The Impact of the ACA Medicaid Expansions 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 the variation in eligibility due to the Affordable Care Act Medicaid expansions that occurred in a subset of U.S. states. We use data from the National Postsecondary Student Aid Study to show that expanding Medicaid resulted in a decrease in employment intensity by students at community colleges, an increase in the number of transfers to four-year colleges, and higher graduation rates in four-year institutions, suggesting that expanding Medicaid led to an improvement in academic progress.

JEL Codes: I13, I21, I22, I24

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1 Introduction

College students are generally considered to be a healthy population, but recent evidence on their demand for medical care highlights their need for access to affordable health insurance.

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For example, roughly one-third of undergraduates exhibit symptoms of a mental health problem such as depression, generalized anxiety or suicidality, yet a majority of these students are not receiving mental health services to treat these conditions (Lipson, Gaddis, Heinze, Beck and Eisenberg 2015). Despite this need for health insurance, gaining access to coverage can be a challenge for college students who do not qualify for their parents' insurance plans or whose parents do not have health insurance. While 82 percent of four-year public institutions offered student health insurance plans in 2008, only 29 percent of community colleges did so (United States Government Accountability Office 2008). Even when student health insurance plans are available, their cost can be a burden for students. The average annual cost of a student health insurance plan in 2014 was $1,699 (Foss, Lyon, Jackson and Plumly 2014), which is almost half of the average tuition at community colleges or 20% of the average cost of on-campus room and board at public, in-state four-year institutions (U.S. Department of Education 2018). Students often work while in school, either to pay for private health insurance or to qualify for employer-sponsored health insurance by working full time. Working more hours while in college has been linked to increased time to degree completion, lower graduation rates, and decline in grade point average (GPA) (Bound, Lovenheim and Turner 2012, Darolia 2014, DeSimone 2008, Stinebrickner and Stinebrickner 2003). Our paper examines whether expanding Medicaid eligibility allows for college students to shift their focus from work to school, which changes their academic experience and improving their chances of completing a four-year degree.

We know little about the relationship between expanding Medicaid and the tradeoff between time spent on employment and academic progress. Numerous studies have shown that the Affordable Care Act (ACA) Medicaid expansions resulted in a significant increase in Medicaid coverage for the adult population (Antonisse, Garfield, Rudowitz and Artiga (2017)), and recent work by McMorrow, Kenney, Long and Anderson (2015) showed large increases for the young adult population (ages 19 to 25) as well. However, the health insurance coverage decisions of college students, especially from low-income families, is likely to differ from those of the entire young adult population given their different coverage and employment options. 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 2017, Jung and Shrestha 2016) or the ACA Medicaid expansions (Chakrabarti and Pinkovskiy 2018) affected college enrollment and find conflicting results. To the best of our knowledge, our study is the first to estimate the effect of expanding Medicaid eligibility on the health insurance coverage, 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). We also examine students' transitions from community colleges to four-year institutions as a measure of academic progress. Light and Strayer (2004) and Liu, Belfield and Trimble (2015) document that students who transfer from a two-year to a four-year institution have considerably higher wage returns and lower probability of unemployment after earning a Bachelor's degree compared the returns to an Associate's degree for students who remain at two-year institutions.

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 persistence and completion. Previous studies have shown that increasing the amount of need-based aid awarded to low-income students decreases drop-out rates (Bettinger 2004) and increases the number of attempted credits (Denning, Marx and Turner 2017), rate of credit accumulation (Castleman and Long 2016), and the probability of Bachelor's degree completion (Castleman and Long 2016, Goldrick-Rab, Kelchen, Harris and Benson 2016, Denning et al. 2017). Denning (2018) shows that for college students close to the age cutoff for being categorized as independent (24 years), additional aid decreases labor earnings, increases the number of attempted credits, and ultimately results in earlier graduation. However, Anderson and Goldrick-Rab (2018) do not find any changes in credit accumulation, degree completion, or transfers to four-year institutions among low-income community college students who were randomly selected to receive additional grant aid.

We estimate the causal impact of expanding Medicaid on the health insurance coverage, employment patterns and academic progress of college students by exploiting the variation in eligibility due to the Medicaid expansions that were part of the ACA. We use a difference-in-differences methodology that compares the source of health insurance coverage, employment, and academic progress of students in expansion states to similar students in non-expansion

states. We focus on students who are most at risk, who we identify as students in less-than-four-year non-profit institutions (which are primarily community colleges[1]) and those who are low-income, independent or a racial or ethnic minority. Students at community colleges are less likely to have access to a student health plan (United States Government Accountability Office 2008), have higher risk of dropping out (Berkner and Choy 2008, Radford, Berkner, Wheeless and Shepherd 2010), and constitute a large share (about 30 percent) of postsecondary students (U.S. Department of Education 2017). Students who are independent from their parents, from low-income families or a racial or ethnic minority are most likely to be burdened by health insurance and health care costs and are also most at risk of dropping out (Berkner and Choy 2008, Radford et al. 2010). They also comprise a large portion of college students; close to one-third of incoming postsecondary students are independent, around the same share receive a federal Pell grant (a measure of low family income), and 38 percent are a racial or ethnic minority (Berkner and Choy 2008, Radford et al. 2010).

Our findings show that many college students substituted private health insurance coverage (both employer sponsored and directly purchased) for Medicaid coverage in response to the 2014 ACA Medicaid expansions. Furthermore, community college students decreased their work intensity in response to the Medicaid expansions by reducing their hours, having a lower likelihood of having a job and being less likely to view themselves as primarily an employee taking classes (as opposed to primarily being a student who is working to meet expenses or not working at all). We also find evidence of improved academic progress in states that expanded Medicaid, with a higher probability of transfering from a community college to a four-year institution and higher graduation rates at four year colleges. Overall, our findings suggest that expanding access to Medicaid causes community college students to reduce their work effort and improves academic progress of college students.

The rest of the paper is organized as follows. Section 2 describes the theoretical framework for the behavioral response we expect to see from college students after the ACA Medicaid

[1]In this paper, we refer to less-than-four-year non-profit institutions as community colleges, but they also include vocational colleges, junior colleges, and technical colleges. In the NPSAS sample, 91% of students at less-than-four-year non-profit institutions attend public two-year colleges, commonly referred to as community colleges; 4% attend a public less-than-two-year institution; 4% attend a private non-profit two-year college, and the remaining 1% are at a private non-profit less-than-two-year school.

expansions. Section 3 describes the data and sample of students used in this analysis. Section 4 outlines our difference-in-differences methodology. Section 5 presents the results of our analyses, and section 6 concludes.

2 Theoretical Framework

Our theoretical model generates predictions for how we expect college students to respond to the ACA Medicaid expansions in terms of their employment and school enrollment decisions. Consider a postsecondary student who is not covered by a parent's or spouse's employer-sponsored health insurance plan. We assume that the availability of employer plans, own or through a parent or spouse, did not change with the Medicaid expansion. Because other ACA provisions affected expansion and non-expansion states equally, this assumption is consistent with the empirical analysis, which only requires that private coverage did not change differentially in expansion and non-expansion states beyond potential Medicaid crowd-out. We also do not model the choice to enroll in postsecondary education and instead model schooling choices only along the intensive margin.

In this two-period model, individuals are enrolled in school and can also choose to work in period 1; period 2 represents the time after leaving school when they only work. In period 1, the individual chooses whether to have health insurance coverage h. We do not analyze differences between various health insurance plans, making the choice of health insurance coverage binary: $h = \{0, 1\}$. The other choice in period 1 is work intensity, denoted by x, where $x \in [0, 1)$. The value of x is lower for individuals who work fewer hours. Individuals also enroll in s units of schooling, $s \in (0, 1]$, allocating their time between work and school according to $s + x = 1$. Because we model the intensive margin of schooling, it is assumed that $s > 0$. We assume that all schooling is completed by the end of period 1 and that there is no disutility of labor, so workers supply 1 unit of labor in period 2.

