



TEACHERS COLLEGE, COLUMBIA UNIVERSITY

Six Years Later: Examining the Academic and Employment Outcomes of the Original and Reinstated Summer Pell

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February 2023

CCRC Working Paper No. 132

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Funding for this research was provided by the William T Grant Foundation. We are grateful for the excellent feedback on prior drafts of this paper from Judith Scott-Clayton, Veronica Minaya, and attendees at the 2022 City University of New York (CUNY) Policy Lab conference. We especially thank the staff at the Office of Applied Research, Evaluation, and Data Analytics at CUNY for providing the data and for their assistance in our data inquiries. We are also grateful for the editing expertise of Andrew Beenken. All errors are our own. The opinions expressed are those of the authors and do not necessarily represent views of the funder.

Abstract

While the Pell Grant covers a substantial proportion of college tuition for low-income students, it has covered only two full-time semesters per year and has not included any support for summer courses through most of its history. As research has shown that continuous enrollment throughout the year increases college persistence and completion, the summer Pell (SP) program was added during the summer of 2009 and allowed eligible low-income students to receive an additional grant for summer tuition and eligible costs. The SP was eliminated in 2011 and then restored in 2017. Using administrative data on community college students in New York City, our difference-in-differences analysis results from both periods show that SP-eligible students had a higher retention rate in the fall of the second year, had higher associate and bachelor's degree attainment rates, and had higher earnings gains up to nine years from college entry compared to SP-ineligible students. Heterogeneous analysis indicates that the SP benefits were driven by Black students and older students.

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1. Introduction

College education is key to upward social mobility. College-educated adults experience both private and social gains: higher earnings, better health, and less reliance on welfare programs (e.g., Card, 1999; Barrow & Rouse, 2005; Belfield & Bailey, 2011). However, too few students from low-income families obtain a college degree: Youth of low socioeconomic status (SES), which is understood in terms of parents' income and level of education, are seven times more likely to have a high school diploma as their highest level of education than youth of high SES (U.S. Department of Education, 2019), and this gap appears to be growing over time (Bailey & Dynarski, 2011). Identifying effective policies to promote college attainment for low-income youth is therefore urgently needed to promote social mobility and build a more equitable society.

The federal government's primary effort to increase postsecondary attainment for low-income students is the Pell Grant program, which allocated over \$29 billion in the 2020-2021 award year to approximately 7 million students, most of whom had an annual family income level below \$50,000 (U.S. Department of Education, 2021). While the Pell Grant covers a substantial proportion of college tuition, through most of its history it has covered only two full-time semesters per year and has not included any support for summer courses.

Years ago, some policymakers and researchers expressed concern that the lack of summer coverage might hurt low-income students' chances of completing their programs of study quickly or at all (e.g., U.S. Department of Education, 2005), as research has shown that continuous enrollment throughout the year increases college persistence and completion (Adelman, 2006; Attewell et al., 2012; Liu, 2016). As a result, the summer Pell (SP) program (or year-round Pell) was added in the summer of 2009; it allowed eligible low-income students to receive an additional grant for summer tuition and eligible costs. However, due to its high costs and the lack of evidence of its effectiveness, the SP was eliminated in 2011, but it was restored in 2017. Surprisingly, little research has considered the impacts of SP in its first or second iterations, and little is known about its long-term effects on students.

This paper uses administrative data from the City University of New York (CUNY) system to provide the first evidence on the impact of SP on student persistence,

completion, and employment outcomes among students pursuing community college degrees. According to the SP's eligibility requirement, students with the equivalent of full-year full-time enrollment can apply for the SP in addition to the traditional Pell Grant they receive for the year, while part-time students are not eligible for the SP since they have residual funds from their traditional Pell Grant to pay for summer coursework. Taking advantage of this full-year, full-time enrollment eligibility requirement, we conduct quasi-experimental research using a difference-in-differences (DID) approach to compare full-time and part-time students' academic and employment outcomes before and after the implementation of the original and reinstated SP programs. Our study specifically focuses on community college students since fewer than 10% of CUNY four-year students enroll part-time, which makes part-time students a poor comparison group for a DID study in the four-year context. Also, summer course offerings are much more limited in four-year colleges than in community colleges given that the majority of the courses are taught by tenure-track faculty, who seldom teach in the summer.

Our results show that the SP has consistently benefited students. Compared to SP-ineligible students, SP-eligible students were more likely to take summer courses in their first year, had a higher retention rate in the fall of the second year, and had higher associate and bachelor's degree attainment rates. The analysis of employment outcomes also shows that SP eligibility could yield earnings gains for up to nine years after college entry. Heterogeneity analysis indicates that the SP benefits were driven by Black students and nontraditional students who were older than 25 at enrollment.

Our paper contributes to the literature on the impact of financial aid on academic and labor market success. In particular, our findings demonstrate that financial aid's incentives for year-round as well as summer enrollment can have long-lasting positive impacts on students' academic and labor market outcomes, especially for underrepresented students in higher education. Our analysis also contributes to a small but growing body of research on summer enrollment and academic momentum (Adelman, 2006; Attewell et al., 2012; Attewell & Jang, 2013). Specifically, it provides evidence that enrollment in the first summer can increase students' academic momentum and improve retention and degree completion outcomes.

This study is also relevant for policy and practice. Most directly, our results encourage continued funding for the SP. As mentioned earlier, in 2011, the SP program was eliminated due to its high cost and a lack of evidence of its effectiveness. Though it was reinstated in 2017, concrete evidence is essential to justify continued funding of the SP. Thus far, only three studies (Bannister & Kramer, 2015; Friedmann, 2016; Liu, 2020) have examined the short-term effectiveness of the SP using causal methods; more evaluation with longer follow-up periods is clearly needed. Notably, this paper is the first to examine both the original and reinstated SP programs, and it provides evidence on the effectiveness of the reinstated SP.

2. History of the Summer Pell Program

The federal Pell Grant program is the largest source of need-based aid for college students. However, the Pell Grant program traditionally only covered students' expenses for up to two full-time semesters each academic year, so a recipient who attended full-time during the traditional school year (fall and spring semesters) would exhaust all of their aid before the summer session began. Only part-time students would have remaining Pell Grant funds for summer courses. Full-time students who might want to enroll in more credits than the academic-year schedule offers in order to reduce the time to a degree would have to rely on financial resources other than the Pell Grant, such as student loans or employment income, for taking any additional credits. However, credit constraints might be a barrier to adequate investment in education, and studies have documented that low-income, minority, and first-generation students tend to be more debt-averse than their counterparts, even in the absence of formal credit constraints (Scott-Clayton, 2012; Oreopoulos & Petronijevic, 2013). Therefore, the limitation of the traditional Pell Grant program raises both efficiency and equity concerns.

