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Denying Loan Access: The Student-Level Consequences When Community Colleges Opt Out of the Stafford Loan Program

A CAPSEE Working Paper

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July 2015

I would like to thank Sue Dynarski, Brian McCall, Stephen DesJardins, Judy Scott-Clayton, Beth Rhodes, Jessica Wiederspan, and Sara Goldrick-Rab for helpful discussions and comments on previous drafts. The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305C110011 to Teachers College, Columbia University. The opinions expressed are those of the author and do not represent views of the Institute or the U.S. Department of Education. All errors are those of the author. Direct correspondence to mwieders@umich.edu.

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Abstract

The degree to which students are able to make adequate repayments on their student loans and avoid default is of special concern for colleges. If too many former students go into default, the college will face sanctions by the federal government and lose eligibility to provide currently enrolled students federal financial aid, such as the Pell grant. To avoid these sanctions, some colleges have chosen not to participate in federal loan programs by excluding loans from students' financial aid packages. In this paper, I investigate the student-level impacts associated with the decision of community colleges to opt out of the Stafford loan program. Utilizing administrative records from over 50 community colleges located in a single state, I estimate the within-college differences in outcomes for Pell-eligible students before and after an institution opts out of the federal loan program. I find that Pell-eligible students enrolling when the community college offered federal loans were 7.6 percentage points more likely to borrow than Pell-eligible students who enrolled when the institutions opted out. Overall borrowing also increased by $368 a year. I also find that students borrowing a loan attempted 19 additional credits in their first year of enrollment and were more likely to attempt and complete math and science courses than non-borrowers.

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1. Introduction

Over the past two decades, rising college tuition rates and a decline in the purchasing power of need-based grants have led student loans to become a key component of the financial aid system in the United States. According to the College Board (2013), over 8 million undergraduates borrow federal loans each year, and for the 2011–12 academic year, the federal government provided over $80 billion in Stafford loans. In comparison, roughly $34 billion was spent on the Pell grant, the nation's largest need-based grant program. For 2013, over two thirds of students graduating from college had an average debt load of $28,400, which is up 2 percent from the year before (The Institute for College Access & Success, 2014b).

Students using loans to pay for college and the resulting debt have been central to the broader national dialogue concerning rising debt levels. The nation's student loan debt grew $124 billion this past year and has become the second largest form of debt at $1.12 trillion (Federal Reserve Bank of New York, 2014). This trend has led to growing concern that the United States is facing a student loan debt crisis (Kamenetz, 2006; Salas Gage & Lorin, 2014) as increasing debt levels, fewer employment opportunities, and low salaries leave some borrowers struggling to repay (Consumer Financial Protection Bureau, 2013). Nationally, student loan default rates have risen steadily over the past decade: today, 13.7 percent of borrowers default on their federal loans within three years of entering repayment (U.S. Department of Education, 2014c).

The degree to which students can repay their loans is of special concern for colleges. Each year, the U.S. Department of Education calculates a cohort default rate (CDR) for colleges, which measures the share of borrowers who fail to repay their loans. If a CDR is over 30 percent for three consecutive years, the federal government can sanction and prohibit the college from offering currently enrolled students any federal financial aid, including the Pell grant, for three years. Colleges with a CDR above 40 percent for one year lose their participation in the federal Stafford loan program, but still have eligibility to offer Pell grants to students. Previous research by Darolia (2013) demonstrates the negative effects for institutions having default rates above sanctioned thresholds. Among institutions that offer academic programs of two years or less, becoming ineligible to offer students federal financial aid decreases enrollment by approximately 12 to 16 percent. The impact is even greater—almost 18 percent—at for-profit institutions.

To avoid sanction and retain the use of federal financial aid, some colleges opt out of the federal Stafford loan program and prohibit students the opportunity to borrow loans with no guarantee of replacing the loan amount with another type of aid.[1] The idea behind this action is simple: if a college has students graduating with no debt, the college is not exposed to having a default rate measure that incurs federal sanction. The Institute for College Access and Success

[1] This policy is different from the no-loan policies found at the Ivy League or highly selective postsecondary institutions, as the no-loan policies for these elite institutions substitute loans for another non-repayable grant or scholarship (DesJardins, Ahlburg, & McCall, 2002a).

(2014a) has estimated that roughly 8.5 percent of all community college students in the United States do not have access to federal loans because the colleges they attend do not participate in federal loan programs.

While community colleges may believe that opting out is in students' best interest, it is possible that limiting loan access has negative consequences for students. Becker's (1993) human capital investment model helps illuminate how students' inability to take out federal loans may condition their educational trajectories in ways that affect their progression toward degree completion and other educational outcomes. According to Becker, the amount of time an individual spends on school-related activities is inversely proportional to the time spent on leisure and working. Without access to loans, financially constrained students are likely to allocate a larger portion of their time to paid employment in order to pay for college, or enroll in fewer course credits to reduce the direct costs. Alternatively, the receipt of loans provides students an option for financing their education that does not involve reducing the amount of time spent on school-related activities and facilitates faster time to degree completion.

The focus of this paper is to investigate how a community college's participation in the federal Stafford loan program affects students' educational performance and completion. Do existing financial aid programs or employment make up for the loss of student loans? Does loan borrowing affect students' credit accumulation and degree completion? To determine whether student loans help students succeed in college, I exploit the variation in loan policies of the over 50 community colleges that are a part of a statewide community college system (henceforth referred to as SCCS), located in a large Southern state. Of the 50 community colleges, 15 were observed as opting out of the Stafford program. My empirical strategy combines fixed effects and instrumental variable strategies to estimate the within-college differences in student outcomes before and after a college opts out of the federal loan program. I use administrative records of students who enrolled for the first time between 2001–02 and 2009–10; among this sample, I analyze outcomes on Pell-eligible students for whom the data are collected most consistently.

I find that Pell-eligible students enrolling when the community college offered federal loans were 7.6 percentage points more likely to borrow than students who enrolled after the community college opted out of the federal loan program. The overall amount borrowed also increased by $368. I also find that after the switch in loan policy, institutions did not replace the loss in loan amounts with another financial aid program. I find no evidence that loan borrowing statistically improved degree completion and transfer to a four-year institution, but do find that Pell-eligible students borrowing a loan attempted 19 additional credits and were more likely to attempt and complete math and science courses than non-borrowers.

In section 2, I describe previous research on student loans in order to illustrate the lack of research examining the relationship between loan borrowing and students' educational outcomes. Section 3 highlights students' loan use within SCCS and explanations for why SCCS colleges

opt out of the federal loan program. Section 4 describes the data and sample used for analysis and my empirical strategy. Results are in section 5, and concluding thoughts are in section 6.

2. Research on Students Loans

Researchers know little about whether loans help students succeed in college. In theory, the availability of loans removes credit constraints and affords educational opportunities to many students who may not otherwise have been able to attend college. However, the findings on student loans have been inconsistent. Some studies have found that loans exert a positive influence on college outcomes (Chen & DesJardins, 2008; Cofer & Somers, 2000), while others have found insignificant or negative effects (Braunstein, McGrath, & Pescatrice, 2000; DesJardins, Ahlburg, & McCall, 2002b; Dowd & Coury, 2006).

Estimating the effects of loans on college outcomes can be difficult because students' loan receipt is not randomly assigned. In the United States, the federal loan program is designed in such a way that students self-select their loan amount. Simply comparing outcomes between student loan borrowers and non-borrowers is likely to produce biased estimates because there are possible unobserved differences between the two groups that could be associated with the decision on whether or not to borrow. In absence of a randomized experiment, the challenge is to counteract this self-selection bias. More recently, researchers have begun to employ quasi-experimental approaches by exploiting an exogenous assignment that determines whether a student is eligible for a loan. This approach allows for the development of a counterfactual of what students would do in absence of receiving a loan.

Two studies examining student loan programs outside of the United States employed a quasi-experimental research method and found positive effects with loan eligibility. Both of these studies used a regression discontinuity design around a minimum score that determines whether or not a student can be offered a loan. Gurgand, Lorenceau, and Melonio (2011) examined a private loan program in South Africa, and students whose parents' credit scores were just above the eligibility threshold were 20 percentage points more likely to enroll in college. Solis (2012) examined students' college admission test scores in Chile and, like Gurgand et al. (2011), found a 20 percentage point increase in the probability of enrollment with eligibility for loan programs. Additionally, Solis found that access to loans led to a lower dropout rate, as loan-eligible students were more likely to enroll in their second and third years of college.

Of the studies evaluating student loans in the United States, most of the research has examined student loans in relationship to college enrollment or post-college employment decisions. Dynarski (2003) used a difference-in-difference strategy to examine the change in federal loan availability with the removal of home equity in the financial aid formula. She found that federal loan eligibility had a weak effect on college enrollment. Rothstein and Rouse (2010) evaluated a no-loan policy at a highly selective university where the loan component of students'

financial aid awards was replaced with grants. Their findings suggest that debt increased the probability of students choosing a high-salary job rather than a job that has low pay or is in the public sector.

There is little research that examines the effect of U.S. loan programs on students' educational outcomes. In the paper most related to the present analysis, Dunlop (2012) exploited the variation in community colleges' participation in the federal Stafford loan program. Using the Beginning Postsecondary Student Study of 2004, Dunlop used a community college's federal loan participation as an instrument to estimate the effect of the loan amount borrowed on credits completed, degree attainment, and transfer to a four-year college. Dunlop mostly interpreted findings from the reduced form estimations, but her results suggest that limiting loan access indeed decreases loan borrowing and hinders transfer to a four-year college. Results on other outcomes, such as credits completed, were statistically insignificant.

