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Start to Finish: Examining the Impact of the El Dorado Promise Program on Postsecondary Outcomes

By Elise Swanson and Gary Ritter

The El Dorado Promise program is a universal, first dollar Promise program that guarantees a full tuition scholarship to students who attend the El Dorado School District from grades K-12, and a partial scholarship for those enrolled for at least 9th through 12th grade. We use a difference-in-differences framework to examine the impact of the El Dorado Promise program on college enrollment and bachelor's degree completion. We find that, overall, the Promise was associated with a 14.0 percentage point increase in postsecondary enrollment, no change in associate's degree completion, and an 8.8 percentage point increase in bachelor's degree completion. Students of color and students with below-average GPAs saw the greatest increases in enrollment. Students with above-average GPAs realized the largest gains in bachelor's degree completion. These results indicate that Promise programs in rural areas can have positive and significant impacts on postsecondary outcomes.

Keywords: *Promise programs, scholarship aid, postsecondary enrollment, degree completion, difference-in-differences*

El Dorado, Arkansas, sits just north of the Louisiana state border. Spurred by the oil and lumber industries, its population peaked in 1960, with 25,292 residents; however, the town began losing residents in 1980 and by 2005 had fewer than 20,000 residents ([Population.us, 2016](http://Population.us,2016)). While public school enrollment in Arkansas as a whole began increasing since the 1990s, enrollment in El Dorado public schools began decreasing in the 1990-91 school year. In 2007, concerned about population loss, low academic achievement, and low rates of college attendance, community leaders and Murphy Oil executives announced the El Dorado Promise, a universal college scholarship program modeled after the Kalamazoo Promise in Michigan (Moreno, 2007).

The El Dorado Promise scholarship¹ is a generous scholarship for which the majority of El Dorado graduates qualify. All students who are continuously enrolled in the El Dorado School District (EDSD) from 9th grade to 12th grade receive a scholarship, with students enrolled from kindergarten through 12th grade receiving the maximum scholarship amount. The maximum scholarship amount is equal to the highest annual in-state cost (for tuition and mandatory fees) at an Arkansas public university. The scholarship is renewable for up to five years, as long as students are enrolled in an accredited two or four-year college or university. Students can use Promise funds to pay for regular undergraduate coursework at both private and

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¹ Details of the El Dorado Promise are available on their website: <http://www.eldoradopromise.com/>. The authors have also discussed the program extensively with Promise staff.

public institutions. Students may combine scholarship funds with other forms of financial aid, such as the Pell Grant or the Arkansas Academic Challenge Scholarship. However, the amount of the Promise scholarship, in combination with other sources of grant aid, cannot exceed a student's total cost of attendance²; students cannot receive Promise scholarship money in the form of a refund.

We address three research questions about the effect of eligibility for the Promise scholarship on student postsecondary outcomes in this paper:

1. Does eligibility for the El Dorado Promise scholarship increase students' likelihood of postsecondary enrollment?
2. Does eligibility for the Promise scholarship increase students' likelihood of earning a college degree on time? More specifically, are Promise-eligible students more likely to earn a bachelor's degree³ within six years of high school graduation?
3. Are there heterogeneous effects of Promise eligibility by student characteristics; in particular, is the program particularly effective for students of color⁴ or for previously high or low-achieving students?

Overview of Promise Programs

Promise programs are place-based scholarships with three broad goals: to increase access to postsecondary education by providing partial or complete financial assistance; to build a college-going culture within the Promise community by providing parents and students with information about college; and to foster community renewal by stabilizing or growing the community population (Miller-Adams, 2015). However, Promise programs differ significantly in their designs across communities. Promise programs can be characterized by requirements for student eligibility, the amount of the scholarship, where the scholarship can be used, and when the scholarship is awarded. In terms of eligibility requirements, Promise programs can be universal, merit-based, or need-based. Universal programs, like the El Dorado Promise, award scholarships based solely on whether the student has attended the school district for the appropriate amount of time. Merit-based programs, such as the New Haven Promise, require students to meet certain eligibility thresholds, such as maintaining a certain grade point average (GPA) or completing a specific number of hours of community service. Need-based programs, such as the Oakland Promise, target students from economically disadvantaged families.

Promise programs can be characterized as narrow or wide in regards to use (LeGower & Walsh, 2014). Narrow Promise programs offer a scholarship applicable at one to three postsecondary institutions. Wide Promise programs, such as the El Dorado Promise, can be used at a variety of institutions, but there is a great deal of diversity in the restrictiveness even of wide Promise programs. The El Dorado Promise scholarship can be used at any accredited two or four-year university, while other wide programs can only be used at institutions in the same state as the scholarship program (as is the case with the Kalamazoo Promise) or, as with Say Yes to Education, at any in-state public institution and certain private institutions.

Promise programs differ from one another based on when funding is awarded. First dollar scholarships, like the El Dorado Promise, are awarded to students before they apply for other forms of financial aid or complete the Free Application For Student Aid (FAFSA) (Miller-Adams, 2009). In contrast, last dollar

² Cost of attendance includes tuition, fees, books and supplies, room and board, transportation, and other necessary personal expenses.

³ We exclude associate's degree completion from this analysis because less than 10% of students complete an associate's degree in each of the years we examine. We find no impact of the Promise on associate's degree completion on average or for any subgroup; these results are shown in Appendix A.

⁴ Students of color are students who identify as black, Hispanic, multiracial, Asian, Native American, or Hawaiian/Pacific Islander.

scholarships are awarded after students have applied for all other potential forms of financial aid and “fill the gap” between students’ financial aid award and their actual cost of tuition and fees. As a first dollar, universal, wide program, the El Dorado Promise is generous in comparison with other Promise programs.

The focal point of any Promise program is the guaranteed college scholarship. The maximum cost of in-state tuition and fees at a public Arkansas university determines the maximum scholarship amount in any given year for a recipient of the El Dorado Promise scholarship. In the 2017-18 school year, this amount was \$9,062 per year. In this paper, we are interested in the effect of this scholarship. Our central research question is: Did the El Dorado Promise increase rates of college enrollment and completion among Promise recipients? We then examine whether the Promise had differential impacts by student race or socioeconomic background. We briefly describe the literature examining the impact of financial aid broadly, and Promise programs specifically, on postsecondary outcomes in the next section, before turning to our evaluation of the El Dorado Promise program.

Prior Literature: Financial Aid, Promise Programs, and Postsecondary Outcomes

In this section, we give a brief overview of the literature examining the impacts of financial aid generally, and Promise programs specifically, on postsecondary outcomes. We focus on both access to postsecondary opportunities, as captured by enrollment, and postsecondary success, as captured by degree attainment. We begin with a broad discussion of the literature on financial aid for college, and then narrow our focus to Promise programs.

Impacts of Financial Aid

Students have access to three types of financial aid they can use to pay the costs associated with postsecondary education: grants or scholarships, which do not need to be repaid; loans, which may be offered at no or below-market interest rates; and work-study, when a student’s salary is partially paid for by the federal government and partially by their employer. The majority of research on the impact of financial aid policies has examined the impact of grants on student outcomes (Dynarski & Scott-Clayton, 2013). However, there are exceptions, with some studies explicitly examining the differences in impacts between loans and grants (e.g., DesJardins & McCall, 2010; Field, 2009).

Grant aid can be separated into two categories: need-based aid, where students qualify for financial assistance based on their (or their family’s) income; and merit-based aid, where students qualify for aid based on their academic achievement or other qualifications. From their review of the literature, Dynarski and Scott-Clayton (2013) conclude that although the majority of the research focuses on grant aid, increased financial aid from any source is generally associated with increased college access and completion; however, impacts tend to decrease as the program application process becomes more difficult to navigate.