An individual is considered to be a full-time worker if $x \geq \overline{x}$ for some fixed $0 < \overline{x} < 1$. We assume that all full-time workers are offered health insurance through their employer[2]

[2]This is not necessarily true for small firms, but differentiating between employers of different size does not change the overall predictions of the model and cannot be examined empirically because we do not observe firm size in the data.

and that the cost of employer-sponsored health insurance is 0 when $x \geq \overline{x}$. Because everyone works full-time in the second period, all individuals receive health insurance coverage at no cost at $t = 2$. Wages in the first period are given by w_1 per unit of labor supplied, so that total earnings equal xw_1. Earnings in period 2 are an increasing function of school attainment in period 1, $w_2(s)$, where $w_2'(s) > 0$ and $w_2''(s) < 0$. In addition, individuals have assets equal to a in the first period; because we study college students, a could represent parental transfers.

The cost of health insurance coverage, $H(h, x, a, w_1)$, equals 0 for those who do not have coverage ($h = 0$). For individuals with health insurance coverage ($h = 1$), the cost of health insurance is 0 for those who work full-time ($x \geq \overline{x}$) or qualify for Medicaid ($a + xw_1 \leq m$, where m represents the income cutoff for Medicaid eligibility) and H for those who purchase a private plan either on the individual market or through their educational institution:

$$H(1, x, a, w_1) = \begin{cases} 0 & \text{if } x \geq \overline{x} \text{ or } a + xw_1 \leq m \\ H & \text{if } x < \overline{x} \text{ and } a + xw_1 > m \end{cases} \tag{1}$$

We model the ACA Medicaid expansions as an increase in m from m_0 to m_1 in states that expanded eligibility; the income cutoff remained at m_0 in states that did not expand.

The cost of s units of schooling is assumed to be linear for simplicity and equal to ts. There is no saving or borrowing so consumption in period 1 equals

$$c_1 = a + xw_1 - t(1 - x) - H(h, x, a, w_1),$$

while consumption in period 2 is given by $c_2 = w_2(s) = w_2(1 - x)$.

The utility maximization problem for the optimal work intensity and decision to purchase health insurance for a student in period 1 is

$$\max_{x,h} u_1(a + xw_1 - t(1 - x) - H(h, x, a, w_1), h) + u_2(w_2(1 - x))$$

subject to (1), where we make the usual assumptions of positive but decreasing marginal utility of consumption. We also impose that $\partial u_1(c, 0)/\partial h < \infty$, so that some students choose

to remain uninsured. We further assume that s is a normal good: when nonlabor income increases, optimal schooling goes up and work intensity goes down. Since the choice of h is binary, we can write the utility maximization problem as:

$$\max_x \{u_1(a + xw_1 - t(1-x) - H(1, x, a, w_1), 1) + u_2(w_2(1-x)),$$
$$u_1(a + xw_1 - t(1-x), 0) + u_2(w_2(1-x))\}$$

subject to (1).

2.1 Interior and Corner Solutions

There are two possible interior solutions to the optimization problem above: one where the student chooses not to purchase health insurance coverage and one where the student chooses to purchase it. The interior solution for work intensity x^*_{noHI} for a student who chooses not to purchase health insurance coverage ($h = 0$) is given by

$$\frac{\partial u_1(a + (x^*_{noHI})\, w_1 - t(1 - x^*_{noHI}), 0)/\partial c}{u_2'(w_2(1 - x^*_{noHI}))} = \frac{w_2'(1 - x^*_{noHI})}{w_1 + t}. \tag{2}$$

The interior solution for work intensity x^*_{HI} for a student who chooses to purchase health insurance solves

$$\frac{\partial u_1(a + (x^*_{HI})\, w_1 - t(1 - x^*_{HI}) - H(1, x^*_{HI}, a, w_1), 1)/\partial c}{u_2'(w_2(1 - x^*_{HI}))} = \frac{w_2'(1 - x^*_{HI})}{w_1 + t}. \tag{3}$$

When considering the tradeoff between first-period income and investments in human capital, the cost of health insurance coverage can introduce discontinuities in the budget constraint; in particular, there is a discontinuity at the point when employment status changes from full-time to part-time and employer-sponsored coverage is no longer available ($x = \overline{x}$) and at the point when a student works part-time but has low enough earnings to become eligible for Medicaid ($x = (m - a)/w_1$). Figure 1 shows the budget contraint with these two discontinuities.

Because of the discontinuities in the budget constraint, a corner solution is possible where the student obtains the highest amount of schooling they can while still qualifying for health

insurance through full-time employment: $x^*_{HI} = \overline{x}$. The condition for this corner solution is

$$\frac{\partial u_1(a + \overline{x}w_1 - t(1-\overline{x}), 1)/\partial c}{u_2'(w_2(1-\overline{x}))} < \frac{w_2'(1-\overline{x})}{w_1 + t}$$

$$u_1(a + \overline{x}w_1 - t(1-\overline{x}), 1) + u_2(w_2(1-\overline{x})) > u_1(a + \tilde{x}w_1 - t(1-\tilde{x}) - H, 1) + u_2(w_2(1-\tilde{x})) \quad (4)$$

where $\tilde{x}$ satisfies (3) for $H(1, \tilde{x}, a, w_1) = H$. The second inequality guarantees that utility at this corner solution is higher than utility without health insurance coverage.

Another possible corner solution is given by $x^* = \frac{m-a}{w_1}$: a student chooses enrollment intensity and labor supply such that labor earnings are just low enough to qualify for Medicaid. Because the implications under this scenario are similar to those from an interior solution in (3) when $H(1, x^*_{HI}, a, w_1) = 0$, we do not examine this corner solution further. We also do not consider the possible corner solution at $x^*_{HI} = 0$ (that is, the individual is a full-time student and does not work) because this case is not interesting when thinking about changes in schooling after the Medicaid expansions.

2.2 Changes in Optimal Employment, Schooling and Health Insurance Coverage after the Medicaid Expansion

By increasing the cutoff for Medicaid eligibility from m_0 to m_1, the expansion changes the budget constraint that many students face. Our focus is on cases where the ACA Medicaid expansions changes the optimal work intensity decision of students based on their Medicaid eligibility, which rules out students with very low wages and assets residing in states where Medicaid coverage was available to them prior to the expansion ($a + w_1\overline{x} < m_0$), students whose assets (or family wealth) are high enough to make them ineligible for Medicaid even when their labor earnings equal 0 ($a > m_1$), and students whose non-wage characteristics make them ineligible for Medicaid. There are two remaining cases in which the work decisions of students could be affected by the expansion, depending on the parameter values for their initial assets (a) relative to the Medicaid eligibility threshold (m):

- **Case I**: $m_0 - w_1\overline{x} < a < m_0$. These students have relatively low assets and reside in a state where some Medicaid coverage is available to them prior to the expansion as long as their labor earnings do not exceed $m_0 - a$. Prior to the Medicaid expansion, these

students can obtain health insurance coverage at a low or no cost if they either work full-time ($x \geq \overline{x}$) and get employer coverage, or choose work intensity below $\frac{m_0-a}{w_1}$ so their income and assets are below the initial Medicaid eligibility cutoff m_0. With the Medicaid expansion in place, it is theoretically possible for some of these students who received Medicaid before the expansion to increase their work intensity to $\frac{m_1-a}{w_1}$ and still retain their coverage. In our main empirical analysis, we exclude states with limited Medicaid coverage available to childless adults before the ACA expansion, which makes the situation unlikely to arise, and we do not analyze this case further.

- **Case II**: $\max\{m_0, m_1 - w_1\overline{x}\} < a < m_1$. In this scenario, even without any labor earnings, a student is not eligible for Medicaid coverage prior to the expansion and can only obtain health insurance coverage at no cost through an employer when $x \geq \overline{x}$. After the expansion, the student is eligible for Medicaid as long as work intensity is below $\frac{m_1-a}{w_1}$; that is, income is below the new Medicaid eligibility cutoff. For values of x between $\frac{m_1-a}{w_1}$ and $\overline{x}$, the student must pay H for health insurance coverage either through the private market or their educational institution.[3] We consider this case to be the most interesting and policy-relevant, as these are the students who gained new access to public health insurance through the Medicaid expansion.