Because Dunlop used cross-sectional variation in community colleges' loan participation, the composition of students across colleges could be different. Community colleges operate to serve the surrounding community, and the composition of the student body could reflect the community's socioeconomic characteristics, some of which could be associated with students' decisions on whether or not to borrow a loan. In addition, colleges are likely to develop academic and financial aid programs that are tailored to meet the needs of the surrounding area. Dunlop's analysis does not fully account for these institutional differences and whether institutions help students make up for the loss of loan access. To do so would require longitudinal observation within an institution to see how students respond before and after the change in loan policy, which is the contribution of my paper.

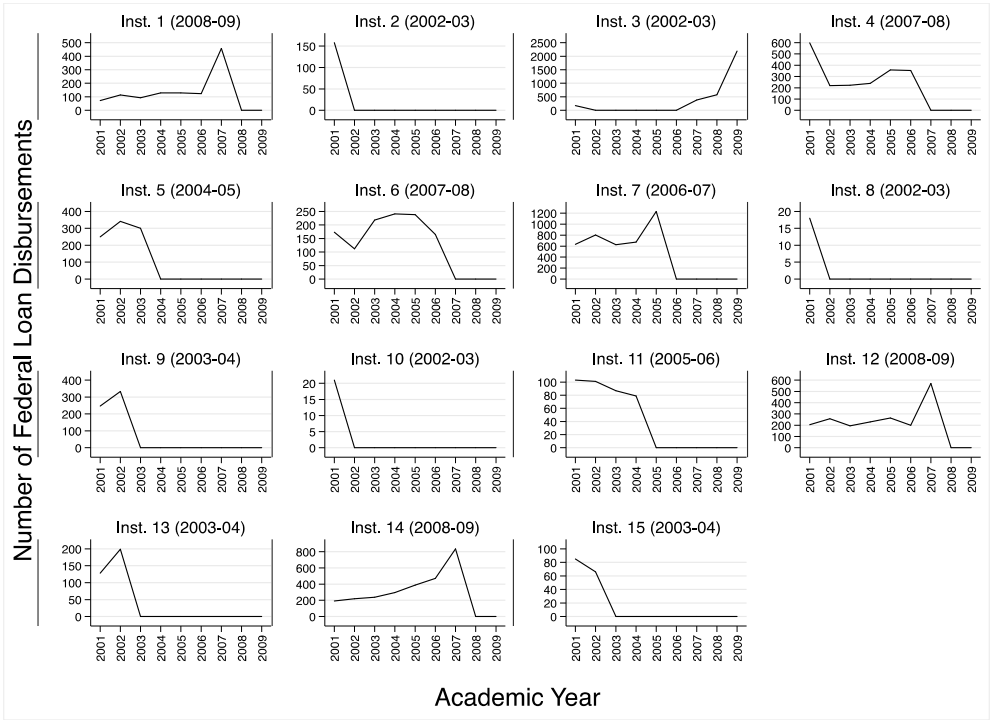
3. Loan Policies Within the Statewide Community College System (SCCS)

To analyze how participation in the federal loan program affects students' educational outcomes, I examine the loan policies of the 50 public community colleges within SCCS. In comparison with other community colleges nationwide, SCCS contains a significantly high number of community colleges that have opted out of the federal Stafford loan program. For example, during the 2001–02 academic year, over 70 percent of all public two-year institutions in the United States participated in the Stafford loan program. In comparison, only 60 percent of SCCS institutions offered federal loans. By 2009–10, the share of participating public two-year colleges was still over 70 percent nationwide, whereas participation among SCCS institutions dropped to almost 35 percent.

Between 2001–02 and 2009–10, 15 community colleges in SCCS altered their federal loan policy. Using data from the U.S. Department of Education's (2014d) Title IV Program

Volume Reports, Figure 1 displays the number of Stafford loans each of the 15 institutions disbursed to students. At some point, these 15 community colleges opted to not participate in the federal loan program. The horizontal line indicates when the switch to not offering loans occurred. Institution 3 is the only institution that altered its loan policy twice by opting out in 2002–03, and then reinstating students' borrowing privileges in the 2007–08 academic year.

Figure 1: Number of Stafford Loan Disbursements

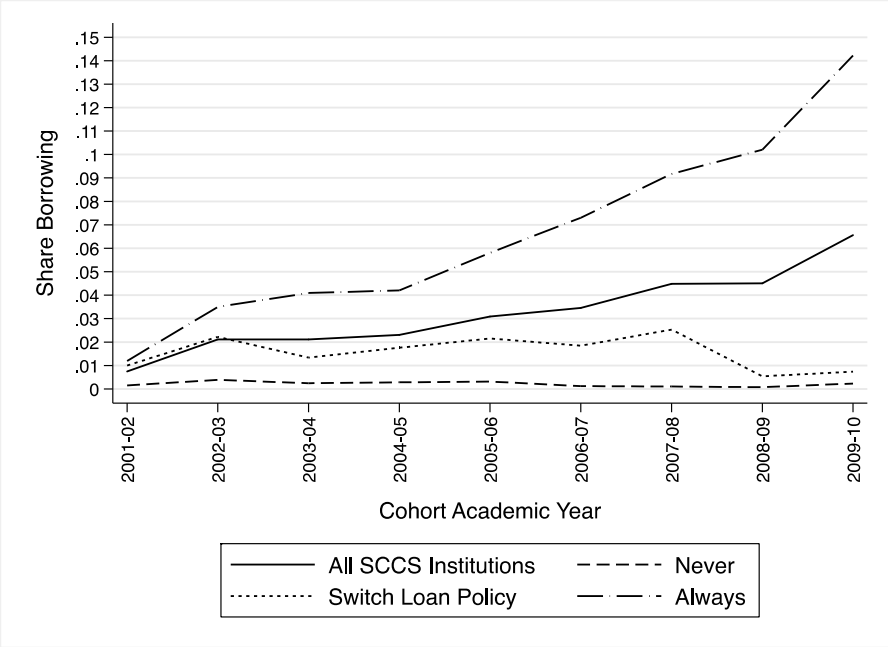


Note. The community colleges represented are the 15 colleges observed as having opted out of the Stafford loan program between 2001–02 and 2009–10. The academic year the institution switched loan policy is in parentheses.

Source: U.S. Department of Education (2014d).

Despite the decrease in the number of SCCS institutions offering federal Stafford loans, the proportion of its students borrowing has substantially increased. Figure 2 displays the growth in borrowing by incoming cohort for all SCCS institutions over a nine-year period; the growth trajectories are also disaggregated according to the institutional loan policy (students from institutions that never offered loans, always offered loans, or changed loan policy during the time period). As the graph illustrates, the overall growth in borrowing has largely resulted from increases among students from institutions that have continuously offered loans.

Figure 2: Share of First-Time Students Borrowing, by School's Loan Participation



Note. Graph illustrates the share of first-time students borrowing a loan in each academic year. School's loan participation is based on the number of disbursements from 2001–02 to 2009–10. Institutions that never disbursed Stafford loans during that time period are considered "never." Institutions that offered loans and then switched to not offering are "sometimes." Institutions that always offered loans over the time period are considered "always."

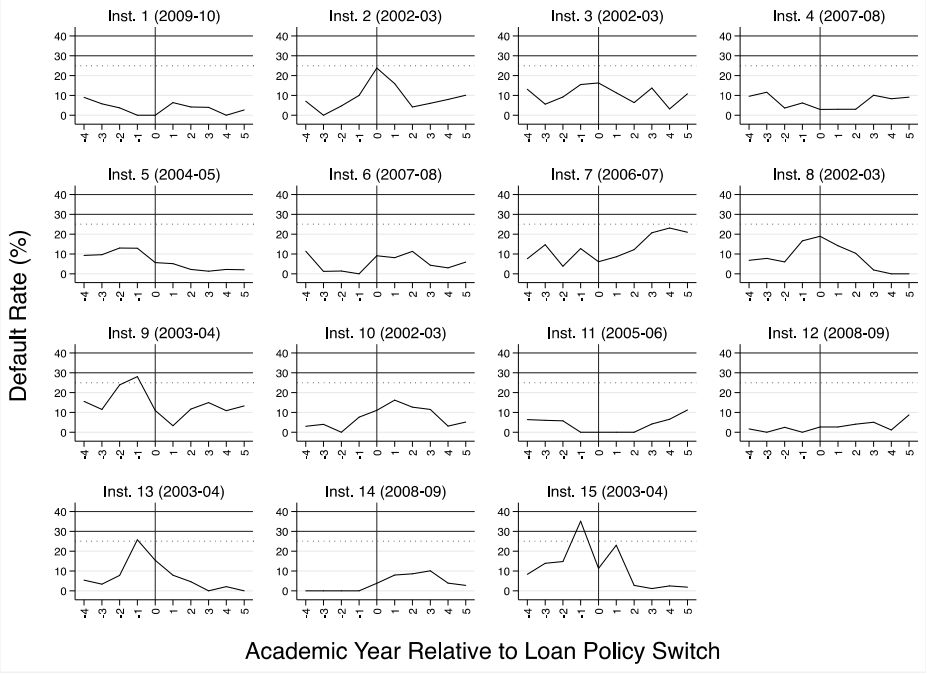
In a series of reports, The Institute for College Access and Success (2008, 2011, 2014a) offered three explanations for why community colleges choose not to participate in federal loan programs. I had discussions with financial aid directors from six of the 30 SCCS community colleges that either never offered federal loans or opted out who provided similar explanations.

The first explanation for not providing students with loans concerns the repercussions that community colleges face under the CDR sanctions. Since a majority of students attending these institutions receive a Pell grant, administrators said it was imperative that their institution maintain eligibility to offer Pell grants. If they were to lose their eligibility, administrators felt that students would not enroll and that the decreasing enrollment rate would affect the community college's ability to remain open.

