Walsh (2017) and Perna and Leigh (2017).

Importantly, one aim of these promise and early commitment programs is to increase college attainment through better high school preparation; the literature on whether they affect high school outcomes is quite limited. Studies that examine high school outcomes tend to be on programs with substantial programmatic differences from the CBS. For instances, evidence from the Knox Achieves suggests this program may have increased high school graduation (Carruthers & Fox, 2016). Still Harris et al. (2018) find that “[The Degree Project] had no measurable effect on students’ academic preparation during high school”. The Degree Project is similar to the Knox Achieves in that the scholarship is sufficient to cover 2-year college costs and partially cover 4-year costs and available to students in high school. Other research by Bartik and Lachowska (2014) and Gonzalez and colleagues (2014) find mixed results for high school outcomes. Bartik and Lachowska (2014) find no overall impact on high school GPA, but an increase in the GPA of African American students and a substantial decrease in suspensions. Gonzalez et al., (2014) find no impact on high school dropout rates, but an increase in test scores. Pinning down programmatic differences is vital to determining how the structure of the program influences high school outcomes. In that vein, the closest analog to the CBS that has

been studied is Indiana's 21<sup>st</sup> Century Scholars program, which we address below. First, however, we delineate how the CBS was designed.

In Washington state, a student is eligible to sign the CBS pledge if during 7<sup>th</sup> or 8<sup>th</sup> grade (or 9<sup>th</sup> grade for the first eligible cohort during 2008-09) any of the following applied: the student was eligible for free or reduced-price lunch (FRPL), the student's family received Temporary Assistance for Needy Families (TANF), the student was a foster youth, or the student's family income was below 185 percent of the poverty line (which would also qualify the student for FRPL). For the first cohort of students eligible to sign the pledge in 2008, 185 percent of the poverty line equaled \$39,220 for a family of four.

The text of the pledge read 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."<sup>2</sup>

When the student enters her senior year, to be eligible for the financial aid the student's family income during that year must be below 65 percent of the state's median family income.<sup>3</sup> The fact that the CBS is contingent on family income during a student's senior year somewhat weakens the clarity of what rewards will follow from signing and fulfilling the pledge. However, note that 65 percent of the state's median family income was \$53,000 for the first eligible cohort, which means that students in this cohort who were income-eligible to sign-up in 8<sup>th</sup> grade (e.g., below \$39,220 for a family of four) were likely still income-eligible to receive the scholarship in 12<sup>th</sup> grade.

Should the student remain income-eligible in their senior year, the guaranteed aid is both generous and transparent, completely covering tuition and service/activity fees.<sup>4</sup> Students attending private institutions of higher education in Washington receive an amount equal to what the average student receives attending a comparable public institution in the state (typically the average award given at the University of Washington and Washington State University). The CBS covers 8 semesters (12 quarters) so long as the student maintains Satisfactory Academic Progress as determined by the college, must be used within five years of high school graduation, and cannot be used for graduate school.

The language surrounding Washington's CBS implies a contractual bond between the student and the state. The "College Bound Scholarship Program... promises annual college tuition and a small book allowance" (WHECB, 2012a). Moreover, given that the student is required to do well in school, be a good citizen, and not commit a felony, it appears that it would be politically hard to break the promise if the student does these things. State Representative Reuven Carlyle noted that the state has "a moral responsibility to fund [the CBS]. There's no way we can break that social contract" (Long, 2012). Thus, these types of pledge programs may bind future legislatures to fund the programs given the promise of funding. These kinds of pledge policies may be appealing to legislatures given their transparency to students and the ability of current legislatures to bind the actions of future legislators.

There are two key programmatic differences between Washington's program and the programs in Indiana and Oklahoma. First, until recently, the programs in Indiana and Oklahoma were not targeted toward economically needy students, i.e. they had no income requirement at the time that students attended college. Heller (2006) noted, "(t)he distinguishing characteristic of these two programs from that of other publicly funded aid programs is that once students are

accepted into the program while in middle school, they will not be removed even if their family's economic circumstances change" (p. 1276). Second, the programs in Indiana and Oklahoma require students to take certain college-appropriate coursework while in high school to be eligible. The CBS, in contrast, has no specific coursework requirements and only a relatively weak 2.0 grade point average standard.

### **Limited Empirical Evidence on Early Commitment Pledge Programs**

Unlike the extensive literature on state merit aid scholarship programs, there is limited research on state-administered early commitment pledge programs likely due to the lack of data needed to form appropriate comparison groups for those students who are eligible to participate in these programs. For instance, St. John et al. (2003, 2004, 2005, 2008) investigate the possible impact of Indiana's 21<sup>st</sup> Century Scholars Program on student-level outcomes. The 21<sup>st</sup> Century Scholars Program is the most analogous studied promise program to the CBS, in that it is state based and is an early commitment program. The studies find significant positive associations between completion of the pledge in Indiana, the likelihood that students completed an advanced high school curriculum, and enrollment in both two- and four-year colleges.

While the St. John et al. studies may be the best evidence about these state-sponsored early commitment programs, they are also quite limited. Specifically, they do not rely on data about cohorts of students before the introduction of the pledge program, and, importantly, lack information needed to identify if a student was eligible for the program. Thus, they were forced to compare students who signed the pledge, to a comparison group of students who may or may not have been eligible. St. John et al. (2004), for example, use students who attended high-poverty schools, but who did not sign the pledge, as the control group. By using students who did not sign the pledge as the comparison group any estimated program effects are likely confounded

by unobserved variables that are correlated both with the likelihood of a student signing the pledge and with the likelihood of a student attending college. Specifically, students who enroll in the program are probably more likely to attend college (holding observable student characteristics constant) given their unobserved motivation.

Our study on the College Bound Scholarship complements research by Fumia et al., (2018) that focuses primarily on college enrollment and attainment, but also replicates our analysis on high school outcomes. Fumia et al., (2018) use a difference in difference estimator with propensity score weighting and find that the scholarship has no effect on on-time graduation, reduced cumulative 12<sup>th</sup> grade GPA, has no effect on misdemeanors, and reduced felony convictions before the end of 12<sup>th</sup> grade. As we report below, our findings focus on a few additional outcomes, but are broadly consistent with these findings.

## **Data and Analytic Approach**

### **Data**

The data we utilize for this research are collected by Washington State's Education Research & Data Center (ERDC).<sup>5</sup> ERDC maintains individual student-level K-12 records for all public-school students in the state. These data include the student's academic performance (GPA, performance on state assessments, etc.) while in middle and high school, and whether the student graduated from high school. These data also include records of whether the student was enrolled in a school associated with a juvenile detention or a juvenile rehabilitation facility.<sup>6</sup> ERDC links these data to data maintained by the Washington State Achievement Council (WSAC) on which students have signed the CBS pledge.

Unlike prior studies of early commitment financial aid programs, we have data on two cohorts of students who did not have the opportunity to sign the CBS pledge, i.e., those who were in 8<sup>th</sup> grade in 2005-06 (“cohort 1”) and 2006-07 (“cohort 2”). Cohorts 3 through 5 include those who had the possibility of being eligible to sign the CBS pledge.

Additionally, through an agreement with the Department of Corrections (DOC), we have access to the census of all individuals who are incarcerated in Washington State prisons at any point between January 2009 and November 2014. This information was linked to the ERDC data through social security numbers, names, and dates of birth, and then de-identified. The overwhelming share of individuals in our sample are incarcerated in state prisons are for more serious crimes, such as felonies, rather than misdemeanors. Indeed, 98.9% of students in our DOC data were convicted of at least one felony. Our outcome measure is whether the student was incarcerated in a Washington State prison within roughly eighteen months after what would be anticipated as on-time high school graduation.<sup>7</sup> Due to the limited span of time included in our DOC data, we can only compute this outcome for our second and third cohorts (i.e. students in the cohorts immediately before and after the introduction of the CBS program).

