The Effect of Academic Calendars on Internship Participation and Employment: Evidence from LinkedIn Profiles*

Xinyao Qiu†

March 17, 2025

Abstract

Internships have become increasingly important for college students, yet much remains unknown about how higher education institutions can be structured to support internship participation. In this study, I estimate the impact of academic calendar systems on students' internship participation, using educational and employment histories from public LinkedIn profiles. Leveraging quasi-experimental variations in the timing of transitions from quarter to semester systems across institutions in Ohio, I find that semester systems increase students' internship participation by 16%. These additional internship experiences enhance students' labor market outcomes, increasing the likelihood that they secure non-entry-level positions with higher starting salaries after college.

JEL classification: I23, I28, J31

Keywords: Internship, Academic Calendar, Higher Education, Labor Market

*The LinkedIn data is accessed through Revelio Labs under a data license from Stanford Graduate School of Business Library.

†Stanford University. Email: xyqiu@stanford.edu.

1 Introduction

Internships have become increasingly important for college students. According to the National Association of Colleges and Employers (NACE), in 2024, more than two-thirds of graduating seniors reported engaging in an internship experience during their college careers. These internship experiences are valued by future employers. Descriptive evidence shows that students with paid internships tend to receive more job offers and enjoy higher average starting salaries than their peers (NACE, 2024). Causal analyses, including randomized audit studies and studies leveraging quasi-experimental policy changes, demonstrate that internships increase graduates' likelihood of receiving job interviews (Nunley et al., 2016; Baert et al., 2021) and boost earnings (Bolli et al., 2021; Margaryan et al., 2022). In addition, internship experiences can facilitate the transition from university to the workforce and help students find jobs that match their talents (Virkola, 2021; Di Meglio et al., 2022).

Given the benefits of internships, it is important for higher education institutions to be structured in a way that accommodates and encourages student participation in these opportunities. The design of academic calendars—specifically, semester systems versus quarter systems—is believed to impact students' ability to engage in summer internships and has drawn the attention of institutions, students, and policymakers. For example, UCLA, one of the University of California system schools that uses a quarter system, has repeatedly debated whether to switch to a semester system.[1] In fact, since 1987, over 100 colleges and universities in the United States have transitioned from quarter systems to semester systems (Bostwick et al., 2022). One of the most common reasons cited for this change is to enhance students' opportunities to secure summer internships. The semester system is considered more advantageous in this regard because it concludes earlier in the spring than the quarter system and is more widely adopted. As a result, firms tend to design their summer internship programs around the more common semester calendar, creating scheduling conflicts for students on the less common quarter system. However, transitioning to semester systems can be costly, both academically—negatively impacting four-year graduation rates (Bostwick et al., 2022)—and financially.[2] Given the large costs and the ongoing debates at institutions still using quarter systems, it is crucial to assess whether converting to semester systems truly increases internship participation and to examine its impact on students' post-graduation outcomes.

In this study, I examine the impact of converting to semester systems on students' internship

[1] `https://new.dailybruin.com/post/throwback-thursday-quarter-or-semester-system-the-debate-ucla-has-been-having-for-decades`.

[2] For example, the estimated cost of converting California State University's East Bay campus to a semester system was $12.1 million. `https://www.csueastbay.edu/semester/faculty/questions-and-answers-for-faculty.html`.

participation during college and their labor market outcomes after graduation. The analysis leverages quasi-experimental changes in academic calendars among colleges and universities in Ohio. I use students' public LinkedIn profiles to gather their self-reported internship experiences and post-college employment histories. Using a difference-in-differences model with staggered adoption, I find that the transition to semester systems increases students' participation in summer internships during college. On average, students graduating under semester systems report 0.054 more internships (a 16% increase relative to the sample mean), are more likely to land a non-entry-level job after college, and have higher starting salaries.

This study is one of the first to evaluate the causal relationship between academic calendars and students' internship experiences, with the notable exception of Bostwick et al. (2022). Also focusing on Ohio, Bostwick et al. (2022) uses whether students earned positive income during the summer from non-food-service and non-retail industries as a proxy for summer internships, finding limited evidence of positive effects. In contrast, this study extracts internship experiences from LinkedIn profiles. As a professional networking platform, LinkedIn is a place where students share their education and employment experiences with connections, recruiters, and potential employers. Thus, using LinkedIn profiles offers the advantage of capturing students' most career-relevant employment experiences, whether paid or unpaid.[3] In addition to using a more precise measure of internships, this study extends the analysis by examining the downstream impacts of increased internship participation on students' post-graduation outcomes, thereby contributing to the literature on the benefits of internships.

The study focuses on colleges and universities in Ohio because the state has experienced the most calendar system transitions over the past 30 years. I obtained data on the academic calendar systems used by each institution for each academic year between 1990 and 2019 from the Integrated Postsecondary Education Data System (IPEDS), to which institutions are required to report their characteristics. The sample includes all Ohio institutions that initially used quarter systems from 1990 to 1995. The analysis leverages the quasi-experimental variation in the timing of these institutions' adoption of semester systems. Students are matched to the academic calendars they experienced based on the education information provided on their LinkedIn profiles, which typically includes the names of the colleges and the years of enrollment.

Using an event study approach, I find that students are 1.17 percentage points more likely to do internships in the summer (April–September) when their institution adopts a semester system.

[3] In contrast, Bostwick et al. (2022) can only observe paid employment.

There is a small and insignificant crowding-out effect on their likelihood of doing internships in other seasons (October–March). Overall, the semester system increases students' internship participation by 1.0 percentage point each calendar year. An individual level analysis shows that college students who are fully exposed to semester systems graduate with 0.068 more summer internships but 0.014 fewer off-cycle internships. Overall, semester systems increase students' total number of internships throughout college by 0.054 (16%).

More internship participation under the semester system improves students' labor market outcomes after college. Based on students' self-reported employment history on their LinkedIn profiles, I find that students who are fully exposed to semester systems during college are 1.2 percentage points more likely to have a non-entry-level first job after college, possibly due to more work experience accumulated during college. Additionally, their starting salary is predicted to be 844 dollars higher.[4] Further analysis suggests that with more internship experience, students are more likely to enter high-paying occupations such as business, management, and engineering, while their likelihood of pursuing advanced degrees remains unaffected. These results are consistent with findings in the literature that internship experience improves students' opportunities in the labor market and boosts their earnings (Nunley et al., 2016; Baert et al., 2021; Bolli et al., 2021; Margaryan et al., 2022).