Based on data published by the U.S. Department of Education (2014c), Figure 3 illustrates that a majority of the 15 community colleges switching loan programs had a CDR below 20 percent. Only three of the 15 institutions (9, 13, and 15) were close to the threshold for sanctions before opting out of the federal loan program (sanction levels are indicated by black

horizontal lines). For these three, the high default rates—including 35 percent at institution 15 (40 percent triggers a one-year sanction)—occurred the year before the change in loan policy. Despite the few community colleges with high default rates, federal sanctions have never been imposed on any SCCS institution.

Figure 3: Cohort Default Rate



Note. The two horizontal black bars at 30 and 40 percent represent the federal sanction thresholds. The dotted horizontal bar at 25 percent represents the federal sanction threshold prior to 2014. The vertical line represents the academic year the community college opted out of the federal loan program. The academic year the institution switched loan policy is in parentheses.

Source: U.S. Department of Education (2014c).

The second explanation for why community colleges do not offer loans follows from the low tuition rates at these institutions and the existence of other federal and state aid programs that cover a large portion of students' expenses. Administrators argue that, given the low tuition, students do not need a loan because federal need-based aid grants, state aid programs, and institutional grants should be sufficient to assist students in paying for college. Tuition rates for SCCS institutions are set at the state level and are uniform across all colleges. For the 2011–12 academic year, the average in-state tuition rate for SCCS institutions was approximately 20 percent less than the national average (U.S. Department of Education, 2014a). When considering the number of federal and state need-based aid programs available to SCCS students, administrators said that the price of paying for college out of pocket is relatively low, even when

considering the cost of attendance.[2] If there is any remaining need after the application of federal and state aid to students' aid packages, administrators stated that institutional aid or aid from privately funded sources should be able to cover the remaining balance.

Finally, administrators at some community colleges believe that providing students with the option of borrowing opens students to the possibility of over-borrowing and taking on debt that is beyond their means. Heavily indebted students need high-paying jobs in order to make their loan payments, and defaulting can have serious consequences for students. The geographic area in which the community college is located plays an important factor in institutions' decisions to offer loans: several administrators mentioned that the surrounding county has a very high unemployment rate and few future employment opportunities. Given students' limited post-graduation job prospects, administrators believe that providing students with an easily obtainable loan is a recipe for enduring financial consequences for students and a high default rate for the institution. Yet, county unemployment data does not suggest there was a significant jump in unemployment prior to the change in loan policy across the 15 institutions. If there was an uptick in unemployment, it occurred after the change in policy and is reflective of the Great Recession that occurred in 2008. Additionally, the county unemployment rate for the 15 institutions was fairly close to the state rate between 2000 and 2010.

According to the aid administrators with whom I spoke, the schools do not offset the loss of the loan with a grant that matches dollar for dollar what the loan would provide. Instead, they rely on existing federal and state aid programs. When asked what portion of financial aid applicants is eligible for a Pell grant, all administrators interviewed estimated figures between 85 to 90 percent.[3] Most of these Pell-eligible students have their direct costs covered with existing aid programs. But what about the 10 to 15 percent who are ineligible for a Pell grant? They lose loan eligibility when their institution opts out, and only a small fraction of these students are eligible to receive a grant through the various state aid programs. Administrators also mentioned they have institutional grants available for these students, but noted that not all students are eligible, especially ones with higher expected family contributions (EFC), which is the amount of money families are expected to contribute toward the students' college costs.

At some SCCS institutions, the decision to opt out of the federal Stafford loan program did not necessarily apply to private loans. Compared with federal loans, a private loan does not provide flexible repayment options and traditionally carries higher interest rates. Because the federal government does not back this type of loan, private loans are not considered in an

[2] During the 2010–11 academic year, for example, the average cost for a traditionally aged (less than 24) full-time student living off-campus with a family was almost $8,000. For these students, a majority of their financial need was met by the Pell grant, as the maximum award for that year was $5,500 and covered 68 percent of the cost. However, the cost of attendance for a full-time student who does not live with his or her parents can be upwards of $15,000. While federal grants can cover a portion of their financial need, these students can also rely on the various state aid programs specific to community colleges and public institutions in the state. The award amounts from these programs range from $1,500 up to $4,000.

[3] Using SCCS administrative files, 37 percent of all SCCS students receive a Pell grant. Among aid recipients, 75 percent receive a Pell grant.

institution's CDR. Consequently, some colleges direct students to private lenders to avoid federal sanction. On the website for one SCCS institution, for example, the financial aid office explicitly states that the college does not participate in the federal loan program, but if students would like to take out a loan, the financial aid webpage suggests that students borrow through a private lender. Currently, however, the use of private loans among SCCS students appears to be relatively small. According to SCCS administrative data, less than 1 percent of students borrow a non-federal loan.[4] This should be regarded as a lower bound estimate, however, as students may take out a private loan and not report it to the college's financial aid office.

4. Methodology

Data Description

For my analysis, I use student-level administrative records from the over 50 public, degree-granting community colleges that are part of SCCS. The records reflect reporting for each semester students are enrolled for-credit between the 2001–02 and 2009–10 academic years. This dataset includes detailed information on student demographics, receipt of financial aid, courses taken, credits attempted and completed, grades earned, and degrees received. In total, there are over 600,000 students represented in the administrative dataset.

These student records are also matched to the student-level database maintained by the National Student Clearinghouse (NSC) and the state's Unemployment Insurance (UI) records.[5] The NSC tracked students' enrollment at postsecondary institutions from 1997 to 2012, allowing me to examine the students' postsecondary enrollment prior and subsequent to enrollment in SCCS. The NSC data contain information on degrees received, fields of study, and the duration of enrollment at a particular institution.

The UI records provide an opportunity to examine students' earnings and employment both while enrolled in and after their exit from a postsecondary institution. There is one limitation to using the UI records as a measure of employment, however, because earnings are reported quarterly and the records do not include information on the number of hours the individual worked. Data on hours worked would provide more accurate estimates of the time directed to employment rather than to school-related activities. Instead, I align the quarterly earnings to the term schedules at the community colleges. This approach allows me to calculate students' total income during a semester in which they are enrolled. I use fourth-quarter wages as

[4] Only students who reported to the college that they borrowed a private loan are reflected in the administrative data.
[5] It is worth noting that the UI records reflect in-state employment and exclude earnings from out-of-state or self-employment. For concerns of students working out-of-state, a sensitivity check was conducted by estimating outcomes excluding students attending college near the state boarder. The results did not change from my main findings.

a measure of employment participation and wages for the fall semester, first-quarter wages for the winter semester, and second-quarter wages for the spring/summer semester.

I identify whether or not a community college opted out of the federal Stafford loan program in a given year using financial aid program data from the U.S. Department of Education (2014d). These data provide information on the total volume of federal loans disbursed by higher education institutions. I consider a community college as not participating in the federal loan program when the number of loan disbursements for subsidized and unsubsidized Stafford loans is 0.[6]

To account for time-varying college characteristics, I use data from the Bureau of Labor Statistics (2014) and the Delta Cost Project (2014). Data from the BLS provides measures on county unemployment rates. The Delta database is derived from data reported in the Integrated Postsecondary Education Data System and includes measures on institutional expenditures.[7] For this study, I use expenditures on student services, academic support, and scholarships and fellowships.

Sample Description

There are 603,522 first-time students from all 50 community colleges represented in the SCCS administrative files. One limitation to the SCCS financial aid data is that it consists of *only* 295,494 students who received financial aid during their enrollment in an SCCS community college. This means that financial aid information, such as EFC and aid amounts, is missing for any student who did not receive any financial aid. The lack of information on these non-financial aid recipients makes it problematic to compare students within and across institutions, because a change in loan policy potentially alters the composition of students represented in the financial aid dataset. For example, a student with a financial aid package consisting of only loans from the period when the institution participated in the federal loan programs appears in the data. But a similar student attending the same institution after the college stopped offering federal loans would not appear in the financial aid dataset.

To account for this data limitation, I use a sample of 206,255 Pell-eligible students with the assumption that if a student applied for financial aid and was Pell-eligible, the student would take the Pell grant they were offered and would be represented in the financial aid dataset regardless of the institution's loan policy. From a policy point of view, focusing on Pell-eligible students is important because this segment of the student population is most sensitive to changes in college price and financial aid (Heller, 1997)**.** Any changes in aid amounts or limiting access

[6] For a small number of community colleges, the total number of loan disbursements from 2001–02 to 2009–10 was less than 10 at each community college, and the disbursements would happen in one year. It is unclear why these institutions would have an outlying year by disbursing a small number of loans. For those colleges that have a single, small disbursement year, I recoded the disbursement to 0.

[7] Delta Cost data provide consistent measures for variables that may have changed overtime in the IPEDS data.

to aid programs that are intended to improve persistence and completion rates should be examined to determine whether such action is beneficial for this subset of students.

It is important to discuss how limiting the sample to Pell grant students relates to the interpretation of the results. This paper does not fully address the impacts of student loans replacing other forms of financial aid (i.e., only borrowing a loan with no other aid versus no financial aid at all). Because the sample includes Pell grant recipients, results should be interpreted as the effect of student loans supplementing grant aid.

To better understand how Pell-eligible students in SCCS compare with all SCCS students, Table 1 presents the summary statistics for all 603,522 students in SCCS (column 1) and 206,255 Pell-eligible students (column 2). Only column 1 includes both aid and non-aid recipients. The first row for each variable in Table 1 displays the average values, and the second row indicates the standard deviations in parentheses. When comparing the Pell-eligible students to all students in SCCS, there are several things worth noting. First, there is a larger share of ethnic/racial minorities and women among Pell-eligible students. Less than half of Pell-eligible students are White, compared with 62 percent of all students in SCCS. Second, the overall share of student in SCCS having access to federal loans is 52 percent, which is similar for Pell-eligible students (50 percent). However, the share of students borrowing a loan is fairly small for both groups. For all of SCCS, only 3 percent of students borrowed, compared to the 7 percent of Pell-eligible students. Third, over half of Pell-eligible students enrolled full-time for at least one semester in their first year of enrollment, compared with the 43 percent of all students in SCCS. This difference in enrollment intensity might reflect the higher share of SCCS students working while enrolled (61 percent vs. 58 percent).