The Higher Education Opportunity Act included a provision creating the Summer Pell (SP) program (or year-round Pell), which was signed into law in August 2008. The purpose of the SP Grant was to provide additional funding beyond two semesters of full-time enrollment for low-income students to accelerate coursework and degree completion. To be eligible for the SP Grant, students must have registered in the awarded

semester for coursework that counted toward a second school year. That is, if 12 credits per semester constitute full-time enrollment at an institution, then students had to be enrolled in the 25th credit in the semester when they intended to receive the SP Grant. To be eligible for the SP Grant, students also had to be enrolled at least half-time in the awarded semester. There were no additional eligibility requirements for the SP Grant as long as the student qualified for the Pell Grant, met Satisfactory Academic Progress standards, and had not exhausted their lifetime Pell Grant eligibility.

The disbursement of the SP Grant was calculated with the same formula used for the regular Pell Grant. The amount of the Pell Grant a student would be awarded each year was a function of three factors: (1) the maximum award set annually by lawmakers; (2) the student's financial need, calculated as the difference between the cost of attendance and expected family contribution; and (3) the student's enrollment status. The maximum SP Grant disbursement was the same as the maximum Pell Grant disbursement for a term of full-time enrollment. That is, an SP-eligible student taking 12 credits in each of the fall, spring, and summer semesters would qualify for 150% of the scheduled yearly award in total for the three semesters.¹

By the 2010-2011 academic year, an estimated 1.2 million students had used the SP Grant. Students on average received an additional \$1,700 from the SP Grant. The total cost was approximately \$2 billion, amounting to 6% of the total Pell Grant disbursement in one academic year (Alsalam, 2013). However, the federal government eliminated the SP during the 2011-2012 school year because there was insufficient evidence of its effectiveness and the cost was twice the expected cost (Office of Management and Budget, 2011; U.S. Department of Education, 2011).

The SP program was reinstated by Congress under an omnibus appropriations bill starting in the award year 2017-2018. The eligibility requirements and award calculation for the SP Grant remain the same across the two time periods. In the 2018-19 award year, the total SP disbursement was \$1.2 billion, benefitting approximately 790,000 recipients with an average award of nearly \$1,600 (U.S. Department of Education, 2021).

¹ For example, if the maximum Pell award for a student is \$6,000, an SP-eligible student would receive \$3,000 per semester, for a total of \$9,000 for the academic year.

3. Literature Review

3.1 Theoretical Framework

The law of demand states that when all other factors remain constant, the lower the price of a product or service, the more people will demand the good. According to this law, because financial aid such as the Pell Grant lowers the cost of college education among students with financial needs, one would assume that it induces higher demand and, consequently, enrollment in higher education among low-income students. Indeed, the literature has documented a 3–6% increase in college enrollment for each \$1,000 disbursement of the Pell Grant (see review by Deming & Dynarski, 2010). Beyond enrollment, several studies have found positive impacts of the Pell Grant on retention and degree completion (Bettinger, 2004; Denning, 2019; Schudde & Scott-Clayton, 2016). In particular, students with Pell aid are less likely to be employed while enrolled in college (Denning, 2019) and can thus focus more on their coursework. Finally, there is some evidence that the Pell Grant can favorably affect students' borrowing patterns and debt outcomes (Denning, 2019; Marx & Turner, 2017).

As a supplement to the Pell Grant, the SP Grant has unique implications for college students with financial needs. The SP program encourages year-round enrollment, especially during summer semesters, which are not part of the traditional Pell schedule. This is significant because research demonstrates that the first summer of college enrollment can be critical to retention and graduation. The academic momentum framework, for example, suggests that students' experience and achievement in the initial stage of college establish a trajectory for future success. Even after controlling for demographic characteristics and baseline preparation, students who accumulate more credits and obtain better grades in the first year are more likely to persist and complete a college degree than their counterparts (Adelman, 2006). Research has also shown that students who enroll in the summer semester after their first year in college have higher retention and completion rates than those who do not enroll in the summer semester (Adelman, 2006; Attewell et al., 2012; Attewell & Jang, 2013).

Incentives for enrollment in summer courses through financial aid programs such as the SP Grant may positively affect college students' educational attainment in several ways. First, summer enrollment allows students to accelerate their course of study by

taking credits beyond a regular school year; specifically, students can use the summer to fulfill remedial, gateway course, or major requirements. Students can also use the summer to take courses that did not fit in their schedule during the fall and spring semesters due to scheduling conflicts or over-enrollment (Dainow, 2001; Kretovics et al., 2005; Taylor & Doane, 2012). Second, continual enrollment throughout the year may help students remain engaged in their education and avoid summer learning loss widely documented in the K-12 literature (Alexander et al., 2007; Burkam et al., 2004; Cooper et al., 1996). Finally, students usually take fewer courses but on a more rigorous schedule during the summer semester, which may improve learning and morale among some students (Attewell & Jang, 2013).

Furthermore, the eligibility requirements of the SP Grant offer stronger incentives for credit accumulation than the traditional Pell Grant. To be eligible for the SP Grant, students need to enroll in more than the minimum number of credits required of full-time students for the academic year. In addition, students are required to enroll at least half-time during the term in which they intend to receive the SP Grant. Both of these requirements provide an incentive for students to accumulate more credits. Importantly, previous studies have found that academic incentives associated with grants, especially those with a focus on improving college performance and completion, can augment aid effectiveness (see review by Dynarski & Scott-Clayton, 2013).

In addition to the potential to increase degree attainment and shorten the time to degree, the SP Grant may also influence future labor market outcomes through its impact on degree completion. Prior literature has found that associate degree completers earn an average wage premium of 13–22% versus individuals with only a high school diploma (see review by Belfield & Bailey, 2011). Also, time to degree determines when an individual starts building up a post-college earnings trajectory. The earlier an individual enters the labor market, the earlier they start their career trajectory and the more time they have to accumulate lifetime earnings. Furthermore, delayed time to degree is associated with lower post-college earnings (Witteveen & Attewell, 2021). This is consistent with signaling theory, in which a delayed entry to the labor market may be perceived by employers as a signal of inadequate skills or competence.

3.2 Related Research on Summer Financial Assistance

While empirical evidence on financial assistance during summer terms is limited, previous research has shown that informational and tuition-assistance interventions encouraging additional summer enrollment have positive effects on academic outcomes. Specifically, Headlam et al. (2018) evaluated two interventions aiming to encourage summer enrollment among low-income community college students in Ohio. One intervention was an informational campaign to simplify and remind students of information about summer enrollment; the other intervention was a last-dollar tuition assistance program that motivated students to enroll in more summer courses. Both interventions had positive impacts on summer enrollment as well as credit accumulation, indicating that thoughtful encouragement programs for summer enrollment can improve educational attainment among financially disadvantaged community college students.