We next analyze how optimal employment and schooling change after the Medicaid expansion for students in Case II, which is when $\max\{m_0, m_1 - w_1\overline{x}\} < a < m_1$. Several outcomes are possible depending on the functional form and parameters of the utility function; below we describe situations in which the optimal x or h or both change when the Medicaid eligibility cutoff increases from m_0 to m_1. Let x^*_{noHI} be the optimal work intensity without health insurance coverage that solves (2) and $\frac{m_1-a}{w_1} < x^*_{noHI} < \overline{x}$. Suppose that x^*_{post} is the optimal work intensity with heath insurance coverage after the Medicaid expansion that solves (3) when $m = m_1$ and $0 < x^*_{post} < \frac{m_1-a}{w_1}$. We start with the corner solution for optimal work intensity prior to the Medicaid expansion where the student works full time:

[3]There is also a case when $m_0 < a < m_1 - w_1\overline{x}$: the expansion is generous enough, to ensure that an individual is eligible for Medicaid for any work intensity above $\overline{x}$, which means that she receives low or no cost coverage regardless of how much she works. This case is unlikely to occur in practice because it requires the Medicaid program to be generous enough to provide coverage even at employment levels close to (but slightly below) full-time. Were this scenario to occur, the model predictions are similar to those for Case II.

Case II.a: Full-time work with employer-provided health insurance to part-time work with Medicaid

$$u_1(a+\overline{x}w_1-t(1-\overline{x}),1)+u_2(w_2(1-\overline{x})) > u_1(a+(x^*_{noHI})\,w_1-t(1-x^*_{noHI}),0)+u_2(w_2(1-x^*_{noHI})). \tag{5}$$

This case is representative of students who choose to work full-time ($x^*_{pre} = \overline{x}$, where x^*_{pre} satisfies (4)) prior to the Medicaid expansion and obtain health insurance coverage through their employer. The inequality in (5) guarantees that this option is preferred to working less and having no health insurance. After the expansion, these students reduce their work intensity to part-time (x^*_{post}) and obtain health insurance coverage through Medicaid. The optimal labor supply choices with health insurance coverage x^*_{pre} and x^*_{post} are illustrated in Panel (a) of Figure 1. For these students, we would observe a decrease in work intensity and change from employer-sponsored health insurance to Medicaid.

We next examine two cases with an interior solution for optimal schooling prior to the Medicaid expansion. It is still assumed that $\max\{m_0, m_1 - w_1\overline{x}\} < a < m_1$ and x^*_{noHI} and x^*_{post} are determined as above. Let x^*_{pre} be the optimal work intensity with health insurance before the Medicaid expansion that satisfies (3).

Case II.b: Part-time work with privately purchased health insurance to fewer hours with Medicaid

$$u_1(a + \left(x^*_{pre}\right) w_1 - t(1 - x^*_{pre}) - H, 1) + u_2(w_2(1 - x^*_{pre})) >$$
$$u_1(a + (x^*_{noHI})\, w_1 - t(1 - x^*_{noHI}), 0) + u_2(w_2(1 - x^*_{noHI})).$$

In this scenario, a student works part-time prior to the Medicaid expansion and purchases health insurance coverage, either directly through the private market or through their educational institution, at a cost of H; this option is preferred to having no health insurance coverage. After the expansion, the student obtains coverage through Medicaid. Because income increases by H and schooling is assumed to be a normal good, enrollment intensity

increases and work intensity decreases. Health insurance coverage changes from privately purchased health insurance to Medicaid. Panel (b) of Figure 1 illustrates the choice of x^*_{pre} and x^*_{post}.

Case II.c: Part-time work without health insurance to fewer hours with Medicaid

$$u_1(a + \left(x^*_{pre}\right) w_1 - t(1 - x^*_{pre}) - H, 1) + u_2(w_2(1 - x^*_{pre})) <$$
$$u_1(a + (x^*_{noHI}) w_1 - t(1 - x^*_{noHI}), 0) + u_2(w_2(1 - x^*_{noHI}))$$

$$u_1(a + \left(x^*_{post}\right) w_1 - t(1 - x^*_{post}), 1) + u_2(w_2(1 - x^*_{post})) >$$
$$u_1(a + (x^*_{noHI}) w_1 - t(1 - x^*_{noHI}), 0) + u_2(w_2(1 - x^*_{noHI})).$$

In this case, the student chooses to work part-time prior to the Medicaid expansion and to be uninsured.[4] After the expansion, the student obtains coverage through Medicaid. Labor supply decreases from x^*_{noHI} to x^*_{post}.

In summary, the model predicts that students who are affected by the Medicaid expansion transition from no health insurance to Medicaid or from private health insurance (either employer-sponsored or privately purchased) to Medicaid. Which of these scenarios occurs depends on the parameter values and utility function. Furthermore, for students affected by the Medicaid expansion, work intensity either decreases and is offset by higher schooling investment or remains unchanged; on average, we should see students working less. This should improve students' academic progress, with more students finishing their degree as a result of the Medicaid expansion. Given these theoretical predictions, the rest of the paper will focus on testing the following hypotheses empirically:

1. Medicaid enrollment rates will increase and private coverage rates will decrease among college students in expansion states compared to students in non-expansion states.
2. Employment intensity will decrease among college students in expansion states compared to students in non-expansion states.

[4]The discussion also applies to the case when x^*_{pre} is a corner solution at $\overline{x}$ but the utility of working less than $\overline{x}$ and being uninsured is greater that the utility of working full-time with health insurance.

3. Academic progress will increase among college students in expansion states compared to students in non-expansion states.

Because the theory is applicable to students who do not have access to a health plan through other sources such as family, we further investigate whether there are heterogeneous effects by dependency status, minority status, family income, and the type of institution a student is attending.

3 Data

The goal of our empirical work is to estimate the impact of the ACA Medicaid expansions on the health insurance coverage, employment patterns, and academic progress for college students as predicted by our theoretical framework. We use annual data from the American Community Survey (ACS) as provided in Ruggles, Flood, Goeken, Grover, Meyer, Pacas and Sobek (2019) to examine the impact of the ACA Medicaid expansions on students' source of health insurance coverage. The ACS is nationally representative and contains information on the state of residence, source of health insurance coverage, and educational enrollment of respondents. We use the ACS data to confirm that college students in ACA expansion states had higher rates of Medicaid takeup after the ACA expansions compared to those in non-expansion states and to examine whether the expansions caused college students to replace private health insurance plans with the more affordable Medicaid health insurance, as predicted in the theoretical model. We use ACS data starting in 2008, which is the year questions about health insurance coverage were added to the survey, through 2017 and limit our sample to respondents between the ages of 18 and 65 who reported attending college as an undergraduate student in the three months preceding their interview. This results in 134,912 student observations in ACA expansion states and 625,796 student observations in non-expansion states. Table 1 shows how we categorized states as expansion versus non-expansion and which states are included in the analyses.

Table 2 shows the descriptive statistics for the sample of undergraduate students in the ACS from 2008 to 2017. The means are calculated separately by the expansion status of the student's state of residency and whether the student is interviewed pre-expansion

(2008–2013) or post-expansion (2014–2017). The students in the ACS sample have similar characteristics before the expansion in both expansion states and non-expansion states; about 45 percent are independent, 21 percent are non-white, 42 to 44 percent have income below 138 percent of the federal poverty line, and 81 percent are at public universities. Students in expansion states are slightly more likely to have health insurance coverage than students in non-expansion states (81 compared to 78 percent), which includes slightly higher rates of Medicaid receipt, and employer-sponsored health insurance; however the rates of privately purchased health insurance are similar. Figure 2 show Medicaid coverage in expansion versus non expansion states by year and reveals that the expansion states increased their Medicaid coverage after the 2014 ACA expansion more than non-expansion states. However, table 2 shows that non-expansion states increased their privately purchased health insurance after the expansion year more than expansion states.

Our analysis of the impact of the ACA Medicaid expansion on employment and academic progress is based on the 2003–04, 2007–08, 2011–12, and 2015–16 waves of the National Postsecondary Student Aid Study (NPSAS), which is a cross-sectional, nationally representative survey of current postsecondary students administered by the National Center for Education Statistics (NCES). 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. Both undergraduate and graduate students are interviewed, but we limit our analysis to undergraduates. The NPSAS collects information on dependency status, enrollment intensity in each month during the given academic year, the type of degree, and the type of institution, which allows us to examine the impact of the ACA Medicaid expansion on different subsamples of students.