Table 1 also presents the summary statistics for Pell-eligible students at SCCS colleges that have not changed their loan policy (column 3) and the Pell-eligible students at the 15 community college switching their loan policy, disaggregated according to students' ability to borrow a Stafford loan (columns 5 and 6). Demographically, students at the 15 community colleges look very similar to students at colleges with no change in loan policy. However, of the 47,683 Pell-eligible students at the 15 community colleges, only 20,285 (43 percent) had access to loans, which is lower than the 52 percent at colleges that never changed their loan policy. Because of this difference in the availability of loans, the students in the 15 colleges borrowed at a lower rate and had a lower average loan amount.

Table 1 also illustrates that there are a few notable differences between students with loan access and students without loan access. First, the EFC is lower for students without access to Stafford loans: $559, compared to $598 for students with loan access. Second, for grants, students without loan access received, on average, $852 more than students with loan access. Third, among students who have access to federal loans, 5 percent borrowed either a federal or non-federal loan, and the average loan amount was $167.

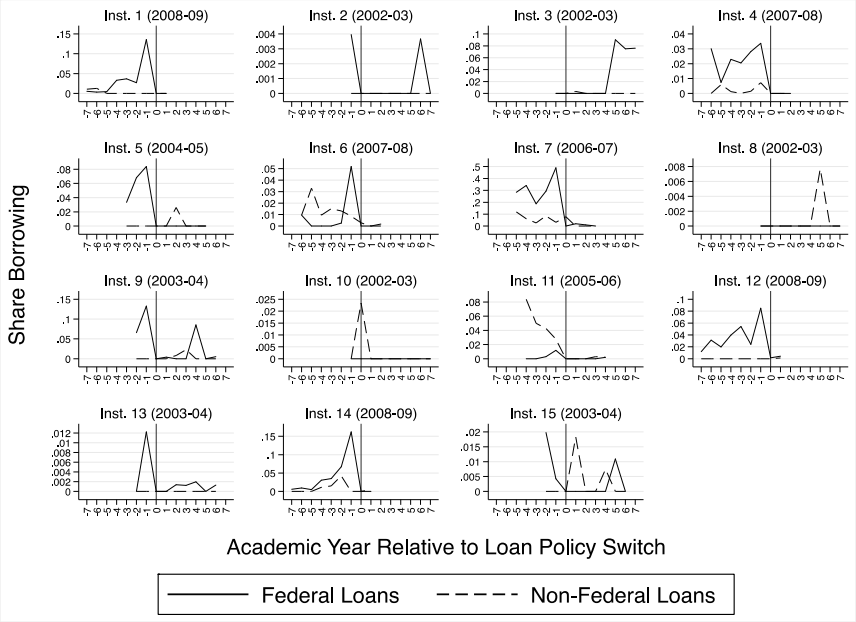
Table 1: Summary Statistics of SCCS Students

	All SCCS Institutions	All SCCS Institutions (Pell-Eligible)	Never Change Loan Policy	Change Loan Policy: Loan Access	Change Loan Policy: No Loan Access
	(1)	(2)	(3)	(5)	(6)
Student characteristics					
Age at entry	26.58	26.41	26.28	27.23	26.56
	(10.43)	(9.75)	(9.66)	(10.30)	(9.78)
Race/ethnicity					
White	0.62	0.49	0.49	0.52	0.44
Black	0.27	0.41	0.41	0.41	0.43
Hispanic	0.04	0.03	0.03	0.02	0.02
Other race	0.07	0.07	0.07	0.05	0.11
Female	0.58	0.66	0.66	0.68	0.67
In-state resident	0.90	0.93	0.92	0.97	0.93
Prior fraction of quarters employed	0.51	0.52	0.52	0.55	0.50
	(0.37)	(0.36)	(0.36)	(0.36)	(0.36)
Student financial aid & earnings					
Share of students with access to loans	0.52	0.50	0.52	1.00	0.00
Receiving financial aid	0.38	1.00	1.00	1.00	1.00
Eligible for Pell grant	0.34	1.00	1.00	1.00	1.00
Borrowed loan in 1st year	0.03	0.07	0.08	0.05	0.00
Borrowed a federal loan in 1st year	0.03	0.06	0.07	0.04	0.00
Borrowed a non-federal loan in 1st year	0.00	0.01	0.01	0.01	0.00
Loan amount in 1st year ($)	132.38	264.34	321.32	167.28	6.43
	(856.47)	(1228.56)	(1355.55)	(898.84)	(192.89)
Received federal, state, or institutional grant in 1st year	0.37	0.99	0.99	0.99	1.00
Grant amount in 1st year ($)	1012.50	2814.62	2829.52	2275.41	3127.60
	(1755.02)	(1921.57)	(1934.89)	(1547.15)	(2010.58)
Expected family contribution ($)	1388.57	628.30	643.94	598.26	559.99
	(4101.12)	(1148.31)	(1159.84)	(1127.30)	(1092.38)
Worked while enrolled in 1st year	0.61	0.58	0.59	0.57	0.53
Earnings while enrolled in 1st year ($)	3460.42	2674.51	2733.38	2646.70	2354.34
	(6166.00)	(4451.85)	(4482.71)	(4473.28)	(4237.89)
Student educational outcomes					
Credits attempted in 1st year	14.56	16.56	16.45	17.03	16.84
	(9.76)	(9.46)	(9.45)	(9.67)	(9.36)
Credits completed in 1st year	12.28	13.34	13.09	14.49	13.97
	(9.79)	(9.93)	(9.85)	(10.43)	(9.93)
Ever enrolled full-time in 1st year	0.43	0.53	0.52	0.56	0.57
Obtain AA within 3 years of entry	0.09	0.09	0.09	0.11	0.08
Transfer to 4-year within 4 years of entry	0.25	0.21	0.21	0.20	0.18
Number of observations	603,522	206,255	158,572	20,285	27,398

Note. Standard deviations in parentheses. Column 1 consists of all students in SCCS. Column 2 consists of all Pell-eligible students in SCCS. Column 3 contains Pell-eligible students attending an SCCS community college that never changed the loan policy. Columns 5 and 6 consist of Pell-eligible students at the 15 colleges that opted out of the Stafford loan program, separated by whether the students have loan access. Dollar amounts are in 2012 dollars. *Obtain AA within 3 years of entry* and *transfer to a 4-year within 4 years of entry* consist of students who enrolled before the 2007–08 academic year.

In comparison, less than 1 percent of students without loan access took out a loan, and the average loan amount was $6, which suggests that a small portion of the sample without loan access either borrowed a private loan (0.2 percent) or was somehow able to borrow a federal loan (0.1 percent). Figure 4 displays the share of Pell-eligible students receiving either a federal or non-federal loan before and after the change in loan policy for the 15 community colleges. The vertical line indicates when the switch from offering loans to not offering loans occurred. As mentioned before, Institution 3 opted out of the federal loan program in 2002–03 and then reinstated their participation in the federal loan program in 2007–08. Figure 4 demonstrates that institutions did not substitute the loss of federal loans with non-federal loans. There are, however, some students, albeit a small share, receiving federal loans during the period when institutions were no longer participating in the federal loan program. These students received a loan in their first year of enrollment because they either transferred to or were dually enrolled at an institution that was offering federal loans.[8]

Figure 4: Share of Pell-Eligible Students Borrowing Federal or Non-Federal Loans



Note. Graph illustrates the share of first-time Pell-eligible students receiving a federal or non-federal loan. The vertical line represents the academic year the community college opted out of the federal loan program. The academic year the institution switched loan policy is in parentheses.

[8] The share of students transferring in the first year generally is low, less than 5 percent. Regressions were performed to determine whether loan policy was correlated with transfer rates. The results provided no significant differences.

Comparison of SCCS Sample to Nationally Representative Sample

To illustrate how the community college students from SCCS colleges compare with a nationally representative sample, Table 2 presents sample means from the 2012 wave of the National Postsecondary Student Aid Study (NPSAS) (columns 1 and 2) and the SCCS data (columns 3 and 4). Column 1 is estimates for all community college students and column 2 consists of Pell-eligible community college students represented in the NPSAS. The estimates in columns 3 and 4 provide the same information from columns 1 and 2 in Table 1.

In both the national and SCCS samples, the average age was close to 26 years old, and over half of the students were female. Compared with the samples in the NPSAS, SCCS had a higher share of Black students and a smaller share of Hispanic students. The average EFC for all SCCS students was also lower than that for the NPSAS students, but SCCS Pell-eligible students (column 4) had a comparable EFC with NPSAS Pell-eligible students (column 2). These differences in racial composition and EFC amounts could be attributed to the state in which SCCS resides, where there is a large African American population and the average household income is lower than the national average. According to the most recent Census estimates,[9] over 20 percent of the population in the state is African American, compared to 13.2 percent nationwide. The state's median household income in 2013 was approximately $46,000, whereas the national median household income was close to $53,000.

Given that the average EFC is lower, Pell-eligible SCCS students (column 4) received, on average, a higher amount of federal grant aid than Pell-eligible students in the national sample (column 2). For state and institutional aid, the amounts are fairly similar for Pell-eligible students. Due to SCCS colleges' lower rate of participation in the federal loan program and the high share of Pell-eligible students receiving grant aid, the share of students with access to federal loans and incurring debt is substantially lower than national estimates. The dollar amount of loans that SCCS students borrow is also less.

