THE EFFECTS OF ACCESS TO MEDICAID ON THE EMPLOYMENT AND ACADEMIC PROGRESS OF COLLEGE STUDENTS

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ABSTRACT

This paper examines whether expanding Medicaid eligibility affects the employment patterns and academic progress of college students. To estimate causal relationships, we use variation in eligibility due to the Affordable Care Act Medicaid expansions that occurred in a subset of US states. Using data from the National Postsecondary Student Aid Study, we show that expanding Medicaid resulted in a decrease in employment intensity that is most pronounced for students at community colleges. We also see evidence of students making better progress towards graduation, suggesting that expanding Medicaid may have benefited some students by allowing them to shift their focus from work to school. These findings provide insight into how access to publicly provided health insurance can reduce inequalities in long-term education and socioeconomic outcomes.

KEYWORDS: postsecondary education, labor supply, health insurance, Medicaid expansion
JEL CLASSIFICATION: I13, I21, I22, I23

I. Introduction

It has been well documented that the health of college students has a large impact on their academic outcomes, with depression, attention-deficit/hyperactivity disorder, and other mental health conditions especially likely to play a role (e.g., Breslau et al. 2008; DuPaul et al. 2009; Eisenberg, Golberstein, and Hunt 2009; Kessler et al. 1995). Approximately one-third of college students in the US have symptoms of at least one mental health problem (Eisenberg et al. 2011; Lipson et al. 2015), highlighting the critical need for access to medical care among this population. Most colleges have student health centers to provide basic care to students at little to no cost, but there is large variation in the range and level of services they provide. Particularly at smaller four-year colleges and community colleges, the primary role of these health centers is to connect students to medical services in the local community, which students must pay for themselves. Obtaining health insurance (which

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is required by many colleges) to cover these costs can be a challenge for college students, particularly those who do not qualify for their parents' insurance plans. According to data from the 2018 American Community Survey (ACS), 29 percent of undergraduate students are ineligible for dependent coverage because they are over the age of 26 (Ruggles et al. 2020). Even those who are under 26 may not be able to get dependent coverage if their parents do not have health insurance coverage themselves. Students can purchase their own health insurance plans through their college or the individual market, but these plans are often costly.[1] Students at community colleges have particularly limited options, with only 29 percent of community colleges offering student health insurance plans compared with 82 percent of four-year public institutions (US Government Accountability Office 2008).

Our paper examines whether increasing access to subsidized health insurance through the Affordable Care Act (ACA) Medicaid expansions affects the employment patterns and academic progress of college students. Without Medicaid, students who do not qualify for coverage through their parents may obtain health insurance by working while attending school, either to pay for private health insurance or to qualify for employer-sponsored health insurance through full-time employment. However, working more hours while in college has been linked to increased time to degree completion, lower graduation rates, and decline in grade point average (Bound, Lovenheim, and Turner 2012; Darolia 2014; DeSimone 2008; Stinebrickner and Stinebrickner 2003). We explore whether expanding Medicaid eligibility allows college students to shift their focus from work to school and improve their chances of completing a degree.

The ACA Medicaid expansions resulted in a significant increase in Medicaid coverage for undergraduate students, and many of these students substituted private health insurance coverage for Medicaid (Anand and Gicheva 2022). These trends were more pronounced for students age 26 or older, minority students, students at public institutions, and students working part-time.[2] Given this evidence that the ACA Medicaid expansions changed the sources of insurance coverage of college students, it is important to understand how this coverage impacted their academic outcomes. A small number of recent studies have examined whether gaining access to affordable health insurance through the ACA's young adult dependent coverage mandate (Heim, Lurie, and Simon 2018; Jung and Shrestha 2016) or the ACA Medicaid expansions (Chakrabarti and Pinkovskiy 2019) increased college enrollment, and they find conflicting results. Cowan and Hao (2020) find the ACA Medicaid expansion to be associated with higher rates of mental health diagnoses and prescription medication use for low-income college students, but do not find any changes in self-reported grade point average. To the best of our knowledge, our study is

1 The average annual cost of a student health insurance plan in 2014 was $1,699 (Foss et al. 2014), which is almost half of the average tuition at community colleges or 20 percent of the average cost of on-campus room and board at public, in-state four-year institutions (US Department of Education 2018). The average monthly premium (after tax credits) for the lowest-cost plan on the marketplace in 2014 was similar to a student health insurance plan at $145 per month, or $1,740 for the year (Office of the Assistant Secretary for Planning and Evaluation 2013).

2 The unconditional increase in Medicaid coverage for undergraduate students, using data from the 2008 to 2019 ACS, is shown in Figure O1 of the Online Appendix.

the first to estimate the effect of expanding Medicaid eligibility on the employment patterns and academic progress of college students. This is an important contribution to the literature because most of the college wage premium comes from degree completion and not just college enrollment (Ma, Pender, and Welch 2016).

Because subsidized health insurance can function as a form of need-based aid, our paper also adds to the literature examining the effects of need-based aid on postsecondary degree completion and the role of labor supply decisions as a mechanism. Past work has shown that need-based aid may improve academic achievement by partially offsetting student employment (Broton, Goldrick-Rab, and Benson 2016), particularly for community college students (Park and Scott-Clayton 2018). As another example, Denning (2018) shows that for college students close to the age cutoff for being categorized as independent (24 years old), additional aid decreases labor earnings during college, increases the number of attempted credits, and ultimately results in earlier graduation.

To estimate the causal impact of expanding Medicaid on the employment patterns and academic progress of college students, we exploit state-level variation in Medicaid eligibility that resulted from the ACA Medicaid expansions. We are particularly interested in community college students,[3] who are most likely to be affected by the policy change because they are less likely to have access to a student health plan (US Government Accountability Office 2008), have higher risk of dropping out (Berkner and Choy 2008; Radford et al. 2010), and constitute a large share (about 30 percent) of postsecondary students (US Department of Education 2017). Our main source of data for this study is the National Postsecondary Student Aid Study (NPSAS), but we conduct additional tests of our assumptions and hypotheses using data from the Current Population Survey (CPS) and the ACS.

Our findings show that college students decreased their work intensity in response to the Medicaid expansions, mainly by switching from full-time to part-time employment. These labor supply changes are most pronounced for students at community colleges. We also find evidence of improved academic progress for students residing in states that expanded Medicaid, in the form of a higher likelihood of graduating in the current academic year. Overall, our findings suggest that expanding access to Medicaid causes college students to reduce their work effort and make better progress towards degree completion.

II. Conceptual Framework

Before examining empirically the employment and human capital investment responses of college students to the ACA Medicaid expansions, we present the intuition behind the hypotheses that we test; a formal theoretical model is available upon request. Our focus is on

3 In this paper, we refer to less-than-four-year nonprofit institutions as community colleges, but vocational colleges, junior colleges, and technical colleges are also included in this category. In the NPSAS sample, 91 percent of students at less-than-four-year nonprofit institutions attend public two-year colleges, commonly referred to as community colleges; 4 percent attend a public less-than-two-year institution; 4 percent attend a private nonprofit two-year college; and the remaining 1 percent are at a private nonprofit less-than-two-year school.

college students who are not covered by a parent or spouse's employer-sponsored health insurance plan, which should be applicable to at least 30 percent of undergraduate students according to a survey administered in 2019 primarily to students in four-year colleges (American College Health Association 2020). There are four main cases in which we expect to see an impact of the ACA Medicaid expansions: (1) students who worked full-time and had employer-provided health insurance prior to the expansion, (2) students who worked part-time and had privately purchased health insurance prior to the expansion, (3) students who worked part-time and had no health insurance prior to the expansion, and (4) students who were out of the labor force prior to the expansion.

In all four cases above, some students who gain Medicaid eligibility through the ACA expansion are expected to transition from no health insurance to Medicaid or from private health insurance (either employer-sponsored or privately purchased) to Medicaid. The underlying intuition is that those who did not previously have health insurance prefer free Medicaid coverage over being uninsured, and some individuals who were previously working full-time to qualify for employer coverage or working extra hours to afford private coverage prefer Medicaid in order to be able to reduce their working hours. We find empirical evidence of this prediction in Anand and Gicheva (2022), which shows that Medicaid coverage rates increased by 5 to 7 percentage points more in expansion relative to non-expansion states, while the change in employer and private direct coverage was 1 to 2 percentage points lower in expansion relative to non-expansion states. In the current paper, we examine empirically transitions in health insurance coverage type in conjunction with employment status.