We limit our NPSAS analysis sample to undergraduate students between the ages of 18 and 55 who are not in the military. This results in 48,710 student observations in ACA expansion states and 122,570 student observations in non-expansion states.[5] Table 3 shows

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

descriptive statistics for the NPSAS sample, which is split by the expansion status of respondents' states of residency and on whether the student enters the sample pre-expansion (2004, 2008, and 2012 surveys) or post-expansion (2016 survey). The characteristics of college students tended to be similar in expansion and non-expansion states before the expansions occurred. Before 2014, slightly under half of students in the sample were independent and a similar share were pursuing a Bachelor's degree. About 40 percent of respondents attended less than four-year non-profit institutions (which we refer to as community colleges, but a small percentage attend vocational training, junior colleges or technical schools). Over two-thirds of respondents held a non-work study job in the given academic year and among those who had a job, they worked an average of 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. The NPSAS student survey asks respondents who work on of off campus if they see themselves as mainly an employee taking classes, as opposed to a student working to meet expenses. The descriptive statistics in Table 3 suggest that 22 percent of undergraduate students work and consider themselves mainly an employee who is also enrolled in school.

4 Empirical Methodology

In order to estimate the causal relationship between access to Medicaid and health insurance coverage, employment patterns and academic progress, it is necessary to use a source of variation in the provision of public health insurance that is not otherwise correlated with the outcomes of interest. To these ends, we use the ACA Medicaid expansions, in which Medicaid eligibility was extended to childless adults with family income below 138 percent of the federal poverty line in a subset of states.[6] 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. Some of these states had no prior coverage for childless adults prior to the expansion, while some had limited coverage available that was less comprehensive than after the ACA expansion.

[6]The official eligibility limit is 133 percent of the federal poverty line, but Medicaid allows for 5 percent of income to be disregarded.

We exclude four states and the District of Columbia from all of our analyses because they had comparable coverage available for childless adults prior to the ACA expansions. We also exclude states that had limited Medicaid coverage available for childless adults prior to the ACA and expanded to full coverage in January 2014 or later, but conduct robustness checks to examine how the results change when states that experienced a partial expansion are included (see technical appendix for those results). For the ACS analyses, we exclude students in states that expanded during or after January 1, 2014 to avoid having variation in treatment timing in the post-ACA calendar years (Goodman-Bacon 2018). For the NPSAS analyses, we exclude states that expanded during or after the 2015-16 academic year because they expanded during the only post-ACA round of NPSAS data collection. The four states that expanded in 2019 or 2020 are considered non-expansion states for the purposes of this study because their expansion occurred after the NPSAS and ACS data collection occurred. Table 1 shows which states are included as treatment and comparison states in our analyses.

We use a difference-in-differences methodology to compare the change in each outcome of interest before and after the Medicaid expansion for college students who live in the states that expanded Medicaid to the change in those same outcomes for otherwise similar students who live in states that did not expand Medicaid. This strategy allows us to use college students in non-expansion states as a control group for college students in expansion states, which are considered having received the "treatment" of gaining access to affordable health insurance through Medicaid. We also control for characteristics of the college students in the sample, such as age, gender, and race. Specifically, we estimate the following regression model for student i residing in state s and surveyed in year t:

$$y_{ist} = \beta_0 + \sum_{\tau} \beta_\tau (Med_{is} * Year_\tau) + \alpha Med_{is} + \delta_s + \delta_t + X_{ist}\gamma + \varepsilon_{ist} \tag{6}$$

where y_{ist} is the outcome of interest. Med_{is} is an indicator for the student living in an expansion state; δ_s and δ_t are, respectively, state and year fixed effects. The vector X_{ist} contains student-level characteristics correlated with y_{ist}, some of which may systematically differ between individuals in expansion and non-expansion states.

A crucial assumption to our analysis of postsecondary outcomes is that the ACA Medicaid

expansions increased the share of college students who are insured through Medicaid. A necessary first step of our analysis is to confirm this relationship by looking at the source of health insurance coverage as an outcome. Using the ACS data, we estimate the model in equation (6) on the sample of undergraduate students where the outcome variables are whether the source of health insurance is Medicaid, employer-sponsored coverage, private direct coverage, or any coverage. For these analyses, the variable τ takes the values of 2009 to 2017, with 2013 being the omitted category, and the variables in X_{ist} include a quadratic in age; dependency status derived from available demographic information; indicator for private institution; indicators for race and ethnicity, marital status and gender; the number of children in the household and the age of the youngest child; and the state-level unemployment rate at time t, which controls for macroeconomic conditions. We allow for the errors to be correlated for students residing in the same state by estimating robust standard errors that are clustered at the state-level in the ACS analyses.

The analysis using the ACS data allows us to examine whether there is a crowding-out effect where expensive private health insurance plans are replaced by the more affordable Medicaid health insurance by comparing the change in Medicaid coverage versus other insurance types in expansion states relative to the change in non-expansion states. We also test for crowd-out by examining whether there was an increase in overall health insurance coverage by using an indicator for any source of health insurance as an outcome. In addition to analyzing these relationships for all undergraduate students, we conduct subgroup analyses for students at public institutions, as well as for independent, minority, and low-income students, defined as those whose family income is below 138% of the federal poverty line.

Because the NPSAS data contain only 1 wave covering the post-expansion period, we estimate two versions of the model when using these data. First, we interact the Medicaid indicator with an indicator for the 2016 survey rather than each individual year. In this specification, β_{2016} in equation (6) provides a simple estimate of the change in y_{ist} for students in expansion states after the Medicaid expansion compared to the change for similar students in non-expansion states, relative to the average for the prior surveys. In the second version of the model, we include individual year dummies for the pre-expansion years to examine any differences in pre-period trends for expansion versus non-expansion states.

The student characteristics we control for in the analyses using NPSAS data include a quadratic in age; gender, race/ethnicity, marital status, information about the presence and ages of children in the household; an indicator for disability; mother's education as a correlate of ability; indicators for dependency status and whether one's spouse is also attending college. We also account for institutional type (four-year, community college and for-profit or not-for-profit), type of degree, year of attendance, and the state-level unemployment rate in the survey year.

There are several groups of employment and academic progress outcomes that we analyze in the NPSAS data. Obtaining employer-sponsored health insurance typically requires an individual to maintain full-time employment status; our hypothesis is that students (especially those who are at community colleges, independent, minorities or from low-income families) replaced their employer-sponsored insurance with Medicaid after the expansion and also reduced their working hours because they no longer had to maintain their full-time employment. To track changes in employment status that may have resulted from the Medicaid expansions, we first use an indicator for whether respondents hold any non-work-study job and the number of hours per week worked in these jobs. Further, we use the responses to the question about whether individuals who work view their main role as an employee taking courses on the side as opposed to mainly as a student working to finance their education or does not work. We also hypothesize that reducing working hours allowed these same students to improve their academic progress. To measure academic progress, we use an indicator for whether the student graduated or plans to graduate in the current academic year. For students at four-year institutions, we examine whether the student transferred from a community college in order to infer whether community college students are more likely to move to a four-year institution when they have access to Medicaid coverage.

The large number of students included in the NPSAS data allows us to estimate equation (6) on the full sample, as well as to conduct subgroup analyses focusing on several groups of interest. Specifically, we estimate the model separately based on institution type, depending on whether it is a four-year or community college. We pay particular attention to students at community colleges because they are more likely to be employed full-time and also at higher risk of dropping out (Berkner and Choy 2008, Radford et al. 2010). We also focus

on students who have ever attended a community college, including students currently enrolled in such institutions and those who have attended one in the past. We are interested in examining whether the Medicaid expansions not only steered students from community colleges to four-year institutions by relaxing job lock, but also allowed students to progress more effectively toward completing their degrees. Further, we show results separately for independent students, those who are racial or ethnic minorities (defined as being black, Hispanic, Native American or an other non-Asian minority), and those whose family income is below 138% of the federal poverty line. We hypothesize that these students have been most affected by the Medicaid expansion and are most likely to respond in terms of their employment patterns and academic progress.

The model in (6) allows us to obtain an unbiased estimate of the effect of the Medicaid expansion on the outcomes of interest as long as $Cov(\epsilon_{ist}, Med_{is}) = 0$, meaning that a state's decision to expand Medicaid is uncorrelated with the employment decisions and academic progress for college students in that state conditional on the explanatory variables included in the model. In support of these conditions being satisfied, Gruber and Sommers (2020) find no evidence that increased Medicaid spending from the expansions produced any reductions in state spending on education. Because outcomes are likely to be correlated within each institution, we report standard errors clustered at the school level in the NPSAS analyses.