[9] Census estimates were retrieved from http://quickfacts.census.gov/qfd/index.html

Table 2: Comparison of SCCS Students to National Sample of Students

	NPSAS:12	NPSAS:12	SCCS	SCCS
	All Community Colleges	All Community Colleges (Pell-Eligible)	All SCCS Institutions	All SCCS Institutions (Pell-Eligible)
	(1)	(2)	(3)	(4)
Student characteristics				
Age	26.27	26.22	26.58	26.41
	(9.83)	(9.14)	(10.43)	(9.75)
Race/ethnicity				
White	0.53	0.44	0.62	0.49
Black	0.19	0.26	0.27	0.41
Hispanic	0.19	0.21	0.04	0.03
Other race	0.09	0.08	0.07	0.07
Female	0.54	0.58	0.58	0.66
Ever full-time during school year	0.38	0.43	0.43	0.53
Student financial aid & employment				
Share of students with access to loans	0.87	0.85	0.52	0.50
Receiving financial aid	0.57	0.88	0.38	1.00
Eligible for Pell grant	0.66	1.00	0.34	1.00
Aid package				
No aid	0.43	0.12	0.62	0.00
Grants only	0.39	0.64	0.35	0.93
Loans only	0.05	0.01	0.01	0.01
Grants & loans	0.13	0.23	0.02	0.06
Borrowed a federal or non-federal loan	0.17	0.24	0.03	0.07
Borrowed a federal loan	0.17	0.23	0.03	0.06
Borrowed a non-federal loan	0.01	0.01	0.00	0.01
Loan amount ($)	762.58	1049.89	132.38	264.34
	(1973.75)	(2275.10)	(856.47)	(1228.56)
Fed. grants ($)	1288.27	2384.96	947.16	2707.90
	(1814.17)	(1865.16)	(1668.60)	(1813.82)
State grants ($)	221.97	304.39	125.62	315.43
	(793.97)	(886.22)	(546.18)	(824.06)
Inst. grants ($)	117.32	158.64	63.24	135.65
	(612.78)	(682.31)	(428.39)	(622.43)
EFC ($)	5812.67	629.29	1388.57	628.30
	(10500.81)	(1274.37)	(4101.12)	(1148.31)
Worked while enrolled	0.64	0.59	0.61	0.58
N	18,230	12,260	603,522	206,255

Note. Columns 1 and 2 are from NPSAS restricted datasets and use NPSAS weights. Columns 3 and 4 are from the SCCS administrative files and contain the same estimates from Table 1. Columns 1 and 3 contain all first-time, first-year students who enrolled at a public, two-year college, represented in respective datasets. Columns 2 and 4 consist of first-time, first-year students who enrolled at a public, two-year college and filed a FAFSA with an EFC that qualified them to be Pell-eligible. All dollar amounts have been adjusted to 2012 dollars.

Empirical Strategy

My identification strategy exploits the variation in student loan policies within the same community college over time. This involves using college fixed effects to estimate the within-college difference in student outcomes before and after the college opted out the federal loan program. The before and after difference in student outcomes at the 15 community colleges opting out of federal loan programs is then compared with the before and after difference in student outcomes at community colleges that did not change their loan policy, resulting in what is essentially a multi-period difference-in-difference analysis.

In the first part of my analysis, I use the following reduced form equation to examine whether there are differences in aid amounts between the periods when institutions offer loans and do not offer loans. I also explore whether there are differences in students' working while enrolled.

$$(1) \qquad y_{ict} = \alpha_0 + \alpha_1 Participate_{ct} + \alpha_2 EFC_{ict} + \alpha_3 X_{ict} + \alpha_4 \delta_{ct-1} + \gamma_t + \theta_c + \mu_{ict}$$

where *i* represents students enrolled at community college *c* during academic year *t,* γ is the time fixed effect, and θ is the college fixed effect. *X* is a vector of student demographics, including age, in-state residency, race/ethnicity, and gender. Students' prior employment is also likely to influence whether students will be employed while enrolled and enrollment intensity. To account for this, the demographic vector also includes a measure on the fraction of quarters employed in the three years prior to entry. *EFC* is a measure of students' Expected Family Contribution. The variable of interest, *Participate*, is an indicator that the given college participated in the loan program in the given year. δ consists of time-varying institutional measures on county unemployment rates and expenditures on student services and academic support in the year prior to a student's enrollment. The random error term (μ) is bootstrapped and clustered at the school level.[10]

For the second part of my analysis, I examine the effect of loan receipt on educational outcomes, including credits attempted and completed in the first year, receipt of an associate degree, and transfer to a four-year institution. If I estimate these student outcomes using only the reduced form equation above, estimates on the effect of loan borrowing will not be not fully captured because of the large share of students not borrowing a loan. Among SCCS Pell-eligible students, the share borrowing a loan is less than 8 percent. This motivates the use of an instrumental variable estimation that will allow for more generalizability on loan borrowing than a general comparison of Pell-eligible students before and after the change in loan policy.

When equation (1) is estimated with a measure on whether a student borrowed a loan as a dependent variable, this creates the first stage in an instrumental variable analysis. Thus, a community college's participation in the federal loan program is used as an instrument to predict the probability of a student borrowing a loan. The second stage of the equation replaces the

[10] Three hundred replications were performed for the bootstrapping.

instrument with the predicted loan borrowing measure created from the first-stage equation (1). This approach minimizes bias due to endogeneity on loan receipt and allows for claims about the effect of loan receipt on college outcomes. The second stage equation is:

$$(2) \quad Y_{ict} = \beta_0 + \beta_1 \widehat{Borrow}_{ict} + \beta_2 EFC_{ict} + \beta_3 X_{ict} + \beta_4 \delta_{ct-1} + \gamma_t + \theta_c + \varepsilon_{ict}$$

The same set of fixed effects, student demographic, and institutional covariates mentioned above are included in the second stage equation. However, in the second part of my analysis I add students' dollar amount of grants received to β_3 in both the first and second stages in order to control for the impact of grants on educational outcomes and the endogeneity of loan receipt.

Identifying Assumptions

Two important identifying assumptions for federal loan participation to be a valid instrument requires the timing of the institutional decision to be randomly assigned across individuals and only affect the outcome variable through its relationship with loan receipt (i.e., the instrument is not correlated with the error term). For both of these assumptions, the biggest threat deals with the compositional difference of students before and after the change in policy. Students could be choosing to attend a specific community college because of the institution's loan policy. Alternatively, the composition differences in students could be due to the community colleges themselves if their decision to change the loan policy was influenced by demographic changes in the student body. I use several approaches to evaluate whether the instrument of participating in the federal loan program is random or correlated with the error term. First, I examine whether there has been a change in the composition of Pell-eligible students by focusing on the 15 community colleges that changed their loan policy. I use equation (1) to compare students with and without loan access within an institution across various demographic and pre-college variables. Second, I examine whether or not students were likely to attend the closest community college. Third, I determine whether there has been a change in enrollment rates for first-time students after the change in loan policy.

Table 3 provides estimates for the differences in student demographics and pre-college variables by loan availability. These student-level variables include age, gender, race/ethnicity, distance from high school to community college, limited English proficiency, parental status, homemaker status, academic disadvantages, disability, employment status in the quarter prior to the first semester of enrollment, and EFC. Each row in Table 3 represents a separate regression of each variable on students' loan access with fixed effects for institution and year. The mean and standard deviation for each variable for students who did not have access to loans is reported in column 2, and the sample size is provided in column 3.

Table 3: Differences in Pre-College Variables by Loan Access

	Participate (1)	Control Mean (2)	Sample Size (3)
Age at entry	–0.615*	26.557	47,683
	(0.343)	[9.778]	
Female	–0.009	0.671	47,683
	(0.013)	[0.470]	
White	0.019	0.437	47,683
	(0.014)	[0.496]	
Black	–0.019**	0.433	47,683
	(0.009)	[0.496]	
Hispanic	0.004**	0.017	47,683
	(0.002)	[0.130]	
Other race	–0.004	0.112	47,683
	(0.014)	[0.316]	
Distance to community college (miles)	–0.675	17.201	34,474
	(1.152)	[29.802]	
In-state resident	0.004	0.932	47,683
	(0.006)	[0.252]	
Limited English proficiency	0.001	0.003	47,683
	(0.001)	[0.058]	
Single parent	–0.014	0.070	47,683
	(0.016)	[0.255]	
Homemaker	–0.003	0.039	47,683
	(0.008)	[0.194]	
Academically disadvantaged	0.078	0.365	47,683
	(0.074)	[0.482]	
Handicap	–0.008*	0.013	47,683
	(0.004)	[0.113]	
Employed 1quarter prior to entry	0.016	0.522	47,683
	(0.013)	[0.500]	
Earnings 1 quarter prior to entry	–146.759	7147.441	47,683
	(482.299)	[9765.362]	
EFC at entry	18.398	503.013	47,683
	(28.011)	[985.208]	

Note. Each row represents a separate regression of each variable on whether the student has loan access. Standard errors are in parentheses and are clustered at the institution level. The variable mean and standard deviation (in brackets) for students with loan access is reported in column 2 and the sample size for the regression is provided in column 3. Distance to community college is measured in miles and is the distance between students' high school and community college. Distance to college is only available for students who reported a high school to the community college.

*** $p < .01$. ** $p < .05$. * $p < .10$

When considering all estimates as a whole, there are no apparent demographic differences between students who did not have loan access and those who did. There are, however, several differences worth discussing, with regard to age, Black and Hispanic students, and disability status. While these differences are significant, the magnitudes of these differences are small and thus unlikely to cause serious bias in the estimates. For example, students with loan access were 1.9 percentage points less likely to be Black. While this difference is significant at the 5 percent level, this difference is small when considering the large share of students who are Black, comprising 43 percent of the sample.