Furthermore, we expect to see students working less and increasing the time spent on education following the ACA Medicaid expansions. The intuition behind this prediction is that without Medicaid eligibility, some students may have to work full-time to obtain health insurance through an employer or work additional hours to pay for privately purchased health insurance. After the Medicaid expansions, these students are able to work less but maintain their health insurance coverage by switching from private coverage to Medicaid. The shift from work to time spent on education-related activities should improve students' academic progress, with more students finishing their degrees as a result of the Medicaid expansion.

Lastly, some students who already had Medicaid coverage prior to the ACA expansions may increase their work intensity after the expansion if they were previously suppressing their work hours down to zero in order to qualify for Medicaid. This is in contrast to the predicted decrease in work intensity among those who worked and did not qualify for Medicaid prior to the expansions. Together, these two predictions produce an ambiguous effect on overall employment.

Given these considerations, the rest of the paper will focus on testing the following hypotheses regarding the effects of the Medicaid expansions on college students:

1. Full-time work with private health insurance decreases.
2. Part-time work with public insurance increases.
3. The number of hours worked decreases for those who were previously working.
4. The overall effect on employment is ambiguous.
5. Academic progress improves.

III. Data

The primary data source we use to estimate the impact of the ACA Medicaid expansions on the employment patterns and academic progress of college students is the 2003–04, 2007–08, 2011–12, and 2015–16 waves of the National Postsecondary Student Aid Study (NPSAS), a cross-sectional, nationally representative survey of current postsecondary students administered by the National Center for Education Statistics (NCES).[4] The population for the study includes students who attended a Title IV–eligible institution at some point during the academic year. The NPSAS data combine information from student surveys with individual-level institutional records and income data from the Free Application for Federal Student Aid (FAFSA) if the student filled one out.

The main advantages of using the NPSAS for our study are its large sample size and detailed information about the educational experiences of college students along with basic information about their employment. However, two downsides to the NPSAS are that the data are collected only every four years (resulting in only three pre-expansion observations and one post-expansion observation) and there is no information about the health insurance status of the students. We address these issues by conducting additional tests of our assumptions and hypotheses with annual 2004–19 data from the CPS and 2008–19 data from ACS;[5] these are both nationally representative surveys administered by the US Census Bureau. The CPS collects monthly information about employment in the week prior to the survey and also administers an educational supplemental survey every October that collects detailed information about college attendance. The October CPS is useful for testing the parallel trends assumption for the difference-in-differences analyses. The ACS also collects employment and education data but is less informative for college students than the NPSAS and CPS.[6] However, unlike the NPSAS and CPS, the ACS contains information on health insurance coverage for college students.[7]

4 While the NPSAS provides weights that make it nationally representative, it is not necessarily representative at the state level. Thus, it is possible that oversampled institutions within states are driving some of the results. We verify that our results change little if we add institution fixed effects to the models, suggesting that the changes we see in expansion states take place at the institution level. Results with institution fixed effects are shown in the Online Appendix.

5 The ACS did not ask questions about health insurance prior to 2008.

6 The ACS asks about typical employment over the entire year, which is difficult to interpret for college students, whose employment patterns are subject to more pronounced seasonal variations compared with the general population. The only educational information available in the ACS is whether the respondent is a student, the grade level, and whether they attend a public or private school. Furthermore, the ACS question about school attendance refers to the three months preceding the interview, while the employment questions refer to the 12 months before the interview.

7 The CPS asks about health insurance in the March Annual Social and Economic Supplement (ASEC), but college students cannot be identified among people older than 24 years old in the March CPS or ASEC before 2013. Furthermore, prior to 2014, the health insurance coverage questions in the CPS are for the previous year instead of current coverage. Finally, the health insurance questions in the CPS underwent a major redesign around the same time as the Medicaid expansions (Pascale 2016), which makes it difficult to compare trends in health insurance coverage before and after 2014.

TABLE 1. Medicaid expansion states

	Treatment states	Excluded states	Comparison states
Prior coverage	ACA expansion states	Pre-ACA expansion states	Non-ACA expansion states
None	**January 2014:** Arkansas, Kentucky, Nevada, New Mexico, North Dakota, Ohio, West Virginia **April 2014:** Michigan **August 2014:** New Hampshire **January 2015:** Pennsylvania **September 2015:** Alaska[1] **January 2016:** Montana[1]		Alabama, Florida, Georgia, Idaho,[4] Kansas, Louisiana,[4] Mississippi, Missouri, Nebraska, North Carolina, Oklahoma, South Carolina, South Dakota, Texas, Utah,[4] Virginia,[4] Wyoming
Partial	**January 2014:** Arizona, Colorado, Connecticut, Hawaii, Illinois, Iowa, Maryland, Minnesota, New Jersey, Oregon, Rhode Island, Washington **February 2015:** Indiana		Maine,[4,5] Tennessee,[5] Wisconsin[5]
Comparable to the ACA Medicaid expansion		California,[2] DC,[3] Delaware,[3] Massachusetts,[3] New York,[3] Vermont[3]	

Note: [1]State excluded from the analyses because they expanded during the 2015–16 school year. [2]California is excluded from the analyses because it expanded coverage in some counties prior to 2014. [3]State excluded from the analyses because they had comparable coverage prior to the ACA Medicaid expansions. [4]State included only as a comparison state in the years before expansion because they expanded Medicaid after the NPSAS data collection (Louisiana in July 2016; Maine and Virginia in 2019; Utah and Idaho in 2020). [5]State had limited coverage prior to the ACA but did not expand in 2014.

For all three surveys, we limit the sample to undergraduate students between the ages of 18 and 55 who are not in the military, are not veterans, and are US citizens. The states included in the sample, along with their expansion status and expansion year, are shown in Table 1. For the ACS, we additionally exclude respondents in states that expanded Medicaid after 2014; we discuss the reasons for this sample restriction in the next section. The sample restrictions result in 128,980 observations in expansion states and 131,870 observations in non-expansion states for the NPSAS;[8] 33,000 observations in expansion states and 27,582 observations in non-expansion states for the CPS; and 525,400 observations in expansion

8 All NPSAS sample sizes in the paper are rounded to the nearest 10 as per NCES restricted data requirements.

states and 617,618 observations in non-expansion states for the ACS. Table 2 shows unweighted descriptive statistics for the samples from each data set, which are split by the expansion status of the respondent's state of residency. We show the pooled means for respondents' demographic and academic characteristics for the period before the Medicaid expansions for expansion states and before 2014 for the non-expansion states. Corresponding descriptive statistics for the outcomes of interest from each data set (employment status, health insurance coverage, and progress towards degree completion) are shown in Table 3.

Table 2 shows that students in expansion and non-expansion states tend to be fairly similar. For example, in the NPSAS, the average age of the student sample in both expansion and non-expansion states is 25; approximately 28 percent do not qualify for dependent health insurance because they are over age 26, and between 14 and 17 percent are single parents. The main demographic differences in the NPSAS between expansion and non-expansion states are in terms of racial composition: students in non-expansion states are more likely to be Black or Hispanic than students in expansion states. Almost half of students in the sample attend four-year nonprofit institutions; about one-third are enrolled in two-year or less nonprofit institutions (which we refer to collectively as community colleges); and the rest attend for-profit institutions. Students in the CPS and ACS samples are less likely than in the NPSAS sample to be single parents or have young children, or to have a disability, and there are also fewer Black and Hispanic students. The CPS sample has more students in four-year institutions (70 percent) than the NPSAS,[9] and slightly more than a quarter are enrolled in community colleges (which are identified in the CPS as public two-year institutions); there are fewer first-year students in the CPS than in the NPSAS.

It is evident from Table 3 that a large share of college students work. Almost three-quarters of students in the NPSAS hold a job during the academic year, and those students work an average of 28 to 29 hours per week, which is close to the 30-hour definition by the ACA of being a full-time employee who must be offered health insurance. Approximately 35 percent of undergraduate students in the NPSAS are working full-time, which we define as working 30 hours or more to align with the ACA threshold. Finally, 24 percent of students in the NPSAS have graduated or expect to graduate during the current academic year, with full-time employment status negatively correlated with degree completion.[10] Because the CPS measures employment over a single week instead of the whole academic year, the overall employment rate is 16 to 17 percentage points lower than in the NPSAS.

IV. Empirical Methodology

In order to estimate the causal relationship between access to Medicaid and employment patterns or academic progress, we use the ACA Medicaid expansions as a source of exogenous

9 The NPSAS sampling design first stratifies the universe of eligible institutions based on level and control, and less-than-four-year institutions are oversampled.

10 This information is based on the NPSAS variable PROGSTAT, which is derived from the student interview and institutional records. It equals 1 for students who indicated in their interview that they had completed or expected to complete all requirements for their program during the current academic year. It also equals 1 if the institutional record indicated that the student was expected to complete all requirements for the program by July of the current academic year (e.g., July 2016 for the 2015–16 year).