5 Results

Panels (a) though (d) of Figure 3 show the estimated coefficients by year for the difference in health insurance coverage between undergraduate students in expansion and non-expansion states from equation (6), along with 95% confidence intervals.[7] The outcome variables in these models are indicators for being covered by Medicaid (panel a), employer-provided health insurance coverage (panel b), private direct health insurance (panel c), and any health insurance coverage (panel d). The results in panel (a) show that Medicaid coverage was 4 to 8 percentage points higher each year in expansion states compared to non-expansion states after 2013. This reveals that undergraduate students in expansion states did indeed increase

[7]The point estimates and standard errors can be found in the Technical Appendix Table 1.

their Medicaid coverage after the ACA expansions in January 2014. Panels (b) and (c) provide suggestive evidence that Medicaid crowded out employer-provided and private direct insurance; we find that the prevalence of these two types of plans was lower in expansion states compared to non-expansion states after the ACA Medicaid expansions. The pre-expansion trends reveal a decrease in employer coverage in expansion states compared to non-expansion states from 2008 to 2010, but the gap was closing from 2010 to 2013 before the ACA expansions caused the gap to grow again. Overall, health insurance coverage was slightly higher in expansion states than non-expansion states after the ACA Medicaid expansions, although these differences are not statistically significant and not as large as the differences in Medicaid coverage, suggesting that there was some crowd-out of private coverage. These findings persist (and are cleaner given the pre-expansion parallel trends in employer coverage) when states that partially expanded Medicaid are included in the analysis; see Technical Appendix Figure 1 and Table 2.

We conducted subgroup analyses for students in public institutions and students who are independent (identified in the ACS data as individuals who are married, age 24 or older, or have children), a racial or ethnic minority, and from low income families; the subgroup results can be found in the Technical Appendix Tables 3 through 6. The results suggests that there was a large increase in Medicaid coverage in expansion states compared to non-expansion states after the ACA expansion in 2014 for all of these subgroups. There was a smaller decrease in employer-sponsored coverage but a larger decrease in private direct coverage in expansion states compared to non-expansion states for most of these subgroups. Independent students saw the largest overall increase in health insurance coverage from any source.

Because the ACS data do not contain much information about the undergraduate experience of postsecondary students, we next turn to the NPSAS data in order to examine in more detail the changes in employment patterns and academic progress for different groups of students after the expansions. Table 4 shows the coefficients on the interaction between the Medicaid expansion indicator for each student's state of residence and an indicator for the post-expansion survey in 2016. Each cell is from a separate regression model, where we vary the sample going across the columns of the table and the outcome going down the rows.

The results in the first column are for the full NPSAS sample. We then restrict the sample based on the type of institution one is attending: those attending community colleges are in column 2, nonprofit four-year institutions are in column 3 and those who have ever attended a community college are in column 4. The last three columns show results for respondents who are independent (column 5), non-white or Hispanic (column 6) and whose family income falls below 138% of the federal poverty line (column 7).[8]

The results in Table 4 suggest that among the at-risk groups of students we examined, the decrease in employment intensity in response to the ACA Medicaid expansions was particularly strong impact for community college students. Students at community colleges were 2.7 percentage points less likely to see themselves as an employee taking courses, were 3.5 percentage points less likely to have a non-work study job, and worked an average of 1.2 fewer hours per week.

We also see that gaining access to Medicaid caused an increase in the probability of graduating in the given academic year and and increase in the likelihood of community college students transferring to and graduating from four-year institutions. A larger percentage of students at four-year institutions reported having ever attended a community college; that is, that more students transferred from community colleges to four-year institutions as a result of the Medicaid expansion. Students who came from or are currently attending a community college were more likely to graduate in the current school year if they live in a state that expanded Medicaid. These results and the decrease in employment intensity for community college students in expansion states persist if we include states that partially expanded Medicaid as well (see Technical Appendix Table 7).

In order to examine whether the parallel trends assumption is satisfied for our difference-in-differences model, we estimate equation (6) using the full set of pre-period year dummies. We focus on the results for community college students because they were the at-risk population that had the largest response to the ACA Medicaid expansions. Figure 4 shows that there were no statistically significant differences between community college students in expansion and non-expansion states from 2004 to 2012 in terms of the employment outcomes we examined. However, in 2016, there was a noticeable drop in the employment intensity

[8]Family income includes parental income for dependent students, but not for independent students.

of community college students in expansion states relative to non expansion states. They were less likely to consider themselves employees taking classes, less likely to have a non-work study job, and worked fewer hours per week. These results are borderline statistically significant but consistent across outcomes.

In terms of academic progress, we see that among all undergraduates at four-year institutions (figure 5, panel a) and among all who have attended or currently attend a community college (figure 5, b), there were no differences in graduation rates between expansion and non-expansion states before the ACA Medicaid expansion, but in 2016, students in expansion states were more likely to graduate than those in non-expansion states. Similarly, figure 6 shows that there were no differences between transfer rates in expansion and non-expansion states from 2004 to 2012, but the number of transfers from two- to four-year institutions increased in expansion states in 2016 compared to non-expansion states. These findings show that the parallel trends assumption is satisfied when estimating our differences-in-difference model of employment and academic progress for the sample of students in community colleges in full expansion states. If we include partial expansion states in the analysis, the parallel trends is violated for some outcomes (see Technical Appendix Figures 2, 3, and 4); this is an additional justification for why we exclude partial expansion states from our main specification of interest.

6 Conclusions

We know little about the relationship between expanding Medicaid eligibility and the academic experiences of postsecondary students. There are a few papers that examine the impact of gaining access to affordable health insurance on college students, but they focus on the extensive margin (enrollment) and use data that are not specifically tailored to the analysis of higher education financing and performance (Jung and Shrestha 2016, Heim et al. 2017, Chakrabarti and Pinkovskiy 2018). It is important to analyze the impacts for college students of gaining access to affordable health insurance beyond the decision to enroll in an institution of higher education because most of the the college wage premium comes from earning a degree rather than from completing some postsecondary education (Ma et

al. 2016).

Our paper is the first to explore whether college students benefit from becoming eligible for Medicaid by allowing them to shift their focus from work to school and improving their academic progress. We use the ACA Medicaid expansions to examine quasi-random variation in access to affordable health insurance for college students. Using data from the ACS and NPSAS, we provide evidence that the ACA Medicaid expansions caused undergraduate students to substitute private coverage for more affordable Medicaid coverage and shift their focus from work to education. These findings were particularly strong for community college students. Specifically, we found that gaining access to Medicaid made community college students less likely to consider their main role to be an employee taking classes, less likely to have a non-work study job, and worked fewer hours per week. We also found that the Medicaid expansions increased the probability of transferring from community college to four-year college and the likelihood of graduating. These findings are noteworthy because research has shown that the returns to earning a postsecondary degree far exceed the return to some college, and four-year degrees have higher returns than the returns to an Associate's degree for students who start at a community college (Light and Strayer 2004, Liu et al. 2015).

There are some limitations to our study. Because only one round of the NPSAS occurred after the 2014 ACA Medicaid expansion, we are not able to compare short- and long-term impacts on academic progress, and instead can only measure impacts two years after the expansion occurred. The NPSAS also does not contain information on the health insurance status of college students. However, our differences-in-differences methodology does not require this information and instead estimates intent-to-treat effects of expanding Medicaid eligibility, which are also important from a policy perspective. Future research can extend this analysis further by directly linking the education-related outcomes of interest to the source of health insurance of the college students. We are also unable to explore the role of health status as a mediating factor because the information is not available in the NPSAS. Nonetheless, our findings should be of interest to policymakers, 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.