Measuring the distance between students' primary home and community college can also help determine whether Pell-eligible students are choosing to attend a specific college based on loan policy. Table 3 illustrates that the difference in distance from students' high school to community college is not statistically significant. But it is worth noting the geographic location of SCCS community colleges in relation to one another and their loan policy. Geographically, the 15 community colleges observed as having opted out of the Stafford loan program are evenly distributed throughout the state. Unique to SCCS is that no two community colleges reside within the same county. These 15 community colleges, and their respective counties, are often surrounded by, or close to, a county containing a community college that has not changed their loan policy (either because it always participated or never participated). However, the majority of students still attend the closest community college. For example, for the 15 community colleges, roughly 77 percent of financial aid recipients attended the community college that was closest to their home; 13 percent attended a community college in a neighboring county, and 10 percent of the sample attended a community college that was deemed to be a far distance. Regressions were estimated to determine whether there was a difference in students attending the closest college or the college deemed to be a far distance. The results indicate that there were no significant differences between students who did not have loan access and those who did.[11]

One important threat that could make the instrument of loan participation invalid deals with the change in loan policy possibly influencing community colleges' enrollment rates. Alternatively, a community college's change in loan policy could have happened in conjunction with or prior to another institutional decision that increased the college's classroom capacity, such as opening a new building. To determine whether enrollment rates are correlated with the timing of the loan policy change for the 15 community colleges, I use data from the Integrated Postsecondary Education Data System (IPEDS) (U.S. Department of Education, 2014b) to examine whether there was a significant difference in the share of the student body attending for the first time before and after the change in loan policy. In the first five years after the switch in loan policy, only four out of the 15 community colleges increased their share of first-time of students, by an average of 5 percent per year. To determine whether these enrollment changes are significant, I use equation 1 without student and institutional controls and the share of first-

[11] Results from these regressions indicate that the differences were –0.003 (0.020) for attendance to closest community college and –0.004 (0.012) for attendance to community college in a neighboring county or farther.

time students as the dependent variable. Results from the fixed effects regression are precisely estimated and close to zero, which suggests that the change in loan policy did not influence enrollment rates.[12]

Another identifying assumption requires there to be a nonzero relationship between the instrument (federal loan participation) and the endogenous treatment variable (loan receipt). Researchers often gauge the strength of the relationship between the two variables from the first stage F-statistics. Since my regression models cluster the standard errors at the college level, I employ the Kleibergen-Paap Wald test. The F-statistic from the first stage is 23.20, which exceeds the rule-of-thumb value of 10 (Staiger & Stock, 1997) and the maximal value of 16.36 proposed by Stock and Yogo (2005). Because the F-statistic from the first stage exceeds recommended levels, the instrument on federal loan participation does not violate this assumption.

5. Results

Main Results

Table 4 presents the results for the first part of my analysis examining the effects of federal loan participation on financial aid and employment. Each panel contains results for separate topical outcomes: panel A examines student loans, panel B grants, and panel F employment while enrolled. In addition to examining all grant programs in panel B, I also examine the differences in grant receipt and amounts for federal (panel C), state (panel D), and institutional (panel E) grant programs. Columns 1 and 3 only include academic year and college fixed effects. Columns 2 and 4 add student demographic controls and time-varying community college measures. The standard errors are provided below each coefficient (cluster bootstrapped at the college level), followed by the mean of the dependent variable for students without access to loans (i.e., those who attended a community college that had opted out of the federal loan program at the time of enrollment).

As the results in panel A in Table 4 illustrate, Pell-eligible students who attended an institution that is participating in the federal loan program were 7.6 percentage points more likely to borrow than students with no such access. Also, having federal loan access significantly increased overall borrowing by $368 a year, or $4,837 ($367.61/0.076) among the 7.6 percent who took out loans. This effect is large, considering the average SCCS student borrows $132 in the first year ($4,400 among the 3 percent who take loans).

[12] Results from this regression indicate that the difference was –0.015 (0.014).

Table 4: Reduced Form Estimates
Effect of Participating in the Federal Loan Program on Financial Aid & Employment

	(1)	(2)	(3)	(4)
Panel A	Borrowed a loan		Loan amount	
Participate in federal loan program	0.077***	0.076***	361.95***	367.61***
	(0.018)	(0.018)	(99.16)	(101.50)
Outcome mean for no loan access	*0.00*		*6.19*	
Panel B	Received any grant		Grant amount	
Participate in federal loan program	–0.007***	–0.006**	–49.78	39.40
	(0.002)	(0.002)	(74.16)	(108.84)
Outcome mean for no loan access	*1.00*		*2,857.75*	
Panel C	Received federal grant		Federal grant amount	
Participate in federal loan program	0.013	0.014	–16.45	60.23
	(0.017)	(0.017)	(72.21)	(105.89)
Outcome mean for no loan access	*0.92*		*2,732.65*	
Panel D	Received state grant		State grant amount	
Participate in federal loan program	–0.004	–0.001	–27.13	–8.70
	(0.011)	(0.011)	(22.96)	(25.59)
Outcome mean for no loan access	*0.22*		*324.65*	
Panel E	Received institutional grant		Institutional grant amount	
Participate in federal loan program	–0.009	–0.009	–5.71	–7.27
	(0.016)	(0.017)	(17.33)	(17.19)
Outcome mean for no loan access	*0.13*		*129.68*	
Panel F	Ever worked while enrolled		Earnings while enrolled	
Participate in federal loan program	0.002	0.008	55.45	130.61
	(0.009)	(0.009)	(80.70)	(95.48)
Outcome mean for no loan access	*0.57*		*2,690.73*	
N	206,255	206,255	206,255	206,255
Demographic and institutional controls		X		X

Note. Standard errors in parentheses and are cluster bootstrapped at the college level. Outcome means are for students who do not have access to loans. All regressions include year and college fixed effects. Demographic and institutional controls include age, race/ethnicity, gender, EFC, indicator on in-state residency, fraction of quarters employed prior to entry, county unemployment rate, and expenditures on scholarships, academic support, and student services.

*** $p < .01$. ** $p < .05$. * $p < .10$

Results in panel B suggest that Pell-eligible students enrolling when a community college participates in the federal loan program are less likely to receive grant aid (combination of federal, state, and institution). Estimates indicate that the share of Pell-eligible students receiving grant aid decreased by less than 1 percent before community colleges opted out of the loan

program. However, the difference in dollar amounts of grant aid students received before and after the institutional opt out is not statistically significant. Without controlling for student demographics and time-varying institutional measures, students with loan access received $50 less in grant aid. With the inclusion of controls, students received $39 more. In general, these findings suggest that the loss in loan amounts is not fully being replaced by grants. Students enrolling after an institution opted out lost the ability to borrow as much as $368 and lost an average of $39 through a combination of federal, state, and institution grant aid programs.

Table 4 also displays whether there was a difference before and after the switch in loan policy for federal (panel C), state (panel D), and institutional (panel E) grant aid programs. The results are not statistically significant for any of the three grant aid programs. I do, however, find that Pell-eligible students with loan access were 1 percentage point more likely to obtain a federal grant and received $60 more than Pell-eligible students without loan access. For state and institution grant programs, the findings show a similar pattern: Pell-eligible students with loan access were less likely to receive grant aid (by less than 1 percentage point), and the dollar amount was smaller by $9 and $7, respectively.

Regarding the relationship between access to federal loans and employment, the results indicate that colleges' loan policies had a positive influence on Pell-eligible students' employment decisions while enrolled in school, but the results are not statistically significant. Students having access to loans were less than 1 percent more likely to work and earned $131 more while enrolled. Taking aside the statistical insignificance of the results, the positive findings associated with loan access are still surprising. One would expect that students without loan access would be more likely to work. But the findings on employment are consistent with previous research. Boushey (2005) found that 84 percent of undergraduates who had loans at four-year institutions, be it not-for-profit or public, had a job while enrolled, compared with 67 percent of undergraduates with no loans at not-for-profit colleges and 78 percent of undergraduates without loans at public colleges.

Next, I investigate the effect of participating in the Stafford loan program and loan borrowing on Pell-eligible students' enrollment intensity. The following results come from the ordinary least squares (OLS) estimation (does not include the instrument), the reduced form equation, and the second stage equation. Results in Table 5 display that students with federal loan access had higher enrollment intensity during their first year compared with students with no loan access. The reduced form estimates indicate that the ability to borrow a federal loan increases the number of credits attempted by 1.4 credits and is significant at the 5 percent level. Though the difference is statistically insignificant, the number of credits completed for students with access to federal loans was higher by three quarters of a credit (column 5, panel A).