TABLE 2. Descriptive statistics for the NPSAS, CPS, and ACS samples: Demographic and academic characteristics

	NPSAS sample		CPS sample		ACS sample	
	Expansion	Non-exp.	Expansion	Non-exp.	Expansion	Non-exp.
	Demographics					
Over age 26	0.275	0.287	0.231	0.247	0.257	0.266
Single parent	0.142	0.166	0.078	0.086	0.078	0.087
Number of dependents	0.480	0.551	0.321	0.374	0.342	0.372
	(1.020)	(1.075)	(0.818)	(0.887)	(0.847)	(0.866)
Youngest dependent age 0–5	0.124	0.147	0.072	0.090	0.082	0.095
Youngest dependent age 6–12	0.061	0.069	0.049	0.053	0.044	0.048
Female	0.594	0.603	0.572	0.581	0.571	0.587
Age	24.5	24.6	23.9	24.2	24.4	24.6
	(7.96)	(7.85)	(7.63)	(7.66)	(8.27)	(8.23)
Has disability	0.110	0.110	0.019	0.017	0.045	0.046
Married	0.138	0.156	0.136	0.175	0.151	0.172
Asian	0.045	0.032	0.043	0.021	0.039	0.026
Black	0.155	0.235	0.089	0.142	0.101	0.184
White	0.562	0.476	0.761	0.714	0.729	0.642
Hispanic	0.091	0.148	0.073	0.098	0.090	0.117
State unemployment rate	0.065	0.058	0.067	0.062	0.083	0.078
	(0.015)	(0.019)	(0.023)	(0.022)	(0.020)	(0.019)
	Academic characteristics					
1st year undergraduate	0.456	0.480	0.291	0.301		
2nd year undergraduate	0.219	0.205	0.286	0.286		
3rd year undergraduate	0.118	0.117	0.239	0.242		
Pursuing bachelor's degree	0.511	0.487				
Pursuing associate's degree	0.330	0.323				
In a certificate or other program	0.158	0.190				
Four-year institution, nonprofit	0.464	0.460	0.699	0.688		
Community college	0.332	0.332	0.274	0.286		
Public institution	0.604	0.639	0.798	0.854	0.773	0.799
N	101,350	101,200	22,873	18,078	267,372	311,858

Sources: US Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves. Current Population Survey (CPS), 2004–19. American Community Survey (ACS), 2008–19.

Note: Standard errors for continuous variables are shown below the means in parentheses. The statistics are unweighted. The NPSAS sample sizes are rounded to the nearest 10. See Table 1 for a list of expansion versus non-expansion states that are included in the sample. Means are pooled across pre-expansion years and pre-2014 for non-expansion states.

TABLE 3. Descriptive statistics for the outcomes of interest: Employment, health insurance coverage, and degree completion

	NPSAS sample		CPS sample		ACS sample	
	Expansion	Non-exp.	Expansion	Non-exp.	Expansion	Non-exp.
Had job in current academic year	0.727	0.715				
Had job last week			0.557	0.576		
Had job in previous year					0.791	0.758
Hours worked per week if > 0	27.5	28.5	26.8	28.3	21.9	21.8
	(14.0)	(13.7)	(13.3)	(13.5)	(16.2)	(16.8)
Not employed			0.443	0.425		
. . . with private HI					0.136	0.157
. . . with public HI					0.031	0.026
. . . with no HI					0.042	0.060
Part-time job	0.378	0.350	0.300	0.285		
. . . with private HI					0.327	0.278
. . . with public HI					0.027	0.019
. . . with no HI					0.050	0.062
Full-time job	0.349	0.365	0.242	0.277		
. . . with private HI					0.302	0.299
. . . with public HI					0.025	0.019
. . . with no HI					0.060	0.081
Part-time conditional on working	0.519	0.490	0.538	0.496	0.511	0.473
Graduating in current academic year						
. . .and not employed FT	0.153	0.148				
. . .and employed FT	0.083	0.086				
N	101,350	101,200	22,873	18,078	267,372	311,858

Sources: US Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves. Current Population Survey (CPS), 2004–19. American Community Survey (ACS), 2008–19.

Note: Standard errors for continuous variables are shown below the means in parentheses. The statistics are unweighted. The NPSAS sample sizes are rounded to the nearest 10. See Table 1 for a list of expansion versus non-expansion states that are included in the sample. Means are pooled across pre-expansion years and pre-2014 for non-expansion states.

variation in Medicaid eligibility. Although the ACA gave all states the option to expand Medicaid eligibility, only 22 states chose to do so in 2014. Another three states expanded coverage in 2015, two states in 2016, two in 2019, and two in 2020. Low-income childless adults experienced the largest eligibility gains from these expansions given that many of these states

had no prior coverage for childless adults, and the coverage that was offered to childless adults was typically less comprehensive than what was provided after the expansions.

Table 1 shows the sample inclusion and treatment status of each state. For our main analyses, we do not differentiate between states with no prior coverage (full-expansion states) and states where some level of less generous coverage was available prior to 2014 (partial-expansion states) because most of the programs that were available for childless adults before 2014 were capped, closed, or otherwise very limited. Consistent with this, Anand and Gicheva (2022) shows the increase in Medicaid coverage among college students to be very similar in full- and partial-expansion states.[11]

Our main analyses use the NPSAS data to estimate the following regression model for student i residing in state s and surveyed in year t:

$$y_{ist} = \beta_0 + \beta_1(Med_{is} \times Post_t) + \delta_s + \delta_t + X_{ist}\gamma + \varepsilon_{ist} \quad (1),$$

where y_{ist} is the outcome of interest. Med_{is} is an indicator for the student residing in an expansion state; $Post_t$ is an indicator for the 2016 survey, which is after the Medicaid expansion; δ_s and δ_t are, respectively, state of residence and year fixed effects.[12] The coefficient of interest in this specification is β_1. The vector X_{ist} contains the following student-level characteristics: a quadratic in age; indicators for gender, race, ethnicity, and marital status; information about the presence and ages of children in the household; an indicator for disability; an indicator for being over age 26; indicators for institution type (four-year, two-year or other, for-profit, or public), type of degree, and year of attendance; and the state-level unemployment rate in the survey year. We explore the role of the covariates by estimating additional specifications that exclude the controls in X_{ist} other than year of attendance; the results are available in the Online Appendix (Table O3).

We analyze employment and degree completion as outcomes. We estimate separate models for whether respondents hold any job (including on-campus work-study), work full-time (30 hours or more per week), work part-time (fewer than 30 hours per week), work part-time conditional on having any job, and the log number of hours per week for those who work. As discussed in Section II, we expect the ACA Medicaid expansions to result in a lower likelihood of working full-time (hypothesis 1), a higher likelihood of working part-time (hypothesis 2) and fewer work hours (hypothesis 3); there is no clear prediction for the impact on having any job (hypothesis 4). We examine unconditional part-time employment, which captures the transition both from not working and from working full-time, and part-time employment conditional on working, which captures the transition from full-time employment only. We also test whether the Medicaid expansions are associated with better progress towards degree completion (hypothesis 5). To measure academic progress, we use the indicator for whether the student graduated or plans to graduate in the current academic year. To examine the joint relationship between

11 Separate treatment effects for full- and partial-expansion states are shown in the Online Appendix and reveal similar results.

12 While the majority of students in the sample are residents of the same state as the institution they are attending, this is not always the case. Including fixed effects for the state of the institution in addition to the state of residence fixed effects has little impact on the estimates (results are available upon request).

employment and degree completion, we construct an indicator for graduating in the current academic year and not being employed full-time as well as an indicator for graduating in the current academic year and full-time employment. If reducing work hours improves progress towards degree completion, as predicted by the theoretical model, then we should see more students not working full-time and graduating after the ACA expansions, but we should not see an increase in the share of students continuing to work full-time and graduating.

We estimate equation 1 on the full sample and conduct separate analyses for community colleges versus four-year colleges. We further explore the impacts for students at community colleges by the following subgroups: students age 26 and older (and therefore not eligible for dependent health insurance coverage) versus students under age 26; underrepresented minority students (defined as those who are Black, Hispanic, or other non-White, non-Asian race) compared with White or Asian students; and family composition (marital and parental status). We expect the effects to be especially large for students who are not parents because low-income childless adults were the main beneficiaries of the ACA Medicaid expansions. Students over age 26 and those who are not married (particularly those who are also parents) may also experience larger impacts from the expansions because they are not likely to have dependent coverage through their parents or spouse, respectively.