In comparison to the large body of research on the traditional Pell Grant (Denning et al., 2019; Eng & Matsudaira, 2021), just a handful of studies have examined the SP Grant (Bannister & Kramer, 2015; Friedmann, 2016; Katsinas et al., 2013; Katsinas et al., 2012; Liu, 2020), and only three studies have provided causal evidence of its impacts. Bannister & Kramer (2015) and Friedmann (2016) found that, on average, the SP Grant increased summer enrollment by 0.4 to 1.5 credits per student. Yet Friedmann (2016) found that the availability of the SP Grant did not affect the percentage of students earning at least six credits in the summer, an eligibility requirement for the program. Neither study measured outcomes beyond the first summer.

Perhaps the most relevant paper is Liu (2020), which used a DID approach to compare first-time students enrolled full- and part-time in a state's community college system before and after the implementation of the SP Grant in 2009. Liu (2020) found positive impacts of SP eligibility on summer enrollment and degree completion within 2.5 years from first-time college enrollment. SP-eligible students also earned more money in the first three years after college entry. While the study provided the first evidence of the SP Grant's impacts on academic and labor market outcomes beyond the first summer, data limitations restricted the findings to short-term academic outcomes up to only 2.5 years from college entry and to one cohort of SP-eligible students in 2009.

3.3 The Current Study

Our work builds on the academic momentum and financial aid literature in several ways. First, evidence of the SP Grant’s impact is very limited, and it is unclear whether it provides any long-term benefits. Also, no research on the reinstated SP has been conducted. The data used in this study allow us to examine long-term outcomes of the SP Grant up to nine years from college entry and to explore the impacts of both the original and the reinstated SP implementations. Policymakers would benefit from evidence on the impacts of the program after its reinstatement. Second, as literature on academic momentum and summer enrollment suggests that credit attainment in the first summer and enrollment in more summer courses have positive implications for college persistence and degree completion, the present study contributes to this literature by showing how financial incentives for summer enrollment can affect college persistence and degree outcomes. Lastly, we explore heterogeneous effects of the SP Grant on academic and employment outcomes by race/ethnicity and age among community college students. Racially minoritized and nontraditional-age students at community college typically face greater hurdles toward degree completion. This study provides needed evidence on whether the SP program acts as a strategy to improve educational equity in higher education.

4. Data and Sample

We utilize CUNY’s administrative data to follow the college trajectories of first-time cohorts starting in 2005-2010 and 2013-2018 in eight community and comprehensive colleges.² CUNY is an ideal data source because it is the largest urban university system and the third largest public system of higher education in the United States. It is also one of the most diverse in the country: Sixty percent of its students are Pell recipients; a quarter enrolled at age 25 or above; and nearly half are first-generation

² Comprehensive colleges offer both two-year and four-year degrees. There are five community colleges and three comprehensive colleges in the analysis sample—one community college is a new college and is in the 2013-2018 sample only. We were not able to look at two additional community colleges in the system because summer enrollment data are missing for those colleges.

college students (Myers, 2016). The data we use include demographic information and term-level academic and financial aid records for CUNY enrollees linked to quarterly earnings records from the New York State Department of Labor. These data track employment and earnings outcomes of our analysis sample up to nine years after the students' first-time college enrollment.

Our analysis sample includes approximately 10,000 Pell-eligible fall entrants seeking community college credentials (certificates or associate degrees) in each entry cohort for the years 2005-2010 and 2013-2018. Students who were awarded the Pell Grant in the first fall according to the financial aid data are identified as Pell-eligible and are included in the sample. We further assign students to two groups based on enrollment and financial aid data: SP-eligible students and SP-ineligible students. Since fall entrants at CUNY must enroll in at least the 25th credit during the first summer to qualify for the SP Grant, we identify SP-eligible students as those who enrolled full-time in the first fall and were also awarded the Pell Grant in the first spring (hereafter referred to as full-time students and the others as part-time students) post-SP implementation. We categorize all other students as SP-ineligible students.

Full-time students who enrolled after the implementation of the SP Grant would receive financial support from the SP Grant if they enrolled in at least 6 credits of summer courses. That is, full-time students in 2008-2010 (the post-2009 SP cohorts) and 2016-2018 (the post-2017 SP cohorts) would qualify for the SP Grant in the first summer. All the fall entrants in 2005-2007 (the pre-2009 SP cohorts) and 2013-2015 (the pre-2017 SP cohorts), as well as part-time students in the post-2009 SP or post-2017 SP cohorts in the sample, would not be eligible for the additional SP Grant.

To provide a comprehensive understanding of the impact of the SP Grant, we examine both short- and long-term academic and employment outcomes. Key short-term outcomes of interest include enrollment and college-level credit accumulation in the first summer. In particular, we examine gateway credits in the first summer, as gateway course completion has been shown to positively correlate with college retention (Flanders, 2017). Also, we track students' persistence in the second year and associate degree completion up to the third year from college entry for both SP implementations. For the reinstated SP, the data allow us to examine students' outcomes up to only three

years from college entry. For the original SP, we examine degree attainment up to six years and labor market outcomes up to nine years after college entry.

Table 1 provides descriptive statistics of our analysis sample. We compare demographic characteristics and outcome means of full-time and part-time students before and after both implementations of the SP program. For the original SP, 78% of the pre-2009 SP cohorts and 81% of the post-2009 SP cohorts are full-time students in our sample. For the reinstated SP, 77% of the pre-2017 SP cohorts and 76% of the post-2017 SP cohorts are full-time students. Across the two implementations, full-time students are slightly less likely than part-time students to be male, Black, or Hispanic, and they are on average younger at college enrollment. They also tend to have better academic and labor market outcomes on average. Overall, demographic characteristics of full-time students before and after the SP implementation look similar within both time periods.

Table 1
Summary Statistics

Variable	Pre-2009 SP		Post-2009 SP		Pre-2017 SP		Post-2017 SP	
	Full-Time	Part-Time	Full-Time	Part-Time	Full-Time	Part-Time	Full-Time	Part-Time
A. Student Characteristics								
Female, %	58%	55%	56%	54%	53%	49%	54%	49%
White, %	11%	10%	10%	8%	8%	6%	8%	7%
Black, %	34%	36%	32%	35%	30%	35%	31%	35%
Hispanic, %	41%	43%	44%	48%	44%	48%	45%	48%
Other race/ethnicity, %	14%	10%	14%	9%	18%	12%	16%	10%
Age at enrollment, years	20	21	20	21	20	21	20	20
Pell award amount in term 1, \$	1770	1345	2336	1803	2622	1999	2711	2128
Zip-code level household income, \$ (adjusted to 2009)	58760	58582	58303	56258	57532	55725	57464	56180
B. Academic outcomes								
Enrolled first summer, %	15%	8%	16%	6%	21%	8%	25%	6%
Gateway credits earned first summer	0.1	0.06	0.12	0.04	0.11	0.03	0.13	0.03
Enrolled in fall of year 2, %	73%	36%	74%	34%	74%	34%	74%	26%
Earned associate degree within 3 years, %	10%	2%	12%	2%	20%	4%	20%	2%
Earned bachelor's degree within 6 years, %	12%	2%	13%	2%			-	
C. Employment Outcomes								
Earnings 6 th year from college enrollment, \$	14535	14582	15519	14670				
Earnings 9 th year from college enrollment, \$	22737	20278	24529	20834				
Employed 6 th year from college enrollment, %	72%	68%	76%	72%				
Employed 9 th year from college enrollment, %	74%	68%	75%	69%				
Observations (N)	16,492	4,549	24,111	5,781	23,424	7,185	23,876	7,460