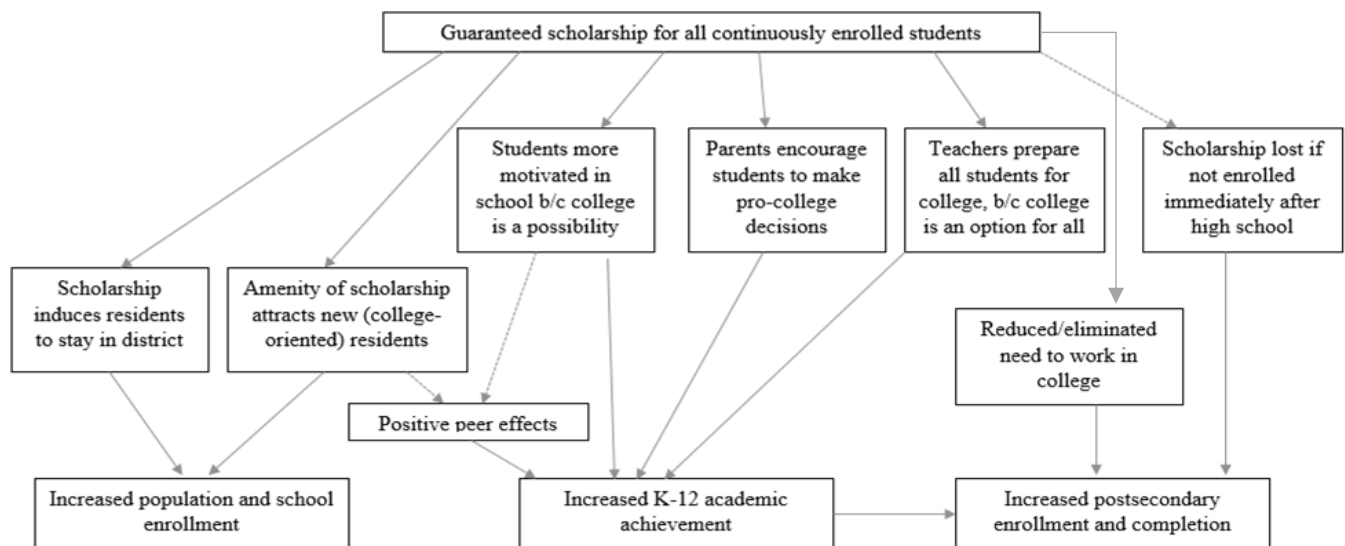
Both need-based and merit-based grant programs have positive impacts on college enrollment. Researchers find a positive relationship between state and federally-funded need-based aid programs with both community college enrollment and public four-year university enrollment (Hicks, West, Amos, & Maheshwari, 2014; Castleman & Long, 2016). The literature on merit-based aid is more mixed, with Zhang, Hu, and Sensenig (2013) finding a positive impact of Florida’s Bright Futures scholarship on enrollment in two and four-year college enrollment, but DesJardins and McCall (2014) finding no impact of the Gates Millennium Scholars Program on undergraduate or graduate enrollment. Unconditional aid, which is not based explicitly on either need or merit, was also found to increase undergraduate enrollment among historically disadvantaged students of color (Linsenmeier, Rosen, & Rouse, 2006).

Researchers have also examined the relationship between merit and need-based aid and college persistence and degree attainment. The Cal Grant program, which has both need and merit-based eligibility requirements, increases rates of bachelor’s and graduate degree completion (Bettinger, Gurantz, Kawano, & Sacerdote, 2016). Need-based aid can increase semester-to-semester persistence, credits attained, and bachelor’s degree completion (Goldrick-Rab, Kelchen, Harris, & Benson, 2016; Mabel, 2017; Denning, Marx, & Turner, 2018; Denning, 2018). Merit-based aid programs also increase first-year persistence, credit accumulation, and, depending on the program, associate’s, bachelor’s, and graduate degree completion, as well as longer-life outcomes (Castleman & Long, 2016; Zhang, Hu, & Sensenig, 2013; DesJardins & McCall, 2014; Welch, 2014; Scott-Clayton & Zafar, 2016). Merit-based aid programs also affect which institution a student attends, and, when those institutions are of lower-quality, students are less likely to complete a degree (Cohodes & Goodman, 2014).

Finally, the research examining whether financial aid has differential impacts based on student characteristics is also mixed. There is some evidence to suggest that students of color experience greater benefits from aid programs than do white students (Zhang, Hu, & Sensenig, 2013; DesJardins & McCall, 2014), although researchers do not consistently find this pattern (Goldrick-Rab et al., 2016; Zhang, Hu, & Sensenig, 2013). It is also unclear whether more academically prepared students experience larger benefits from aid programs, in part because there are few direct examinations of differential effects by prior achievement among students receiving aid from the same aid program. Cross-study results are difficult to interpret because of differences in program design; for example, Castleman and Long (2016) find larger effects of a merit-based program in Florida on students with relatively high senior year GPAs, while Goldrick-Rab et al. (2016) find that need-based aid in Wisconsin had larger effects on students who were less academically prepared. An area ripe for future study, therefore, is how students’ prior achievement interacts with students’ aid receipt to affect student outcomes.

There is evidence that financial aid can increase college enrollment and degree attainment. However, the studies described so far have focused on general financial aid programs, where the only real intervention is the provision of funds to students. In this paper, we are interested in the impacts of a Promise program, which guarantees a college scholarship to all students who graduate from a particular school district. In contrast to other types of financial aid, Promise programs aim to affect student outcomes not just by relaxing credit constraints to make college a financial possibility, but also by improving the quality of instruction students receive during their K-12 education as teachers and administrators raise expectations for all students and by building a college-going culture within the Promise community. Figure 1 details these potential mechanisms.

Figure 1: Theoretical Framework for Promise Programs



We examine the impact of the El Dorado Promise on students generally and on the same subgroups (students of color, students with below average achievement, students with above average achievement) as have been examined in the financial aid literature to compare the impacts of Promise programs to more general financial aid programs. We thus contribute to a larger, and still unsettled, discussion of the extent to which financial aid affects students' postsecondary matriculation and completion, and whether these effects vary by student demographics.

Due to the multiple channels through which a Promise can alter student outcomes, we expect a Promise program would have larger impacts on college enrollment and completion outcomes than more general forms of financial aid. The next section details the prior research specifically examining the impact of Promise programs on postsecondary outcomes.

Postsecondary Impacts of Promise Programs

As described above, Promise programs vary based on which students are eligible for a scholarship, whether the scholarship is awarded before or after students apply for other forms of financial aid, and the number of postsecondary institutions at which a student can use their scholarship. Researchers have analyzed how Promise programs with varying designs affect students' postsecondary outcomes.

A universal, narrow, last-dollar Promise program in Tennessee increases high school graduation, community college enrollment, college credits earned in two years, and decreases four-year university enrollment (Carruthers & Fox, 2016). The Kalamazoo Promise, a universal, wide, first-dollar program, increases the share of students applying to a college or university after high school, increases postsecondary enrollment, increases the number of credits students attempted while enrolled, and increases six-year degree completion rates (Bartik, Hershbein, & Lachowska, 2017; Andrews, DesJardins, & Ranchold, 2010). Merit-based Promise programs in New Haven, CT, and Pittsburgh, PA, also increase postsecondary enrollment and persistence (Gonzalez, 2014; Daugherty & Gonzalez, 2016; Gonzalez et al., 2011; Bozick, Gonzalez, & Engberg, 2015; Page, Iriti, Lowry, & Anthony, 2018).

While the literature consistently finds positive impacts of Promise programs on college enrollment, researchers have only estimated the impact of a Promise program on degree completion in Kalamazoo, MI (Bartik, Hershbein, & Lachowska, 2017). While the Kalamazoo Promise does increase degree completion, we need more studies replicating this finding in different contexts to conclude that Promise programs generally increase postsecondary degree completion. Additionally, with the exception of Carruthers and Fox's (2016) evaluation of the Knox Achieves program, all of the Promise programs researchers have examined for their impact on postsecondary outcomes are located in urban areas. Further, although the financial aid literature disaggregates the impact of different types of aid on student subgroups, few studies of Promise programs conduct similar analyses (Bartik, Hershbein, & Lachowska, 2017 and Gonzalez et al., 2011 are exceptions). Thus, there is a gap in the literature regarding the impact of Promise programs in rural areas on postsecondary outcomes, the impact of Promise programs on postsecondary degree completion, and the differential impacts of Promise programs on student subgroups. This study and its findings represent an important contribution to the nascent but growing research base on the postsecondary impacts of community-based Promise programs.

Data

This analysis relies on administrative data that the El Dorado Promise, the El Dorado School District (EDSD), and the National Student Clearinghouse (NSC) have collected. We use information on 14 graduating classes from EDSD: cohorts who graduate in 2004, 2005, or 2006 are the pre-Promise cohorts, while students who graduate between 2007 and 2017 could potentially receive the Promise scholarship. In

total, we have data on 3,727 students who graduated from the EDSD (the smallest graduating cohort is 214 students in 2004; the largest cohort is 318 students in 2012). All cohorts are included in our enrollment analysis, as we have NSC data through the spring semester of 2018 (the last observed enrollment start date is May 30, 2018). However, we require six years of post-high school graduation data for our analysis of bachelor's degree completion rates. For our analysis of six-year bachelor's degree completion, we include students who graduated between 2004 and 2012 (N=2,302). For each cohort, we are able to identify students who are (or would have been) eligible for the Promise, based on when they enter the El Dorado school district. All students who transfer into the district by ninth grade are eligible for a Promise scholarship. Students who attend the district from kindergarten through 12th grade receive the full scholarship amount and students who attend the district from the ninth to 12th grades receive 65% of the maximum scholarship award. In the next section, we describe how we use this eligibility criterion to identify the impact of the Promise on postsecondary enrollment and completion. In this section, we present descriptive trends in our data.

First, we describe the students in our data. Table 1 illustrates the characteristics of students included in this study, divided into groups based on whether they graduate from the El Dorado School District before or after the announcement of the Promise program and by whether they meet the eligibility criterion of the Promise program, which is simply whether they enrolled in the EDSD before their 10th-grade year.