To test for parallel trends prior to 2014, we estimate a second version of the model where we include individual year dummies for each survey year, with 2012 excluded:

$$y_{ist} = \beta_0 + \sum_{\tau=[2004,2008,2016]} \beta_\tau (Med_{is} \times [\mathbb{I}(t = \tau)]) + \delta_s + \delta_t + X_{ist}\gamma + \varepsilon_{ist} \quad (2),$$

where $\mathbb{I}(\cdot)$ is an indicator function. Because the treatment occurs at the level of the respondent's state of residence, we report standard errors clustered at the state level for the specifications in equations 1 and 2 (Abadie et al. 2017). The results are similar when we cluster the errors at the institution level (results are available upon request). As a robustness check, we estimate separate treatment effects for full- and partial-expansion states. We also estimate the model including institution fixed effects to control for unobserved differences at the institution level. The results from these robustness checks are available in Figures O3 and O4 in the Online Appendix.

We test the validity of the parallel trends assumption further by estimating an event study model using annual CPS data for the period from 2004 to 2019:

$$y_{ist} = \beta_0 + \sum_{\tau=-10}^{5} \beta_\tau (Med_{is} \times [\mathbb{I}(t = T_s + \tau)]) + \delta_s + \delta_t + X_{ist}\gamma + \varepsilon_{ist} \quad (3),$$

where T denotes the year when state s expanded Medicaid. Given recent developments in the econometrics literature that show biases that arise from having variation in the timing of the Medicaid expansions across states (Goodman-Bacon 2021), we estimate equation 3 using the Callaway and Sant'Anna (2021) method that limits the comparison group to not-yet and never-treated states.[13] The outcomes we examine in the CPS are whether the student is employed, works full- or part-time (defined using a threshold of 30 hours per week),

13 Variation in treatment timing is not a concern when using the NPSAS data because all expansion states have the same single post-expansion observation in 2015–16.

works part-time conditional on having a job, and the log number of hours worked in the week before the interview conditional on working. The CPS does not contain information about the student's progress towards graduation.

We use the ACS data to examine students' employment status jointly with their health insurance coverage by estimating the following multinomial logit model:

$$\ln\left(\frac{P(Employment_{ist} = k)}{P(Employment_{ist} = 0)}\right) = \beta_0^k + \sum_{\tau=-6}^{5} \beta_\tau^k (Med_{is} \times [\mathbb{I}(t = 2014 + \tau)]) + \delta_s^k + \delta_t^k + X_{ist}\gamma^k \quad (4),$$

where $Employment_{ist}$ is a categorical variable that equals 0 if individual i has a full-time job and private health insurance; equals 1, 2, or 3 if they are not employed and are uninsured, have public health insurance, or have private health insurance, respectively; 4, 5, or 6 if they are employed part-time and uninsured, have public health insurance, or have private health insurance, respectively; and 7 or 8 if they are employed full-time and are uninsured or have public health insurance, respectively. This model follows the methods used by Buchmueller and Valletta (1999) that examine whether the availability of health insurance through a spouse shifts women from full-time jobs with insurance to part-time jobs without insurance or nonemployment. The β_τ^k coefficients estimate the effect of gaining access to Medicaid on the probability of having outcome k relative to having a full-time job and private health insurance. Specifically, we look for evidence that the ACA Medicaid expansions decreased the likelihood of working full-time with private health insurance (hypothesis 1) and increased the probability of working part-time or not working with public health insurance (hypotheses 2 and 4, respectively). We can also use the multinominal logit results as additional evidence in support of the parallel pre-trend assumption.

We limit the sample for the ACS analysis to non-expansion states and states that expanded in 2014 in order to avoid the problems associated with having variation in the timing of the treatment.[14] We include all undergraduate students but are unable to conduct a subgroup analysis for community colleges because the ACS does not ask about institution type beyond being public or private.

A. POTENTIAL THREATS TO VALIDITY

Our empirical methodology allows us to obtain unbiased estimates of the effect of the Medicaid expansion on the outcomes of interest as long as $\text{Cov}(\varepsilon_{ist}, Med_{is}) = 0$, meaning that a state's decision to expand Medicaid is uncorrelated with the employment decisions and academic progress of college students in that state conditional on the explanatory variables included in the model. One instance when the assumption may be violated is if the decision to expand Medicaid is correlated with changes in state spending on higher education. While Kane, Orszag, and Gunter (2003) show a negative correlation between state per capita spending on Medicaid and spending on higher education in the years before our analysis period (between 1977 and 2001), Gruber and Sommers (2020) find no evidence that increased Medicaid spending from the ACA expansions produced any reductions

14 The results are robust to including post-2014 expansion states (results are available upon request).

in state spending on education. We show in the Online Appendix (Table O1) that the expansions did not have a statistically significant effect on total state support or educational appropriations for higher education per full-time-equivalent student. There is some evidence that state financial aid per full-time student decreased while tuition revenue per student increased in expansion states, but if anything, these changes would have negative effects on students' academic outcomes and should increase employment intensity, causing our results to be biased towards zero. Furthermore, we do not see any correlation between total state spending per student and later Medicaid expansion status for the period between 2001 and 2013. For these reasons, we are not concerned that a relationship between state spending on Medicaid and higher education produces spurious results.

The empirical model is also contingent on the assumption that other provisions of the ACA did not impact college students differentially in expansion and non-expansion states; of particular interest is the dependent coverage mandate that allows those under age 26 to obtain health insurance through a parent's plan. Prior findings from the literature suggest that the dependent coverage provision of the ACA did not affect most labor market outcomes but resulted in a small increase in postsecondary enrollment and a small decrease in the probability of receiving fringe benefits on the job (Heim, Lurie, and Simon 2018). Given that the ACA dependent coverage mandate was implemented concurrently in all states in 2010, the difference-in-differences framework ensures that the year fixed effects control for these changes. Dillender (2014) examines pre-ACA reforms that extended dependent coverage and finds increases in college enrollment and educational attainment for men, which result in higher wages. However, his study includes both states that did and states that did not expand Medicaid in 2014 or 2015, which means these early dependent coverage policies should not have affected Medicaid expansion states differentially. To alleviate any additional concerns that other provisions of the ACA (such as the dependent coverage mandate) affected college students in expansion and non-expansion states differently, we check for discrepancies in the outcome pre-trends as part of our empirical analyses.

Finally, our empirical methodology assumes that the unobserved characteristics of college students did not change differentially in states that expanded Medicaid compared with states that did not expand. This assumption would be violated if, for example, the expansions affected college attendance decisions on the extensive margin, impacting who goes to college. As mentioned above, Dillender (2014) found that extending dependent coverage increased college enrollment for men, although the response to the Medicaid expansions may differ given that it affects a different population and offers a different type of insurance. The NPSAS samples already enrolled college students and therefore does not allow us to test directly for changes on the extensive margin. However, in very careful analysis of the effects of the Medicaid expansions on postsecondary enrollment, Chakrabarti and Pinkovskiy (2019) find that the expansions increased enrollment in less-than-two-year for-profit certificate programs but did not affect enrollment in other types of institutions. Our own analysis of institution-level enrollment data from the Integrated Postsecondary Education Data System for the NPSAS sample period (2004–16), shown in Appendix Figure A1, also does not reveal differential changes in enrollment between expansion and non-expansion states.

To confirm that changes in the composition of students are not driving our results, we examine whether student demographics and family characteristics changed differentially in

expansion and non-expansion states before and after 2014. For example, there was a large increase in enrollment in community colleges and the for-profit sector in the early 2010s owing to the Great Recession and various education policies implemented during that time that increased the number of enrolled students who are older, are financially independent, and were displaced workers (Barr and Turner 2013). We use the NPSAS data to estimate specifications similar to equation 2 but with student characteristics as the dependent variables and without demographic controls.

The results, shown in Appendix Figure A2, do not point to any statistically significant differences in the share of Black or Hispanic students, students with a college-educated mother, single-parent students, or students who are independent between expansion and non-expansion states after the ACA Medicaid expansion relative to before. We also do not see statistically significant changes in the share of Pell-eligible students or the family income of dependent students after the expansions. There is a marginally significant decrease in the average age of students at community colleges. We observe noisy pre-trends for some of the variables, but their timing and direction do not align with our main findings. Overall, there is little evidence that the characteristics of college students (including their decision to enroll in college) changed differentially in expansion states compared with non-expansion states and are biasing the results. To further alleviate concerns that changes in the composition of students are driving the results, we estimate versions of the main models excluding the controls for student and institutional characteristics and confirm that these covariates are not playing a major role; these results are shown in the Online Appendix (Table O3).