We do not have access to data on county jails. Many misdemeanors and minor crimes are handled by county jails, rather than state prisons. Thus, our outcome measure of incarceration mainly reflects serious crimes of adults and those under 18 years of age who are tried as adults. In our sample, 0.15% experience incarceration which is equal to the national incarceration rate in state prisons for individuals between the ages of 18 and 19 in 2014 (Carson, 2015).

Our data include 443,315 individual student records for the five cohorts, but we drop from these data foreign exchange students, observations with missing ID codes, observations with multiple IDs and irreconcilable birthdates, students enrolled part time in public high school,

and students who were not identified in a school in 8<sup>th</sup> grade. These restrictions reduce the number of observations to 415,383, including 169,887 in the pre-policy cohorts 1 and 2, and 245,497 in the post-policy cohorts 3, 4, and 5. Nearly half of the students in the post-policy cohorts, 114,612, were clearly eligible for the CBS program as a result of being enrolled in foster care or FRPL eligible in 8<sup>th</sup> or 9<sup>th</sup> grade (cohort 3) or 7<sup>th</sup> or 8<sup>th</sup> grade (cohorts 4 and 5). Similarly, nearly half of the students in the pre-policy cohorts, 75,146, were enrolled in foster care or were FRPL eligible in 8<sup>th</sup> or 9<sup>th</sup> grade – yet, these disadvantaged youth were ineligible for the CBS scholarship. Since these students would have been eligible to apply for the CBS scholarship had the CBS been implemented one or two years earlier, we refer to them as “pseudo-eligible”. As a robustness check, we alternatively define students as pseudo-eligible if they were in a pre-policy cohort and were enrolled in foster care or were FRPL eligible in 7<sup>th</sup> or 8<sup>th</sup> grade (i.e., consistent with cohorts 4 and 5).<sup>8</sup>

In our triple-difference specification, described below, we contrast the experiences of eligible or pseudo-eligible students with ineligible students who were enrolled in foster care or eligible for FRPL in a grade that is adjacent to the grades which would have made the student eligible (or pseudo-eligible) to sign the CBS pledge, and also not enrolled in FRPL or foster care in the grades that would make them eligible for the CBS. We define these students as “border-eligible”. Border-eligible students are essentially disadvantaged at the wrong time to receive the CBS. Figure 1 graphically illustrates the definitions for CBS-Eligible, Pseudo-Eligible, and Border Eligible for our five cohorts.<sup>9</sup>

Note that we define a student as “eligible” for the CBS program if the student is enrolled in foster care or is known to be eligible for FRPL. Unfortunately, this is an imperfect definition and it is not possible with existing administrative data to construct a perfect measure of whether

the student is eligible to sign up for the CBS in middle school, as we do not have information on students who may be income eligible despite not receiving FRPL, the Supplemental Nutrition Assistance Program (SNAP), the Food Distribution Program on Indian Reservations (FDPIR), or TANF.<sup>10</sup> We estimate that our definition of “eligible” will miss 13.4 percent of students who are actually eligible.<sup>11</sup> Given that these income-eligible-only students will also be missed in our control group, border-eligible students, their absence is unlikely to bias our estimates.<sup>12</sup>

Panel A of Table 1 provides descriptive statistics for student outcomes. Our first outcome is whether a student is enrolled in Washington State public schools by 10<sup>th</sup> grade. We find that 7.8% of our sample transferred to an out-of-state or private school or dropped out by 10<sup>th</sup> grade.<sup>13</sup> Among enrolled students, 2.0% (1.2%) were enrolled in juvenile detention or rehabilitation in 10<sup>th</sup> (12<sup>th</sup>) grade. However, there is a strong disparity in rates of such enrollment; in the pre-policy cohorts, 4.4% of pseudo-eligible students were enrolled in juvenile detention or rehabilitation in 10<sup>th</sup> grade compared to only 0.6% of students who were ineligible. We also find large pre-policy disparities in 12<sup>th</sup>-grade GPA (2.36 versus 2.92); 12<sup>th</sup>-grade GPA above 2.0 (0.679 versus 0.874); graduating high school on-time (0.547 versus 0.820), and incarceration (0.0037 versus 0.0007).

As shown in the last column, during the pre-policy period, border-eligible students have higher rates of enrollment in juvenile detention or rehabilitation, lower GPAs, and lower rates of high school graduation than other pre-policy ineligible students. Border-eligible students are nearly as disadvantaged in the pre-policy period as students who are eligible for the CBS.<sup>14</sup>

For both eligible and ineligible students, 12<sup>th</sup> grade GPAs increased after the CBS policy was implemented. Figure 2 shows the shifts in these distributions. As we show below, there is no statistically significant evidence that the CBS policy caused an increase in eligible students’



GPA. Moreover, there is no evidence that CBS increased the likelihood of students being above the 2.0 GPA threshold, and no spike is visible in the distribution of eligible students' 12<sup>th</sup> grade GPAs at 2.0.<sup>15</sup>

We observe a considerable reduction in the on-time high school graduation gap between eligible and ineligible students (by just under 3-percentage points from -0.273 to -0.244). We also find a narrowing of the difference between eligible and ineligible students in their likelihood of being in juvenile detention or rehabilitation and incarcerations (with pre-policy disparities in these outcomes narrowing by 26% to 43%). These changes in mean differences are suggestive of a policy effect, however, as we show below, we find evidence that suggests that these changes were not caused by the CBS policy.

Panel B of Table 1 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 7<sup>th</sup> grade test scores, but these disparities narrowed somewhat, with the reading test score disparity narrowing from -0.68 s.d. pre-policy to -0.61 s.d. post-policy.

### **Analytic Approach**

Our beginning analytic strategy is to utilize a differences-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) and after (cohorts 3, 4, and 5) 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). This DnD analysis is expressed in Equation 1:

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

$Y_{imt}$  is the outcome for student  $i$  attending middle school  $m$  in cohort  $t$ .  $\beta_m$  are middle school fixed effects based on the student's enrollment during the fall of 8<sup>th</sup> grade.  $Post_t$  is an indicator that equals one if the student is in post-policy cohorts 3, 4, or 5.  $CBS\_Eligible_i$  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 6<sup>th</sup>, just 7<sup>th</sup>, just 8<sup>th</sup>, just 9<sup>th</sup>, just 10<sup>th</sup>, 6<sup>th</sup> & 7<sup>th</sup>, 6<sup>th</sup> & 8<sup>th</sup>, ..., and eligibility in all five grades).  $X_i$  is a vector of individual student characteristics as listed in Table 1.  $\varepsilon_{imt}$  is the error term.<sup>16, 17</sup>

We include 8<sup>th</sup> 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.<sup>18</sup> 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 (Micheltore & Dynarski, 2016).<sup>19</sup>

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 the CBS, 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 the 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), and 6.9 percent (2013)) (Bureau of Labor Statistics, 2019). Moreover, Federal Pell grants for low income students were increased during the Great Recession, therefore 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 or increased federal funding, 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. These changes are likely to have disproportionate negative impacts on the enrollment decision of low-income students (WHECB, 2012b). To attenuate some of these concerns, we include in  $X_i$  the county unemployment rate by cohort and grade.