Note. Table shows summary statistics for Pell Grant-eligible students who entered community college pre-2009 SP (2005-2007), post-2009 SP (2008-2010), pre-2017 SP (2013-2015), and post-2017 SP (2016-2018) from the state administrative data. Only fall entrants who were awarded the Pell Grant in Term 1 and who enrolled in a community college with summer enrollment data in the system are kept in the sample. Full-time students are those in the sample who enrolled full-time in Term 1 (fall) and were awarded the Pell Grant in Term 2 (spring), and part-time students are other students. Earnings are adjusted by CPI to 2015 dollars.

5. Empirical Methodology

A simple comparison of average outcomes across students who were awarded the SP Grant and those who were not would likely bias our estimates because certain student groups may be more likely than others to self-select into the SP program. For example, younger students without children may be more likely to self-select into the SP program given that they have fewer financial or household responsibilities throughout the year and over the summer in particular. Moreover, selection into the SP program based on student characteristics would lead to differences in outcomes even without the SP Grant due to intrinsic differences correlated with both the selection and eventual outcomes.

Similar to Liu (2020), we employ a DID approach to compare the differences in academic and employment outcomes between full-time and part-time students before and after the implementation of the SP program:

$$Y_i = \alpha + \gamma Post_i + \delta Treat_i + \beta(Post_i \cdot Treat_i) + \sigma X_i + \epsilon_i \quad (1)$$

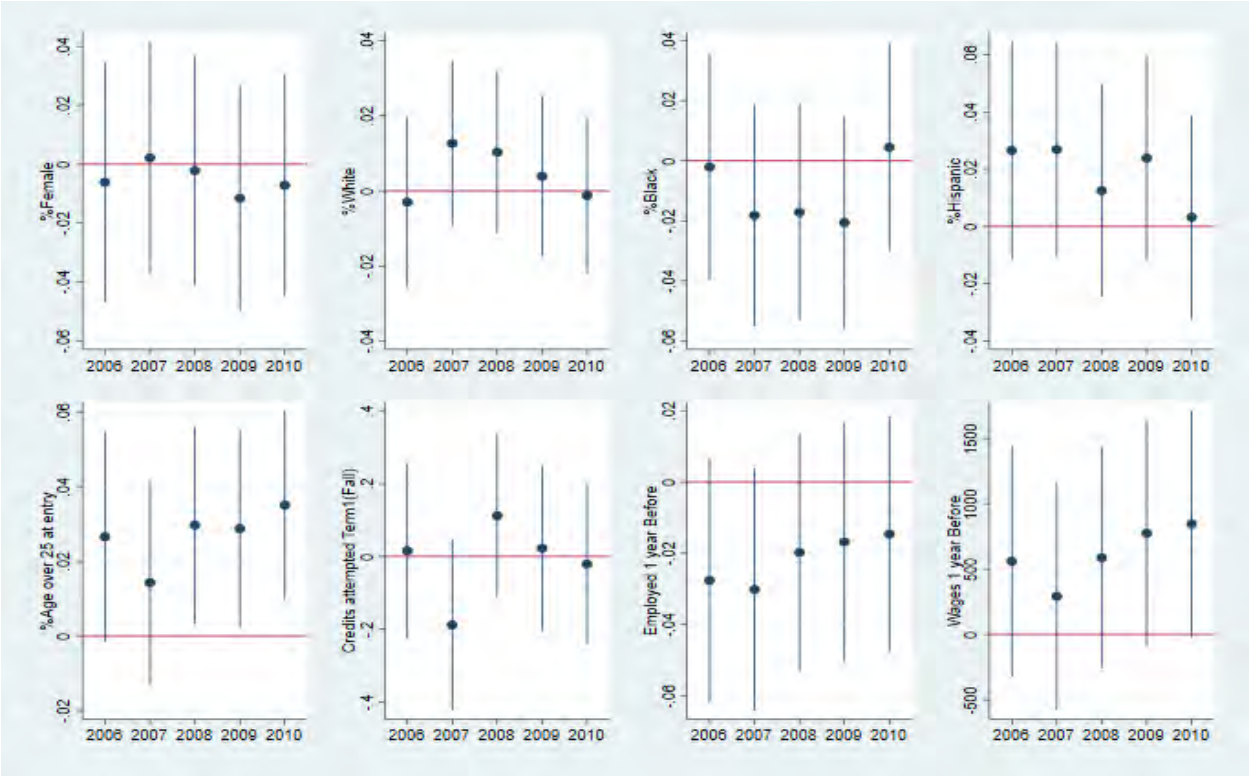
where Y_i refers to students' academic and labor market outcomes; $Post_i$ indicates whether individual i enrolled in college after the implementation of the SP program; and $Treat_i$ indicates SP eligibility, which equals the value of 1 for students enrolled full-time in the first fall semester and were awarded Pell Grant in the first spring semester. As students must first use up the Pell Grant for the regular school year to qualify for any additional SP Grant, it is difficult for part-time students to be SP-eligible. The coefficient on the interaction term captures the causal effect of SP eligibility. Our analysis focuses on estimating the intent-to-treat effect of the SP Grant. Our conceptual framework predicts that SP eligibility makes summer enrollment more affordable for low-income youth and improves retention, degree completion, and post-degree employment outcomes. We thus expect the coefficient on the interaction term to be positive and statistically significant for summer outcomes and at least non-negative, if not positive, for subsequent outcomes.

X_i is a vector of individual characteristics including gender, race/ethnicity, age at college entry, zip-code-level average household income, degree intention at college entry,

college-level credits attempted and earned in the first term, Pell Grant award amount in the first term, other aids amount in the first term, and initial college fixed effects.