Even though we have strong evidence that the composition of college students did not change differentially in expansion versus non-expansion states, it is worth considering how the results of our study would be affected if this were not the case. If gaining access to Medicaid allowed some full-time workers to reduce their hours and enroll in school, then the marginal person who enrolled in college during this period is likely to have a higher propensity for work. Since individuals on the margin between working and attending college tend to be nontraditional students and enroll in open-access institutions (e.g., Barr and Turner 2013), they are expected to have lower persistence and completion rates. This means we would expect to see higher propensity to work and lower degree completion rates among college students after the Medicaid expansions, in which case our results would be a lower bound for the true impacts of the Medicaid expansions on employment and academic progress.

V. Results

We first present the results from the difference-in-differences model in equation 1 using the NPSAS data. Combining the years prior to the Medicaid expansions allows us to estimate more precisely the effects of providing college students with access to Medicaid. The results are shown in Table 4, where we vary the outcome going across the columns and the samples going down the panels; a separate model is estimated for each outcome and each sample. The results in panel A of Table 4 are for the full NPSAS sample. We then show the results for students attending community colleges in panel B and nonprofit public and private

four-year institutions in panel C. For each outcome and sample, we also show the baseline mean of the dependent variable in non-expansion states prior to 2014.

The results in Table 4 suggest that there was a decrease in employment intensity in response to the ACA Medicaid expansions, and that this decrease was particularly large for community college students. Students at community colleges were 4 percentage points less likely to have a job (5.4% decrease relative to the baseline), 4 percentage points less likely to have a full-time job relative to working part-time or not working (9% decrease), 3 percentage points more likely to work part-time conditional on having positive hours (6.6% decrease), and worked 3 percent fewer hours per week if they were residents of an expansion state compared with residents of non-expansion states. These estimates are all consistent with the conceptual framework in Section II.

We also find evidence consistent with the hypothesis that gaining access to Medicaid increased the probability of graduating in the given academic year (hypothesis 5). The results in column 6 show a 2.6 percentage point increase in the probability of having graduated or expecting to graduate in the current academic year for students who reside in expansion states compared with those who reside in non-expansion states, which represents an 11 percent increase relative to the baseline of 0.235.[15] The effect is larger for students attending a community college (3.9 percentage points or a 22 percent increase). Furthermore, for all samples, there is an increase in the likelihood of graduating while not working full-time after the ACA Medicaid expansions (column 7), suggesting a joint relationship between decreasing full-time employment and making better progress towards degree completion. As expected, such effects are not showing up for the joint outcome of working full-time and graduating.

Because we see such large effects for community college students, who comprise a third of college students in the NPSAS sample, compared with any other subgroup, we examine the effects of the ACA Medicaid expansion in community colleges in more detail by estimating equation 1 separately for several subgroups of interest. As shown in Table 5, there is a particularly large decrease in employment intensity for those students in community colleges who are older than 26 (panel B), minorities (panel C), and non-parents (panels E and F), especially those who are married. Childless adults were the least likely to have Medicaid coverage prior to the ACA expansions, which may explain why they decreased their work intensity to qualify for Medicaid more than low-income parents (panels G and H), who may have already had coverage (hypotheses 1 through 3). We also find that the Medicaid expansions resulted in an increase in the likelihood of graduating in the current year while not being employed full-time for all groups except for parents, suggesting that they allowed students at community colleges to shift their focus from work to school.

Next, we estimate equation 2, which uses the full set of survey year dummies, with the NPSAS data, and the event study model in equation 3 with the CPS data to check for differences

15 The 2004 and 2008 NPSAS oversample first-year students in order to generate a larger sample for the Beginning Postsecondary Students Longitudinal Study. As a result, the share of the sample graduating in 2004 and 2008 (0.234 in non-expansion states) is considerably lower than the share graduating in 2015–16 (0.463). If the non-expansion mean for 2015–16 is used as baseline instead, the relative increase caused by the ACA Medicaid expansions is 5.6% in the full sample.

TABLE 4. Effect of the ACA Medicaid expansions on employment and degree completion, by subgroup

	Outcome							
	Any job (1)	Ln(hours per week) (2)	Employed FT (3)	Employed PT (4)	Employed PT (cond. on working) (5)	Graduation in current year (6)	Graduation × not employed FT (7)	Graduation × employed FT (8)
	A. Full sample (N = 260,850)							
Expansion × 2016	−0.0045	−0.0131	−0.0124[b]	0.0080	0.0201[a]	0.0261[b]	0.0349[a]	−0.0088
	(0.0070)	(0.0103)	(0.0056)	(0.0063)	(0.0066)	(0.0123)	(0.0081)	(0.0079)
Mean (SD) of dep. variable	0.715	3.188	0.365	0.350	0.490	0.235	0.148	0.086
		(0.649)						
	B. Community college (N = 77,510)							
Expansion × 2016	−0.0403[a]	−0.0311[b]	−0.0396[a]	−0.0006	0.0269[b]	0.0386[b]	0.0367[a]	0.0020
	(0.0103)	(0.0149)	(0.0101)	(0.0105)	(0.0124)	(0.0171)	(0.0097)	(0.0119)
Mean (SD) of dep. variable	0.746	3.302	0.441	0.305	0.409	0.174	0.099	0.075
		(0.570)						

	C. Four-year nonprofit (N = 123,460)							
Expansion × 2016	−0.0027	−0.0178	−0.0083	0.0056	0.0213[b]	0.0122	0.0365[a]	−0.0243[a]
	(0.0094)	(0.0127)	(0.0064)	(0.0081)	(0.0081)	(0.0164)	(0.0117)	(0.0088)
Mean (SD) of dep. variable	0.725	3.042	0.290	0.435	0.600	0.265	0.179	0.086
		(0.698)						

Source: US Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.

Note: The table shows coefficient estimates for the (*Expansion state*) × (*2016 survey*) interaction, with a separate regression estimated for each outcome and each sample. The dependent variable means are for expansion states in 2004–12. The sample sizes are rounded to the nearest 10. The errors are clustered at the state of residence level. The regression models include year fixed effects; state of residence fixed effects; state-year unemployment rate; a quadratic in age; gender, race, ethnicity, marital status, information about the presence and ages of children in the household; an indicator for disability; an indicator for being age 26 or older; institution type (four-year, two-year or other, for-profit, or public); indicators for degree type (bachelor's and associate's); and year of attendance. [a]$p < 0.01$, [b]$p < 0.05$.

TABLE 5. Effect of the ACA Medicaid expansions on employment and degree completion for community college students

	Any job (1)	Ln(hours per week) (2)	Employed FT (3)	Employed PT (4)	Employed PT (cond. on working) (5)	Graduation in current year (6)	Graduation × not employed FT (7)	Graduation × employed FT (8)
	A. Age < 26 (N = 50,040)							
Expansion × 2016	−0.0282[b]	−0.0264[c]	−0.0276[b]	−0.0006	0.0261	0.0494[a]	0.0442[a]	0.0052
	(0.0139)	(0.0151)	(0.0121)	(0.0141)	(0.0158)	(0.0141)	(0.0104)	(0.0096)
	B. Age ≥ 26 (N = 27,480)							
Expansion × 2016	−0.0610[a]	−0.0394[c]	−0.0636[a]	0.0026	0.0301	0.0219	0.0236[c]	−0.0017
	(0.0168)	(0.0226)	(0.0212)	(0.0136)	(0.0195)	(0.0277)	(0.0122)	(0.0207)
	C. Minority (N = 26,940)							
Expansion × 2016	−0.0185	−0.0468[c]	−0.0443[b]	0.0257	0.0492[b]	0.0290	0.0318[b]	−0.0028
	(0.0183)	(0.0257)	(0.0180)	(0.0167)	(0.0218)	(0.0243)	(0.0125)	(0.0197)
	D. White or Asian (N = 50,580)							
Expansion × 2016	−0.0498[a]	−0.0228	−0.0359[a]	−0.0140	0.0156	0.0473[a]	0.0408[a]	0.0064
	(0.0119)	(0.0143)	(0.0105)	(0.0105)	(0.0117)	(0.0164)	(0.0123)	(0.0090)

	E. Single non-parents (N = 48,770)							
Expansion × 2016	−0.0370[a]	−0.0307[b]	−0.0320[a]	−0.0049	0.0229	0.0465[a]	0.0421[a]	0.0044
	(0.0135)	(0.0142)	(0.0109)	(0.0141)	(0.0155)	(0.0141)	(0.0110)	(0.0081)
	F. Married non-parents (N = 3,910)							
Expansion × 2016	−0.0693	−0.1126[b]	−0.1118[b]	0.0425	0.0748	0.0734	0.0940[b]	−0.0206
	(0.0422)	(0.0479)	(0.0534)	(0.0395)	(0.0512)	(0.0439)	(0.0362)	(0.0300)
	G. Single parents (N = 14,470)							
Expansion × 2016	−0.0322	−0.0340	−0.0496[c]	0.0174	0.0387	0.0025	0.0151	−0.0125
	(0.0232)	(0.0359)	(0.0272)	(0.0241)	(0.0305)	(0.0276)	(0.0141)	(0.0244)
	H. Married parents (N = 10,360)							
Expansion × 2016	−0.0504[c]	−0.0003	−0.0340	−0.0164	0.0001	0.0418	0.0218	0.0199
	(0.0254)	(0.0392)	(0.0286)	(0.0203)	(0.0284)	(0.0374)	(0.0178)	(0.0318)

Source: US Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.