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, 22% of students are FRPL eligible at least once between grades 6 and 9 were also ineligible in at least one of these grades.

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 of 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  $\beta_1$  and  $\beta_6$  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  $\beta_1$  and  $\beta_6$ .

The main threat to validity of this DnDnD specification is the possibility that border-eligible students respond differently to these secular forces 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). On the other hand, the group of students that are FRPL eligible in the right grades (making them CBS-eligible) include both chronically FRPL eligible and transitory FRPL eligible students. To the extent that the number of years spent being FRPL eligible is a good proxy for lower socioeconomic status (Micheltore and Dynarski, 2016), this likely makes the border-eligible students slightly less poor than the CBS-eligible students (consistent with statistics shown in Table 1). 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 forces than students who are slightly less poor.

## Results

Table 2 reports estimates for the key parameters of Equations 1 and 2: being CBS-eligible when the program was in effect ( $\beta_1$ ); being CBS-eligible, i.e. low income ( $\beta_2$ ); not being eligible in virtue of being low-income in the wrong grade when the program was in effect, i.e. only “border-eligible”,  $\beta_6$ ; and the difference between the estimated effects of being eligible and border-eligible,  $\beta_1 - \beta_6$ .<sup>20</sup> Panel A shows the results from Equation 1 (the DnD specification), while Panel B shows the results from Equation 2 (the DnDnD specification). The interpretation of the coefficients in the table varies according to the outcomes in question.

Column 1 shows a surprising negative effect on the likelihood of CBS-eligible students 10<sup>th</sup> grade enrollment in Washington State public schools. In Panel A, which shows the DnD results, this estimated policy effect is -1.2 percentage points, and in Panel B, which shows the DnDnD results, this estimated policy effect is -0.9 percentage points. However, conditional on 10<sup>th</sup> grade enrollment CBS-eligible students are more likely, by 0.5%, to be enrolled in 12<sup>th</sup> grade, as shown in Column 5. Yet these positive results do not hold under the DnDnD specification.

When using the DnD specification, we find apparent evidence that the CBS reduced eligible youth’s likelihood of enrollment in juvenile detention and rehabilitation (Columns 2 and 6). Yet, as shown in the DnDnD results, this decline in juvenile detention and rehabilitation

enrollment is a secular trend for disadvantaged youth, and the differences between  $\beta_1$  and  $\beta_6$  are precisely estimated, small, and not statistically significant.

The next set of results regarding the student's grade point average, which are shown in Columns 3 and 4 for 10<sup>th</sup> grade and Columns 7 and 8 for 12<sup>th</sup> grade, show negative impacts. Focusing on the DnDnD results, we find that CBS lowered GPA by 0.039 (0.012) in 10<sup>th</sup> (12<sup>th</sup>) grade and lowered the likelihood of 10<sup>th</sup> (12<sup>th</sup>) grade GPA being above 2.0 by 1.7 (1.2) percentage points.<sup>21</sup>

Column 9 of Table 2 shows the estimated effects on graduating from high school on time. The DnD results seem to suggest a positive effect on graduation of 2.5 percentage points. Yet, in the DnDnD results, this apparent effect is ephemeral and rather reflects a secular improvement in the high school graduation rates of Washington's disadvantaged students as reflected by the near equality of  $\beta_1$  and  $\beta_6$  (i.e., 2.7 and 3.3 percentage points, respectively).

Column 10 of Table 2 assesses whether the CBS's requirement that the youth not commit a felony had an effect on incarceration in state prison. The DnD results suggest that the CBS significantly lowered the likelihood of incarceration by 0.15 percentage points. If true, this would reflect a cut of nearly half from the baseline (i.e., the pre-policy rate of incarceration among pseudo-eligible youth, which was 0.37 percent). Using this estimate and the number of CBS-eligible youth, we compute that the CBS policy would lower the number of incarcerated youths in the state by 57 persons per cohort. This finding is roughly in line with Doleac and Gibbs (2016), who find that the announcement of promise-style type college scholarship programs reduce juvenile arrests in affected counties. The DnDnD results, however, do not provide us confidence in this finding – here we find a difference in  $\beta_1$  and  $\beta_6$  of -0.12 percentage points, which is close to significant at the 0.10 level. However, this result is sensitive to our robustness

check shown in Appendix Table 1, which uses the alternate definition of pseudo-eligible grades (shown in Appendix Figure 1).<sup>22</sup>

In summary, we do not find any persuasive evidence that CBS improved outcomes for eligible youth during high school nor significantly reduced their likelihood of incarceration as young adults.<sup>23</sup>

## **Discussion and Conclusion**

Substantial high school achievement gaps between advantaged and disadvantaged students are a significant factor in explaining their disparities in college access and success. Legislators in Washington State attempted to close these achievement gaps via an early commitment need-based scholarship pledge, the College Bound Scholarship. The operating assumption of this policy is that an early promise of aid coupled with the student signing the pledge should encourage low-income students to fulfill pledge requirements to stay out of trouble and academically prepare for college while in high school. Unfortunately, our results do not show beneficial effects on measures of college preparation.

In fact, some of our findings are puzzling in that they suggest the implementation of the CBS program led to worse high school outcomes. In particular, the DnDnD findings show negative effects on GPA and the likelihood of students having their 12<sup>th</sup> grade GPA be above the 2.0 threshold that is a requirement to receive the scholarship.

Why did we not observe more positive results for a program that would seem to strongly incentivize students to get onto a college-going track in high school? One possible explanation for this counterintuitive finding is that students are taking more rigorous high school courses in

order to prepare for college. This explanation is consistent with findings by St. John and colleagues (2008). Unfortunately, we cannot investigate this issue because of data inaccuracies regarding course-taking in early cohorts.

Another possible explanation for the unanticipated findings is a discouragement effect. In particular, a substantial share of students who are eligible to sign the pledge in middle school fail to do so. Goldhaber and colleagues (2019) estimate that only 39% of clearly eligible students signed the pledge during the first three post-policy cohorts. It is merely speculation, but failing to sign the pledge 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.<sup>24</sup> Discouraged students who were eligible to sign-up, but did not do so, would contribute to the estimate of the treatment effect in this intent-to-treat model. We have no evidence at hand with which to assess this hypothesis and leave it for future work. If such a discouragement effect exists, it could explain our null and negative findings. It also might suggest that effects of the CBS program could be different for future cohorts of students as the proportion of eligible students who signed up for the program increased rapidly over time.

Interestingly, the State of Washington's most important source of state funding for low-income students is the "State Need Grant." Students who are eligible for the CBS first receive their maximum allowable State Need Grant funding, as well as Federal Pell Grants, and then supplement these funds with support from the CBS program (WSAC, 2015). Thus, most of the state funds received by CBS recipients likely represents funding that they would have received under the State Need Grant even in the absence of the CBS program.<sup>25</sup> If students who failed to sign the pledge are being discouraged, it would be quite unfortunate as CBS funding is a minority of the funding they are likely to receive from the state.



Furthermore, there is question about the horizontal equity as a result of the CBS program. Funding for this pledge program may siphon off other state-based financial aid that would otherwise go to low-income students who failed to sign-up for the program in middle school, were poor in the wrong year (e.g., income-eligible in 6<sup>th</sup> or 9<sup>th</sup> grade, but not in 7<sup>th</sup> or 8<sup>th</sup> grade when the pledge can be signed), or moving into the state during high school and thus not able to sign the pledge in middle school. Since these pledge programs are, in effect, a promise made by the state, it is hard to not fully fund such promises. Yet, in contrast, Washington State's older mechanism for providing funding for low-income college students, the State Need Grant, has been underfunded. "Every year since 2009, at least a quarter of eligible students have not received grants due to lack of state funding" (Cauce, Sundborg, & Pan, 2017). Given that there is the potential for tradeoffs in terms of which students receive college aid under Washington's different programs, it is worthwhile to investigate the extent to which the early commitment element of the CBS program may influence whether other needy, but non-CBS qualifying, students fail to receive state aid when it comes time to enroll in college.