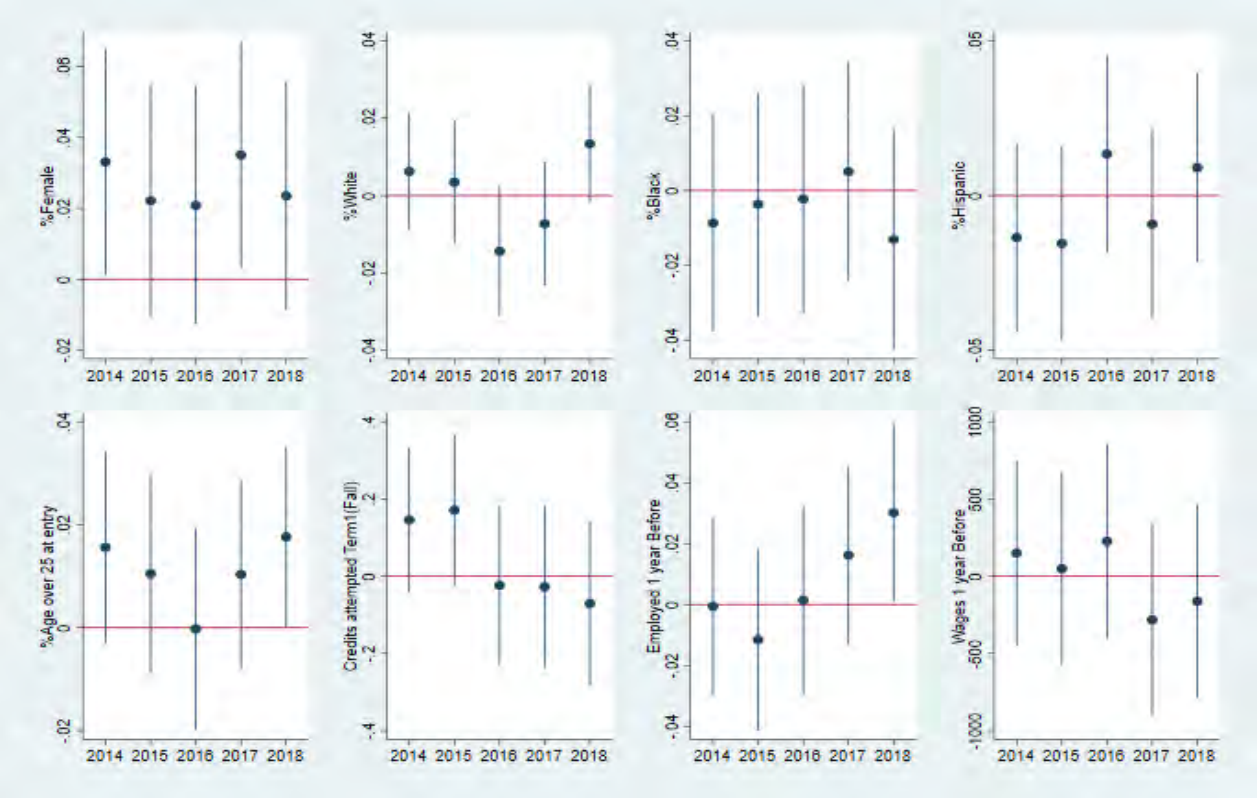
The key assumption behind the DID approach is the parallel trend assumption, which requires that the treatment group (full-time students) and the control group (part-time students) have similar underlying trends in the absence of the treatment. To this end, we present validity checks of our study design using event study plots for both SP implementations in Figures 1 and 2. The event study replaces the $Post_i$ variable in the DID regression with the year fixed effect and the $Post_i \cdot Treat_i$ variable with interaction terms for each year. The plots show coefficients on the interaction terms using student demographic characteristics and employment trends before college enrollment, indicating trends of changes in the variables due to the treatment by year. The years 2005 and 2013 are excluded as the respective baseline years for the two SP implementations. The event study plots show no significant differences across pre-SP and post-SP cohorts in gender, race/ethnicity, age at college entry, and credits attempted in the first term. The results of the event study thus confirm that the parallel trend assumption holds in the study context. Finally, Figure 3 displays the trends of several outcomes, including receiving the Pell Grant in the first summer, enrolling in a gateway course in the summer, and persisting to fall of the second year. The significant jump in these dependent variables during years post-SP implementation shows that students benefited from the additional Pell Grant in the summer.

Figure 1
Validity Check for 2005-2010 Cohorts



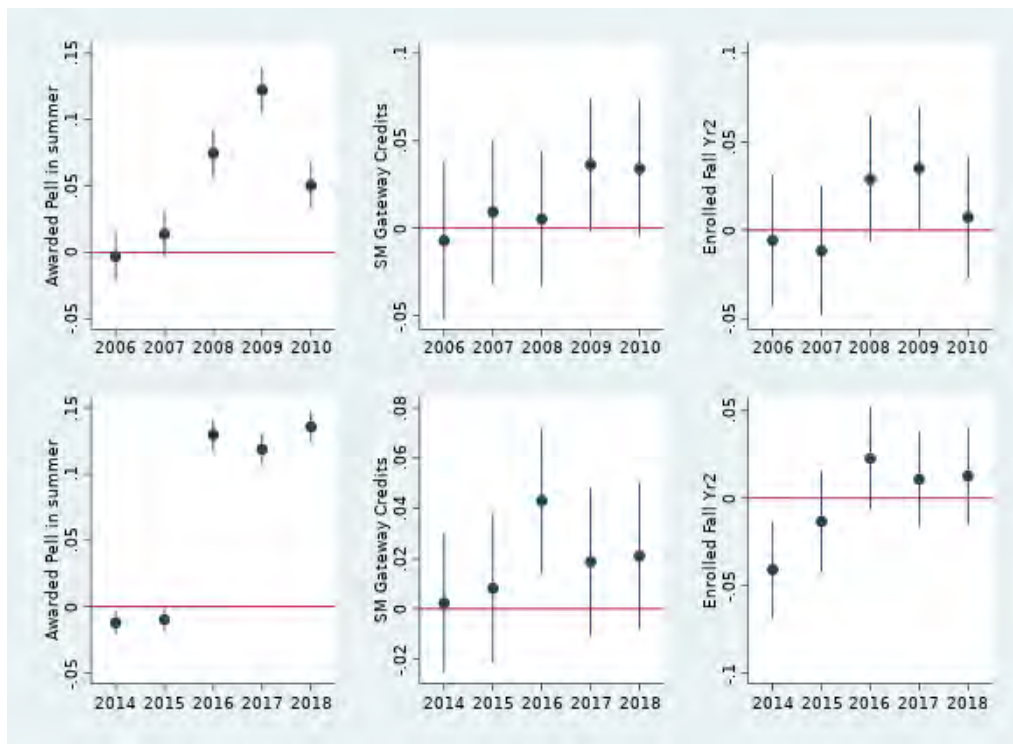
Note. The figure shows event study plots for both SP implementations as validity checks.

Figure 2
Validity Check for 2013-2018 Cohorts



Note. The figure shows event study plots for both SP implementations as validity checks.

Figure 3
Outcome Trends



Note. The figure shows event study plots for both SP implementations.