This study contributes to the literature on the impact of academic calendars on postsecondary students. Existing research has primarily focused on academic outcomes, showing that switching to semester systems negatively affects academic performance (Gibbens et al., 2015), reduces students' credit hour loads, and increases course withdrawals (Coleman et al., 1984). In their comprehensive analysis using panel data on nearly all four-year institutions in the US, Bostwick et al. (2022) find that transitioning from a quarter system to a semester system reduces on-time graduation rates by 3.7 percentage points.[5] In this study, I focus on whether and how the academic calendar affects students' employment, including internship participation during college and labor market outcomes after graduation.

Broadly speaking, this study also relates to the literature that explores different school calendars in primary and secondary education. The school structures discussed in the literature include four-day school weeks (e.g., Anderson and Walker, 2015; Fischer and Argyle, 2018; Morton, 2021; Thompson, 2021), extended school days (Battistin and Meroni, 2016; Figlio et al., 2018), extended or shortened school years (Pischke, 2007; Parinduri, 2014; Aucejo and Romano, 2016), and year-round academic

[4] In Section 4.2, I discuss whether and how the reduced-form estimates can be interpreted as the effect of having one additional internship on students' labor market outcomes.

[5] Additionally, Rosenthal (2000) finds that public colleges experience enrollment declines after transitioning to semester systems.

calendars (Graves, 2010, 2011; McMullen and Rouse, 2012; Graves, 2013; Depro and Rouse, 2015).

Finally, this study contributes to the literature on causally estimating the benefits of internship participation. Leveraging mandatory firm internships at German universities, Margaryan et al. (2022) finds that college graduates with internship experience face a lower risk of unemployment during the first year of their careers and enjoy 6% higher earnings. Similarly, Bolli et al. (2021) shows that completing a mandatory internship increases graduates' income, while Klein and Weiss (2011) and Weiss et al. (2014) find no wage effects associated with such mandatory internships. Resume audit studies show that students with internship experience are perceived as more employable (Pinto and Pereira, 2019) and receive more job interview invitations (Nunley et al., 2016; Baert et al., 2021). Utilizing random selection into internship programs in Yemen and internship subsidy programs in Finland, McKenzie et al. (2016) and Virkola (2021) find that treated students accumulated more work experience and achieved higher earnings. This study offers one of the first causal assessments of the labor market benefits of internships in the United States, leveraging variation in internship participation induced by quasi-experimental changes in academic calendars.

2 Background and Data

2.1 Academic Calendar Systems

In the United States, colleges and universities operate under different academic systems, with the semester system and the quarter system being the most common. The semester system, adopted by the majority of institutions, organizes the academic year into two 15- to 16-week terms (fall and spring), followed by a summer break. The quarter system splits the academic year into four 10-week terms. Students typically attend three quarters (fall, winter, and spring) and may take the summer as an optional quarter. There are two other systems that are much less common: the trimester system, which divides the year into three terms, and the four-one-four system, which includes two four-month blocks separated by a one-month block. Following the categorization in Bostwick et al. (2022), I classify the trimester system as the quarter system and the four-one-four system as the semester system in the analysis due to their relative similarities in scheduling.[6]

Compared to the semester system, the quarter system features shorter terms with fewer courses taken simultaneously, making it more flexible for course scheduling but also resulting in an increased pace and more frequent evaluations. More relevant to this study, the two systems also differ in the

[6]The empirical results are robust to excluding the three institutions in the sample that have ever used the trimester or four-one-four systems.

timing of the summer break. Under the semester system, the academic year typically concludes in May and resumes in late August. In contrast, under the quarter system, the school year ends in June and recommences in September. Since many firms structure their internship programs according to the more prevalent semester system schedule, students on the quarter system often miss these opportunities because their summer break starts about a month later.

The data on the academic calendar of each institution are obtained from the Integrated Postsecondary Education Data System (IPEDS). IPEDS is maintained by the U.S. Department of Education's National Center for Education Statistics. It gathers information from every institution that participates in federal student financial aid programs. Specifically, for each academic year, all institutions report their predominant calendar system. The options include semester, quarter, trimester, four-one-four, other nontraditional academic systems, or calendars that differ by program.

In this study, the analyses focus on institutions in Ohio, as it is the state that has experienced the most transitions from quarter systems to semester systems over the past 30 years. This is partially because the Ohio Department of Higher Education mandates that all public universities and colleges in Ohio switch to semester systems. Specifically, the policy required all public institutions that were operating under quarter systems to adopt the semester system by the fall of 2012.[7] The goal of the policy is to make it easier for students to transfer between institutions. Using records from IPEDS, I constructed a panel that includes the academic calendars of all degree-granting institutions in Ohio that are at the baccalaureate level or higher, spanning from 1990 to 2019. To study the impact of the transition from quarter to semester systems, I restrict the sample to institutions that initially operated under quarter systems between 1990 and 1995. For each institution, I identify the academic year in which it transitioned to a semester system, and exclude those that used non-traditional calendars or underwent multiple calendar transitions.

Appendix Table A1 lists the 17 colleges and universities included in the final sample for analysis. These institutions transitioned from the quarter system to the semester system between 1996 and 2013, except for Franklin University, which remains on the trimester system. Many of these universities have multiple campuses across the state, and campuses belonging to the same university share the same year of transition. As of 2019, these institutions collectively enrolled approximately 55% of the total undergraduate student population in Ohio.

[7] https://transfercredit.ohio.gov/educational-partners/educational-partner-resources/academic-calendar-conversion/overview.

2.2 LinkedIn Profiles

Students' educational and employment records are obtained from their public LinkedIn profiles through Revelio Labs. LinkedIn is a business- and employment-focused social media platform. It first launched in 2003 and now has 200 million users in the United States. The platform is more commonly used by college-educated white-collar workers, the sample this study intends to focus on. Through Revelio Labs, I have access to all public profiles created by LinkedIn users as of early 2023. LinkedIn profiles serve as online resumes where individuals share their education and employment histories with their connections, recruiters, and the general public. The education section includes the institutions users have attended or are currently attending, years of attendance, and degrees obtained or in progress. The employment section includes users' past and current employers, employment start and end dates (year and month), job titles, and brief job descriptions.