Of course, the main impetus for the CBS program is to encourage college-going. Our findings are generally supportive of the notion that students are on a better college-going trajectory in high school, but, importantly, not because of the CBS. The primary mechanism through which we might expect the program to affect college going is through the provision of financial aid. Thus, in future work we plan to assess the degree to which the CBS impacts college matriculation and persistence.

## Notes

1. For instance, California is increasing college preparatory course offerings at schools with higher numbers of low-income students (SB-1050, 2016). See also the Southern Regional Education Board's description of efforts to improve college readiness among students who are struggling academically (Barger, Murray, & Smith, 2011).
2. This was the pledge for the cohorts in our sample. The current pledge (as of 2018) reads "Graduate from a Washington high school or home school program with a cumulative grade point average of 2.0 or higher. Have no felony convictions. Apply for financial aid by completing the FAFSA or WASFA beginning my senior year." In 2017, the pledge also included "(b)e a good member of my community."
3. Like all need-based government policies, this feature of the program gives an incentive for families to stay low-income. If parents respond to this adverse incentive, it could have longer-term negative effects on students.
4. Specifically, the CBS documentation states: "The scholarship amount will be based on tuition rates at Washington public colleges and universities. It will cover the tuition and fees (plus a small book allowance) that are not covered by other state financial aid awards such as the State Need Grant. You will receive your scholarship through your college or university as part of your financial aid award" (WHECB, 2012a).
5. 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). The views expressed here are those of the author(s) and do not necessarily represent those of the OFM or other data contributors.
6. Juvenile detention facilities are operated by counties and juvenile rehabilitation facilities are run by the state. These programs are described by the following quotes. "King County uses detention sparingly and only for the most serious or violent crimes and high-risk offenders. While in detention, youth attend school and have access to a wide range of programs and services." (King County Juvenile Division, 2017). "All detention facilities in the state are used for the custody of accused or adjudicated juvenile delinquent offenders; some of these facilities also hold remanded juveniles awaiting sentencing. These facilities also hold status offenders pursuant to the federal valid court order exception. Other juveniles are held in those facilities under limited conditions." (WSDSHS, 2014a). "The county juvenile courts commit the most serious offenders to [Juvenile Rehabilitation]. With rare exception, youth committed to [Juvenile Rehabilitation] have been adjudicated for at least one violent offense, or have a history of a large number of felony offenses." (WSDSHS, 2014b).
7. Specifically, the felony indicator equals 1 if a student is observed to have committed a crime that leads to incarceration between January 1st of their sophomore year in high school and October 24th four years later.

8. We lack data on 6<sup>th</sup> grade enrollment and student characteristics for the first cohort. Using our difference-in-difference-in-differences strategy described below requires this 6<sup>th</sup> grade data. We are able to impute the needed data for the first cohort.

9. In the appendix we show these patterns for an alternative definition of pseudo-eligible that is based on the fact that, in the first year of the CBS program, students were eligible to sign the pledge in the 8<sup>th</sup> and 9<sup>th</sup> grades, rather than the 7<sup>th</sup> and 8<sup>th</sup> grades for later cohorts of students.

10. 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 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.

11. 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 the 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) 8<sup>th</sup> grade students participate in FDPIR.]

12. Bias could be introduced if the high school outcomes of income only eligible students in either the eligible or border-eligible group substantially and differentially changed across the period of CBS implementation.

13. The enrollment in 10<sup>th</sup> grade, 12<sup>th</sup> grade, and graduating outcomes can theoretically be censored to exclude students who leave Washington public schools, but who do not drop out, i.e. transfer out of state or to private schools. This is accomplished using the school level withdrawal codes. Nonetheless, transfers must be confirmed and we are unable to discern if students with "unknown" withdrawal codes transferred or dropped out. For these reasons we do not censor transfers from our enrollment or graduation results. Results may be interpreted as enrollment or graduation from Washington public schools. Nevertheless, as a sensitivity analysis we run our models censoring known transfers and find similar results. Results are available upon request.

14. Students who are eligible for FRPL every year including the grades during which the CBS sign-up is available are included among the CBS-eligible group, but are not included in the border-eligible group. Thus, border-eligible students who are disadvantaged at the wrong time are, by definition, inconsistently disadvantaged, and consequently a bit less disadvantaged than the CBS-eligible population.

15. Theoretically, we expect that the program should raise the likelihood that the student's GPA exceeds 2.0. However, the effect on cumulative GPA is a bit more ambiguous since, we might expect CBS eligibility to influence expectations about college-going and, in doing so, affect course-taking patterns. And if CBS-eligible students take more rigorous courses (with tougher grading standards), it could adversely affect cumulative GPA. We lack data on the rigor of course-taking and thus cannot assess this hypothesis.

16. When the outcome is dichotomous, 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 3, reflected in the first four terms, is essentially a comparison of conditional means. Further, given the complexities of interpreting interaction terms in non-linear models (Ai & Norton, 2003), we prefer a linear probability model for its ease of interpretation.

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

18 See Goldhaber et al. (2019) 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 an 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; Conger, Long, & Iatarola, 2009).

19. 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, and 5 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 Table 2, which focuses on key variables.

20. Full regression results are available from the authors, and these results are as expected based on prior research. For instance, we find that students who perform better on 7th grade math and reading tests are predicted to have significantly higher high school grades (Kobrin, Camara, & Milewski, 2002) and are much more likely to graduate on time (Neild, Stoner-Eby, & Furstenberg, 2008). Asian students have higher grades than White students, whereas Hispanic students have lower grades (Nord et al., 2011); similar patterns exist for female relative to male students (Fortin, Oreopoulos, & Phipps, 2015). We observe that Hispanic and African American students are more likely to be incarcerated, while female students and students with higher baseline test scores are less likely to be incarcerated (Chesney-Lind & Shelden, 2013; Zahn et al., 2010).

21. The estimated DnDnD effect on 12th grade GPA is not statistically significant.

22. Specifically, see Column 12 of Appendix Table 1, which shows that we find identical incarceration effects (-0.15 percentage points) for CBS-eligible and border-eligible students. We also find that the 10<sup>th</sup> grade GPA and enrollment results are not statistically significant under this definition.

23. Our results are broadly consistent with the results in Fumia, Bitney, and Hirsch (2018) of the Washington State Institute of Public Policy (WSIPP). WSIPP was commissioned by the state's legislature 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" (i.e., the research contained in our paper). The WSIPP report, which uses a different methodology, concludes that "signing the pledge in middle school, on average, reduces students' 12th grade GPAs by 0.091 grade points" and "students who sign the pledge are no more likely to complete high school on time" (p. 21).

24. Conger et al. (2019) find a paradoxical effect of offering more Advance Placement (AP) courses on some high school students' confidence. In some instances, increasing access to AP courses may set underprepared students up for failure and, therefore, lower students confidence resulting in academic discouragement.

25. In 2015-16, for instance, CBS recipients, on average, received \$7,085 from the state of Washington to pay for college, but only \$1,343 came from the funding designated for the College Bound Scholarship; the remaining 81% (\$5,742) was State Need Grant funds (WSAC, 2017).