Note: The specifications are the same as in Table 2. The sample sizes are rounded to the nearest 10. [a]$p < 0.01$, [b]$p < 0.05$, [c]$p < 0.10$.

in trends prior to the expansions. In Figure 1, we show the employment results for the full sample and for community college students in the NPSAS, for whom we found the strongest impacts in the difference-in-differences model; the results for the three graduation outcomes are shown in Figure 2. In Figure 3, we show results for the full sample of students in the CPS. We do not show results for community college students in the CPS in the main analyses because the sample size for this group is small, resulting in noisy and unreliable estimates (see Table O2 and Figure O2 in the Online Appendix for more details).

Consistent with our difference-in-differences results, Figure 1 shows a drop in employment intensity in expansion states relative to non-expansion states in 2016 (after the ACA Medicaid expansions), and Figure 2 shows better progress towards degree completion, particularly for community college students; that is, community college students in expansion states were less likely to have a job, less likely to be employed full-time, worked fewer hours per week, and were more likely to have graduated or expect to graduate without full-time employment. For all students, there is a lower likelihood of being employed full-time and a higher likelihood of being employed part-time conditional on working, as well as higher probability of graduation.

The pre-trends are similar for NPSAS students in expansion and non-expansion states, but having only three pre-expansion data points makes it difficult to assess the pre-trends with certainty. Figure 3 presents the event study results using annual data on college students in the CPS. These graphs provide further evidence that the employment patterns of college students did not differ between expansion and non-expansion states prior to the ACA Medicaid expansions. Furthermore, the graphs support the NPSAS findings that students in expansion states are less likely to work full-time, are more likely to work part-time, and work fewer hours after gaining access to Medicaid. The CPS analyses point to an increase in the likelihood of having a job, which differs from the NPSAS results of no impact. One possible explanation for the difference in the results is that employment status in the NPSAS is measured over the whole academic year, while employment in the CPS refers to the week prior to the survey, which was administered in October. As a result, the NPSAS sample has a higher baseline level of employment than the CPS (72 percent were employed in the NPSAS compared with slightly more than a half in the CPS). Given the conflicting empirical findings, we cannot draw any conclusions on the impact of the ACA Medicaid expansions on the likelihood of being in the labor force.

We conduct additional robustness checks, shown in the Online Appendix, estimating the model without covariates (Table O3), with institution fixed effects (Figure O3), and allowing for different impacts in full- and partial-expansion states (Figure O4). The results are similar across these alternative specifications. The impacts in the institution fixed-effects specifications are slightly smaller in magnitude and less precisely estimated, suggesting that there may be some cross-institution sorting. The estimated impacts are similar in magnitude for community college students in full- and partial-expansion states but are somewhat noisier for full-expansion states, which tend to be smaller and therefore comprise fewer observations in the data. It is not surprising that the estimated effects are similar for full- and partial-expansion states given that college students in partial-expansion states were unlikely to be eligible for coverage prior to 2014, in part because most of those programs were capped, closed, or otherwise very limited.

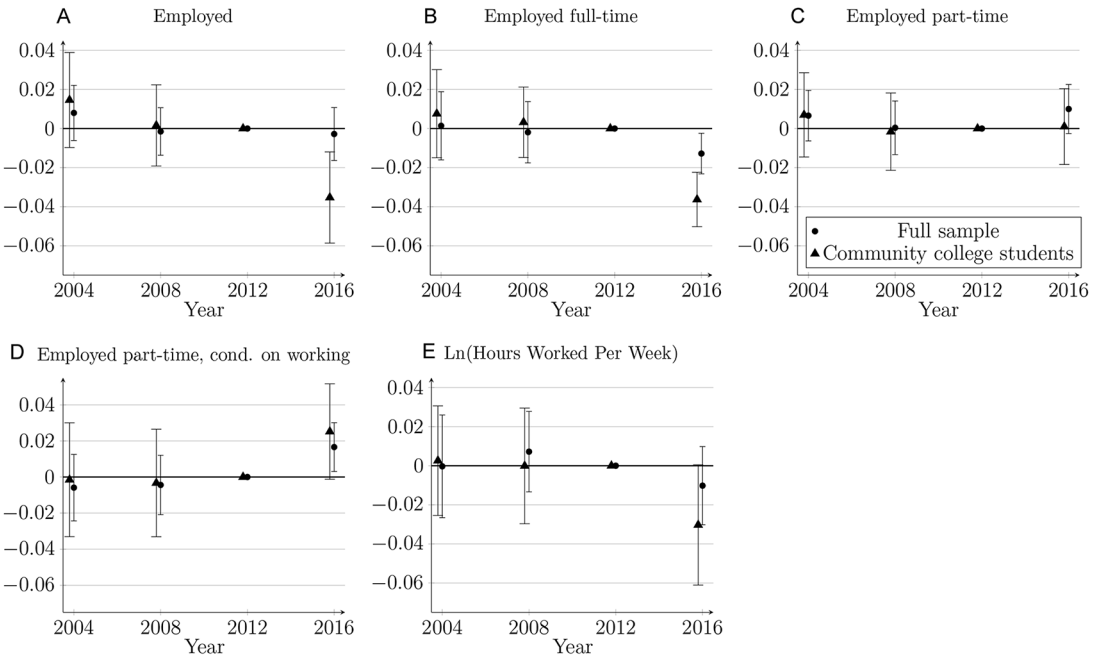

FIGURE 1. Changes in employment after the ACA Medicaid expansions: NPSAS results. $N = 260{,}850$ for the full sample and $N = 77{,}510$ for the community college sample. The graph shows coefficient estimates and 95 percent confidence intervals from linear probability models for the interactions between year indicators and indicators for whether the student's state of residence is an expansion state. The errors are clustered at the state of residence level. The regression models include the controls from Table 4. See Table 1 for a list of expansion versus non-expansion states that are included in the sample. Source: US Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.

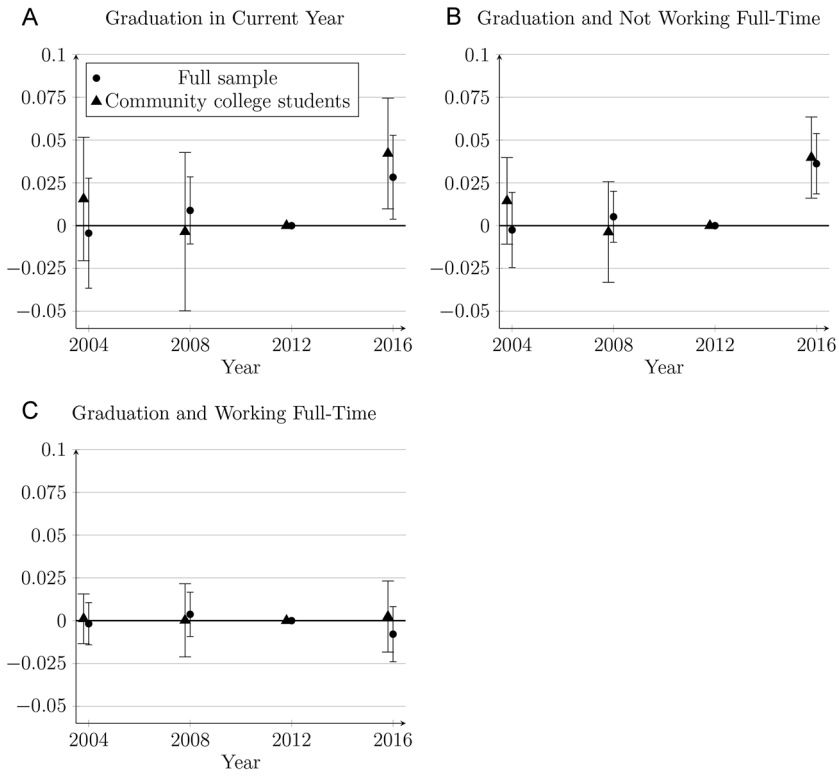

FIGURE 2. Changes in degree completion after the ACA Medicaid expansions: NPSAS results. $N = 260{,}850$ for the full sample and $N = 77{,}510$ for the community college sample. The graph shows coefficient estimates and 95 percent confidence intervals from linear probability models for the interactions between year indicators and indicators for whether the student's state of residence is an expansion state. The errors are clustered at the state of residence level. The regression models include the controls from Table 4. See Table 1 for a list of expansion versus non-expansion states that are included in the sample. Source: US Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.