Table 1

Student Characteristics by Promise Period

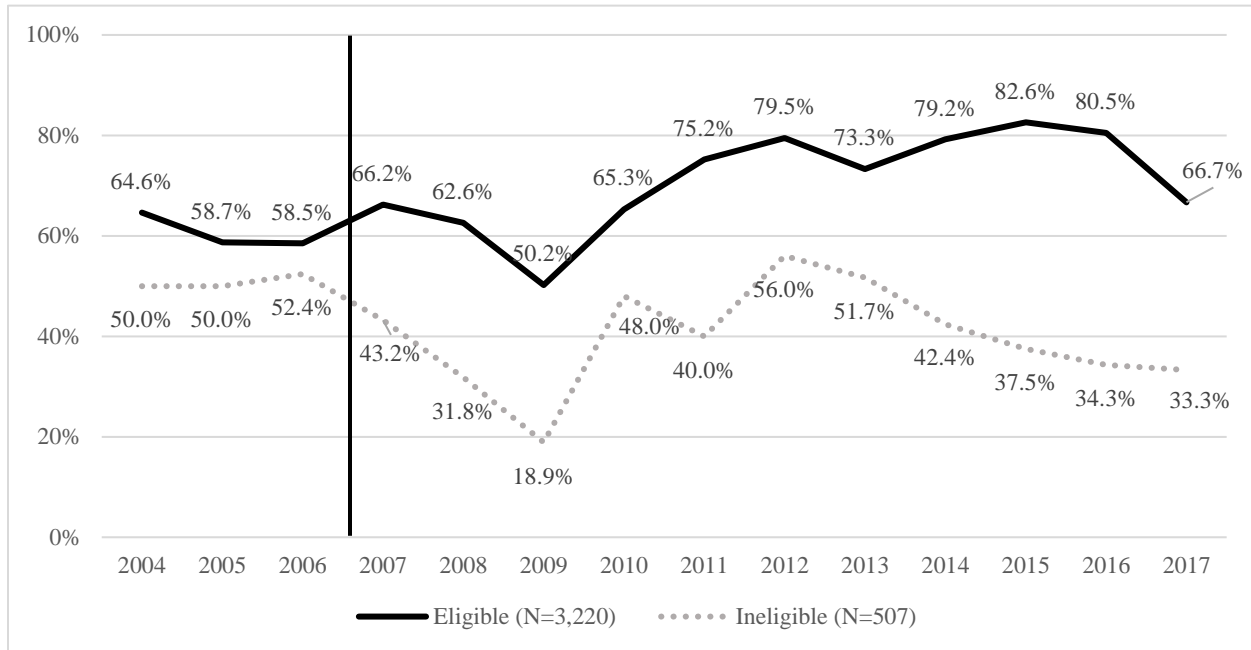
Demographics	All El Do Graduates	All Eligible	All Ineligible	Pre-Promise All	Post-Promise All
N	3,727	3,220	507	691	3,036
Female	52.4%	52.7%	52.4%	54.8%	51.9%
Students of Color	52.7%	53.0%	51.2%	49.8%	53.4%
Black Students	48.3%	48.9%	44.0%	48.5%	48.2%
Latino/a Students	2.7%	2.5%	3.7%	1.0%	3.1%
Other Race Students	1.3%	1.1%	2.5%	0.3%	1.5%
White Students	47.3%	47.0%	48.8%	50.2%	46.6%
Mean GPA	2.77	2.79	2.61	2.72	2.78

Our total sample includes 3,727 students who graduated from EDSD between 2004 and 2017. Just over half of all students are female; this share is consistent among both Promise-eligible and Promise-ineligible students. However, a slightly larger share of eligible students are students of color than are ineligible students. Further, the share of students of color in EDSD increases from the pre-Promise period to the post-Promise period. Finally, we see that average GPA increases slightly from the pre-Promise to post-Promise period, and that eligible students tend to have higher GPAs than do ineligible students.

Next, we look descriptively at our outcomes of interest: postsecondary enrollment and bachelor degree completion. Figure 2 presents trends in enrollment in any postsecondary institution within six months of high school graduation by students' Promise eligibility. The vertical line indicates the announcement of the Promise program in January 2007.

Figure 2

Percent of El Dorado Students Enrolled in ANY Postsecondary Institution within 6 Months of High School Graduation, by Promise Eligibility

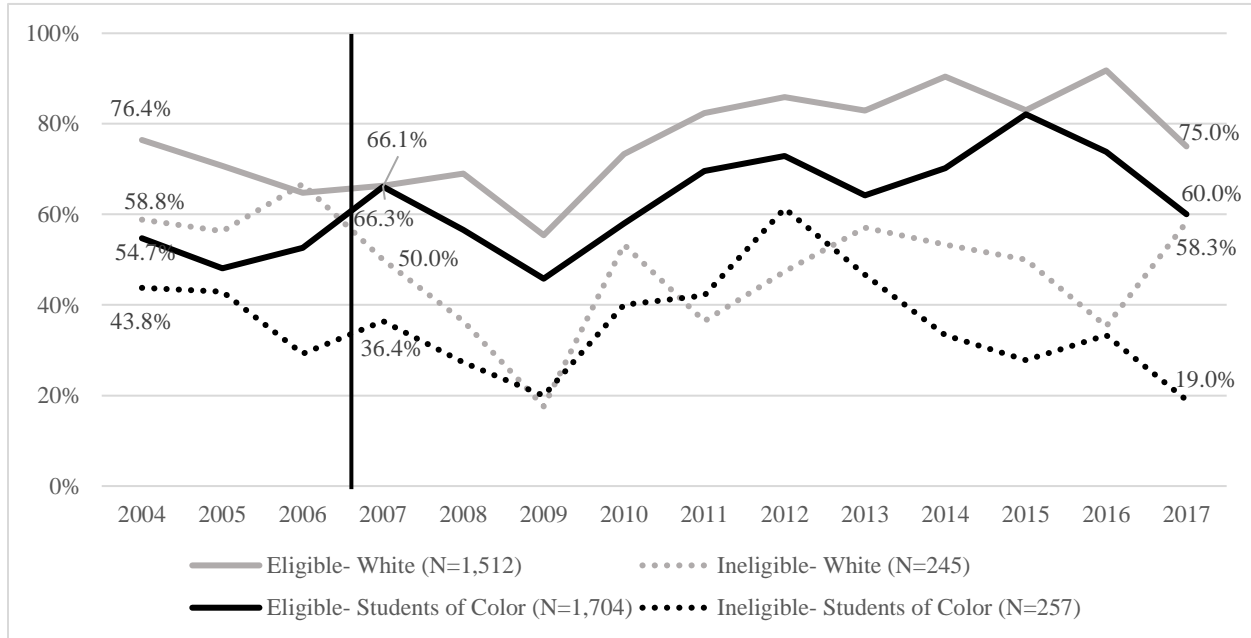


There are generally similar trends in postsecondary enrollment between Promise-eligible and ineligible students prior to the introduction of the Promise, with enrollment rates hovering around 60% for would-be eligible students and around 50% for would-be ineligible students between 2004 and 2006. Among the first cohort of students who could receive the Promise, 66% enroll in postsecondary education, while 43% of ineligible students enroll in a postsecondary institution. Enrollment rates decrease for both groups between 2007 and 2009, with enrollment rates among eligible students generally increasing after 2009 while rates remain volatile among ineligible students. In our last observed cohort, 67% of eligible students enroll in a postsecondary institution, while 33% of ineligible students enroll in a postsecondary institution within six months of graduation.

Figure 3 disaggregates postsecondary enrollment trends by student race.

Figure 3

Percent of El Dorado Students Enrolled in ANY Postsecondary Institution within 6 Months of High School Graduation, by Eligibility and Race