Revelio Labs preprocesses the raw data. First, they predict users' genders by feeding their first names into a model trained on the Social Security Administration data. Similarly, they predict users' race and ethnicity using a model trained on U.S. Census data, which considers users' first names, last names, and locations. For each employment record, Revelio Labs assigns a seniority level and an O*NET code based on the job title, company, and industry. Finally, Revelio Labs imputes the salary for each position using information specific to the position, including job title, seniority level, company, and location, as well as user-specific information such as years of experience. This model is trained with salary data from publicly available labor certification applications, self-reported data, and information from online job postings.

The main sample of analysis includes college students with public LinkedIn profiles who were enrolled in the 17 Ohio colleges and universities between 1990 and 2019.[8] For each student, I observe their imputed demographics, duration and field of study, and post-graduation outcomes. The post-graduation outcomes include whether they enroll in advanced degree programs, when they start their first job, as well as the imputed salary, seniority level, and occupation of their first job. Most importantly, I identify all their internship experiences while enrolled in college. An employment record is classified as an internship if the job title includes the keyword "intern." Following Bostwick et al. (2022), I classify an internship experience as a "summer internship" if it begins between April and September of the year.[9] I refer to the remaining ones as "off-cycle internships". Appendix Table A2 provides the summary statistics. On average, a student reports completing a total of 0.28

[8] Years after 2020 are excluded to avoid the impact of the COVID-19 pandemic.

[9] This definition of summer is broad enough to cover the summer break for students on both semester and quarter systems.

internships while in college, with the majority being summer internships.

3 Internship Participation: Individual-by-Year Level Analysis

3.1 Empirical Strategy

I exploit the staggered transitions from quarter to semester systems to estimate the impact of the academic calendar on students' internship participation. Specifically, I build a panel data with students enrolled at the 17 Ohio institutions between 1990 and 2019, recording whether they participated in internships in each calendar year. As a baseline specification, I estimate the following two-way fixed-effect (TWFE) event study model with staggered adoption:

$$Y_{ist} = \sum_{k=-7}^{7} \theta_k SemSys_{stk} + \gamma_s + \eta_t + \rho_{g(s)} \times t + \varepsilon_{ist}, \tag{1}$$

for student i who enrolls at institution s in calendar year t. The outcome variable Y_{ist} denotes whether student i from institution s participates in internships in year t. In particular, I consider three different measures: (1) whether a student participates in a summer internship, (2) whether a student participates in an off-cycle internship, and (3) whether a student participates in any internship during the year. For example, for a student enrolled at Ohio State University from 2010 to 2014, I examine whether the student participated in internships in each calendar year t—2010, 2011, $\cdots$, and 2014—and distinguish between summer and off-cycle internships.[10]

The variable $SemSys_{stk}$ is an indicator for k years since institution s transitioned to the semester system. For Ohio State University, which transitioned to the semester system in the fall of 2012, $k = 0$ in the calendar year $t = 2013$, $k = -1$ in calendar year 2012, and $k = 1$ in 2014.[11] I normalize the coefficient in the year immediately preceding the switch (θ_{-1}) to zero. θ_ks are the coefficients of interest. Following Bostwick et al. (2022), I assume the effect of the treatment at least seven years before or after the shift to be unchanging, with the average effects being captured by θ_{-7} and θ_7. γ_s and η_t denote the institution and calendar year fixed effects, respectively. I additionally control for group-specific linear time trends $\rho_{g(s)} \times t$, where a group includes the institutions that made the transition in the same year. The standard error ε_{ist} is clustered at the institution level.

[10] I measure internships by calendar year rather than academic year because LinkedIn profiles only show the calendar year of enrollment, making it difficult to determine the specific term in which the student started.

[11] Since this study focuses on summer internships, and the transition to the semester system occurred in the fall of 2012, I consider 2012 as the year before the treatment and 2013 as the first year of treatment. The results are not sensitive to an alternative coding of the first treatment year as quarter 4 of 2012 to quarter 3 of 2013.

To better quantify the average treatment effect, I also estimate the TWFE staggered difference-in-differences model:

$$Y_{ist} = \beta SemSys_{st} + \gamma_s + \eta_t + \rho_{g(s)} \times t + \varepsilon_{ist}. \tag{2}$$

The model includes similar covariates as in equation (1), but instead of examining each year relative to the transition separately, it uses a single dummy variable, $SemSys_{st}$, indicating whether institution s operates under the semester system in calendar year t. The coefficient β captures the average treatment effect of transitioning to semester systems, assuming (1) parallel trends and (2) treatment effect homogeneity.

The parallel trends assumption requires that students' internship participation across different institutions would have followed the same trend if they had all continued using the quarter system. I control for any institution-specific, time-invariant variations by including institution fixed effects, and I account for any time trends in internship participation that are common across all institutions by including year fixed effects. Additionally, by including adoption group-specific linear trends, I control for the possibility that institutions adopting the semester system in different years were following differential linear trends in internship participation. This provides a weaker version of the parallel trends assumption, requiring only that institutions follow their group-specific differential linear trends in the absence of treatment. I also present the results without group-specific linear trends, as well as the results with institution-specific linear trends.

Since I use students' self-reported internship experiences on their LinkedIn profiles as a proxy for actual internship participation, the parallel trends assumption also requires that students' engagement with LinkedIn is uncorrelated with the transition to semester systems. Although there is institution-level heterogeneity and overall time trends in LinkedIn usage, these are accounted for through the inclusion of institution and year fixed effects. It is reasonable to assume that students' LinkedIn usage and their propensity to report internship experiences on their profiles are unrelated to the academic calendar. It is also important to ensure that students do not select institutions based on the current or future academic calendar. Therefore, I conduct a placebo test to verify that the characteristics of students enrolled at these institutions do not change in response to the transition to semester systems. Finally, to rule out any anticipation effects, I visually examine the estimates of equation (1) prior to the calendar transition and find no evidence that students delayed their internships in anticipation of the future adoption of semester systems or any other forms of pretrends.