## References

- Ai, C., & Norton, E. C. (2003). Interaction terms in logit and probit models. *Economics letters*, 80(1), 123-129.
- Apel, R. J., & Sweeten, G. A. (2009). *The effect of criminal justice involvement in the transition to adulthood*. US Department of Justice, National Institute of Justice.
- Aud, S., Hussar, W., Kena, G., Bianco, K., Frohlich, L., Kemp, J., Tahan, K. (2011). *The condition of education 2011*. Government Printing Office.
- Barger, K., Murray, R., & Smith, J. (2011). *State college and career readiness initiative: Statewide transitional courses for college readiness*. Southern Regional Education Board.
- Barr, A., & Turner, S. E. (2013). Expanding enrollments and contracting state budgets: The effect of the Great Recession on higher education. *The ANNALS of the American Academy of Political and Social Science*, 650(1), 168-193.
- Bartik, T. J., & Lachowska, M. (2014). The short-term effects of the Kalamazoo Promise scholarship on student outcomes. In Polachek, S., & Tatsiramos, K. (Eds), *New Analyses of Worker Well-Being* (pp. 37-76). Emerald Group Publishing Limited.
- Bartik, T. J., Hershbein, B., & Lachowska, M. (2017). The effects of the Kalamazoo Promise Scholarship on college enrollment, persistence, and completion. *W.E. Upjohn Institute for Employment Research*, Working Paper 15-229. doi: 10.17848/wp15-229
- Black, S. E., Lincove, J., Cullinane, J., & Veron, R. (2015). Can you leave high school behind? *Economics of Education Review*, 46, 52-63.
- Carson, E. A. (2015). *Prisoners in 2014*. NCJ 248955. Washington, DC: Bureau of Justice Statistics.
- Carruthers, C. K., & Fox, W. F. (2016). Aid for all: College coaching, financial aid, and post-secondary persistence in Tennessee. *Economics of Education review*, 51, 97-112.
- Carruthers, C. K., & Özek, U. (2016). Losing HOPE: Financial aid and the line between college and work. *Economics of Education Review*, 53, 1-15.
- Cauce, A.M., Sundborg, S. V., & Pan, S. (2017, April 17). Fund state need grant, the backbone of college financial aid. *Seattle Times*, Retrieved from <http://www.seattletimes.com/opinion/fund-state-need-grant-the-backbone-of-state-financial-aid/>
- Chesney-Lind, M., & Shelden, R. G. (2013). *Girls, delinquency, and juvenile justice*. John Wiley & Sons.

- Conger, D, Kennedy, A, Long, MC, McGhee Jr., R (2019). Effects of Advanced Placement Science Courses on Skill, Confidence, and Interest in Science. Working Paper.
- Conger, D., Long, M.C., & Iatarola, P. (2009). Explaining race, poverty, and gender disparities in advanced course-taking. *Journal of Policy Analysis and Management*, 28(4), 555-576.
- Cornwell, C., Mustard, D. B., & Sridhar, D. J. (2006). The enrollment effects of merit-based financial aid: Evidence from Georgia's HOPE Program. *Journal of Labor Economics*, 24(4), 761-786.
- Darolia, R., & Koedel, C. (2017). *How High Schools Explain Students' Initial Colleges and Majors* (Institute of Education Sciences Working Paper No.165).
- Dobbie, W., & Fryer Jr, R. G. (2009). *Are high quality schools enough to close the achievement gap? Evidence from a social experiment in Harlem* (NBER Working Paper No. w15473). National Bureau of Economic Research.
- Doleac, J., & Gibbs, C. (2016.) A Promising alternative: How making college free affects teens' risky behaviors. Working paper, available at: [http://jenniferdoleac.com/wp-content/uploads/2015/03/Doleac\\_Gibbs\\_PromiseRiskyBehaviors.pdf](http://jenniferdoleac.com/wp-content/uploads/2015/03/Doleac_Gibbs_PromiseRiskyBehaviors.pdf)
- Duncan, G.J., Kalil, A. & Ziol-Guest, K.M. (2017). Increasing inequality in parent incomes and children's schooling. *Demography* 54(5), 1603-1626.
- Fletcher, J., & Tienda, M. (2010). Race and ethnic differences in college achievement: Does high school attended matter? *The Annals of the American Academy of Political and Social Science*, 627(1), 144-166.
- Fortin, N.M., Oreopoulos, P. & Phipps, S. (2015). Leaving boys behind: gender disparities in high academic achievement. *Journal of Human Resources*, 50(3), 549-579.
- Fumia, D. (2013). *Compounding Inequality: Criminal Sanctions and Racial Gaps in Educational Attainment*. (Doctoral Dissertation), University of Washington.
- Fumia, D., Bitney, K., & Hirsch, M. (2018). The effectiveness of Washington's College Bound Scholarship Program (Document Number 18- 12-2301). Olympia: *Washington State Institute for Public Policy*.
- Goldhaber, D., Long, M. C., Person, A., & Rooklyn, J. (2019). College-Going Expectations and the Factors Predicting Whether Students Sign Up for Washington's College Bound Scholarship Program? A Mixed Methods Evaluation. *Center for Analysis of Longitudinal Data in Education Research*. Working Paper.
- Gonzalez, G. C., Bozick, R., Daugherty, L., Scherer, E., Singh, R., Suárez, M. J., & Ryan, S. (2014). *Transforming an Urban School System: Progress of New Haven School Change and New Haven Promise Education Reforms (2010-2013)*. Research Report. RAND Corporation. PO Box 2138, Santa Monica, CA 90407-2138.

- Harris, D. N., Farmer-Hinton, R., Kim, D., Diamond, J., Reavis, T. B., Rifelj, K. K., ... & Carl, B. (2018). The promise of free college (and its potential pitfalls). Brown Center on Education Policy at Brookings.
- Heller, D. E. (2006). Early commitment of financial aid eligibility. *American Behavioral Scientist*, 49(12), 1719-1738.
- Jacob, B.A., & Linkow, T.W. (2011). Educational expectations and attainment. In G. J. Duncan & R. J. Murnane (Eds.), *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances*, pp. 133-164. New York: Russell Sage.
- Kena, G., Musu-Gillette, L., Robinson, J., Wang, X., Rathbun, A., Zhang, J., Wilkinson-Flicker, S., Barmer, A., and Dunlop Velez, E. (2015). *The Condition of Education 2015*. (NCES 2015-144) U.S. Department of Education, National Center for Education Statistics. Washington, DC.
- King County Juvenile Division. (2017). King County Juvenile Division. Retrieved from <http://www.kingcounty.gov/depts/jails/juvenile-detention.aspx>, Accessed on September 20, 2017.
- Kirk, D. S., & Sampson, R. J. (2013). Juvenile arrest and collateral educational damage in the transition to adulthood. *Sociology of education*, 86(1), 36-62.
- Kirst, M. W., Venezia, A., & Antonio, A. L. (2004). What have we learned, and where do we go next.? In Kirst, M.W., Venezia, A., & Antonio, A. L. (Eds), *From high school to college: Improving opportunities for success in postsecondary education*, pp. 285-319. San Francisco: Jossey-Bass.
- Kobrin, J. L., Camara, W. J., & Milewski, G. B. (2002). *Students with Discrepant High School GPA and SAT I Scores*. College Board, Office of Research and Development. Research Note RN-15.
- LeGower, M., Walsh, R. (2017). Promise scholarship programs as place-making policy: Evidence from school enrollment and housing prices. *Journal of Urban Economics*, 101, 74-89.
- Long, K. (2012, February 5) College Bound Scholarship Program could face test as more apply. *Seattle Times*, Retrieved from [http://seattletimes.nwsourc.com/html/localnews/2017434773\\_collegebound06m.html](http://seattletimes.nwsourc.com/html/localnews/2017434773_collegebound06m.html)
- Michelsmore, K., & Dynarski, S. (2016). *The gap within the gap: Using longitudinal data to understand income differences in student achievement* (NBER Working Paper No. w22474). National Bureau of Economic Research.