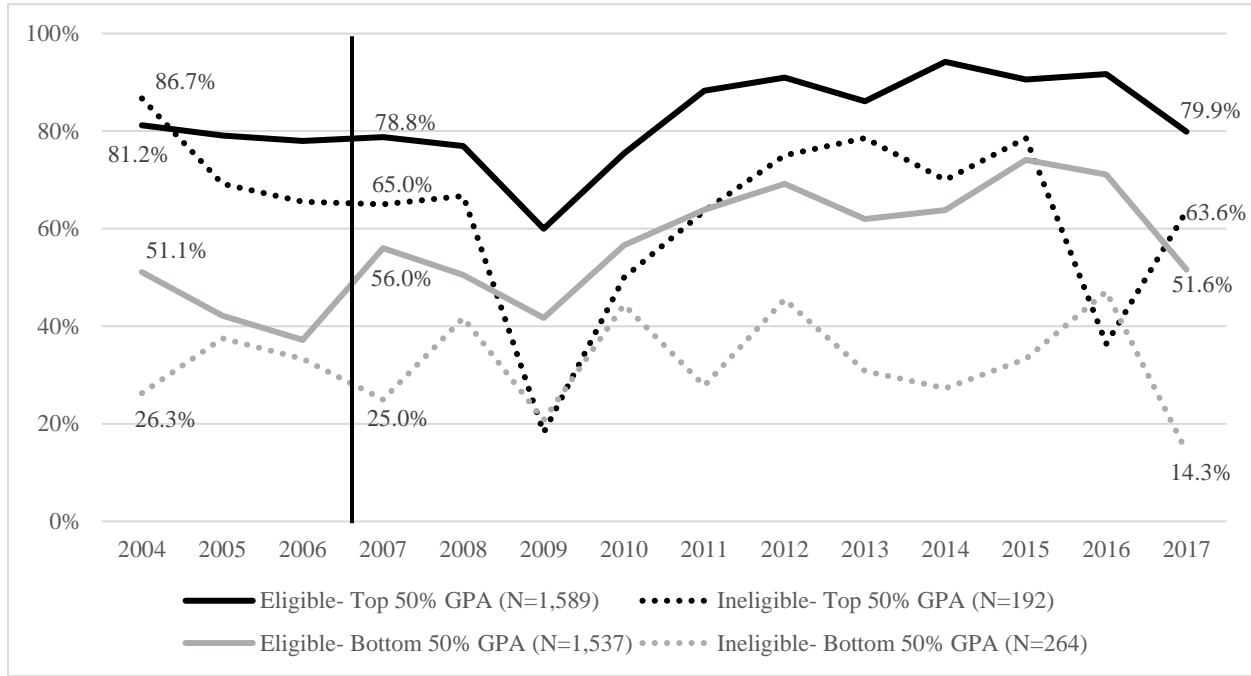


When we split our data by student race and Promise eligibility, we limit the number of observations in each cell, which can lead to volatility in the descriptive trends of enrollment rates over time. Despite this, we see in Figure 3 that postsecondary enrollment rates for Promise-eligible students of color decline between 2004 and 2005, in the pre-Promise period, and generally increase between 2009 and 2017, in the post-Promise period. Similarly, enrollment rates for ineligible students of color decrease between 2004 and 2006, and generally increase from 2009 to 2012, but fall in the following five years. For white students, we see in the pre-Promise period that enrollment rates decrease between 2004 and 2006 for Promise-eligible students. Following 2009, enrollment rates for eligible white students trend up, ending in 2017 at about 75%. Enrollment trends are volatile for ineligible white students throughout the period of analysis, largely due to the small cell sizes; for example, there are fewer than ten ineligible white students in the 2017 cohort.

In Figure 4 we present trends in enrollment by prior achievement, as measured by high school GPA.

Figure 4

Percent of El Dorado Students Enrolled in ANY Postsecondary Institution within 6 Months of High School Graduation, by Eligibility and GPA



Postsecondary enrollment is relatively flat, around 80 percent, for students with above-average GPAs who would have been eligible for the Promise scholarship from 2004 to 2006, while postsecondary enrollment for would-be eligible students with below-average GPAs declines during that time. After the announcement of the Promise program, enrollment increases, albeit inconsistently, for eligible students with below-average GPAs, but remains relatively flat, although again not consistently, for eligible students with above-average GPAs. For the last observed cohort, graduating in 2017, 80% of eligible students with above-average GPAs enroll in a postsecondary institution, as do 52% of eligible students with below-average GPAs. The trends for ineligible students are more volatile, in part because of small cell sizes. Ineligible students with above-average GPAs tend to enroll at higher rates than do ineligible students with below-average GPAs, except in the 2009 and 2016 cohorts.

Table 2 summarizes the pre and post-Promise average rates of enrollment overall, by race, and by GPA.

Table 2

Percent of El Dorado HS Graduates Enrolled at Any Institution within 6 months

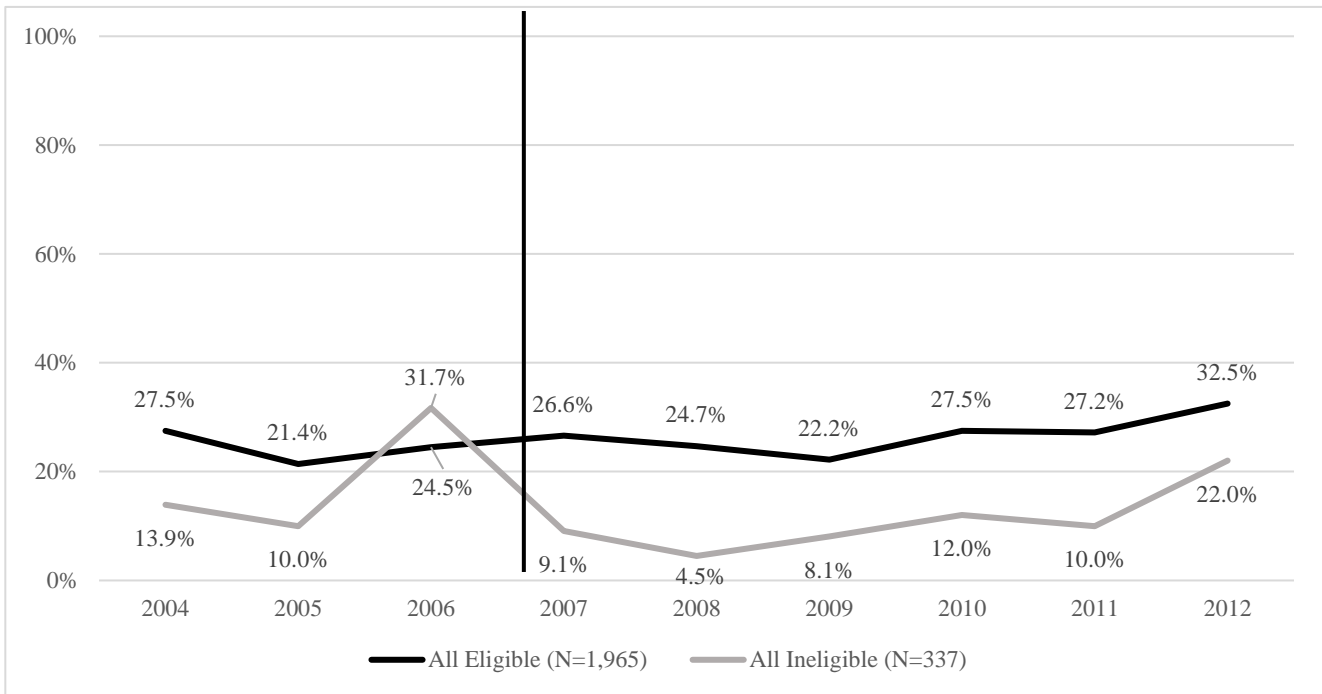
	Pre-Promise Eligible	Pre-Promise Ineligible	Post-Promise Eligible	Post-Promise Ineligible	Diff-in- Diff
Overall	60.5%	51.2%	71.3%	40.2%	21.8 ppts
<i>Difference</i>		<i>9.3 ppts</i>		<i>31.1 ppts</i>	
Students of Color	51.6%	37.0%	65.4%	36.5%	14.3 ppts
<i>Difference</i>		<i>14.6 ppts</i>		<i>28.9 ppts</i>	
White students	70.6%	62.5%	78.1%	45.1%	24.9 ppts
<i>Difference</i>		<i>8.1 ppts</i>		<i>33.0 ppts</i>	
Above Average GPA	79.3%	71.9%	83.2%	63.0%	12.8 ppts
<i>Difference</i>		<i>7.4 ppts</i>		<i>20.2 ppts</i>	
Below Average GPA	43.5%	32.3%	60.5%	31.7%	17.6 ppts
<i>Difference</i>		<i>11.2 ppts</i>		<i>28.8 ppts</i>	

For all subgroups, the simple difference-in-differences estimate (without accounting for student characteristics or changes in enrollment and completion over time) for the effect of the Promise on postsecondary enrollment (shown in the far-right column) is positive. The simple difference-in-differences indicates white students may benefit more from the Promise scholarship than students of color, and that students with below-average GPAs may experience a greater increase in enrollment than do students with above-average GPAs. However, we should not draw any conclusions from these descriptive statistics, as there are likely differences between Promise-eligible and ineligible students that affect postsecondary outcomes beyond Promise eligibility. For instance, Promise-ineligible students are, by definition, more mobile than Promise-eligible students. Students frequently moving between schools may be less academically prepared for college than their more stable counterparts due to inconsistencies in the curriculum they experience. If we do not account for this lower level of initial achievement by controlling for high school GPA, we will inappropriately conflate our estimate of the effect of the Promise program with the effect of lower academic preparedness on postsecondary outcomes. Thus, we prefer a multivariate approach that accounts for observable student characteristics, including high school GPA and race, which past work indicates are correlated with postsecondary outcomes and which may also be correlated with Promise eligibility.

We turn now to the descriptive trends in bachelor's degree completion, first overall and then by race and prior achievement (measured by cumulative high school GPA). Figure 5 presents the share of students earning a bachelor's degree within six years of high school graduation by Promise eligibility.