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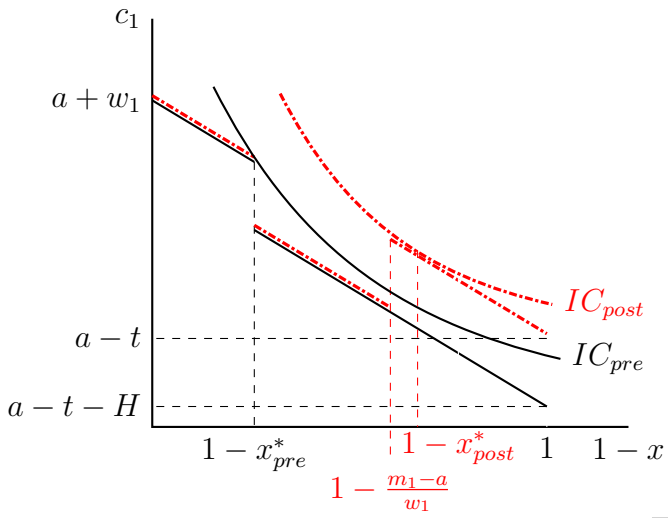
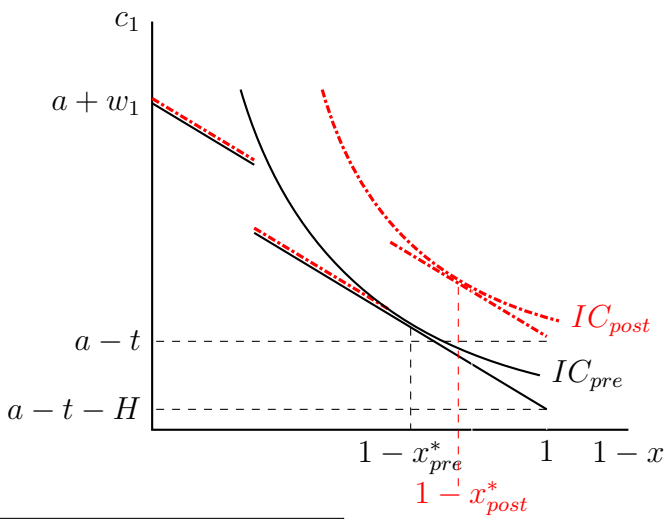
Figure 1: Predicted Changes in Optimal Work Intensity After the ACA Medicaid Expansions

(a) Full-time work with employer-provided health insurance to part-time work with Medicaid



(b) Part-time work with privately purchased health insurance to fewer hours with Medicaid



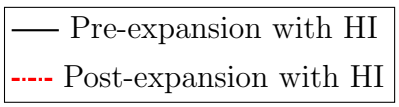
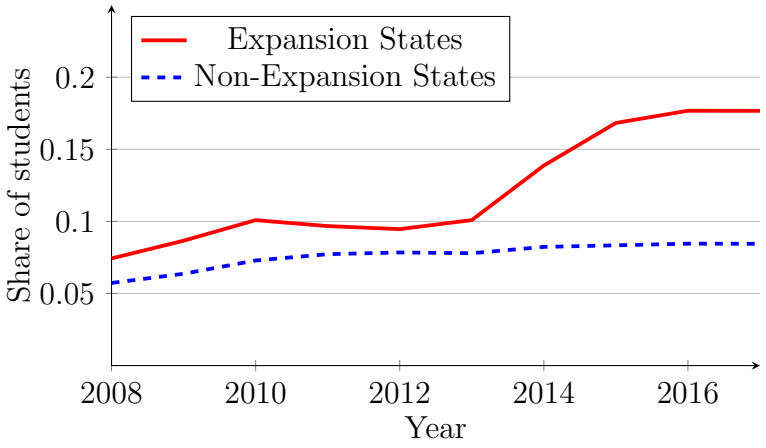
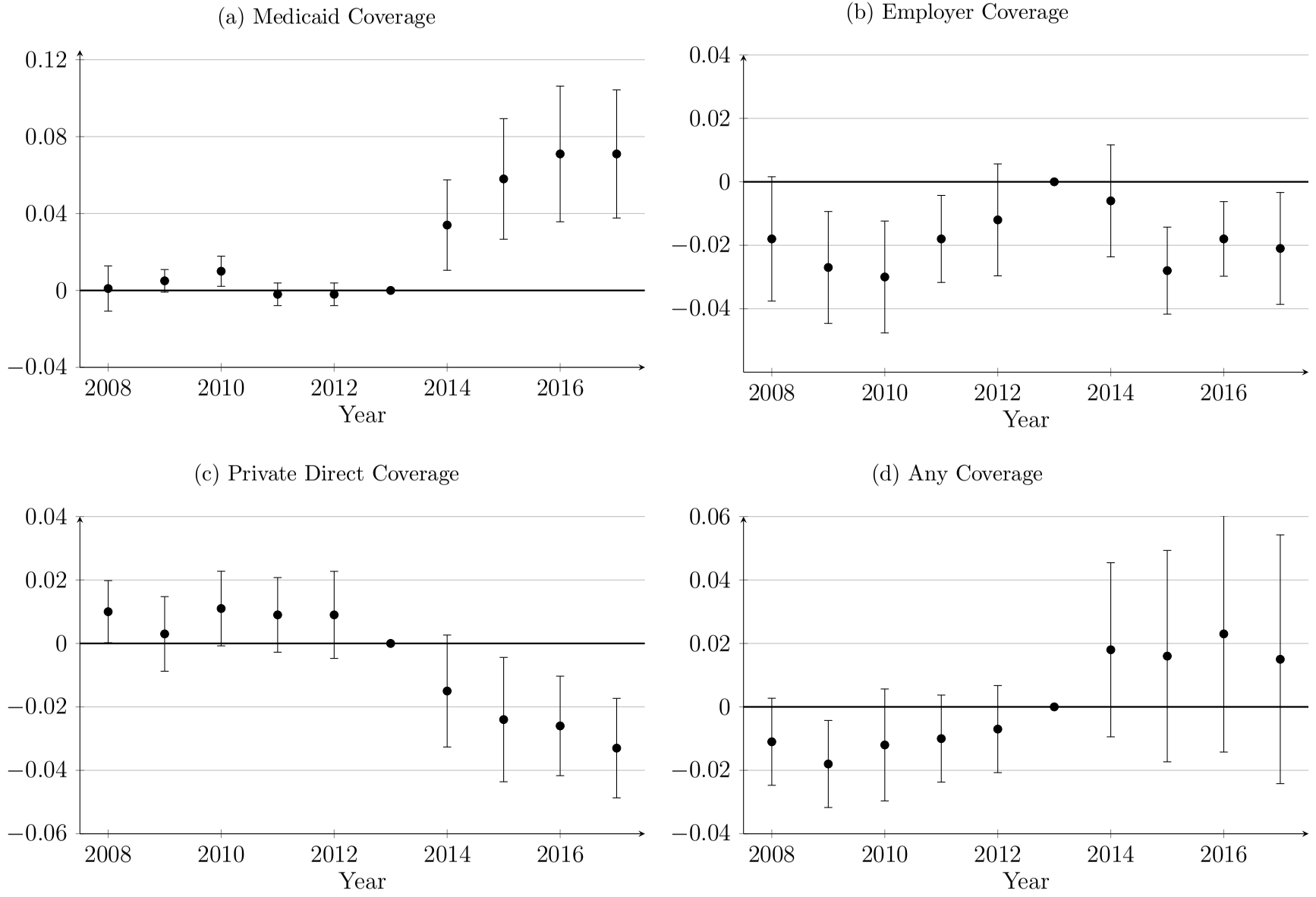


Figure 2: Percent of college students enrolled in Medicaid in ACA expansion versus non-expansion states, 2008–2017



Notes: See table 1 for a list of expansion versus non-expansion states.
Source: Ruggles et al. (2019): American Community Survey, 2008–2017.