We additionally require that the treatment effects are homogeneous across institutions and over

time to interpret the coefficient of interest β in equation (2) as the average treatment effect on the treated (e.g., De Chaisemartin and d'Haultfoeuille, 2020; Goodman-Bacon, 2021). Later, I relax this assumption by presenting results using heterogeneity-robust estimators.

3.2 Baseline Results

Figure 1(a) presents the estimates of θ_k from equation (1) for the three measures of internship participation. The near-zero and statistically insignificant coefficients before the transition to semester systems suggest that the parallel trends assumption is met. There are no significant deviations from trends in internship participation (in the summer or other seasons) across institutions with different calendar change timings. We observe a significant increase in summer internship participation in the year immediately following the adoption of semester systems. The treatment effects remain stable, with a slight increase over time, possibly due to an overall rise in internship participation and reporting on LinkedIn. Meanwhile, internship participation during non-summer seasons decreases after the transition to the semester system. This may be because, under semester systems, students take more courses concurrently, making it harder to add an internship to their schedules. This could also be due to a crowding-out effect, as students become less likely to participate in off-cycle internships when more summer opportunities are available. When combining both types, students are significantly more likely to have internship experiences when their institutions operate under semester systems.

Panel A of Table 1 reports the results from equation (2), where I control for adoption group-specific linear time trends. Columns (2), (4), and (6) also control for student characteristics, including imputed gender, imputed race and ethnicity, and fields of study in college. The estimates remain unchanged with the inclusion of student characteristics. Column (2) suggests that, under the semester system, students are 1.17 percentage points (pp) more likely to undertake internships *each summer*, which represents a 28% increase relative to the sample mean. Meanwhile, column (4) indicates a slight, statistically insignificant decrease in off-cycle internship participation under the baseline specification. Overall, according to column (6), students are 1.00 pp (18%) more likely to have internship experiences *each year* after their institutions transition to semester systems. The magnitude of the average treatment effect should be interpreted with caution because we only observe internship experiences listed on LinkedIn profiles. Given that not everyone reports every internship experience they had—especially individuals who were in college many years before LinkedIn became available—it is not possible to directly map the sample mean or the estimates one-to-one to actual internship

participation. However, the 18% *relative* increase compared to the sample mean is informative and suggests that academic calendars can have large impacts on internship participation.

3.3 Robustness

Appendix Figure A1 and Panels B-E of Table 1 show the results under alternative specification. Appendix Figure A1(a) presents the estimates without group-specific linear time trends, showing slight differences in the trends that different institutions followed prior to the calendar change, which leads to an overestimated average treatment effect (Panel B of Table 1). Figure A1(b) and Panel C of Table 1 report the results with institution-specific linear trends instead of group-specific trends, which do not impact the estimates. Figure A1(c) and Panel D of Table 1 report the results excluding the first and last year of college enrollment for each student. For a typical student who enrolls in the fall of their first year and graduates before the summer of their last year, internship participation during those partial years is unlikely to be affected by the academic calendar. The results indeed show a larger average treatment effect after excluding the partial years. Finally, Appendix Figure A1(d) and Panel E of Table 1 include graduate students in the analysis and find a smaller treatment effect than when focusing only on undergraduate students in the baseline specification.

Appendix Table A3 shows that the increase in summer internship participation is robust whether focusing on internships at companies that are publicly traded or not, located in Ohio or not, and based in the United States or abroad, although some estimates are noisier than others. Additionally, Appendix Table A4 shows that the results are robust to excluding the three institutions in the sample that were ever on trimester or four-one-four systems.

More importantly, recent econometric literature points out that TWFE estimators in staggered setups require homogeneous treatment effects across both units and time periods to ensure consistency. Alternatively, I employ newly proposed methods that are robust to potential heterogeneity in treatment effects (Callaway and Sant'Anna, 2021; Sun and Abraham, 2021; Borusyak et al., 2024; De Chaisemartin and d'Haultfoeuille, 2024). Figures 1(b)-(d) present the results separately for the three measures of internship participation. Although different estimators are not perfectly comparable to one another due to differences in sample selection and methodology, it is reassuring to see that the heterogeneity-robust estimators exhibit patterns very similar to those of the TWFE estimators.

4 Post-Graduation Outcomes: Individual Level Analysis

4.1 Empirical Design

To estimate the impact of semester systems on students' total number of internships while in college and on their post-graduation outcomes, I conduct an individual level analysis that leverages the variation in their entry years relative to the year of the calendar change. Specifically, I consider a student as fully exposed to the semester system if she enters college in the year of or after the transition to semester systems. I consider a student as partially exposed if she enters college one or two years before the transition, meaning that her institution transitions to semester systems during her sophomore or junior years. I do not consider students who are in their senior year at the transition as treated because, if they graduate on time, there are no summers left for them to do internships while in college. Some students do not graduate on time, so they become de facto exposed by spending extra years in college. However, as shown in Bostwick et al. (2022), the on-time graduation rate is endogenous to academic calendars. Therefore, rather than using their actual exposure, I define it as "intended" exposure assuming everyone graduates on-time and estimate the intent-to-treat effects.

I estimate the same TWFE event study model as in equation (1) but at the individual level, with t now denoting the college entry year of student i. The outcome variable Y_{ist} represents the number of internships or some post-graduation outcomes of student i who enters institution s in year t. The θ_ks are the coefficients of interest: θ_0 captures the treatment effect for students who enter college in the year of the calendar change, and θ_{-1} (θ_{-2}) captures the effect for students who are in their sophomore (junior) year when the institution transitions to a semester system. I normalize θ_{-3} to zero. Similarly, I control for institution and entry year fixed effects and group-specific linear trends, and cluster standard errors at the institution level.