6. Results

6.1 Effect on Academic Outcomes

To measure the effect of the introduction of the SP on students' academic outcomes, we look at outcomes in the first summer, retention outcomes in the fall of the second year, and degree attainment outcomes. Table 2 presents the coefficient of the interaction term ($Post_i \cdot Treat_i$) from Equation 1 above, which estimates the intent-to-treat effect of the SP program. Each cell represents one regression. Panels A and B present the results for the original SP and the reinstated SP, respectively. Since our data only follow students until the third year from college entry for the reinstated SP, we are only able to estimate impacts on bachelor's degree completion outcomes for the original SP. Overall, SP eligibility has a positive impact on students' academic outcomes.

Table 2
Difference-In-Difference Estimates of the Impacts of the Summer Pell on Academic Outcomes

OUTCOMES	Awarded Pell in Summer	Took Class in Summer	Gateway Credits Earned in Summer	Enrolled in Fall of Year 2	Earned Associate Degree in 3 Years	Earned Bachelor's Degree in 6 Years
Panel A: 2009 SP (N = 50,715)						
Full-Time X 2009 SP	0.079 (0.005)***	0.023 (0.006)***	0.025 (0.011)**	0.029 (0.010)***	0.013 (0.004)***	0.008 (0.004)*
Baseline Means (FT students, Pre-SP)	0.024	0.154	0.105	0.733	0.102	0.119
R-squared	0.036	0.045	0.013	0.214	0.099	0.117
Panel B: 2017 SP (N = 60,241)						
Full-Time X 2017 SP	0.135 (0.004)***	0.051 (0.006)***	0.023 (0.008)***	0.035 (0.008)***	0.054 (0.005)***	
Baseline Means (FT students, Pre-SP)	0.014	0.210	0.108	0.741	0.200	
R-squared	0.104	0.066	0.011	0.282	0.170	

Note. Table shows difference-in-difference estimates of the impacts on academic outcomes of the 2009 SP (Panel A) and the 2017 SP (Panel B). The regressions include covariates to control for gender, race/ethnicity, age at college entry, credits attempted and earned in Term 1, Pell award amount in Term 1, award amount of other aid in Term 1, degree intent at college entry, zip-code-level average household income, and college fixed effects. Robust standard errors are in parentheses.

*** $p < .01$, ** $p < .05$, * $p < .1$.

Panel A shows that the implementation of the original SP caused an increase in the likelihood of Pell Grant receipt and coursetaking in the first summer by 7.9 percentage points and 2.3 percentage points, respectively. With a baseline average of first summer enrollment being 15% among full-time students, a 2.3 percentage point increase is equivalent to a 15% increase. Our analysis of the summer coursetaking pattern shows that introduction of the SP induces an increase in gateway course credits of 0.025 credits. As a result of the positive effects on first-year outcomes, the introduction of the SP also increases the retention rate to the second year (2.9 percentage points) and the associate degree completion rate within three years (1.3 percentage points) from college entry. Given that the baseline average rate of associate degree completion is 10% among full-time students, an increase of 2.9 percentage points is equivalent to a 29% increase. In addition, the SP causes gains of a 0.8 percentage point higher chance of completing a bachelor's degree within six years.

As shown in Panel B, the results for the reinstated SP are consistent with the estimates for the original SP, though the effect sizes are larger. The introduction of the SP induces a 13.5 percentage point increase in Pell Grant receipt in the first summer and a 5.1 percentage point higher rate of summer course enrollment. The SP also increases students' earned gateway credits by 0.023 credits. Finally, the SP induces an increase in the retention rate by 3.5 percentage points and in the associate degree completion rate within three years from college entry by 5.4 percentage points. The corresponding percent increase for the associate degree completion rate is 27%, given a baseline average rate of 20%.

6.2 Effect on Labor Market Outcomes

Next, we look at whether the positive effects of SP eligibility on academic outcomes carry over to success in the labor market. For employment outcomes, we examine whether SP eligibility affects the likelihood of being employed between the third and ninth years from first-time college entry. Table 3 shows that while the introduction of the SP has no effect on whether one is employed in the years following the third year of college, it does have a positive effect on earnings in those years. For example, the SP causes an increase in earnings in the third year from college entry by \$753. The earnings gain is found in each year up to the last year of follow-up and is equal to \$1,357.

Table 3
Difference-In-Difference Estimates of the Impacts of the 2009 Summer Pell on Labor Market Outcomes

Year Relative to College Entry	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Panel A: Probability of Employment (N = 50,715)							
Full-Time X 2009 SP	0.008 (0.010)	0.018 (0.010)*	0.007 (0.010)	0.008 (0.010)	0.006 (0.010)	0.008 (0.010)	0.01 (0.010)
Baseline Means (FT students, Pre-SP)	0.723	0.704	0.711	0.722	0.730	0.736	0.736
R-squared	0.025	0.022	0.019	0.019	0.018	0.016	0.016
Panel B: Annual Earnings (N = 50,715)							
Full-Time X 2009 SP	753 (282)***	715 (312)**	606 (344)*	995 (382)***	1028 (421)**	1372 (473)***	1357 (517)***
Baseline Means (FT students, Pre-SP)	9580	10809	12428	14535	16968	19888	22737
R-squared	0.046	0.031	0.019	0.016	0.020	0.025	0.029

Note. Table shows difference-in-difference estimates of the 2009 SP impacts on the probability of employment (Panel A) and annual earnings (Panel B) from the third to the ninth year after college entry. The regressions include covariates to control for gender, race/ethnicity, age at college entry, credits attempted and earned in Term 1, Pell award amount in Term 1, award amount of other aid in Term 1, degree intent at college entry, zip-code-level average household income, and college fixed effects. We assume that years with missing earnings represent unemployed years, and we replace missing earnings data with zeros. Robust standard errors are in parentheses.

*** $p < .01$, ** $p < .05$, * $p < .1$.

6.3 Heterogeneous Impact of the Summer Pell

So far, our results have indicated that SP eligibility has an overall positive effect on students' academic and labor market outcomes. Given the concern about the lack of summer tuition assistance among underrepresented students, we further examine whether the SP has heterogeneous effects across various student subgroups by race/ethnicity and age at enrollment. We focus on Black and Hispanic students since they have been historically underrepresented in higher education nationwide. CUNY provides a unique context for examining the impact of the Summer Pell among minoritized students because they constitute the majority of the student population at CUNY.

Panel A of Table 4 presents the results limited to White, Black, and Hispanic students, respectively. For White students, the introduction of the SP does not appear to have significant effects on any outcomes except for the Pell receipt in the first summer. It is important to note that White students have low representation in the analytic sample, and the low sample size may have led to a lack of power in the estimation. Therefore, most of the coefficients are not statistically significant despite having a similar size and direction as the coefficients in the main result.