Figure 5

Percent of El Dorado Students Earning a BA within 6 Years of High School Graduation

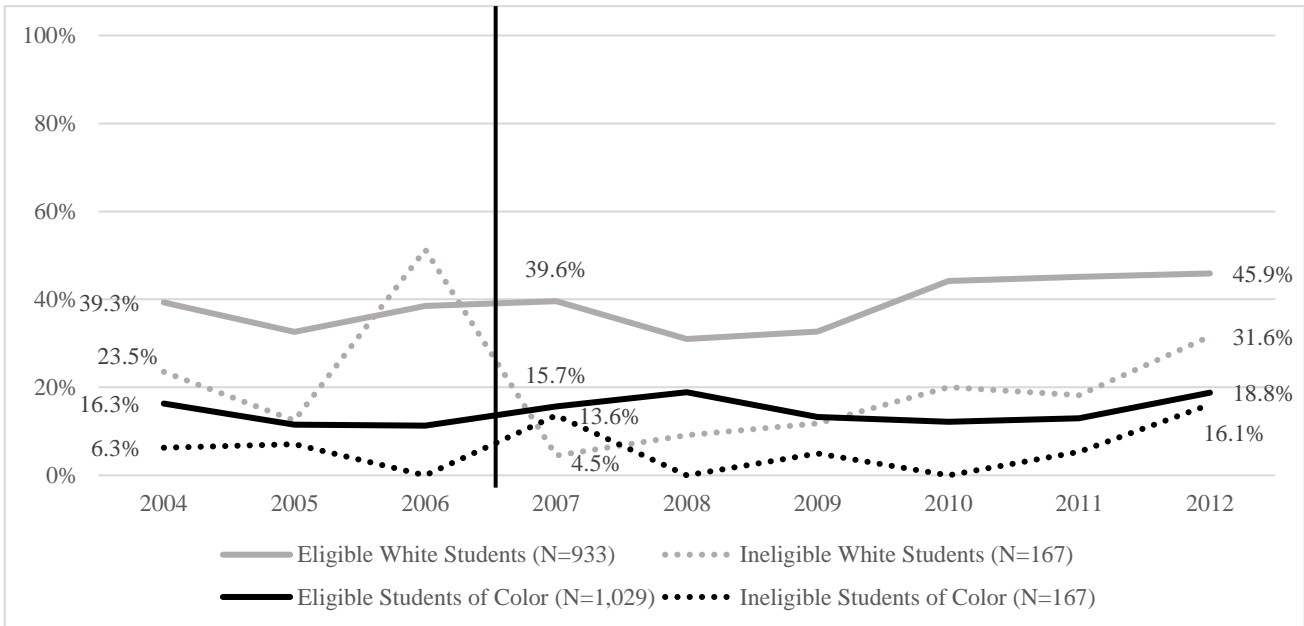


Overall bachelor’s degree attainment rates are relatively flat for Promise-eligible students, hovering around 25% during this time. For ineligible students, rates of attainment are more volatile, but in the post-Promise period generally, less than 10% of Promise ineligible students earn a bachelor’s degree within six years of graduating high school.

Figure 6 disaggregates rates of bachelor’s degree attainment rates by race.

Figure 6

Percent of El Dorado Students Earning a BA within 6 Years, by Race

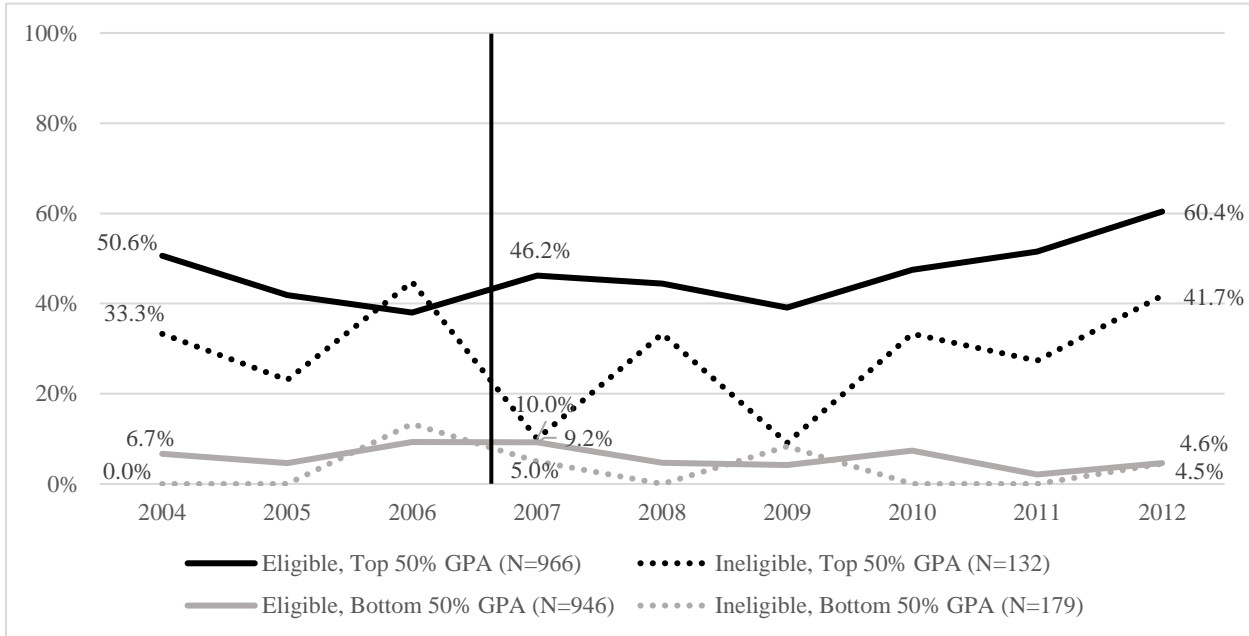


Rates of attainment are particularly volatile for would-be ineligible white students in the pre-Promise period, while attainment rates for eligible students of color and white students are more stable. Attainment rates tend to be higher for eligible students than ineligible students for all cohorts.

Figure 7 illustrates these trends in bachelor’s degree completion rates based on students’ cumulative high school GPA.

Figure 7

Percent of El Dorado Students Earning a BA within 6 Years, by GPA



S

Students with higher GPAs earn a bachelor’s degree within six years of graduating from high school at a higher rate than students with lower GPAs. However, there is still evidence of volatility in the trends, particularly for ineligible students.

Table 3 summarizes the pre and post- Promise bachelor’s degree attainment rates overall, by race, and by GPA.

Table 3

Percent of El Dorado HS Graduates Earning a BA within 6 Years of Graduation

	Pre-Promise Eligible	Pre-Promise Ineligible	Post-Promise Eligible	Post-Promise Ineligible	Diff-in-Diff
Overall	24.4%	21.7%	18.1%	9.3%	6.1 ppts
<i>Difference</i>		<i>2.7 ppts</i>		<i>8.8 ppts</i>	
Students of Color	12.9%	3.7%	9.5%	7.4%	-7.1 ppts
<i>Difference</i>		<i>9.2 ppts</i>		<i>2.1 ppts</i>	
White students	36.8%	36.1%	27.9%	11.6%	15.6 ppts
<i>Difference</i>		<i>0.7 ppts</i>		<i>16.3 ppts</i>	
Above Average GPA	43.2%	36.8%	32.9%	20.0%	6.5 ppts
<i>Difference</i>		<i>6.4 ppts</i>		<i>12.9 ppts</i>	
Below Average GPA	6.7%	6.2%	3.1%	2.5%	0.1 ppts
<i>Difference</i>		<i>0.5 ppts</i>		<i>0.6 ppts</i>	

Although overall the rate of bachelor's degree completion among Promise scholarship eligible students has a more positive rate of change than the rate of change among ineligible students, there is significant variation by student characteristics. Eligible white students and students with above-average GPAs experience the greatest gains in bachelor's degree attainment relative to ineligible students of color and students with below average GPAs, respectively. However, it is clear that overall and for all groups except ineligible students of color, rates of bachelor's degree attainment decline over time.

Analytic Strategy

To examine the impact of the El Dorado Promise on student higher education outcomes, we conduct a straightforward difference-in-differences analysis. We exploit the low eligibility threshold for students to receive any funding from the El Dorado Promise; namely, that students must enroll in the district for at least 9th through 12th grades in order to receive a Promise scholarship. Our basic model is:

$$(1) Y_i = \beta_0 + \beta_1 \text{promiseelig}_i + \beta_2 \text{postpromise} + \delta \text{elig} * \text{post} + \gamma \mathbf{X}_i + \tau \text{cohort}_i + \varepsilon_i,$$

where Y_i represents, in turn, each of our outcome variables: entering any postsecondary institution within six months and earning a bachelor's degree within six years. promiseelig_i captures whether student i was eligible to receive a Promise scholarship, postpromise indicates whether the Promise program was in effect, \mathbf{X}_i is a vector of student level demographic characteristics (high school GPA, gender, and race), and τ captures time trends specific to each graduating cohort. Our coefficient of interest is δ , the coefficient on the interaction between eligibility for the Promise scholarship and the Promise time period, which captures the impact of the Promise program on student outcomes. We use a Probit model for all our analyses.⁵ For our subgroup analyses, we interact the main difference-in-differences parameter (δ) with an indicator for, first, student race and, second, above or below- average GPA. We calculate standard errors robust to heteroscedasticity.