Table 4: Reduced Form Estimates
Effect of Participating in the Federal Loan Program on Financial Aid & Employment

	(1)	(2)	(3)	(4)
Panel A	Borrowed a loan		Loan amount	
Participate in federal loan program	0.077***	0.076***	361.95***	367.61***
	(0.018)	(0.018)	(99.16)	(101.50)
Outcome mean for no loan access	*0.00*		*6.19*	
Panel B	Received any grant		Grant amount	
Participate in federal loan program	–0.007***	–0.006**	–49.78	39.40
	(0.002)	(0.002)	(74.16)	(108.84)
Outcome mean for no loan access	*1.00*		*2,857.75*	
Panel C	Received federal grant		Federal grant amount	
Participate in federal loan program	0.013	0.014	–16.45	60.23
	(0.017)	(0.017)	(72.21)	(105.89)
Outcome mean for no loan access	*0.92*		*2,732.65*	
Panel D	Received state grant		State grant amount	
Participate in federal loan program	–0.004	–0.001	–27.13	–8.70
	(0.011)	(0.011)	(22.96)	(25.59)
Outcome mean for no loan access	*0.22*		*324.65*	
Panel E	Received institutional grant		Institutional grant amount	
Participate in federal loan program	–0.009	–0.009	–5.71	–7.27
	(0.016)	(0.017)	(17.33)	(17.19)
Outcome mean for no loan access	*0.13*		*129.68*	
Panel F	Ever worked while enrolled		Earnings while enrolled	
Participate in federal loan program	0.002	0.008	55.45	130.61
	(0.009)	(0.009)	(80.70)	(95.48)
Outcome mean for no loan access	*0.57*		*2,690.73*	
N	206,255	206,255	206,255	206,255
Demographic and institutional controls		X		X

Note. Standard errors in parentheses and are cluster bootstrapped at the college level. Outcome means are for students who do not have access to loans. All regressions include year and college fixed effects. Demographic and institutional controls include age, race/ethnicity, gender, EFC, indicator on in-state residency, fraction of quarters employed prior to entry, county unemployment rate, and expenditures on scholarships, academic support, and student services.

*** $p < .01$. ** $p < .05$ * $p < .10$

Table 5: IV Estimates - Effect of Loan Borrowing on Enrollment Intensity

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A		Credits attempted			Credits completed	
	OLS	Reduced Form	IV	OLS	Reduced Form	IV
Borrowed a loan	1.631***		18.525**	1.153		9.609
	(0.202)		(8.157)	(0.263)		(11.252)
Outcome mean for non-borrowers	*16.46*		*16.46*	*13.33*		*13.33*
Participate in federal loan program		1.413**			0.733	
		(0.560)			(0.705)	
Outcome mean for no loan access		*16.33*			*13.54*	
N	206,255	206,255	206,255	206,255	206,255	206,255
Panel B		Enrolled full-time for at least 1 semester			Enrolled full-time for at least 2 semesters	
	OLS	Reduced Form	IV	OLS	Reduced Form	IV
Borrowed a loan	0.044***		0.539	0.027*		0.519*
	(0.009)		(0.365)	(0.009)		(0.273)
Outcome mean for non-borrowers	*0.53*		*0.53*	*0.20*		*0.20*
Participate in federal loan program		0.041			0.040**	
		(0.028)			(0.020)	
Outcome mean for no loan access		*0.52*			*0.19*	
N	206,255	206,255	206,255	206,255	206,255	206,255
Panel C		Math & science credits attempted			Math & science credits completed	
	OLS	Reduced Form	IV	OLS	Reduced Form	IV
Borrowed a loan	0.102		3.943**	0.083**		3.729**
	(0.075)		(1.778)	(0.072)		(1.806)
Outcome mean for non-borrowers	*1.08*		*1.08*	*1.03*		*1.03*
Participate in federal loan program		0.301***			0.284***	
		(0.109)			(0.106)	
Outcome mean for no loan access		*1.02*			*0.98*	
N	206,255	206,255	206,255	206,255	206,255	206,255

Note. Standard errors in parentheses and cluster bootstrapped at the college level. All regressions include year and college fixed effects. Demographic and institutional controls include age, race/ethnicity, gender, EFC indicator on in-state residency, fraction of quarters employed prior to entry, dollar amount of grants received, unemployment, and institutional expenditures on scholarships, academic support, and student services.

*** $p < .01$. ** $p < .05$ * $p < .10$

Columns 3 and 6 in panel A for Table 5 display the effects of actual loan borrowing on credits attempted and completed. These results come from the second stage equation (IV model). The point estimates are larger than the reduced form estimates (columns 2 and 5, panel A) because they have been scaled up by the inverse of the first-stage equation (from Table 2, column 2 in panel A). The findings do suggest a positive effect on first year credits attempted (an increase of 18.5 credits) and is significant at the 5 percent level. For credits completed, the estimate is positive (an increase of nearly 10 credits), but is not statistically significant. This suggests that loan borrowing may increase students' enrollment intensity at the beginning of a term or academic year, but does not increase the number of credits completed. Assuming that students enroll for three semesters in the academic year, these results would suggest that Pell-eligible students who borrow attempt six credits more a semester, yet only compete three credits more.

Table 6: IV Estimates—Effect of Loan Borrowing on College Completion

	(1) OLS	(2) Reduced Form	(3) IV
Panel A: Obtain AA within 3 y ears of entry			
Borrowed a loan	0.001		0.204
	(0.005)		(0.167)
Outcome mean for non-borrowers	*0.09*		*0.09*
Participate in federal loan program		0.012	
		(0.008)	
Outcome mean for no loan access		*0.08*	
N	132,147	132,147	132,147
Panel B: Transfer to a 4-year within 4 years of entry			
Borrowed a loan	0.061		0.038
	(0.007)		(0.166)
Outcome mean for non-borrowers	*0.20*		*0.20*
Participate in federal loan program		0.002	
		(0.008)	
Outcome mean for no loan access		*0.19*	
N	138,017	138,017	138,017

Note. See notes for Table 5. Samples consist of Pell-eligible students who enrolled before the 2007–08 academic year.

*** $p < .01$. ** $p < .05$ * $p < .10$

In terms of full-time enrollment (panel B), I find that Pell-eligible students with loan access or who borrowed a loan were more likely to be enrolled full-time in their first year, but

only the estimates on the probability of being enrolled full-time for at least two semesters are significant. The reduced form estimate suggests an increase of 4 percentage points for Pell-eligible students with loan access and an increase of 52 percentage points for Pell-eligible students who borrowed a loan.

To ascertain whether loan access and borrowing affected students' course selection, I compared the number of credits in math and science courses, which are considered to be more rigorous courses that require more time in and out of the classroom. As panel C illustrates, there are significant differences in patterns of enrollment in these courses. When an institution participated in the federal loan program, Pell-eligible students attempted and completed approximately a quarter of a credit more in math and science courses. For Pell-eligible students who borrowed a loan, there was an increase of almost four credits attempted and completed.

For outcomes on degree completion, the results suggest that participating in the Stafford loan program did not significantly affect Pell-eligible students' degree attainment and transfer to a four-year institution. In panel A of Table 6, I examine the likelihood that students received an associate degree within three years of entry. The reduced form estimate is positive at 1.2 percentage points. For the IV model, students who borrowed were 20 percentage points more likely to graduate, but the difference is not statistically significant. In terms of transfer to a four-year institution (panel B, Table 6), the findings are also statistically insignificant, but indicate that the difference in transfer rates within four years is positive. Consequently, the findings imply that a community college's participation in the federal loan program did not significantly affect the rates at which Pell-eligible students completed their associate degrees and continued their studies at four-year institutions.

Results by Subgroups

A change in loan policy is likely to differentially affect subgroups of students. For example, traditionally aged students (less than 24 years of age) are likely to have different educational goals than non-traditional students (over 25 years of age) (Cohen & Brawer, 2008). Also, students have different levels of financial constraints, as some are likely to receive financial support from family members and thus may have a lower level of financial need. In Table 7, I examine outcomes across subgroups and employ the same model specifications as above on each group—students less than 24 years of age, older than 24 years of age, White, Black, male, and female. Column 1 in Table 7 contains the same coefficients from columns 2 and 4 in Table 4, columns 3 and 6 in Table 5, and column 3 in Table 6. Panel A consists of the reduced form estimates on financial aid and panel B consists of the IV estimates on enrollment intensity and degree completion. The standard errors appear below each coefficient in parentheses, cluster bootstrapped at the college level; the means of the dependent variable for students who did not have access to loans (in panel A) or did not borrow (in panel B) are in italics.

Table 7: Effects of Participating in the Federal Loan Program & Borrowing, by Subgroups

Dependent Variable	Full Sample (1)	Age < 24 (2)	Age >= 24 (3)	White (4)	Black (5)	Male (6)	Female (7)
Panel A: Reduced Form Estimates							
Borrowed a student loan	0.08***	0.06***	0.10***	0.06***	0.10***	0.07***	0.08***
	(0.02)	(0.01)	(0.02)	(0.01)	(0.03)	(0.02)	(0.02)
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
Student loan amount	368***	240***	546***	273***	514***	350***	375***
	(101)	(62)	(163)	(65)	(169)	(89)	(109)
	6	*7*	*6*	*8*	*5*	*8*	*6*
Received grant	–0.01**	–0.01**	0.00*	–0.01***	0.00	–0.01*	–0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	1.00	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Grant amount	39	9	32	–7	47	24	35
	(109)	(131)	(103)	(104)	(121)	(147)	(101)
	2,858	*3,175*	*2,451*	*2,817*	*2,845*	*2,788*	*2,892*
Ever worked while enrolled	0.01	0.01	0.00	0.01	0.02*	0.02	0.00
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
	0.57	*0.63*	*0.50*	*0.57*	*0.57*	*0.51*	*0.60*
Earnings while enrolled	131	74	188	134	149	229*	87
	(95)	(49)	(166)	(103)	(114)	(129)	(88)
	2,691	*2,286*	*3,211*	*2,684*	*2,708*	*2,411*	*2,827*
Panel B: IV Estimates							
Credits attempted	18.5**	28.1**	10.5*	26.4**	12.7	27.4***	14.8*
	(8.2)	(11.5)	(5.5)	(10.3)	(7.9)	(10.1)	(7.9)
	16.5	*17.3*	*15.4*	*17.5*	*15.0*	*16.8*	*16.3*
Credits completed	9.6	13.5	6.0	15.9	6.2	16.3	6.6
	(11.3)	(16.5)	(7.2)	(13.7)	(10.3)	(13.3)	(10.7)
	13.3	*13.9*	*12.5*	*14.8*	*11.4*	*13.9*	*13.1*
Math & science credits attempted	3.9**	6.1**	1.8**	6.7**	1.3	3.8*	4.0**
	(1.8)	(3.0)	(0.9)	(3.1)	(0.9)	(2.0)	(1.8)
	1.1	*1.4*	*0.7*	*1.5*	*0.6*	*1.1*	*1.1*
Math & science credits completed	3.7**	5.8*	1.7*	6.5**	1.1	3.6*	3.8**
	(1.8)	(3.1)	(0.9)	(3.1)	(0.9)	(2.0)	(1.8)
	1.0	*1.3*	*0.7*	*1.4*	*0.5*	*1.0*	*1.0*
Obtain AA within 3 years of entry	0.20	0.23	0.21	0.18	0.16	–0.09	0.31
	(0.17)	(0.18)	(0.27)	(0.27)	(0.30)	(0.25)	(0.22)
	0.09	*0.08*	*0.11*	*0.13*	*0.05*	*0.08*	*0.10*
Transfer to 4–year within 4 years of entry	0.04	0.07	0.04	–0.07	0.17	0.01	0.03
	(0.17)	(0.24)	(0.18)	(0.21)	(0.32)	(0.29)	(0.18)
	0.20	*0.25*	*0.14*	*0.18*	*0.23*	*0.19*	*0.21*
Sample size	206,255	116,407	89,848	100,655	84,793	69,986	136,269