Table 4
Difference-In-Difference Estimates of the Impacts of the 2009 Summer Pell by Subgroup

OUTCOMES	Awarded Pell in Summer	Took Class in Summer	Gateway Credits Earned in Summer	Enrolled in Fall of Year 2	Earned Associate Degree in 3 Years	Earned Bachelor's Degree in 6 Years	Earnings 6 th Year From College Entry	Earnings 9 th Year From College Entry
Panel A: Race/Ethnicity								
White (N=5,089)	0.089 (0.017)***	0.006 (0.021)	0.023 (0.047)	-0.000 (0.033)	0.013 (0.014)	0.009 (0.018)	2,039 (1542)	2,674 (2179)
Baseline Means (FT students, Pre-SP)	0.017	0.156	0.164	0.783	0.102	0.213	14072	23904
Black (N = 16,819)	0.083 (0.009)***	0.034 (0.011)***	0.052 (0.018)***	0.054 (0.017)***	0.005 (0.006)	0.013 (0.006)**	1,412 (625)**	2,283 (824)***
Baseline Means (FT students, Pre-SP)	0.029	0.159	0.092	0.697	0.082	0.081	14376	21686
Hispanic (N = 22,102)	0.053 (0.007)***	0.015 (0.009)*	-0.008 (0.013)	0.009 (0.015)	0.010 (0.006)	-0.000 (0.006)	258 (548)	177 (730)
Baseline Means (FT students, Pre-SP)	0.021	0.134	0.076	0.717	0.099	0.089	15387	23040
Panel B: Age at Enrollment								
Younger than 25 (N = 46,384)	0.067 (0.005)***	0.014 (0.006)**	0.005 (0.011)	0.027 (0.011)***	0.011 (0.004)**	0.009 (0.005)*	490 (386)	892 (534)*
Baseline Means (FT students, Pre-SP)	0.023	0.146	0.101	0.735	0.102	0.123	14253	22680
25 or Older (N = 4,328)	0.178 (0.019)***	0.096 (0.024)***	0.181 (0.044)***	0.056 (0.029)**	0.026 (0.014)*	0.004 (0.012)	3,151 (1,408)**	2,750 (1746)
Baseline Means (FT students, Pre-SP)	0.044	0.246	0.145	0.718	0.106	0.080	17878	23135

Note. Table shows difference-in-difference estimates of the 2009 SP impacts on academic and labor market outcomes by race/ethnicity and age at college enrollment. The regressions include covariates to control for gender, race/ethnicity, age at college entry, credits attempted and earned in Term 1, Pell award amount in Term 1, award amount of other aid in Term 1, degree intent at college entry, zip-code-level average household income, and college fixed effects. We assume that years with missing earnings represent unemployed years, and we replace missing earnings data with zeros. Robust standard errors are in brackets.

*** $p < .01$, ** $p < .05$, * $p < .1$.

Of the three racial/ethnic subgroup populations we consider, Black students appear to benefit the most from the introduction of the SP. The implementation of the SP increases the chance of Black students using the Pell Grant by 8.3 percentage points and enrollment by 3.4 percentage points in the first summer. There are also gains in 0.052 gateway credits earned in the first summer associated with the SP introduction. These credit gains as a result of the SP also lead to a 1.3 percentage point increase in the likelihood of completing a bachelor's degree within six years. Finally, the academic benefits from the introduction of the SP Grant also translate into longer-term earning advantages in the sixth and ninth years from college entry.

We also consider Hispanic students. Despite some positive effects on receiving the Pell Grant and taking classes in the first summer, the introduction of the SP does not show any effects on the rest of the outcomes for these students. The subgroup results therefore indicate that the positive effects of the SP program are driven by Black students.

In addition to differences by racial/ethnic status, we are also interested in whether the SP benefit differs by students' age at enrollment. Close to 90% of students seeking a two-year credential in this state are under 25 at college entry. Nontraditional-age students typically face a higher number of obstacles at college due to family, work, and other obligations. Panel B shows that nontraditional-age students benefit more from the introduction of the SP in terms of summer enrollment and credit outcomes as well as in the likelihood of completing an associate degree within three years. However, only younger students experience gains in bachelor's degree attainment within six years. This may reflect a preference for shorter degrees among older students. There are also higher earnings gains from the SP implementation among older students than among younger students.

6.4 Robustness Checks

Since we are not able to observe students' SP eligibility directly from the data, the main analysis uses the proxy of full-time status in the first semester to identify SP-eligible students. Students who enroll part-time in the first semester are not very likely to be eligible for the SP because they must enroll in at least the 25th credit during the summer semester to receive the SP. However, we recognize that it is possible for students

who enroll part-time in the first semester to enroll in more than a full-time credit load in the second semester. To test for the sensitivity of our treatment definition, we apply an alternative treatment proxy: students who accumulated more than 18 credits before the first summer and were awarded the Pell Grant in the first spring. Appendix Table A1 presents the results of the robustness check. Results using the alternative treatment proxy have consistent signs and similar magnitudes as results from the main analysis. That is, results are robust to the choice of treatment proxies for SP eligibility.

In addition, we include a range of individual controls in our DID estimation to ensure that the treatment group and the control group have similar underlying trends in the absence of the treatment. Among the controls, credits and Pell Grant award amount in the first term could be correlated with our treatment indicator: enrollment intensity in the first term. We test the robustness of the inclusion of these controls by leaving out the controls from the estimation. As shown in Appendix Table A2, the estimation results without these controls are similar to the main results with the controls. In fact, the results are still consistent when we remove all controls.

7. Discussion and Conclusion

7.1 Discussion of Key Findings

Drawing on administrative data that match college academic records with students' employment outcomes in New York City, the quasi-experimental evidence presented in this study indicates that the SP program led to meaningful increases in the probability of students' summer enrollment and college retention, as well as a higher rate of degree completion and future earnings. The benefits of the SP Grant for academic and labor market outcomes are particularly pronounced among Black students, which points to the importance of summer enrollment and summer financial incentives as an opportunity to address the persistent racial gaps in college success.

We also find a larger SP effect for the reinstated SP compared to that for the original SP. This may be due to three factors. First, there was significant confusion around the details of the SP program when it was first rolled out, which led to lower uptake of the program. The final regulations were not published until October 2009 (U.S.

Department of Education, 2011), which meant that many colleges did not advertise or implement the program in time for students to take advantage of the SP program until the summer of 2010. When the SP program was signed into law again for the 2017 implementation, there was greater anticipation of and familiarity with the program, and colleges were more prepared to take advantage. As a result, the take-up rate may be larger in the reinstated implementation. Indeed, 18% of SP-eligible students (full-time enrolled in both first fall and spring) in our analytical sample received Pell Grant in the first summer under the reinstated SP, while only 12% did so under the original implementation.