I also estimate the difference-in-differences model that is parallel to equation (2):

$$Y_{ist} = \beta_1 Partial_{st} + \beta_2 Full_{st} + \gamma_s + \eta_t + \rho_{g(s)} \times t + \varepsilon_{ist}, \tag{3}$$

where $Partial_{st}$ denotes whether students who enter institution s in year t are partially exposed to semester systems if they graduate on time, and $Full_{st}$ denotes whether they are fully exposed. The sample for analysis includes college students who entered the 17 institutions in Ohio between 1990 and 2015. I exclude students who spent fewer than four years or more than six years in college.[12] I conduct a placebo analysis and show in Appendix Table A5 that students' characteristics, including

[12] Bostwick et al. (2022) finds transitioning to semester systems reduces four-year graduation rates but has no significant impact on six-year graduation rates.

gender, racial minority status, and fields of study, do not change in response to the transition to semester systems. This helps alleviate concerns that students select institutions based on their academic calendars.

4.2 Results

Figure 2 presents the estimates from the event study model. Figure 2(a) overlays the coefficients for three internship measures: the total number of internships undertaken throughout college that are (1) summer internships, (2) off-cycle internships, and (3) both types combined. There are no differential pretrends in internship participation across institutions that transitioned to semesters in different years. The coefficients suggest that students graduate with significantly more summer internships if their institutions transition to a semester system in their junior or sophomore years. The effects are stronger if the transition occurs in their freshman year or before they enroll. Meanwhile, we observe a small and marginally significant decrease in off-cycle internship participation for students who are partially or fully exposed to semester systems. The increase in summer internships outweighs the decrease in off-cycle internships, leading to more overall internship experiences, especially for students who are fully exposed.[13]

Figure 2(b) shows the impact of semester systems on the share of students with a non-entry-level first job after college. Specifically, I use the seniority levels imputed by Revelio Labs, which characterize positions such as assistants, clerks, and trainees as entry level. The coefficients suggest that students exposed to semester systems are more likely to have their first non-internship job after college classified as non-entry-level, although the estimates are noisier and only marginally significant. Figure 2(c) shows the impact of semester systems on students' starting salaries. The outcome variable is the imputed starting salary of students' first non-internship job after college, adjusted to 2012 dollars. Although marginally insignificant, students who are partially exposed to semester systems earn higher starting salaries. And the effects are larger and statistically significant for students who are fully exposed.

Table 2 presents the regression results from equation (3). According to column (1), students who are partially exposed to semester systems complete 0.034 more summer internships throughout college, while fully exposed students complete 0.068 more summer internships—a 27% increase relative to the sample mean. However, column (2) suggests that the transition to a semester system decreases

[13] Appendix Figure A2 presents the heterogeneity-robust estimators separately for the three internship measures. I exclude the Callaway and Sant'Anna (2021) estimator because the number of covariates is too large given the sample size.

the number of off-cycle internships by 0.014 for fully exposed students who enter college in the year of or after the transition. Overall, when institutions transition to semester systems, students who are partially exposed have 0.025 more internships in college (statistically insignificant), and fully exposed students have 0.054 more internships, a 16% increase relative to the sample mean of 0.339 internships. These results are consistent with the findings from the individual-by-year level analyses. For post-graduation outcomes, column (4) shows that partial exposure to semester systems makes students 0.8 pp more likely to land a non-entry-level job after college, while full exposure increases this likelihood by 1.2 pp, or 2.2% relative to the sample mean. Column (5) shows a positive but statistically insignificant change in starting salary for partially exposed students, and a significant \$844 (1.5%) increase in salary for fully exposed students.

Table 2 finds that when institutions adopt semester systems, students gain more (summer) internship experiences and see improved labor market outcomes after college. Descriptively, this finding is consistent with the literature, which suggests that internship participation increases labor market opportunities and boosts earnings. However, caution is needed in interpreting these reduced-form estimates as a causal quantification of the impact of internships on labor market outcomes, for two main reasons. First, the exclusion restriction is not satisfied if we use calendar changes as an instrument for internship participation. Specifically, academic calendars can influence students' labor market outcomes through channels other than internships, such as academic performance. For instance, Bostwick et al. (2022) finds that students have worse academic performance and lower on-time graduation rates under semester systems. Assuming that academic performance is positively correlated with labor market outcomes, this implies that IV estimates will *underestimate* the benefits of internship participation on labor market outcomes.

Second, the magnitudes should be interpreted with caution because LinkedIn profiles do not necessarily include all internship experiences or complete employment histories. If we assume that, during the sample period, students have an average of 0.7 internships throughout college, this implies that only half (0.339/0.7) of these internships are listed on their LinkedIn profiles. Consequently, the point estimate of the effect of full exposure to semester systems on the number of internships (0.054) is about half of the actual magnitude. Even if the exclusion restriction holds, the IV estimate of the effect of one additional internship on earnings (\$844/0.054) would be twice the actual magnitude.

Therefore, I rely on the relative magnitudes to interpret the results. According to column (3), students' internship participation increases by 16% (0.054/0.339) if they are fully exposed to semester systems. Assuming the exclusion restriction holds, this 16% increase in internship participation

leads to an $844 increase in their starting salaries. By linear extrapolation, the results suggest that students' starting salaries would increase by $5,276 if their total number of internships in college were to double. Similarly, the likelihood of students finding a non-entry-level job after college would increase by 7.5 percentage points if their number of internships doubled. Finally, considering the likely violation of the exclusion restriction, it is possible that these labor market benefits of internships are underestimated and may actually be stronger.

4.3 Additional Results

I explore whether more internship experience under semester systems affects other post-graduation outcomes. Appendix Table A6 shows how students enter different occupations when their institutions transition to semester systems. Based on the O*NET code of their first job after college, I find that more students enter high-paying occupations, such as business and management, engineering, and mathematics, when exposed to semesters. This could be due either to internship experience influencing students' occupational choices or to students with more internship experience gaining an advantage in the labor market, enabling them to secure jobs in high-paying occupations. In either case, this contributes to the positive impact of internships on students' long-term earnings.

I also explore whether academic calendars affect students' pursuit of advanced degrees. Appendix Table A7 shows that exposure to semester systems does not affect the gap between college graduation and students' first job. The likelihood of students pursuing advanced degrees (one year, three years after graduation, or ever) remains unchanged.

Robustness Appendix Table A8 reports the results of alternative specifications of equation (3). Panel A excludes student characteristics (gender, race and ethnicity, and field of study) as covariates in the regression. Panel B restricts the sample to students who graduate on time, and Panel C includes all college students regardless of their duration of study. The results are quantitatively similar to the baseline results in Table 2.