Our final analysis uses the ACS data to test whether the decreased work intensity observed in the NPSAS and CPS data is associated with a decrease in reliance on private health insurance coverage. The results of the multinomial logit model in equation 4, which examines employment and health insurance coverage status jointly, are presented in Table 6. We show coefficients relative to full-time work with private health insurance coverage. We find positive and statistically significant effects on the probability of being in all employment categories with public health insurance coverage. This is consistent with the findings in Anand and Gicheva (2022) that the ACA Medicaid expansions increased the probability that college students have public health insurance relative to private health insurance; however, these

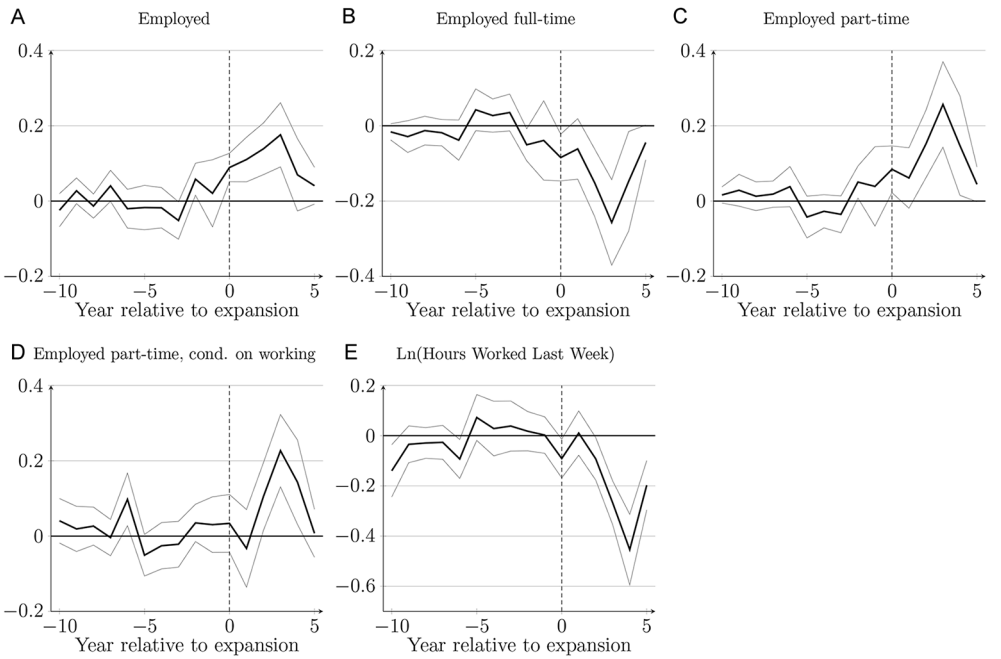

FIGURE 3. Changes in employment after the ACA Medicaid expansion using data on all college students in the Current Population Survey. $N = 62{,}276$. The graph shows coefficient estimates and 95 percent confidence intervals from linear probability models for the interactions between year relative to expansion indicators and indicators for whether the student's state of residence is an expansion state. The coefficients were estimated using the Callaway and Sant'Anna (2021) estimation strategy. The errors are clustered at the state of residence level. The regression models include the controls from Table 4. See Table 1 for a list of expansion versus non-expansion states that are included in the sample. Source: Current Population Survey, 2004–19.

TABLE 6. Effect of the ACA Medicaid expansions on employment using ACS data and multinomial logit

	Employment type (omitted category: FT work and has private HI)							
	Not employed			PT work			FT work	
Independent variable	Uninsured (1)	Has public HI (2)	Has private HI (3)	Uninsured (4)	Has public HI (5)	Has private HI (6)	Uninsured (7)	Has public HI (8)
$t-6$	0.114	0.143	0.071	0.083	−0.086	0.002	0.068	−0.032
	(0.082)	(0.128)	(0.074)	(0.066)	(0.098)	(0.034)	(0.046)	(0.092)
$t-5$	0.188[b]	0.107	0.058	0.131[b]	−0.063	0.025	0.018	−0.047
	(0.079)	(0.088)	(0.055)	(0.064)	(0.103)	(0.030)	(0.050)	(0.080)
$t-4$	0.165	0.129	0.110	0.092	0.088	0.070[c]	0.051	0.071
	(0.104)	(0.091)	(0.067)	(0.059)	(0.095)	(0.037)	(0.048)	(0.078)
$t-3$	0.106	0.114	0.061	0.032	0.037	0.042	0.009	−0.041
	(0.093)	(0.098)	(0.055)	(0.061)	(0.092)	(0.030)	(0.045)	(0.079)
$t-2$	0.052	0.073	0.018	0.006	−0.054	−0.009	−0.010	−0.065
	(0.064)	(0.066)	(0.042)	(0.059)	(0.062)	(0.028)	(0.047)	(0.068)
t	−0.121	0.236[a]	−0.030	−0.204[a]	0.298[a]	−0.008	−0.154[a]	0.313[a]
	(0.075)	(0.064)	(0.038)	(0.066)	(0.076)	(0.033)	(0.044)	(0.087)
$t+1$	−0.255[a]	0.352[a]	−0.014	−0.208[b]	0.458[a]	0.025	−0.271[a]	0.490[a]
	(0.098)	(0.088)	(0.062)	(0.081)	(0.090)	(0.035)	(0.064)	(0.106)
$t+2$	−0.432[a]	0.379[a]	−0.019	−0.408[a]	0.468[a]	−0.011	−0.299[a]	0.569[a]
	(0.114)	(0.091)	(0.070)	(0.097)	(0.096)	(0.034)	(0.072)	(0.107)
$t+3$	−0.340[a]	0.336[a]	−0.081	−0.326[a]	0.392[a]	−0.053	−0.292[a]	0.497[a]
	(0.123)	(0.099)	(0.081)	(0.096)	(0.112)	(0.037)	(0.076)	(0.121)
$t+4$	−0.272[b]	0.217[b]	−0.021	−0.361[a]	0.445[a]	−0.034	−0.314[a]	0.426[a]
	(0.120)	(0.092)	(0.084)	(0.090)	(0.121)	(0.031)	(0.086)	(0.126)
$t+5$	−0.315[a]	0.246[b]	−0.133	−0.431[a]	0.285[b]	−0.014	−0.280[a]	0.187
	(0.110)	(0.116)	(0.087)	(0.108)	(0.127)	(0.035)	(0.080)	(0.152)

Source: American Community Survey, 2008–19.

Note: States that expanded after 2014 are excluded from the analysis. $N = 1{,}153{,}708$. Year t stands for 2014. The standard errors are clustered at the state level. The model includes year fixed effects; state of residence fixed effects; state-year unemployment rate; a quadratic in age; gender, race, ethnicity, marital status, information about the presence of children in the household; an indicator for disability; and an indicator for being age 26 or older. [a]$p < 0.01$, [b]$p < 0.05$, [c]$p < 0.10$.

results demonstrate that college students are not only more likely to have public health insurance after the expansions, but they are more likely to work part-time or not at all relative to working full-time with private health insurance. This finding supports hypotheses 1 through 4 in the theoretical model and suggests that the decrease in employment intensity observed in the NPSAS and CPS can be attributed to gaining Medicaid coverage. The pre-expansion coefficients are generally not statistically significant in Table 6, which further supports the validity of the parallel pre-trends assumption.

VI. Conclusion

There is little existing literature on the relationship between expanding Medicaid eligibility and the employment and academic experiences of postsecondary students. A few papers examine the impact of gaining access to affordable health insurance on college students, but they focus on the extensive margin (enrollment) and do not use data that are specifically tailored to the analysis of higher education financing and performance (Chakrabarti and Pinkovskiy 2019; Heim, Lurie, and Simon 2018; Jung and Shrestha 2016). It is important to analyze the impacts of gaining access to affordable health insurance on college students beyond the decision to enroll in an institution of higher education because most of the college wage premium comes from earning a degree rather than from completing some postsecondary education (Ma, Pender, and Welch 2016). We are also interested in whether reduced labor supply is a mechanism for this effect.

Our paper explores whether college students benefit from becoming eligible for Medicaid by being able to shift their focus from work to school and make better academic progress. We use the ACA Medicaid expansions to examine quasi-random variation in access to affordable health insurance for college students. Our previous work showed that college students substitute their private coverage for more affordable Medicaid coverage in response to the expansions (Anand and Gicheva 2022), and in this paper, we use data from the NPSAS, CPS, and ACS to show that gaining access to Medicaid also caused some students to shift their focus from work to education and improve their progress towards degree completion. These findings are particularly strong for community college students. Specifically, we find that gaining access to Medicaid makes community college students less likely to have a job or work full-time and incentivizes them to work fewer hours per week. We also find that the Medicaid expansions increased the likelihood of graduating in the current year. This finding is noteworthy because community college students tend to have low persistence rates (Berkner and Choy 2008; Radford et al. 2010).