Second, as the SP Grant was eliminated in 2011, SP-eligible students under the original implementation were exposed to a maximum of two summers of SP, while those under the reinstated implementation could enjoy at least three summers of SP assistance (among the years we can observe). The larger SP effects for the 2017 implementation may therefore be a result of the reinstated SP's longer life and more consistent financial support for summer terms.

Finally, it is important to point out that different macroeconomic conditions underlying the two analyses may impact the estimates as well. The original SP was implemented under the Great Recession, when students had lower confidence in their future employment prospects and lower perceived future value of a college degree. The opposite may have been the case during the economic boom surrounding the reinstated SP, giving students a confidence boost to finish their degrees. The larger impact found in Panel B compared to Panel A in Table 2 may be partially explained by the different macroeconomic conditions, while the overall SP impacts were positive under both conditions.

Our findings are in line with previous research on summer enrollment, academic momentum, and financial aid. In particular, we apply a difference-in-difference model like Liu (2020) but with data from a different state college system and confirmed the positive impacts of SP eligibility found in that paper. Our estimates are smaller than the results in Liu (2020), perhaps due to the different settings of the education systems studied and the different demographic compositions of the student bodies. The education system in the current study is located in an urban setting where the cost of living is

higher, the majority of the students commute to their schools through the public transport system, and there are ample opportunities for students to work during college. Relative to students in a non-urban setting, urban students may face a higher cost to enroll in the summer; therefore, the real value of the SP Grant may be smaller, which may explain the smaller impact of SP eligibility. Furthermore, over half of the student body in Liu (2020) is White, while in our system, nearly half of the students are Hispanic and only 10% are White. Our results show that the benefit of the SP Grant was much lower for Hispanic students than for White students, which accounts for the smaller overall estimates we found. These differences indicate that the same amount of financial assistance intended to boost summer enrollment can have different impacts depending on the student body and educational setting.

7.2 Policy Implications

This paper has important implications for policymakers and school leaders seeking to understand how financial incentives can shape students' summer enrollment and later success. First, our findings show that tuition and costs are indeed a barrier to summer enrollment, especially for underserved populations at community colleges. Policymakers may consider providing financial incentives for summer enrollment, which could have substantial implications for students' long-term success and reduce inequality in both higher education and the labor market.

Second, our findings indicate students' demand for summer courses as a result of summer aid and highlight the importance for colleges of increasing summer course offerings that contribute to degree requirements. If the SP program is here to stay, community colleges will need to make structural changes to hire more qualified instructors and increase course availability in the summer. College counselors should also encourage students to take advantage of the summer to speed up their degree progress. Finally, we found that student demographics and macroeconomic climates affect how students respond to financial aid policy. When designing financial incentives for summer enrollment, policymakers should be aware of the hidden costs of summer enrollment beyond tuition and direct costs, such as foregone earnings and childcare, as well as how these hidden costs differ for different student populations and under different macroeconomic contexts.

7.3 Limitations and Future Research

Our study has several limitations and leaves open questions for future research. First, we focus on the intent-to-treat effects of SP eligibility rather than the treatment effects of the receipt of the SP Grant. We recognize that our proxy for students' SP eligibility is imperfect. However, the majority of SP-eligible students should be identifiable by the full-time students in the analysis. Also, we tested the robustness of the results using an alternative treatment proxy and showed that results for the robustness check are similar to the main results. Additionally, we are unable to examine the long-term impacts of the reinstated SP due to the limited follow-up window. However, the early outcomes of the reinstated SP are positive and larger than those of the original SP. Therefore, we expect the reinstated SP would also have positive, if not stronger, impacts on students' later outcomes.

Furthermore, we do not have data to examine heterogeneous effects of SP eligibility by students' financial background. Our research already focuses on low-income students, as we restricted our analysis sample to Pell-eligible students. Future research using expected family contribution data may further explore how the effects vary by students' income level. Lastly, although we show that SP eligibility increases gateway course completion in the summer, the relationship between the SP Grant and students' coursetaking patterns is still unclear. Future research using more detailed course data may explore the types of courses that students use the SP Grant to take. For example, it would be interesting to see how the SP Grant affects the completion of remedial credits and major credits, as well as its impacts on long-term outcomes. Such evidence would guide students and colleges to use the SP Grant more effectively.

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Appendix

Table A1
Robustness Check Using Alternative Treatment Definition

OUTCOMES	Awarded Pell in Summer	Took Class in Summer	Gateway Credits Earned in Summer	Enrolled in Fall of Year 2	Earned Associate Degree in 3 Years	Earned Bachelor's Degree in 6 Years	Earnings 6 th year from college entry	Earnings 9 th year from college entry
2009 SP (N = 50,715)	0.067 (0.005)***	0.013 (0.007)*	0.027 (0.013)**	0.012 (0.008)	0.012 (0.007)*	0.004 (0.007)	465 (331)	52 (483)
2017 SP (N = 60,241)	0.143 (0.004)***	0.063 (0.006)***	0.015 (0.010)	0.034 (0.006)***	0.051 (0.006)***	- -	- -	- -

Note. Table shows difference-in-difference estimates of the SP impacts on academic and labor market outcomes. The check includes the following students as treated: observations who accumulated more than 18 credits before the first summer and were awarded the Pell Grant in the first spring. The regressions include covariates to control for gender, race, age at college entry, credits attempted and earned in Term 1, Pell award amount in Term 1, award amount of other aid in Term 1, degree intent at college entry, zip-code level average household income, and college fixed effects. We assume that years with missing earnings represent unemployed years, and we replace missing earnings data with zeros. Robust standard errors are in brackets. ***p < .01, **p < .05, *p < .1.

Table A2
Robustness Check Dropping Controls for First-Term Credits and Pell Award

OUTCOMES	Awarded Pell in Summer	Took Class in Summer	Gateway Credits Earned in Summer	Enrolled in Fall of Year 2	Earned Associate Degree in 3 Years	Earned Bachelor's Degree in 6 Years	Earnings 6th year from college entry	Earnings 9th year from college entry
2009 SP (N = 50,715)	0.078 (0.005)***	0.021 (0.006)*	0.025 (0.011)**	0.025 (0.010)**	0.013 (0.004)***	0.008 (0.004)*	856.642 (383.790)**	1,175.734 (520.603)**
2017 SP (N= 60,241)	0.144 (0.004)***	0.063 (0.006)***	0.031 (0.008)***	0.076 (0.009)***	0.062 (0.006)***	- -	- -	- -

Note. Table shows difference-in-difference estimates of the SP impacts on academic and labor market outcomes. The regressions include covariates to control for gender, race, age at college entry, other aids award amount in Term 1, degree intent at college entry, zip-code level average household income, and college fixed effects. We assume that years with missing earnings represent unemployed years, and replace missing earnings data with zeros. Robust standard errors are in brackets.

***p < .01, **p < .05, *p < .1