Figure 3: Effect of the ACA Medicaid Expansions on Health Insurance Coverage for College Students

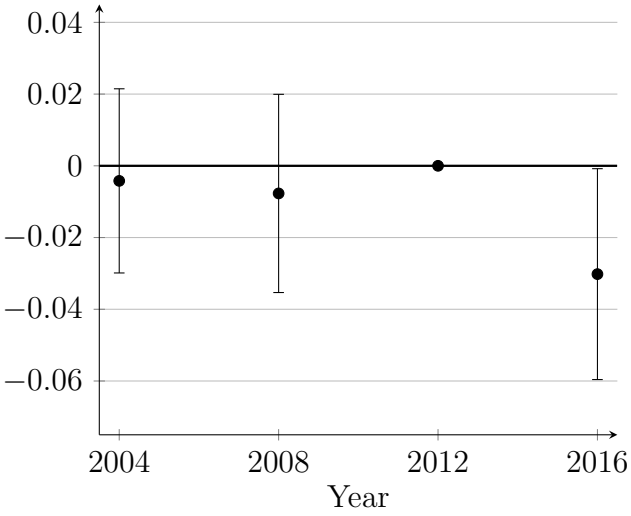


Notes: The sample consists of individuals enrolled as undergraduate students. The graph shows coefficient estimates and 95% confidence intervals from linear probability models for the interactions between year indicators and expansion state indicator. N = 760,708. The standard errors are clustered by state. The regression model also includes state fixed effects; a quadratic in age; dependency status derived from available demographic information; indicator for private institution; indicators for race and Hispanic ethnicity, marital status and gender; the number of children in the household and the age of the youngest child; and the state-level unemployment rate at time t. See table 1 for a list of expansion versus non-expansion states.

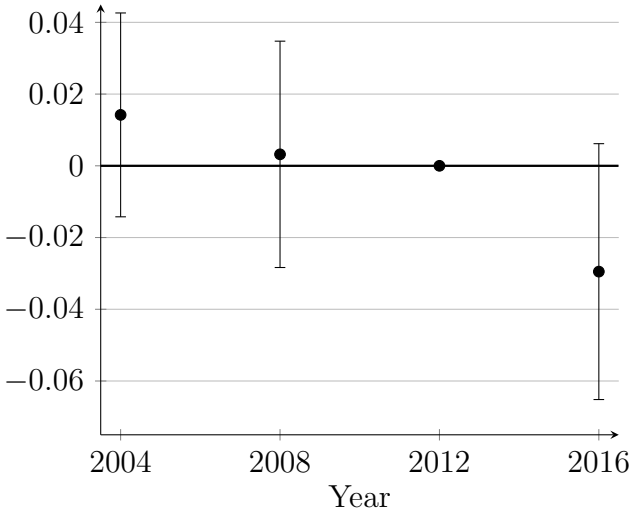
Source: Ruggles et al. (2019): American Community Survey, 2008–2017.

Figure 4: Effect of the ACA Medicaid Expansions on Employment for Students at Community Colleges - States that Expanded Fully

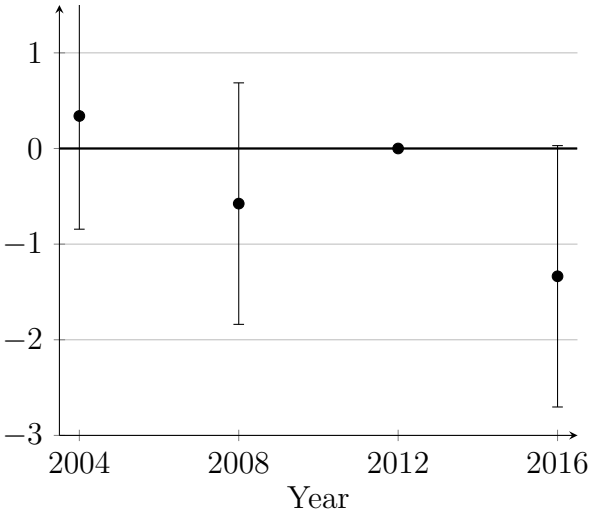
(a) Main Role: Employee Taking Classes



(b) Has a Job (Excluding Work-Study)

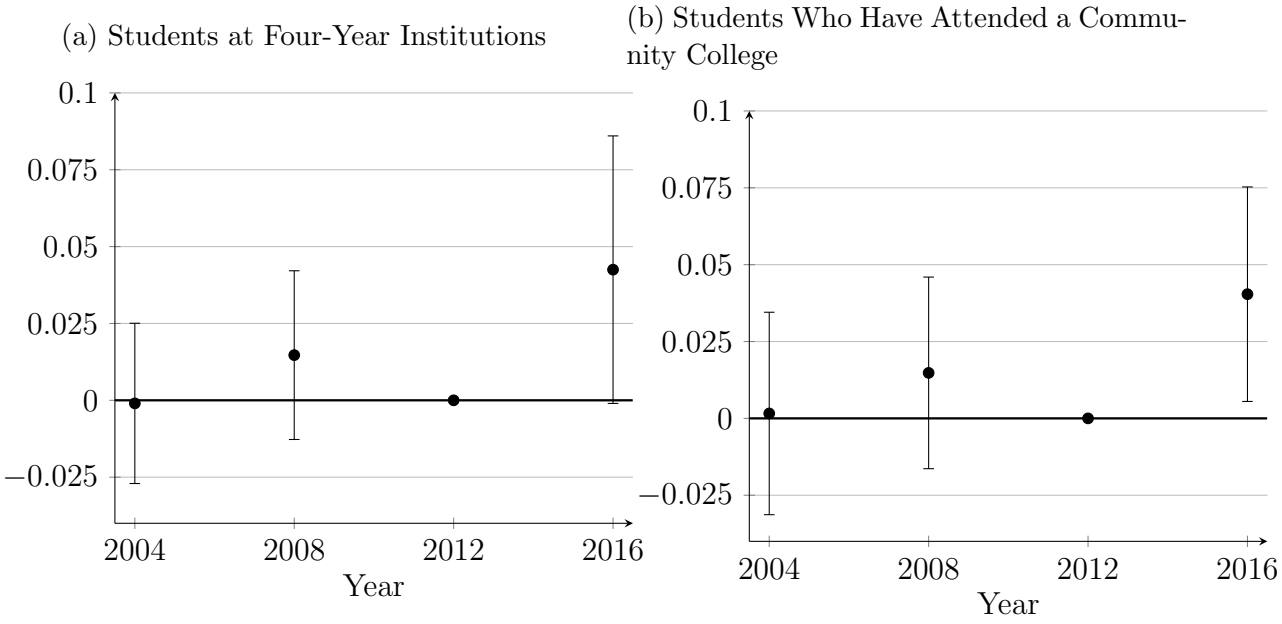


(c) Hours Worked Per Week (Excluding Work-Study)



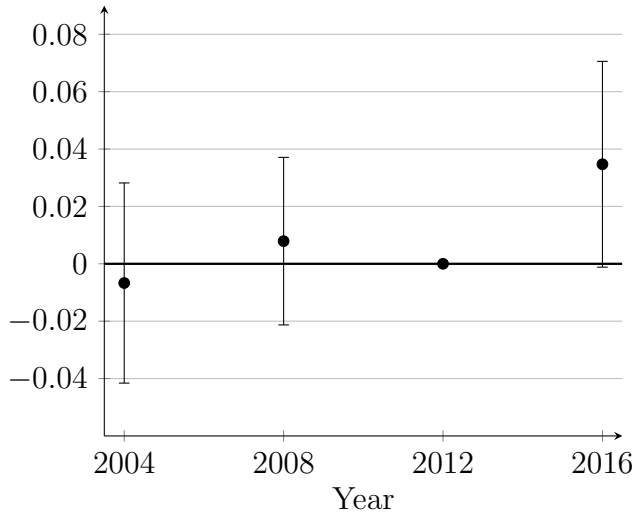
Notes: The sample is restricted to students enrolled at public and private not-for-profit less-than-four-year institutions (N= 50,470). The graph shows coefficient estimates and 95% confidence intervals from linear probability models for the interactions between year indicators and indicator for whether the student's state of residence is an expansion state. States that had a public health insurance program prior to 2014 are excluded from the sample. The errors are clustered at the institution level. The regression models include the controls from Table 4. See table 1 for a list of exansion versus non-expansion states.
Source: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.

Figure 5: Effect of the ACA Medicaid Expansions on Graduation Rates



Notes: The dependent variable is an indicator for whether the student graduated or plans to graduate in the current academic year. The graph shows coefficient estimates and 95% confidence intervals from linear probability models for the interactions between year indicators and indicator for whether the student's state of residence is an expansion state. States that had a public health insurance program prior to 2014 are excluded from the sample. The errors are clustered at the institution level. The regression models include the controls from Table 4. See table 1 for a list of expansion versus non-expansion states.
Source: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.

Figure 6: Effect of the ACA Medicaid Expansions on Transfers from Community College to Four-Year Institutions.