Our findings should be of interest to policy makers, higher education administrators, and researchers by providing insight into how access to publicly provided health insurance can reduce inequalities in long-term education and socioeconomic outcomes. Because as of the writing of this study only one post-expansion round of the NPSAS is available, we are not able to examine longer-term impacts on academic progress. The NPSAS also does not contain information on the health insurance status of college students; however, our supplementary analysis using the ACS data provides strong evidence that health insurance is playing an important role in the switch from work to education. Furthermore, we estimate the intent-to-treat effects of expanding Medicaid eligibility, which does not require

information on health insurance status and is an important margin from a policy perspective. Future research can further extend the analysis by directly linking the education-related outcomes of interest to the source of health insurance and health status of college students.

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Appendix

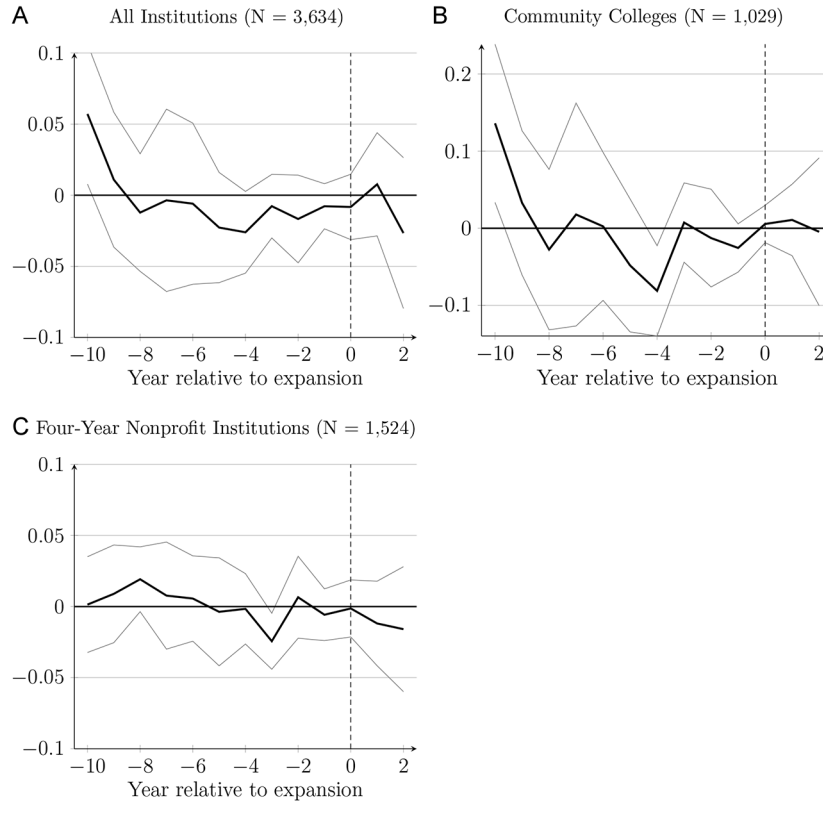

FIGURE A1. Changes in enrollment after the ACA Medicaid expansion. The dependent variable is the natural log of the total number of entering undergraduate students in the fall of the given year. The graph shows coefficient estimates and 95 percent confidence intervals for the interactions between year indicators and indicators for whether the student's state of residence is an expansion state. The coefficients were estimated using the Callaway and Sant'Anna (2021) estimation strategy for unbalanced panel data at the institution level. The errors are clustered at the state of residence level. Source: Integrated Postsecondary Education Data System, 2004–16.

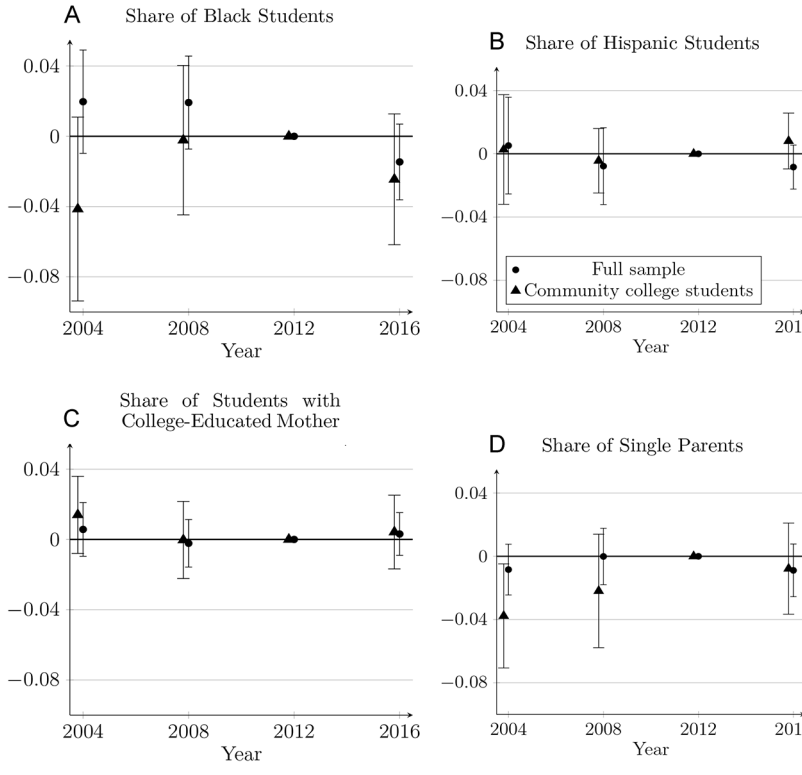

Figure A2. Student composition changes in expansion and non-expansion states. The graph shows coefficient estimates and 95 percent confidence intervals from linear probability models for the interactions between year indicators and indicators for whether the student's state of residence is an expansion state. The errors are clustered at the state of residence level. The regression models include state of residence fixed effects, year fixed effects, and controls for institutional type (four-year, two-year or other, for-profit, or public), indicators for degree type (bachelor's and associate's), and year of attendance. See Table 1 for a list of expansion versus non-expansion states that are included in the sample. Source: US Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.

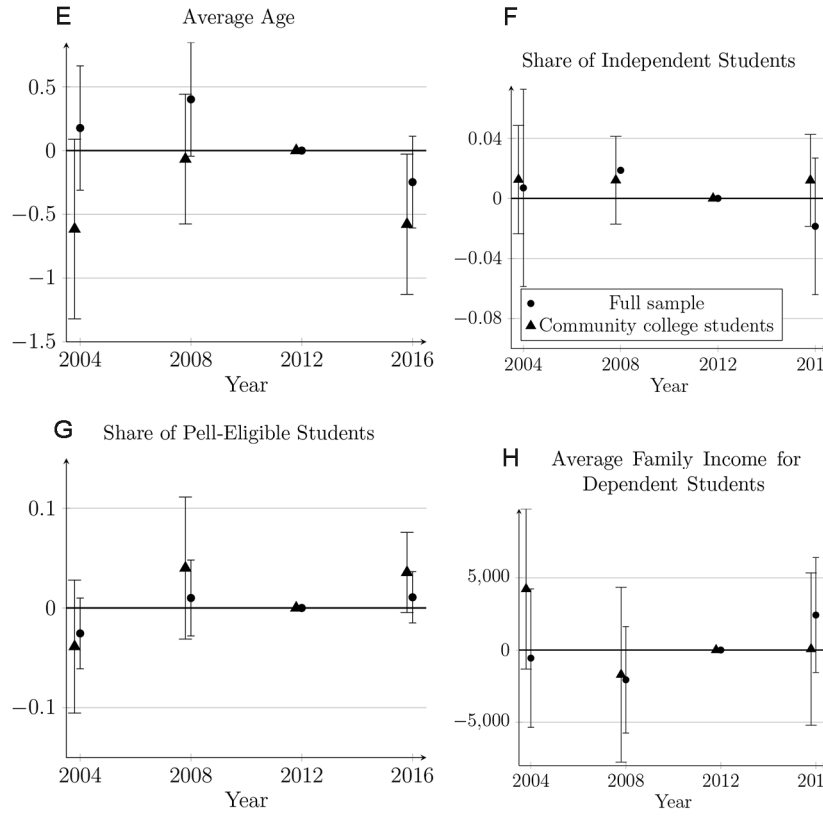

Figure A2. *Continued*

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