- Neild, R. C., Stoner-Eby, S., & Furstenberg, F. (2008). Connecting entrance and departure: The transition to ninth grade and high school dropout. *Education and Urban Society*, 40(5), 543-569.
- Neuberger, Z. (2006.) *Implementing Direct Certification: States and School Districts Can Help Low-Income Children Get the Free School Meals for Which They Are Eligible*. Center on Budget and Policy Priorities. Retrieved from <http://www.cbpp.org/files/8-11-06fa.pdf>.
- Nord, C., Roey, S., Perkins, R., Lyons, M., Lemanski, N., Grown, J., & Schuknecht, J. (2011). *The Nation's Report Card [TM]: America's High School Graduates. Results of the 2009 NAEP High School Transcript Study*. NCES 2011-462. National Center for Education Statistics.
- Page, L. C., Iriti, J. E., Lowry, D. J., & Anthony, A. M. (2018). The promise of place-based investment in postsecondary access and success: Investigating the impact of the Pittsburgh Promise. *Education Finance and Policy*, 1-60. Doi 10.1162/edfp\_a\_00257
- Perna, L.W., & Leigh, E. W. (2018). Understanding the promise: A typology of state and local college promise programs. *Educational Researcher*, 47(3), 155-180.
- Ranalli, D., Harper, E., O'Connell, R., Hirschman, J., Cole, N., Moore, Q., & Coffee-Borden, B. (2008). *Direct Certification in the National School Lunch Program: State Implementation Progress* (No. 583c6a2ecb4943d2a8790a7017c1d075). Mathematica Policy Research.
- Rosenbaum, J. E. (2001). *Beyond college for all: Career paths for the forgotten half*. Russell Sage Foundation.
- Ryan, C.L., & Bauman K. (2016). *Educational Attainment in the United States: 2015*. U.S. Census Bureau, Retrieved from <https://www.census.gov/content/dam/Census/library/publications/2016/demo/p20-578.pdf>, Accessed on 12/31/2018.
- SB-1050, Assemb. Reg. Sess. 2015-2016 (CA. 2016)
- Scott-Clayton, J. (2011). On money and motivation: A quasi-experimental analysis of financial incentives for college achievement. *Journal of Human Resources*, 46(3), 614-646.
- Sjoquist, D. L., & Winters, J.V. (2014). Merit aid and post-college retention in the State. *Journal of Urban Economics*, 80, 39-50.
- Snyder, T. D., & Dillow, S. A. (2012). *Digest of education statistics 2011*. National Center for Education Statistics (NCES Publication 2012-001).

- St John, E. P. S., Hu, S., & Weber, J. (2001). State policy and the affordability of public higher education: The influence of state grants on persistence in Indiana. *Research in Higher Education*, 42(4), 401-428.
- St John, E. P., Musoba, G. D., & Simmons, A. B. (2003). Keeping the promise: The impact of Indiana's Twenty-First Century Scholars program. *The Review of Higher Education*, 27(1), 103-123.
- St John, E. P. S., Musoba, G. D., Simmons, A., Chung, C. G., Schmit, J., & Peng, C. Y. J. (2004). Meeting the access challenge: An examination of Indiana's Twenty-first Century Scholars Program. *Research in Higher Education*, 45(8), 829-871.
- St John, E. P., Gross, J. P., Musoba, G. D., & Chung, A. S. (2005). A Step toward college success: Assessing attainment among Indiana's Twenty-First Century Scholars. *Lumina Foundation for Education*.
- St John, E. P., Fisher, A. S., Lee, M., Daun-Barnett, N., & Williams, K. (2008). Educational opportunity in Indiana: Studies of the Twenty-first Century Scholars Program using state student unit record data systems. The University of Michigan. *Ann Arbor: University of Michigan*.
- Tanner, J., Davies, S., & O'Grady, B. (1999). Whatever happened to yesterday's rebels? Longitudinal effects of youth delinquency on education and employment. *Social Problems*, 46(2), 250-274.
- United States Department of Labor Bureau of Labor Statistics [BLS]. (2019). Local Area Unemployment Statistics: Washington [Data file]. Retrieved from <https://data.bls.gov/pdq/SurveyOutputServlet>
- U.S. Department of Agriculture [USDA]. (2012). *Food Distribution Program on Indian Reservations: Persons Participating*. Retrieved from <http://www.fns.usda.gov/pd/21irpart.htm>, Accessed on April 25, 2012.
- Usher, C., Shanklin, D., & Wildfire, J. (1990). *Evaluation of the Food Distribution Program on Indian Reservations*. Alexandria, VA: US Department of Agriculture, Food and Nutrition Service. Retrieved from <http://ddr.nal.usda.gov/dspace/bitstream/10113/46399/1/CAT93996877.pdf>, Accessed on April 25, 2012.
- WHECB (Washington Higher Education Coordinating Board). (2012a). *Questions and Answers*. Retrieved from [https://www.wsac.wa.gov/sites/default/files/2011-12\\_Q&A.pdf](https://www.wsac.wa.gov/sites/default/files/2011-12_Q&A.pdf), Accessed on May 24, 2012.
- . (2012b). *Key Facts about Higher Education in Washington*. Retrieved from <https://wsac.wa.gov/sites/default/files/KeyFacts2012.pdf>, Accessed on April 24, 2012.

- WSAC (Washington Student Achievement Council). (2015). *State Need Grant and College Bound Scholarship: Program Manual 2015-16*. Retrieved from <http://www.wsac.wa.gov/sites/default/files/2015-16.SNG.CBS.Program.Manual.REV11-15.pdf>, accessed May 26, 2017.
- . (2017). *College Bound Scholarship Report*. Retrieved from <http://www.wsac.wa.gov/sites/default/files/2017.CBS.Report.pdf>, accessed May 26, 2017.
- WSDSHS (Washington State Department of Social and Health Services). (2014a.) *Juvenile Justice and Delinquency Prevention Act*. Retrieved from <https://www.dshs.wa.gov/sites/default/files/JJRA/pcjj/documents/Attachment%20II%20-%20Compliance%20Monitoring%20Policies%20%20Procedures%20Manual%20WA%20State.pdf>, Accessed on September 21, 2017.
- . (2014b.) *Juvenile Population in Juvenile Rehabilitation (JR)*. Retrieved from <https://www.dshs.wa.gov/sites/default/files/JJRA/pcjj/documents/annual-report2014/Sect-71-Juvenile.Rehabilitation.pdf>, Accessed on September 21, 2017.
- Zahn, M. A., Agnew, R., Fishbein, D., Miller, S., Winn, D., Dakoff, G., & Chesney-Lind, M. (2010). *Girls study group: Understanding and responding to girls' delinquency*. Washington, DC: US Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.
- Ziol-Guest, Kathleen, and Kenneth T. H. Lee. (2016). Parent income-based gaps in schooling: Cross-cohort trends in the NLSYs and the PSID. *AERA Open* 2(2), 233–85.