Heterogeneity Appendix Tables A9, A10, and A11 present the heterogeneity of individual-level analyses by gender, racial minority status, and fields of study. Overall, the adoption of semester systems increases internship participation across all student backgrounds, especially for female and racial minorities, and for students who major in business, economics, and engineering. However, it seems that male and white students enjoy larger benefits for labor market outcomes, along with students majoring in business and economics.

5 Conclusion

For college students, internships have become a critical part of their educational experience, offering practical training, financial benefits, and future job opportunities. Therefore, it is crucial for policymakers and institutions to ensure that internship participation is both accommodated and encouraged as part of the higher education experience. Specifically, the choice of academic calendar is widely believed to affect students' access to internships. Under the less common quarter system, the summer starts one month later, which can cause scheduling conflicts for students seeking summer internships. However, to date, there lacks empirical evidence confirming the negative impacts of the quarter system on students' internship participation.

This study leverages the quasi-experimental variation in the timing of the transition from quarter to semester systems across colleges and universities in Ohio. Using students' internship experiences reported on their LinkedIn profiles and a staggered difference-in-differences design, I document that the transition to a semester system increases students' internship participation. In particular, college students graduate with 27% more summer internship experiences, and there is a net increase of 16% after accounting for the slight negative impact on off-cycle internships. These additional internship experiences improve students' labor market outcomes, making them more likely to secure non-entry-level jobs with higher starting salaries. The findings have important policy implications, both for institutions currently debating whether to change their academic calendars and for the broader higher education system. How institutions are structured can have long-term impact on students' well-being beyond their academic success.

References

Anderson, D Mark and Mary Beth Walker, "Does Shortening the School Week Impact Student Performance? Evidence from the Four-Day School Week," *Education Finance and Policy*, 2015, *10* (3), 314–349.

Aucejo, Esteban M and Teresa Foy Romano, "Assessing the Effect of School Days and Absences on Test Score Performance," *Economics of Education Review*, 2016, *55*, 70–87.

Baert, Stijn, Brecht Neyt, Thomas Siedler, Ilse Tobback, and Dieter Verhaest, "Student Internships and Employment Opportunities After Graduation: A Field Experiment," *Economics of Education Review*, 2021, *83*, 102141.

Battistin, Erich and Elena Claudia Meroni, "Should We Increase Instruction Time in Low Achieving Schools? Evidence from Southern Italy," *Economics of Education Review*, 2016, *55*, 39–56.

Bolli, Thomas, Katherine Caves, and Maria Esther Oswald-Egg, "Valuable Experience: How University Internships Affect Graduates' Income," *Research in Higher Education*, 2021, *62* (8), 1198–1247.

Borusyak, Kirill, Xavier Jaravel, and Jann Spiess, "Revisiting Event-Study Designs: Robust and Efficient Estimation," *Review of Economic Studies*, 2024, p. rdae007.

Bostwick, Valerie, Stefanie Fischer, and Matthew Lang, "Semesters or Quarters? The Effect of the Academic Calendar on Postsecondary Student Outcomes," *American Economic Journal: Economic Policy*, 2022, *14* (1), 40–80.

Callaway, Brantly and Pedro HC Sant'Anna, "Difference-in-Differences with Multiple Time Periods," *Journal of Econometrics*, 2021, *225* (2), 200–230.

Chaisemartin, Clément De and Xavier d'Haultfoeuille, "Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects," *American Economic Review*, 2020, *110* (9), 2964–2996.

_ **and** _ , "Difference-in-Differences Estimators of Intertemporal Treatment Effects," *Review of Economics and Statistics*, 2024, pp. 1–45.

Coleman, Daniel, John R Bolte, and Leroy Franklin, "Academic Calendar Change Impact on Enrollment Patterns and Instructional Outcomes," *Research in Higher Education*, 1984, *20*, 155–166.

Depro, Brooks and Kathryn Rouse, "The Effect of Multi-Track Year-Round Academic Calendars on Property Values: Evidence from District Imposed School Calendar Conversions," *Economics of Education Review*, 2015, *49*, 157–171.

Figlio, David, Kristian L Holden, and Umut Ozek, "Do Students Benefit from Longer School Days? Regression Discontinuity Evidence from Florida's Additional Hour of Literacy Instruction," *Economics of Education Review*, 2018, *67*, 171–183.

Fischer, Stefanie and Daniel Argyle, "Juvenile Crime and the Four-Day School Week," *Economics of Education Review*, 2018, *64*, 31–39.

Gibbens, Brian, Mary A Williams, Anna K Strain, and Courtney DM Hoff, "Comparison of Biology Student Performance in Quarter and Semester Systems," *College & University*, 2015, *90* (3).

Goodman-Bacon, Andrew, "Difference-in-Differences with Variation in Treatment Timing," *Journal of Econometrics*, 2021, *225* (2), 254–277.

Graves, Jennifer, "The Academic Impact of Multi-Track Year-Round School Calendars: A Response to School Overcrowding," *Journal of urban Economics*, 2010, *67* (3), 378–391.

_ , "Effects of Year-Round Schooling on Disadvantaged Students and the Distribution of Standardized Test Performance," *Economics of Education Review*, 2011, *30* (6), 1281–1305.

_ , "School Calendars, Child Care Availability and Maternal Employment," *Journal of Urban Economics*, 2013, *78*, 57–70.

Klein, Markus and Felix Weiss, "Is Forcing Them Worth the Effort? Benefits of Mandatory Internships for Graduates from Diverse Family Backgrounds at Labour Market Entry," *Studies in Higher Education*, 2011, *36* (8), 969–987.

Margaryan, Shushanik, Nils Saniter, Mathias Schumann, and Thomas Siedler, "Do Internships Pay Off? The Effects of Student Internships on Earnings," *Journal of Human Resources*, 2022, *57* (4), 1242–1275.

McKenzie, David, Nabila Assaf, and Ana Paula Cusolito, "The demand for, and impact of, youth internships: evidence from a randomized experiment in Yemen," *IZA Journal of Labor & Development*, 2016, *5*, 1–15.