A key assumption of a difference-in-differences analysis is that there are parallel pre-trends between our two groups. As demonstrated in the figures in the previous section, the trends in enrollment and bachelor's degree completion are volatile in the pre-Promise period, particularly for would-be Promise ineligible students. This volatility is most likely due to the low number of students who enter the district after their 9th-grade year (and are, therefore, Promise ineligible) and suggests that readers should interpret our results with caution. However, this analytic strategy is the standard in the limited research examining the impact of Promise programs on postsecondary outcomes, particularly for universal programs like the El Dorado Promise that do not have a minimum GPA or other eligibility criteria that could be used in a regression discontinuity design. Thus, while the cautious reader may be justified in interpreting our results as descriptive, our difference-in-differences approach is the best strategy for estimating the impact of the El Dorado Promise program on postsecondary outcomes.

Results

In our main model, we control for a student's high school cumulative GPA, since it captures both observed and unobserved student characteristics that plausibly predict a student's likelihood of enrolling in and graduating from a postsecondary institution (Armstrong & Carty, 2003; Adelman, 2006; Bowen, Chingos, & McPherson, 2009; Mattern & Wyatt, 2012; Easton, Johnson, & Sartain, 2017). Past work (Ash, 2015) has demonstrated that the El Dorado Promise led to an increase in scores on state standardized assessments. Students could be incentivized by the Promise to achieve at higher levels, as measured by test scores, and

⁵ We also check our results using a linear probability model; however, 389 of 3,727 predictions (10.4%) fall outside the 0-1 range when using an LPM. Thus, we only report results from our Probit.

this increase in achievement could lead to increased GPAs. However, an unintended consequence of the guaranteed scholarship could have been an incentive for teachers to relax their grading standards to improve students' chances of being accepted to college, leading to grade inflation and increased student GPAs. Empirically, we see that average GPAs does increase over time: the average cumulative GPA for a student graduating before the Promise is 2.72, while the average cumulative GPA for a student graduating in the post-Promise period is 2.78; the raw difference in average GPA in the pre and post-Promise periods is statistically significant at the 95% confidence level using a two-tailed t-test.

While the average cumulative GPA of EDSD graduates increases over time, it is not clear that there is rapid grade inflation (or deflation) following the announcement of the Promise program. The lack of a striking change in GPA in the pre and post-Promise periods might indicate that we can include cumulative GPA in our model estimating the impact of the Promise scholarship on college enrollment and bachelor's degree completion. However, it is possible that the Promise affected GPA directly, and controlling for GPA implicitly controls for some of the Promise "treatment." We believe that high school GPA is an important measure of both student academic ability and non-cognitive skills related to college matriculation and success, such as completing college applications on time, attending class, and visiting professors' office hours. Thus, in the models presented below, we control for cumulative high school GPA. We present alternative specifications in Appendix B that do not control for GPA; all estimates point in the same direction and are of a roughly similar magnitude.

Table 4 presents the results from the difference-in-difference Probit overall and by subgroups. Overall, the Promise is associated with a 14.0 percentage point increase in postsecondary enrollment, which is both statistically significant and practically large. The estimated coefficients on the covariates also point in the expected directions. As high school GPA increases so too does a student's likelihood of enrolling in a postsecondary institution. Female students are about four percentage points more likely to enroll in a postsecondary institution than are male students.

Table 4

Impacts of the El Dorado Promise on Postsecondary Enrollment within 6 months of Graduation

	(1)	(2)	(3)
	Overall Impacts	Impacts by Race	Impacts by GPA
Elig*Post	0.140***		
	(0.046)		
Elig*Post*Of Color		0.150***	
		(0.048)	
Elig*Post*White		0.127***	
		(0.049)	
Elig*Post*Top 50% GPA			0.108**
			(0.051)
Elig*Post*Bottom 50% GPA			0.155***
			(0.049)
Promise Eligible	0.064	0.065*	0.083**
	(0.039)	(0.039)	(0.040)
Post Promise Announcement	0.058	0.056	0.060
	(0.058)	(0.058)	(0.060)
Cumulative High School GPA	0.185***	0.185***	
	(0.010)	(0.010)	
Top 50% GPA			0.244***
			(0.026)
Female	0.041***	0.040***	0.064***
	(0.015)	(0.015)	(0.015)
Student of Color	-0.011	-0.027	-0.050***
	(0.016)	(0.026)	(0.016)
Observations	3,502	3,499	3,502

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Standard errors in parentheses

Note: Marginal coefficients from Probit model presented

We next estimate the impacts of the Promise separately for students of color and white students. The Promise is associated with an estimated 15.0 percentage point increase in postsecondary enrollment for students of color, and a 12.7 percentage point increase in postsecondary enrollment for white students. In separate analyses, we test whether each of these effects is significantly different from the overall effect. We find that the effect for students of color is not significantly different from the overall effect, while the effect for white students is significantly lower than the overall effect. Controlling for GPA, the overall impact of the Promise program on enrollment is largely driven by students of color.⁶ Again, the estimated coefficients on the covariates in the model point in the expected direction.

⁶ This result differs from the descriptive difference-in-differences estimate, which suggests that white students experience a larger increase in enrollment after the introduction of the Promise. This difference is largely because we control for high school GPA; in both the pre and post-Promise period, white students have a higher average GPA than do students of color. When we do not control for high school GPA, the effects for students of color and white students are not significantly different from each other.

Finally, we estimate the impact of the Promise program separately for students whose GPA is average or above average for their cohort and students whose GPA is below average for their cohort. While students with average or above-average GPAs are 24.4 percentage points more likely to enroll in postsecondary education than are students with below-average GPAs, all else equal, the Promise program seems to encourage students with all levels of high school achievement to attend college. Specifically, we estimate that Promise-eligible students with below-average GPAs are 15.5 percentage points more likely to attend college than Promise-ineligible students with below-average GPAs. Students with above-average GPAs are 10.8 percentage points more likely to enroll at a postsecondary institution. Post hoc tests indicate that the impact of the Promise on students based on their prior GPA is not significantly different, suggesting any positive effects of the Promise on postsecondary enrollment are experienced by students across the distribution of high school achievement.

Although the El Dorado Promise can be used at any postsecondary institution in the country, it could induce students to stay in Arkansas for college because it is pegged to the highest cost of tuition and fees for an in-state university. We examine whether eligible students are more likely to attend an in-state institution following the introduction of the Promise program. In results available upon request, we find that overall the Promise is not associated with a shift towards in-state institutions, although Promise-eligible students with below-average GPAs are 10.7 percentage points more likely than Promise-ineligible students with below-average GPAs to attend an in-state institution following the introduction of the program.

We turn now to the estimated impacts of the Promise program on bachelor’s degree completion within six years of high school graduation, presented in Table 5.

Table 5

Impacts of the El Dorado Promise on BA Completion within 6 Years of High School

	(1) Overall Impacts	(2) Impacts by Race	(3) Impacts by GPA
Elig*Post	0.088* (0.052)		
Elig*Post*Of Color		0.088 (0.056)	
Elig*Post*White		0.088* (0.053)	
Elig*Post*Top 50% GPA			0.111** (0.052)
Elig*Post*Bottom 50% GPA			0.042 (0.058)
Promise Eligible	0.005 (0.039)	0.005 (0.039)	0.042 (0.037)
Post Promise Announcement	-0.055 (0.053)	-0.055 (0.053)	-0.038 (0.054)
Cumulative High School GPA	0.266*** (0.010)	0.266*** (0.010)	
Top 50% GPA			0.281*** (0.027)
Female	-0.006 (0.016)	-0.006 (0.016)	0.025 (0.016)
Student of Color	-0.046*** (0.017)	-0.046* (0.028)	-0.100*** (0.016)
Observations	2,219	2,219	2,219

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Standard errors in parentheses

Note: Marginal coefficients from Probit model presented

On average, the Promise program is associated with an 8.8 percentage point increase in bachelor’s degree attainment within six years of high school graduation. This effect is statistically significant at the 90% confidence level. We next examine the impact of the Promise program by student race. The Promise program is associated with an 8.8 percentage point increase in bachelor’s degree attainment among eligible students of color relative to ineligible students, and an 8.8 percentage point increase in bachelor’s degree attainment among white students. Only the effect for white students is statistically significant, but neither the effect of the Promise scholarship on students of color nor the effect of the program on white students can be statistically distinguished from the overall effect. Finally, we examine the relationship between Promise eligibility and bachelor’s degree completion among students with above and below- average GPAs. Students with above-average GPAs appear to benefit the most from the Promise, experiencing an increase in bachelor’s degree attainment of 11.1 percentage points relative to ineligible students with above-average GPAs. This effect is statistically significant at the 95% confidence level. There is no statistically significant

impact of the Promise program on students with below-average GPAs in terms of bachelor's degree attainment within six years of high school graduation. Post hoc tests indicate the estimated effect of the Promise on students with below-average GPAs is significantly less than the overall impact of the Promise, while the impact of the Promise on students with above-average GPAs is not statistically different from the overall impact of the Promise. Taken together, these findings suggest that students with above-average achievement drive the overall impact of the Promise program on bachelor's degree completion.