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

		<b>Grade</b>				
<b>Cohort</b>		6	7	8	9	10
Pre-Policy	1		Border	Pseudo-Eligible	Border	Border
Pre-Policy	2		Border	Pseudo-Eligible	Border	Border
Post-Policy	3		Border	--- CBS Eligible ---	Border	Border
Post-Policy	4	Border	--- CBS Eligible ---	Border		
Post-Policy	5	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 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.

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

	(1)	(2)		(3)	(4)		(5)	(6)
	All Students	Eligible Students			Ineligible Students			
<b>Student Outcome</b>		Pre-Policy (Pseudo-Eligible)	Post-Policy		Pre-Policy	Post-Policy	Pre-Policy, Border-Eligible	
10th Grade, Enrolled in Washington Public Schools	0.922	0.912	0.911		0.928	0.933	0.922	
10th Grade, Involved with in Juvenile Justice (*1)	0.020	0.044	0.033		0.006	0.005	0.033	
10th Grade, GPA (*1)	2.62	2.22	2.24		2.91	2.94	2.45	
(st. dev.)	(1.00)	(1.00)	(1.00)		(0.88)	(0.87)	(0.99)	
10th Grade, GPA > 2.0 (*1)	0.738	0.591	0.603		0.835	0.850	0.679	
12th Grade, Enrolled in Washington Public Schools (*1)	0.896	0.835	0.854		0.934	0.939	0.880	
12th Grade, Involved with in Juvenile Justice (*4)	0.012	0.029	0.020		0.005	0.003	0.017	
12th Grade, GPA (*4)	2.73	2.36	2.41		2.92	2.99	2.57	
(st. dev.)	(0.85)	(0.88)	(0.86)		(0.78)	(0.75)	(0.85)	
12th Grade, GPA > 2.0 (*2)	0.806	0.679	0.701		0.874	0.893	0.760	
Graduated from High School on Time (*1)	0.712	0.547	0.588		0.820	0.832	0.664	
Incarcerated in State Prison (*3)	0.0015	0.0037	0.0020		0.0007	0.0003	0.0011	
<b>Student Characteristic</b>								
Age in 8th Grade	14.4	14.4	14.4		14.3	14.3	14.4	
(st. dev.)	(0.5)	(0.7)	(0.5)		(0.4)	(0.4)	(0.4)	
Female	0.485	0.483	0.485		0.480	0.489	0.478	
Migrant	0.039	0.077	0.087		0.001	0.003	0.007	
Bilingual	0.097	0.149	0.211		0.015	0.026	0.046	
Gifted	0.093	0.032	0.053		0.101	0.157	0.050	
Homeless	0.062	0.096	0.131		0.014	0.017	0.054	
Disabled	0.174	0.207	0.234		0.113	0.146	0.162	
Home Language not English	0.158	0.245	0.299		0.042	0.067	0.093	
White	0.622	0.479	0.438		0.783	0.748	0.672	
Hispanic	0.169	0.272	0.313		0.053	0.067	0.110	
African American	0.044	0.073	0.065		0.026	0.022	0.043	
Asian	0.065	0.058	0.055		0.069	0.073	0.062	
Other Race	0.101	0.119	0.129		0.069	0.089	0.113	
7th Grade Math (WASL) Test (*4)	-0.04	-0.46	-0.41		0.28	0.29	-0.12	
(st. dev.)	(1.01)	(0.95)	(0.93)		(0.95)	(0.95)	(0.92)	
7th Grade Reading (WASL) Test (*4)	-0.04	-0.43	-0.35		0.25	0.25	-0.10	
(st. dev.)	(1.01)	(0.97)	(0.99)		(0.95)	(0.93)	(0.93)	
Took WASL out-of-grade-level	0.0007	0.0012	0.0009		0.0006	0.0003	0.0004	
Took a modified version of WASL	0.02	0.006	0.04		0.003	0.013	0.004	
High School in Puget Sound Region (*5)	0.643	0.614	0.604		0.672	0.672	0.646	
High School in Remainder of Western Washington (*5)	0.160	0.152	0.157		0.164	0.164	0.157	
High School in Eastern Washington (*5)	0.197	0.234	0.239		0.164	0.164	0.197	
County's Unemployment Rate in 7th Grade	5.06	5.47	4.93		5.34	4.74	5.46	
County's Unemployment Rate in 8th Grade	5.90	5.13	6.59		4.96	6.41	5.06	
County's Unemployment Rate in 9th Grade	6.71	4.78	8.13		4.54	8.13	4.71	
County's Unemployment Rate in 10th Grade	7.52	4.98	9.31		4.76	9.37	5.05	
County's Unemployment Rate in 11th Grade	8.16	7.53	8.64		7.51	8.57	8.13	
County's Unemployment Rate in 12th Grade	8.47	9.54	7.82		9.66	7.60	9.68	
	415,383	75,146	114,612		94,741	130,885	7,888	

(\*1) Conditional on: 10th Grade, Enrolled in Washington Public School = 1

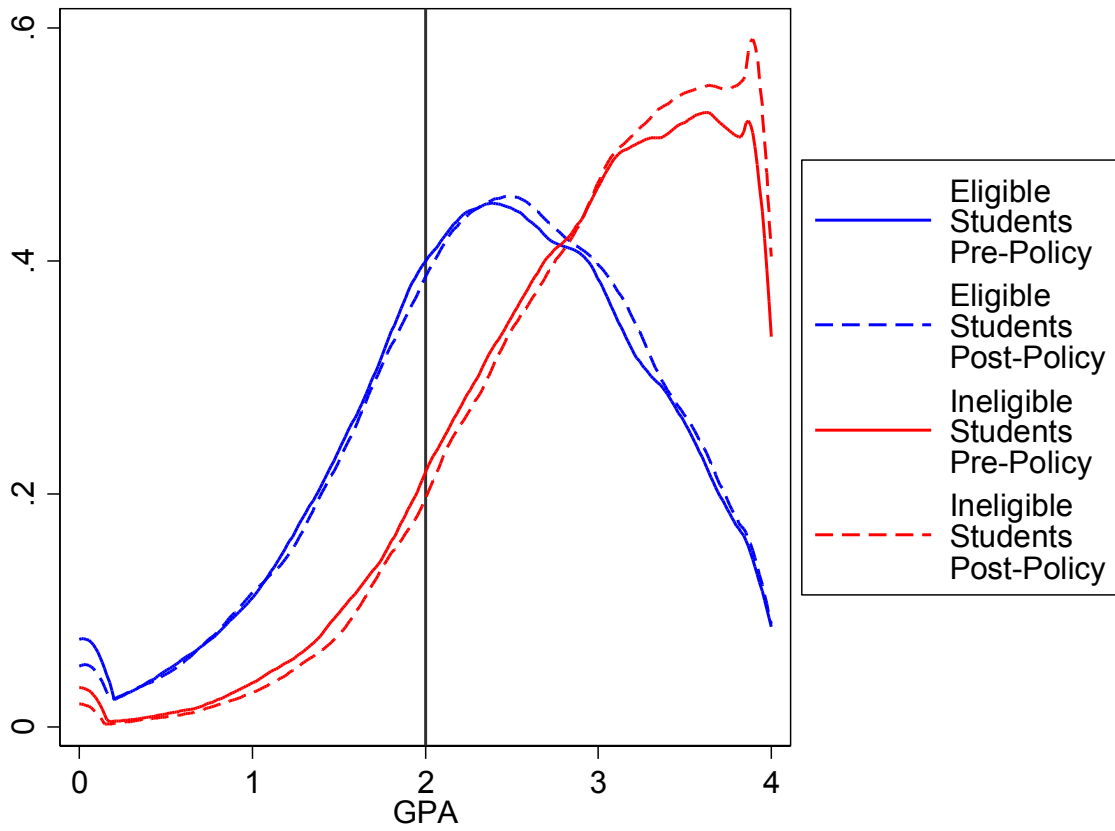
(\*2) Conditional on: 12th Grade, Enrolled in Washington Public School = 1

(\*3) Available for two cohorts, just prior to and following implementation of CBS.