Notes: The dependent variable is an indicator for whether the student has ever attended a community college. The graph shows coefficient estimates and 95% confidence intervals from linear probability models for the interactions between year indicators and indicator for whether the student's state of residence is an expansion state. States that had a public health insurance program prior to 2014 are excluded from the sample. The sample is restricted to students currently enrolled at 4-year institutions (N = 93,920). The errors are clustered at the institution level. The regression models include the controls from Table 4. See table 1 for a list of exansion versus non-expansion states.
Source: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.

Table 1: Medicaid Expansion States

	Treatment 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[2] **August 2014**: New Hampshire[2] **January 2015**: Pennsylvania[2] **September 2015**: Alaska[1] **January 2016**: Montana[1] **July 2016**: Louisiana[1]		Alabama, Florida, Georgia, Idaho[4], Kansas, Mississippi, Missouri, Nebraska, North Carolina, Oklahoma, South Carolina, South Dakota, Texas, Utah[4], Virginia[4], Wyoming
Limited	**January 2014**: Arizona[3], California[3], Colorado[3], Connecticut[3], Hawaii[3], Illinois[3], Iowa[3], Maryland[3], Minnesota[3], New Jersey[3], Oregon[3], Rhode Island[3], Washington[3] **February 2015** Indiana[3]		Maine[4], Tennessee, Wisconsin
Comparable to the ACA Medicaid expansion		DC[1], Delaware[1], Massachusetts[1], New York[1], Vermont[1]	

[1] States excluded from all analyses

2 States excluded from the ACS analysis only.

3 States excluded from main analyses but included in robustness checks

4 States expanded Medicaid after the NPSAS and ACS data collection (Maine and Virginia in 2019 and Utah and Idaho in 2020).

Table 2: Descriptive statistics for the ACS sample

	Expansion states		Non-expansion states	
	2008–2013	2014–2017	2008–2013	2014–2017
Demographics				
Independent student	0.454	0.409	0.451	0.421
Single parent	0.096	0.078	0.085	0.069
Female	0.566	0.552	0.564	0.549
Age	25.963	25.394	25.792	25.465
	(9.254)	(9.163)	(9.131)	(9.029)
Has disability	0.999	0.998	0.999	0.999
Married	0.192	0.165	0.195	0.176
Asian	0.028	0.037	0.037	0.044
Black	0.129	0.124	0.205	0.199
Other race (non-white)	0.058	0.075	0.061	0.069
Hispanic	0.083	0.107	0.141	0.170
Less than 138% FPL	0.441	0.445	0.415	0.407
Academic characteristics				
Undergrad at private university	0.189	0.187	0.194	0.184
Undergrad at public university	0.811	0.813	0.806	0.816
Health insurance coverage				
Has HI coverage	0.811	0.916	0.781	0.853
Covered by Medicaid	0.093	0.165	0.072	0.084
Covered by employer-sponsored HI	0.603	0.632	0.57	0.595
Covered by private HI	0.133	0.131	0.137	0.167
Covered by Medicare	0.010	0.011	0.009	0.010
Covered by VA HI	0.017	0.018	0.017	0.021
Covered by Tricare	0.033	0.033	0.051	0.054
N	81,816	53,096	371,919	253,877

Notes: The sample is restricted to individuals enrolled as undergraduate students. The means are calculated using survey weights.
Source: Ruggles et al. (2019): American Community Survey, 2008 to 2017.

Table 3: Descriptive statistics for the NPSAS sample

	Expansion states		Non-expansion states	
	2004–2012	2016	2004–2012	2016
Demographics				
Independent student	0.468	0.444	0.488	0.472
Single parent	0.148	0.131	0.155	0.147
Number of dependents	0.535	0.470	0.568	0.499
	(1.058)	(1.036)	(1.080)	(1.021)
Youngest dependent age 0–5	0.341	0.116	0.36	0.126
Youngest dependent age 6–12	0.070	0.062	0.075	0.067
Female	0.589	0.593	0.598	0.597
Age	25.521	24.976	25.537	25.132
	(8.503)	(7.945)	(8.353)	(8.028)
Has disability	0.112	0.190	0.109	0.197
Married	0.168	0.133	0.186	0.148
Spouse in college	0.042	0.022	0.05	0.026
Asian	0.028	0.035	0.034	0.044
Black	0.150	0.161	0.208	0.235
Other race (non-white)	0.054	0.061	0.065	0.06
Hispanic	0.060	0.091	0.119	0.17
Less than 138% FPL	0.301	0.372	0.325	0.410
Mom has college degree	0.256	0.367	0.261	0.357
State unemployment rate	0.068	0.051	0.061	0.047
	(0.014)	(0.007)	(0.015)	(0.006)
Academic characteristics				
1st year undergraduate	0.409	0.348	0.403	0.364
2nd year undergraduate	0.264	0.297	0.268	0.299
3rd year undergraduate	0.131	0.125	0.132	0.129
Pursuing Bachelor's degree	0.488	0.536	0.474	0.481
Pursuing Associate's degree	0.393	0.366	0.403	0.41
In a certificate or other program	0.119	0.098	0.123	0.109
4-year institution, not-for-profit	0.482	0.573	0.482	0.548
Community colleges	0.396	0.328	0.41	0.357
For-profit institution	0.121	0.099	0.108	0.095
Public institution	0.731	0.715	0.782	0.777
Employment outcomes and progress towards degree completion				
Main role: employee	0.227	0.149	0.23	0.167
Had job in current AY (excl. work-study)	0.709	0.634	0.715	0.639
Hours worked/week (excl. work-study)	20.422	17.687	20.99	18.612
	(17.194)	(16.978)	(17.244)	(17.354)
Hours conditional on > 0	28.815	28.128	29.368	29.137
	(13.286)	(12.988)	(13.038)	(12.837)
Graduating in current AY	0.180	0.223	0.201	0.216
Ever attended community college	0.606	0.545	0.648	0.595
N	36,940	11,770	94,410	28,160

Notes: Standard errors for continuous variables are shown in parentheses. The statistics are calculated using NPSAS estimation weights. The sample sizes are rounded to the nearest 10.
Source: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.

Table 4: Effect of the ACA Medicaid Expansions on Employment and Progress Towards Degree Completion

Sample:	All	Community college	4-year nonprofit	Ever comm. college	Independent	Nonwhite/ Hispanic	$\leq$ 138% FPL
Outcome	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Main role: employee	-0.0052	-0.0266	-0.0045	-0.0110	-0.0052	-0.0006	-0.0072
	(0.0060)	(0.0126)	(0.0061)	(0.0087)	(0.0108)	(0.0111)	(0.0089)
Any job	0.0000	-0.0346	0.0050	-0.0022	0.0163	-0.0041	0.0201
(excl. work-study)	(0.0079)	(0.0146)	(0.0097)	(0.0093)	(0.0103)	(0.0127)	(0.0116)
Hours per week	0.0266	-1.2493	0.1556	-0.1624	0.5540	-0.1645	0.6436
(excl. work-study)	(0.3081)	(0.5710)	(0.3508)	(0.3869)	(0.4641)	(0.5021)	(0.4378)
Graduate this year	0.0288	0.0327	0.0357*	0.0341	-0.0040	0.0146	0.0176
	(0.0147)	(0.0259)	(0.0205)	(0.0147)	(0.0185)	(0.0168)	(0.0165)
Ever comm. college	0.0173		0.0325**		0.0281	0.0307	0.0149
	(0.0117)		(0.0151)		(0.0159)	(0.0158)	(0.0153)
N	171,280	50,470	81,670	93,920	80,520	59,960	65,650

Notes: The table shows coefficient estimates for the (*Expansion state*) x (*2016 survey*) interaction, where each cell represents a separate regression. The sample sizes are rounded to the nearest 10. The errors are clustered at the institution level. The regression models include year fixed effects; institution state fixed effects; an indicator for state of residence being an expansion state; state-year unemployment rate; a quadratic in age; gender, race, marital status, information about the presence and ages of children in the household; an indicator for disability; mother's education as a correlate of ability; indicators for dependency status and whether one's spouse is also attending college; institutional type (four-year, community college and for-profit or not-for-profit); indicators for degree type (Bachelor's and Associate's); and year of attendance.
Source: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study (NPSAS) 2004, 2008, 2012, and 2016 waves.