We find that the Promise is associated with an increase in bachelor's degree completion rates, but no change in associate's degree completion rates.⁷ This might raise the question of whether the Promise induced more students to enroll in four-year universities and fewer students to enroll in two-year colleges. We look at this descriptively in our difference-in-differences regression framework in. In results available upon request, we find that the Promise program is associated with an increase in the likelihood of enrollment in four-year universities overall (10.3 percentage points) and for all student subgroups except students with below-average GPAs. The Promise program is associated with an increased likelihood that eligible students with below-average GPAs will enroll in a two-year college (11.2 percentage points), but otherwise does not increase the likelihood of enrollment at a two-year college for students overall or other subgroups examined. This suggests that the El Dorado Promise induces students who would not otherwise have enrolled in college to attend a four-year university, or, for more marginal students, a two-year college, but that the Promise does not shift already college-bound students from two-year to four-year institutions.

Robustness Checks

Because the small number of ineligible students in any given cohort makes our enrollment and completion trends volatile, it is difficult to verify the parallel trends assumption for a difference-in-differences analysis in our data by a simple visual inspection of the graphs. We therefore conduct a placebo test as an additional check of this assumption. We regress each of three demographic variables (gender, race, and high school GPA) that should be unrelated to the introduction of the Promise on an indicator for the post-Promise period, Promise eligibility, and an interaction between the post-Promise period and Promise eligibility. If the difference-in-differences estimate for each demographic characteristic is insignificant, it will give us greater confidence that our findings are not the result of changes in student composition in the ESDS during this time and that our main estimate of the effect of the Promise on student outcomes is unbiased. These results are presented in Appendix C. There is no statistically significant impact of the Promise program on student gender, race, or high school GPA. These results give us greater confidence that our estimates give the true impact of the Promise and are not biased by simultaneous compositional changes in the district.

In our main specification, we use the largest sample available to estimate effects for each of our outcomes of interest: postsecondary enrollment and bachelor's degree attainment. Specifically, when looking at enrollment effects, we use data from 14 cohorts of students (2004 through 2017); when looking at bachelor's degree attainment, we use data from nine cohorts (2004 through 2012). In order to test the robustness of these findings, we estimate the impact of all both outcomes using a consistent sample: students graduating from the ESDS between 2004 and 2012.

Using this restricted sample, we find that the overall estimated effect of the El Dorado Promise on postsecondary enrollment is 11.9 percentage points, slightly less than the 14.0 percentage points estimate found when using our full sample. This result is statistically significant at the 95% confidence level. Similar to our main results, the relationship between Promise eligibility and enrollment is larger for students of color than for white students. Enrollment rates among students of color increase by 13.9 percentage points following the announcement of the Promise program, an effect that is significant at the 95% confidence

⁷ Results shown in Appendix A.

level. We estimate the Promise program is associated with a 9.1 percentage point increase in enrollment among white students, but the effect is not statistically significant. In the restricted sample the effect of the Promise on enrollment is concentrated on students with above-average GPAs. Students with above-average GPAs are an estimated 23.3 percentage points more likely to enroll in college, an effect that is significant at the 99% confidence level. There is no statistically significant impact of the Promise program on enrollment for students with below-average GPAs. The effects of the Promise program on this restricted sample are smaller than the effects we estimate for the whole sample.⁸ These results indicate that the effect of the Promise program grew over time, with students exposed to the Promise longer benefitting more from the guarantee of a scholarship. This could be because teachers and students needed time to adjust their expectations and behaviors after the announcement of the Promise to fully prepare students for college. Students in the 2013 cohort, for example, would have known about the Promise scholarship since their sixth-grade year, providing them (and their teachers) ample time to adjust their expectations and effort to prepare for college. The El Dorado Promise office has also worked continuously to provide programming for students and teachers related to college awareness and enthusiasm for the Promise; improvements in that programming could also contribute to an increasingly positive relationship between the Promise and postsecondary outcomes.

There is also a concern that, because we are conducting a difference-in-differences analysis using 14 years of data, our standard errors are biased because of serial correlation (Bertrand, Duflo, & Mullainathan, 2002). We test the robustness of our findings following the randomization inference procedures described in Bertrand, Duflo, and Mullainathan (2002). We run 500 permutations with our data, randomly assigning 3,220 students to Promise-eligible status and 507 students to Promise-ineligible status each time. We then compare the distribution of estimated difference-in-differences “effects” of being eligible for the Promise in the post-Promise period from those 500 permutations to the effect we estimate given students’ actual eligibility status. Figures 8 and 9 show the results from these permutations for our enrollment and bachelor’s degree completion analyses, respectively.⁹

⁸ We find a null effect of the Promise on associate’s degree completion when using this restricted sample; results available upon request.

⁹ The same procedure indicates the estimated effect of the Promise on associate’s degree completion rates would occur by chance 14-15% of the time, further indicating there is no significant impact of the Promise on associates’ degree completion.

Figure 8

Randomization Inference for Postsecondary Enrollment Effects

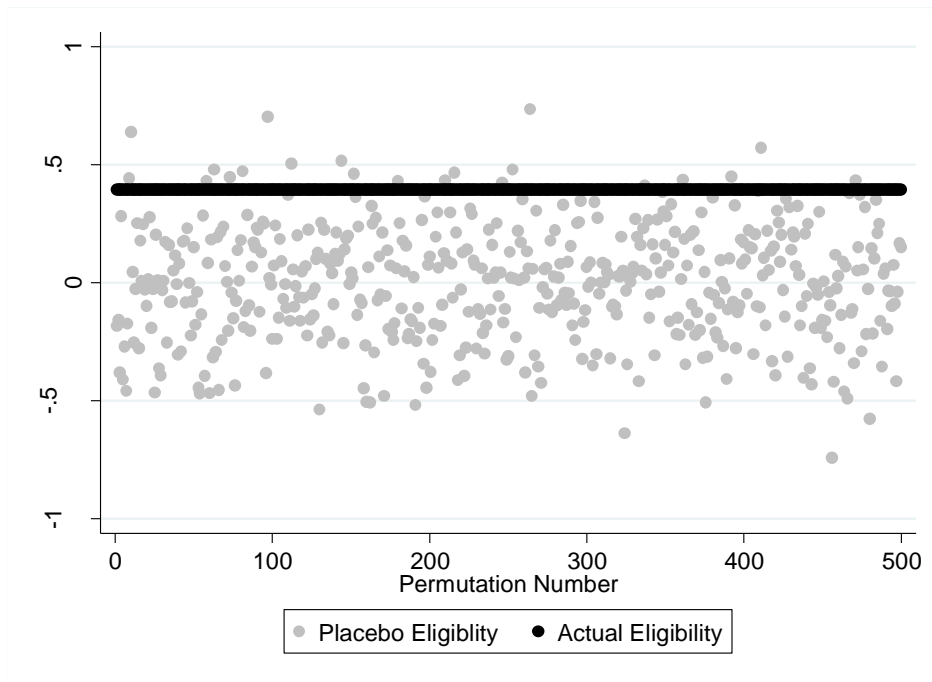
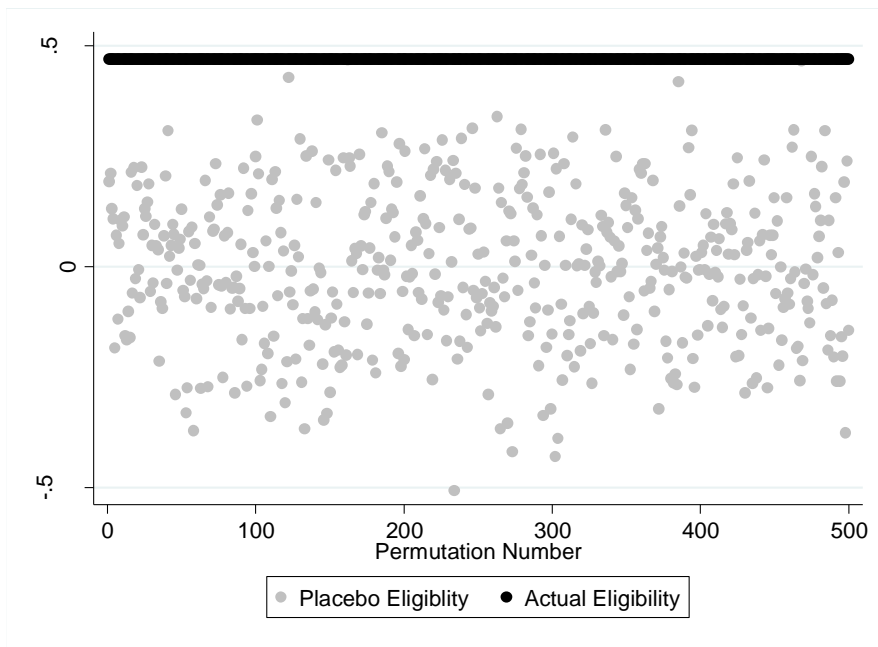


Figure 9

Randomization Inference for 6-Year BA Completion Effects



We find that our estimated effects for postsecondary enrollment would occur by chance less than 1% of the time. Further, the estimated effects for six-year bachelor’s degree completion given actual student eligibility would occur by chance 4-5% of the time. These results support the statistical inferences we reached in our main analyses: the Promise program is significantly and positively related to postsecondary enrollment and six-year bachelor’s degree completion rates.