McMullen, Steven C and Kathryn E Rouse, "The Impact of Year-Round Schooling on Academic Achievement: Evidence from Mandatory School Calendar Conversions," *American Economic Journal: Economic Policy*, 2012, *4* (4), 230–252.

Meglio, Gisela Di, Andrés Barge-Gil, Ester Camiña, and Lourdes Moreno, "Knocking on Employment's Door: Internships and Job Attainment," *Higher Education*, 2022, *83* (1), 137–161.

Morton, Emily, "Effects of Four-Day School Weeks on School Finance and Achievement: Evidence from Oklahoma," *Educational Researcher*, 2021, *50* (1), 30–40.

NACE, "2024 Student Survey Report," *National Association of Colleges and Employers*, 2024.

Nunley, John M, Adam Pugh, Nicholas Romero, and R Alan Seals Jr, "College Major, Internship Experience, and Employment Opportunities: Estimates from a Résumé Audit," *Labour Economics*, 2016, *38*, 37–46.

Parinduri, Rasyad A, "Do Children Spend Too Much Time in Schools? Evidence from a Longer School Year in Indonesia," *Economics of Education Review*, 2014, *41*, 89–104.

Pinto, Luísa Helena and Pedro Capa Pereira, "'I wish to do an internship (abroad)': investigating the perceived employability of domestic and international business internships," *Higher Education*, 2019, *78*, 443–461.

Pischke, Jörn-Steffen, "The Impact of Length of the School Year on Student Performance and Earnings: Evidence from the German Short School Years," *The Economic Journal*, 2007, *117* (523), 1216–1242.

Rosenthal, Dan, "Transition to Semesters: Effects on Enrollment and FTE Students," 2000.

Sun, Liyang and Sarah Abraham, "Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects," *Journal of Econometrics*, 2021, *225* (2), 175–199.

Thompson, Paul N, "Is Four Less than Five? Effects of Four-Day School Weeks on Student Achievement in Oregon," *Journal of Public Economics*, 2021, *193*, 104308.

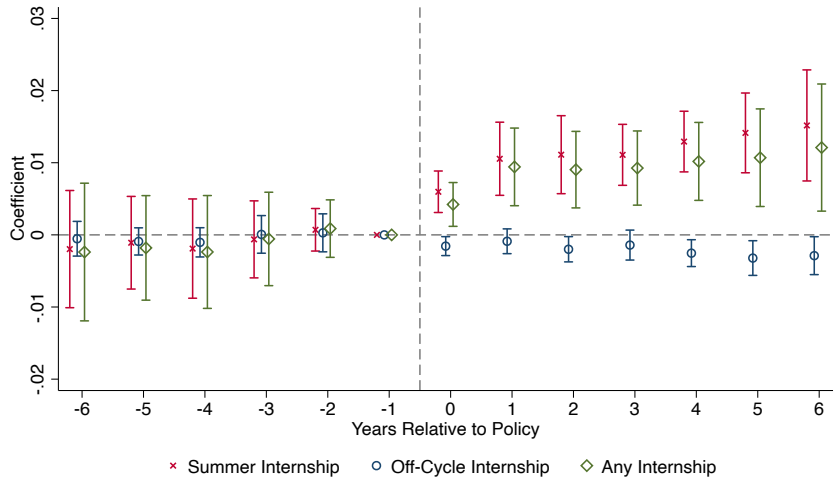
Virkola, Tuomo, "Internships and the Allocation of Talent," *Essays in Applied Economics*, 2021, p. 4.

Weiss, Felix, Markus Klein, and Thomas Grauenhorst, "The effects of work experience during higher education on labour market entry: learning by doing or an entry ticket?," *Work, Employment and Society*, 2014, *28* (5), 788–807.

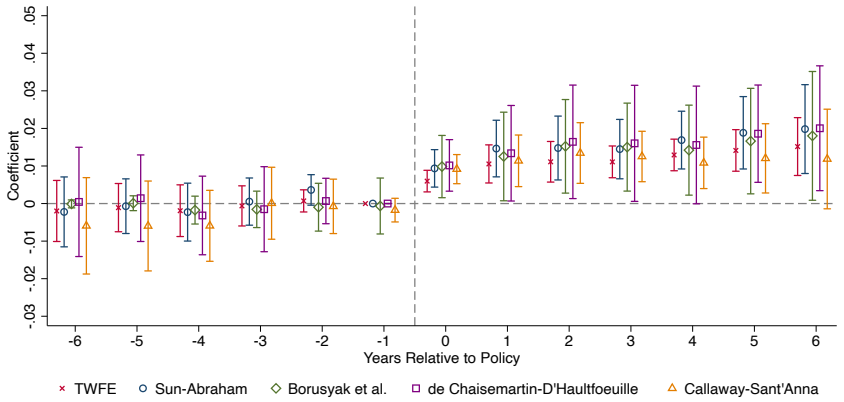
Figures and Tables

Figure 1: Effect of Switching to Semesters on Internship Participation: Individual-by-Year Level Analysis