(\*4) 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.

(\*5) Puget Sound Region includes King, Pierce, Kitsap, Thurston, and Snohomish counties. Western and Eastern Washington divided by the Cascade Mountains.

**Figure 2: Change in Distributions of 12<sup>th</sup> Grade Cumulative Grade Point Averages for Eligible and Ineligible Students**



**Table 2: Estimated Effects of Washington's College Bound Scholarship Program**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	10 <sup>th</sup> Grade				12 <sup>th</sup> Grade				High School and Early Adulthood	
Independent Variable	Enrolled in Washington Public Schools	Enrolled in Juvenile Detention or Rehabilitation (*1)	GPA (*1)	GPA > 2.0 (*1)	Enrolled in Washington Public Schools (*1)	Enrolled in Juvenile Detention or Rehabilitation (*2)	GPA (*2)	GPA > 2.0 (*2)	Graduation (*1)	Incarceration
<b>Panel A:</b>										
CBS-Eligible × Post-Policy	<b>-.012</b> *** (.002)	<b>-.008</b> *** (.001)	<b>-.016</b> ** (.008)	<b>.000</b> (.004)	<b>.005</b> ** (.002)	<b>-.007</b> *** (.001)	<b>-.005</b> (.006)	<b>.007</b> ** (.003)	<b>.025</b> *** (.003)	<b>-.0015</b> *** (.0004)
Post-Policy	.008 (.005)	-.016 *** (.003)	.055 ** (.022)	.027 *** (.009)	.045 *** (.009)	-.019 *** (.003)	-.015 (.017)	-.009 * (.008)	.022 (.007)	.0019 (.0013)
<b>Panel B:</b>										
CBS-Eligible × Post-Policy	-.013 *** (.002)	-.009 *** (.001)	-.014 * (.008)	.001 (.004)	.006 ** (.002)	-.008 *** (.001)	-.005 (.007)	.008 ** (.003)	.027 *** (.003)	-.0015 *** (.0004)
Border-Eligible × Post-Policy	-.004 (.005)	-.012 *** (.003)	.025 (.018)	.018 ** (.009)	.014 ** (.006)	-.004 * (.002)	.007 (.015)	.024 *** (.008)	.033 *** (.009)	-.0003 (.0007)
Post-Policy	.008 (.005)	-.015 *** (.003)	.053 ** (.022)	.025 *** (.009)	.044 *** (.009)	-.019 *** (.003)	-.016 (.017)	-.010 (.008)	.019 * (.011)	.0020 (.0013)
<b>DnDnD</b> <b>(CBS-Eligible × Post-Policy) - (Border-Eligible × Post-Policy)</b>	<b>-.009</b> * (.005)	<b>.003</b> (.003)	<b>-.039</b> ** (.018)	<b>-.017</b> * (.009)	<b>-.008</b> (.006)	<b>-.003</b> (.002)	<b>-.012</b> (.016)	<b>-.016</b> * (.009)	<b>-.006</b> (.009)	<b>-.0012</b> (.0008)
Observations	415383	383155	352253	352253	383155	347354	320293	320293	383155	164517

Notes:

(\*1) Conditional on: 10th Grade, Enrolled in Washington Public School = 1

(\*2) Conditional on: 12th Grade, Enrolled in Washington Public School = 1

(\*3) Available for two cohorts, just prior to and following implementation of CBS.

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, highly capable/gifted program participation, 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 the middle school level.

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

		<b>Grade</b>				
<b>Cohort</b>		6	7	8	9	10
Pre-Policy	1	Border	Pseudo-Eligible	Border	Border	
Pre-Policy	2	Border	Pseudo-Eligible	Border	Border	
Post-Policy	3		Border	--- CBS Eligible ---		Border
Post-Policy	4	Border	--- CBS Eligible ---	Border	Border	
Post-Policy	5	Border	--- CBS Eligible ---	Border	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 7th or 8th grade. "Border-Eligible" includes 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.



**Appendix Table 1: Estimated Effects of Washington's College Bound Scholarship Program Using Alternate Definition of Pseudo-Eligible in Pre-Policy Era**

Independent Variable	10 <sup>th</sup> Grade				12 <sup>th</sup> Grade				High School and Early Adulthood	
	Enrolled in Washington Public Schools	Enrolled in Juvenile Detention or Rehabilitation (*1)	GPA (*1)	GPA > 2.0 (*1)	Enrolled in Washington Public Schools (*1)	Enrolled in Juvenile Detention or Rehabilitation (*2)	GPA (*2)	GPA > 2.0 (*2)	Graduation (*1)	Incarceration
<b>Panel A:</b>										
CBS-Eligible × Post-Policy	<b>-.012</b> *** (.002)	<b>-.007</b> *** (.001)	<b>-.022</b> *** (.008)	<b>-.003</b> (.004)	<b>.005</b> * (.002)	<b>-.007</b> *** (.001)	<b>-.010</b> (.006)	<b>.005</b> * (.003)	<b>.023</b> *** (.003)	<b>-.0015</b> *** (.0004)
Post-Policy	.007 (.005)	-.017 *** (.003)	.057 ** (.022)	.028 ** (.009)	.045 *** (.009)	-.020 *** (.003)	-.013 (.017)	-.008 (.008)	.022 ** (.010)	.0019 (.0013)
<b>Panel B:</b>										
CBS-Eligible × Post-Policy	-.012 *** (.002)	-.008 *** (.001)	-.022 *** (.008)	.002 (.004)	.005 ** (.002)	-.007 *** (.001)	-.011 * (.006)	.007 ** (.003)	.026 *** (.003)	-.0015 *** (.0004)
Border-Eligible × Post-Policy	-.006 (.005)	-.010 *** (.003)	-.007 (.017)	.012 (.008)	.013 ** (.006)	-.004 (.002)	-.018 (.015)	.023 *** (.008)	.033 *** (.008)	-.0015 (.0013)
Post-Policy	.008 (.005)	-.016 *** (.003)	.058 ** (.022)	.027 *** (.009)	.044 *** (.009)	-.019 *** (.003)	-.012 (.017)	-.009 (.008)	.020 * (.010)	.0020 (.0013)
<b>DnDnD</b> <b>(CBS-Eligible × Post-Policy) - (Border-Eligible × Post-Policy)</b>	<b>-.006</b> (.005)	<b>.003</b> (.003)	<b>-.015</b> (.018)	<b>-.014</b> (.009)	<b>-.008</b> (.006)	<b>-.003</b> (.002)	<b>0.007</b> (.016)	<b>-.016</b> ** (.008)	<b>-.007</b> (.009)	<b>-.0000</b> (.0014)
Observations	415383	383155	352253	352253	383155	347354	320293	320293	383155	164517

Notes:

(\*1) Conditional on: 10th Grade, Enrolled in Washington Public School = 1

(\*2) Conditional on: 12th Grade, Enrolled in Washington Public School = 1

(\*3) Available for two cohorts, just prior to and following implementation of CBS.

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, highly capable/gifted program participation, 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 the middle school level.