Discussion

Our results indicate that the El Dorado Promise program increases postsecondary enrollment on average and particularly for students of color and students with below-average GPAs. These effects (14.0, 15.0, and 15.5 percentage points, respectively) are statistically significant and practically large. We also find suggestive evidence that the Promise program does increase in bachelor's degree attainment. We estimate an 8.8 percentage point increase in bachelor's degree attainment within six years of high school graduation on average among Promise-eligible students following the announcement of the scholarship. This effect is largest for students with above-average GPAs, whose bachelor's degree completion rate increased by 11.1 percentage points. These results indicate that a Promise program, which includes an increased emphasis on college readiness throughout K-12 and financial support throughout college, can improve students' postsecondary outcomes, particularly for students seemingly well-prepared for postsecondary academics. Our results are robust to decisions about sample inclusion and randomization inference procedures and are not driven by observable compositional changes in the district.

Our results are consistent with prior findings from the Kalamazoo Promise. Bartik, Hershbein, and Lachowska (2017) find that the Kalamazoo Promise led to a 14 percent increase in postsecondary enrollment and a 10-percentage point increase in six-year bachelor's degree attainment. Our replication of the same pattern of effects in El Dorado suggests these results are not the product of sample selection or methodological choices, but rather a true effect of a Promise program on postsecondary outcomes. However, readers should still interpret our results with caution. Descriptively, overall postsecondary enrollment and completion rates declined for students graduating between 2007 and 2017. The Promise program seems to have acted as a buffer for eligible students, maintaining enrollment and completion rates or leading to slight increases, but it is clear that other factors besides the Promise program were affecting both eligible and ineligible EDSD students during the period we analyze. Future work should examine these broader trends.

Additionally, we have limited evidence that the identifying assumption of our difference-in-differences analysis is met. Our comparison group is students who are, or would be, ineligible for the Promise, meaning they transferred into the district after 9th grade. This is a small group of students, and rates of postsecondary enrollment and completion are volatile in the pre-Promise period. It is therefore difficult to determine if the eligible and ineligible students have common pre-trends, which is necessary to attach a causal interpretation to the results of a difference-in-differences analysis. However, at the least, our results descriptively indicate that a Promise program is associated with improved postsecondary outcomes. Given the dearth of research on the impacts of Promise programs in general and rural Promise programs in particular, on postsecondary outcomes, our results make a valuable contribution to our understanding of the ability of Promise programs to impact students in the long-term. Future analyses of the impact of the El Dorado Promise on postsecondary outcomes are warranted, as sample sizes will continue to increase as more students are exposed to the Promise and the volatile trends, we observe in this analysis may smooth out with additional data. The El Dorado Promise is unique in its geographic context and relatively generous scholarship, so understanding its full impacts should be of interest to policymakers and researchers alike.

Nexus

We find suggestive evidence that a guaranteed scholarship program in a largely rural area can have positive effects on postsecondary enrollment and completion rates. Our results carry several implications for both policy and practice:

- **Promise programs are a worthwhile investment for private philanthropists and communities.** Promise programs can influence a variety of outcomes: population stabilization or growth, increases in housing values, improved K-12 achievement, increased rates of college-going, and increased rates of degree completion. Particularly for struggling areas, establishing a place-based scholarship could be a smart investment with multiple benefits.
- **Communities should create employment opportunities to prevent ‘brain drain’.** Place-based scholarships, such as the El Dorado Promise, can lead more students to attend college and earn a bachelor’s degree. However, without economic opportunities in their community, these students may later move from their hometown to a nearby city or other location that offers more jobs aligned with their postsecondary credentials. If a goal of a Promise program is to help grow the area, the community also needs to support employers looking to hire college-educated workers.

A scholarship can help get students into college, but students may need additional supports after matriculation. We find positive effects of the El Dorado Promise on both postsecondary enrollment and bachelor’s degree completion rates. However, the effects we estimate for enrollment are larger and more robust than the effects we estimate for degree completion, indicating that even when students have a full scholarship, they encounter barriers to success while in college. Postsecondary institutions need to work to offer students the supports they need to complete their degree within a reasonable amount of time.

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Appendix A: Associates' Degree Completion

Table A.1

Impacts of the El Dorado Promise on AA Completion within 3 Years of Graduation

	(1)	(2)	(3)
	Overall Impacts	Impacts by Race	Impacts by GPA
Elig*Post	0.036		
	(0.036)		
Elig*Post*Of Color		0.031	
		(0.038)	
Elig*Post*White		0.043	
		(0.037)	
Elig*Post*Top 50% GPA			0.027
			(0.039)
Elig*Post*Bottom 50% GPA			0.051
			(0.036)
Promise Eligible	-0.004	-0.005	-0.006
	(0.031)	(0.030)	(0.031)
Post Promise Announcement	0.033	0.032	0.033
	(0.040)	(0.039)	(0.040)
Cumulative High School GPA	0.012*	0.012	
	(0.007)	(0.007)	
Top 50% GPA			0.044**
			(0.021)
Female	0.005	0.005	0.004
	(0.010)	(0.010)	(0.010)
Student of Color	-0.029**	-0.020	-0.027**
	(0.012)	(0.021)	(0.011)
Observations	3,005	3,005	3,005

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Standard errors in parentheses

Note: Marginal coefficients from Probit model presented

Appendix B: Results from Alternative Specifications

Table B1

Impact of the El Dorado Promise on Postsecondary Enrollment without Controlling for High School GPA

	(1) Overall Impacts	(2) Impacts by Race	(3) Impacts by GPA
Elig*Post	0.184*** (0.047)		
Elig*Post*Of Color		0.193*** (0.049)	
Elig*Post*White		0.173*** (0.051)	
Elig*Post*Top 50% GPA			0.268*** (0.047)
Elig*Post*Bottom 50% GPA			0.107** (0.047)
Promise Eligible	0.091** (0.041)	0.093** (0.041)	0.085** (0.040)
Post Promise Announcement	0.061 (0.062)	0.057 (0.062)	0.063 (0.060)
Female	0.100*** (0.014)	0.099*** (0.015)	0.079*** (0.015)
Student of Color	-0.131*** (0.014)	-0.145*** (0.026)	-0.092*** (0.015)
Observations	3,640	3,637	3,640

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Standard errors in parentheses

Note: Marginal coefficients from Probit model presented

Table B2

Impact of the El Dorado Promise on BA Completion without Controlling for High School GPA

	(1)	(2)	(3)
	Overall Impacts	Impacts by Race	Impacts by GPA
Elig*Post	0.110**		
	(0.054)		
Elig*Post*Of Color		0.113*	
		(0.058)	
Elig*Post*White		0.106*	
		(0.055)	
Elig*Post*Top 50% GPA			0.223***
			(0.047)
Elig*Post*Bottom 50% GPA			-0.121**
			(0.051)
Promise Eligible	0.058	0.059	0.044
	(0.040)	(0.040)	(0.035)
Post Promise Announcement	-0.048	-0.047	-0.039
	(0.059)	(0.059)	(0.052)
Female	0.078***	0.078***	0.041**
	(0.017)	(0.017)	(0.017)
Student of Color	-0.226***	-0.231***	-0.146***
	(0.016)	(0.028)	(0.016)
Observations	2,296	2,296	2,296

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Standard errors in parentheses

Note: marginal coefficients from Probit model presented

Appendix C: Robustness Check of Parallel Trends

Table C.1

“Impact” of the El Dorado Promise Program on Student Demographics

	(1) Female	(2) Of Color	(3) GPA
Eligible*Post	0.049	-0.086	0.076
	(0.057)	(0.057)	(0.086)
Promise Eligible	-0.041	0.085*	0.114
	(0.049)	(0.049)	(0.074)
Post Promise Announcement	-0.066	0.101*	0.002
	(0.051)	(0.052)	(0.079)
Observations	3,646	3,640	3,506
R-squared			0.007

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ *Standard errors in parentheses**Probit models used for gender and race; marginal effects shown**OLS linear regression model used for GPA*