Note. Each row and column represents a separate regression. Panel A consists of the reduced form estimates and Panel B consists of the instrumental variable estimates. Standard errors are in parentheses and are cluster bootstrapped at the institution level. In Panel A, means for students who do not have loan access are in italics. In Panel B, means for students who did not borrow a loan are in italics. All regressions include college and year fixed effects and demographic and institution controls.

*** $p < .01$. ** $p < .05$ * $p < .10$

Similar to previous results, I find that access to Stafford loans significantly increased Pell-eligible students' likelihood of borrowing and their loan amounts across all subgroups. While the results form the entire analytic sample showed a 7.6 percentage point increase in borrowing and a $368 increase in loan amounts, the difference in borrowing and loan amounts is even larger for particular subgroups. For non-traditional students, access to federal loans is associated with a 10-percentage point increase in borrowing, and the loan amount increased by $546. For Black students, participation in federal loans increased loan amounts by $514.

Across all subgroups, the share of Pell-eligible students enrolling before the community college opted out were less likely to receive a grant, yet the dollar amount of grants they received was higher than students without loan access. The only group that received less grant aid before the switch in loan policy was White Pell-eligible students. For Black students, the before and after difference in the share of students receiving a grant is statistically insignificant. However, Black students with loan access were 1.7 percentage points more likely to work while enrolled, an estimate that is significant at the 10 percent level.

Though estimates from Table 5 showed that Pell-eligible students who borrowed a loan attempted more credits in their first year, disaggregating results by subgroups reveals the estimated differences in credits attempted is even larger for particular subgroups. For example, for students younger than 24 years old, the difference is 28 credits. The difference in credits completed is also positive across all subgroups, but statistically insignificant. For attempted and completed math and science credits, the results are positive across subgroups, and, except for Black students, is statistically significant at the 5 or 10 percent level. Similar to the results in Table 6, the share of Pell-eligible students obtaining an associate degree within three years of entry and transfer to a four-year college within four years of entry is statistically insignificant across subgroups. However, the results indicate that the difference is negative for particular subgroups. For example, male students borrowing a loan were 8.6 percentage points less likely to receive an associate degree. White students who borrowed were 7.4 percentage points less likely to transfer to a four-year institution.

Robustness Check

One concern with the main results is that the sample includes only students who were eligible for a Pell grant. Limiting the sample to this particular sample hinders the ability to make inferences for the SCCS system as a whole. For my first robustness check, I run my estimations again using the full sample of financial aid recipients, which also includes students who were ineligible for a Pell grant.

The results in Table 8 are similar to the main results presented in Table 4. Access to loans increases the probability of borrowing by 9.5 percentage points and the average loan amount increases $436 (or $4,589, conditional on borrowing). Consistent with my previous results, students enrolling when the community college participated in the federal loan program were 2.4 percentage points less likely receive a grant. The average dollar amount of grants for these s

Panel B in Table 8 displays the results on enrollment intensity and degree completion. Again, the findings are consistent with the main results. More specifically, financial aid recipients who borrowed a loan attempted 17 more credits than non-borrowers, with the difference being significant at the 1 percent level. The difference in credits completed is also positive, but like the main results, is not statistically significant. Students borrowing a loan also attempted and completed three more credits in math and science courses. Results on degree completion and transfer to a four-year are positive, but not statistically significant.

Table 8: Robustness Check—Effects of Loan Participation and Borrowing on Aid, Enrollment, and College Completion

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Reduced form estimates	Borrowed a Loan	Loan Amount	Received Any Grant	Grant Amount	Worked While Enrolled	Earnings While Enrolled
Participate in federal loan program	0.095***	436.07***	-0.024***	-22.03	0.009	146.43
	(0.018)	(107.966)	(0.005)	(94.189)	(0.009)	(93.331)
Outcome mean for no loan access	*0.01*	*8.59*	*1.00*	*2801.79*	*0.58*	*2735.49*
N	222,258	222,258	222,258	222,258	222,258	222,258
Panel B: IV Estimates	Credits Attempted	Credits Completed	Math & Science Credits Attempted	Math & Science Credits Completed	Obtain AA within 3 years of entry	Transfer to 4-year within 4 years of entry
Borrowed a loan	16.550***	8.777	3.173**	2.976**	0.207	0.045
	(6.336)	(8.781)	(1.244)	(1.258)	(0.129)	(0.122)
Outcome mean for non-borrowers	*16.69*	*13.60*	*1.14*	*1.09*	*0.10*	*0.21*
N	222,258	222,258	222,258	222,258	140,423	146,863

Note. Each row and column represents a separate regression. Panel A consists of the reduced form estimates and Panel B consists of the instrumental variable estimates. Standard errors are in parentheses and are cluster bootstrapped at the institution level. In Panel A, means for students who do not have loan access are in italics. In Panel B, means for students who did not borrow a loan are in italics. All regressions include college and year fixed effects and demographic and institution controls.

*** $p < .01$. ** $p < .05$ * $p < .10$

6. Conclusion

Over the past two decades, students loans have become a popular form of aid helping individuals pay for a postsecondary degree (College Board, 2013). As a result, more students are graduating with higher debt loads, and the rising national student loan default rate reflects their struggles to repay what they borrow (Hillman, 2014). Should a certain share of former students default on their government-backed loans, the federal government sanctions these colleges and prohibits them from providing any federal aid to currently enrolled students. In response, colleges are restricting their students' access to federal loan as a proactive approach to protect their eligibility to disburse federal financial aid. The unintended consequence of this accountability mechanism may dramatically reduce access to federal loans if the number of institutions opting out of the program continues to increase.

The findings from this paper suggest that providing Pell-eligible students with the opportunity to borrow has positive effects on the number of credits students attempt in their first year. Loan borrowing also increases the number of credits completed, degree completion, and transfer to a four-year institution, although the results are not statistically significant. More importantly, Pell-eligible students borrowing a loan have a higher enrollment intensity in STEM related courses, which are in alignment with occupations that are considered to be in demand and offer higher pay in the workforce. Given the positive effects for students, policymakers may want to consider revising accountability rules so that metrics on loan use and default rates do not create an incentive for institutions to opt of the program and limit the ability of students to borrow loans.

Furthermore, results from this paper suggest that colleges choosing to exclude federal loans from students' financial aid packages should have practices in place to help students financially and academically. One particular federal, state, or institution aid program—or a combination of all three—will not necessarily cover the amount of aid lost when opting out of the federal student loan program; institutions may need to develop financial aid programs to supplement existing grant aid. Institutions should also be aware that students might reduce their enrollment intensity in the absence of loans, and institutions may want to have academic resources available to ensure that students are able to complete their degree.

It is important to note that the share of SCCS students borrowing a loan is lower than national estimates. Nationally, roughly 17 percent of community college students borrow, compared to 3 percent at SCCS. Possible reasons provided by SCSS financial aid administrators for the low borrowing rates are the extremely low tuition rates and a combination of aid programs that can cover directs costs for students with extremely high need. Additionally, the low loan take-up also reflects the high share of community colleges that prohibit students from borrowing; only 35 percent of SCCS community colleges participated in the federal loan program in 2009–10. These are important issues to consider when thinking about the generalizability of these results to other contexts. More specifically, this paper is not able to fully

examine the impact of losing loan eligibility for students who are just above the Pell-eligibility threshold or for students who attend highly priced institutions, which are two groups of students who depend on using loans to pay for college. If the results from this paper provide any indication, it is that the impact of losing loan eligibility for these students may be even larger.

Though the analysis in this paper offers insight into the student-level consequences of community colleges' decisions about whether or not to participate in the Stafford loan program, additional research is needed surrounding institutional decisions to not participate in the federal loan program—and on the effects of loan access more generally. At the institutional level, further research is necessary to determine whether other factors besides the cohort default rate contribute to institutions' decision to opt out and how accountability mechanisms could be revised to reduce or eliminate the impact of federal loan access (or lack thereof) on college access and educational outcomes. Information on employment and private loan use is limited with the SCCS datasets. More research needs to examine how the institutional decision not to offer federal loans leads students to rely on working while in school or rely on private loans with higher interest rates and less flexible repayment plans. The national dialogue is currently dominated with concerns over rising debt levels, but before limiting access to loans is embraced as the solution, it is important to better understand both the extent to which federal loans are contributing to the problem and the effects that a reduction in loan access might have on educational outcomes.

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