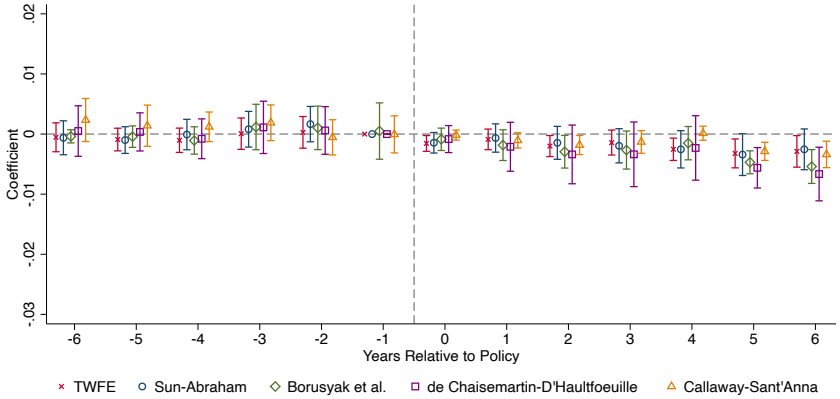
(a) TWFE Estimators



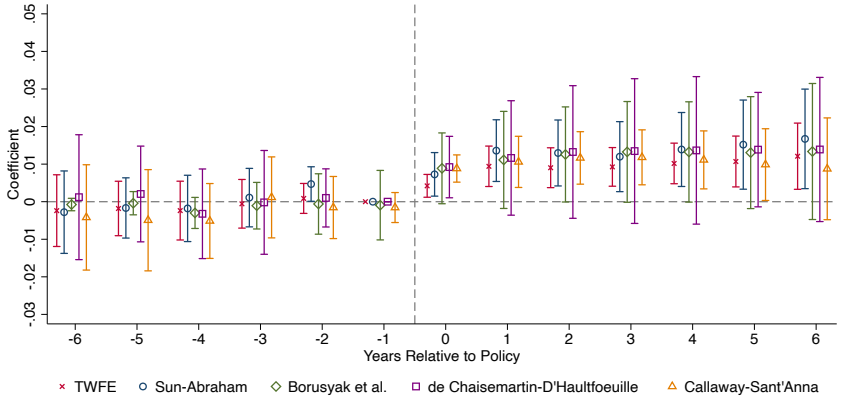
(b) Robust Estimators: Summer Internship



(c) Robust Estimators: Off-Cycle Internship



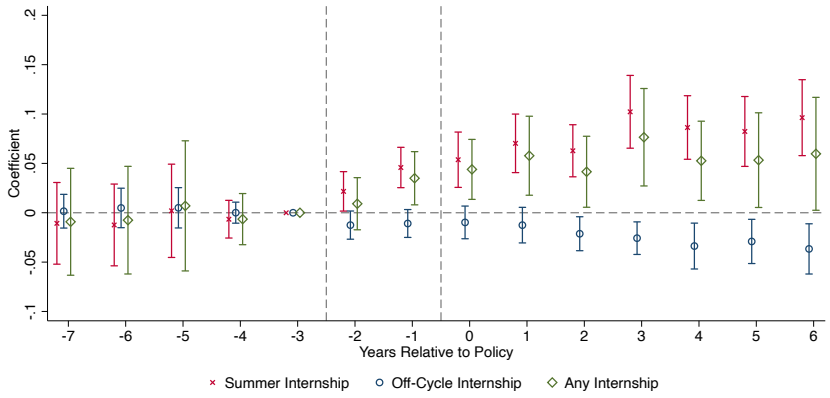
(d) Robust Estimators: Any Internship



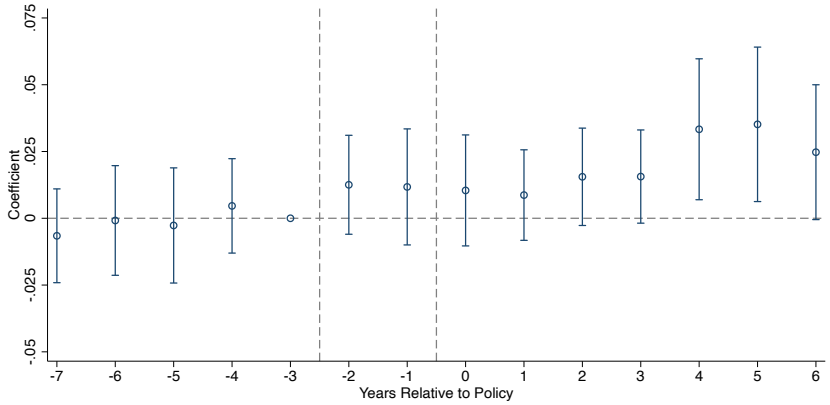
Notes: Sub-figure (a) presents the estimated coefficients, θ_k, of equation (1). The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. Sub-figures (b)-(d) overlay the event-study plots constructed using five different estimators for the three outcomes: the staggered TWFE model (equation 1), Sun and Abraham (2021), Borusyak et al. (2024), De Chaisemartin and d'Haultfoeuille (2024), and Callaway and Sant'Anna (2021). All specifications control for institution and year fixed effects, along with group-specific linear time trends. I normalize the coefficients to zero in the year immediately preceding the switch to semester systems. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level. For Borusyak et al. (2024), I conduct a two-step estimation. I regress the outcome variable on group-specific linear time trends, institution, and year fixed effects, and I use the residuals for the event study analysis.

Figure 2: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis

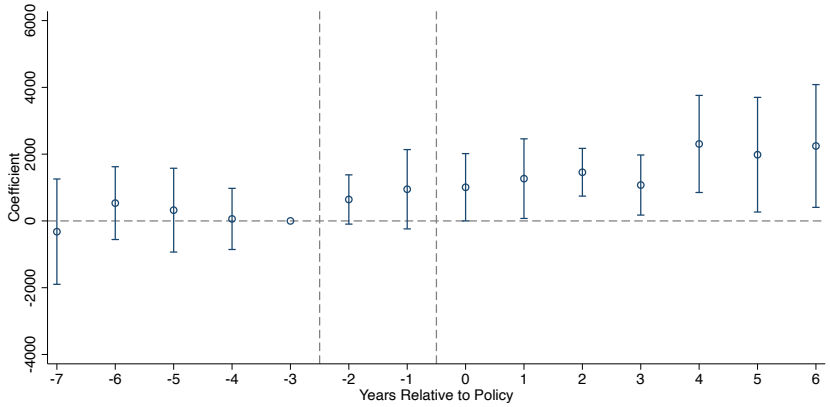
(a) Internship Participation



(b) Non-Entry-Level Job



(c) Starting Salary (in 2010 Dollars)



Notes: This figure presents the estimated coefficients of equation (1) but at the individual level. The outcome variables in sub-figure (a) are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. The outcome variable in sub-figure (b) is whether the student has a non-entry-level first job after college. The outcome variable in sub-figure (c) is the imputed starting salary in 2010 dollars. All specifications control for institution and year fixed effects, along with group-specific linear time trends. I normalize the coefficients to zero for the cohort that enter college three years prior to the switch. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level.

Table 1: Effect of Switching to Semesters on Internship Participation: Individual-by-Year Level Analysis

	Summer Internship		Off-Cycle Internship		Any Internship	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Baseline Specification						
Semester	0.0116**	0.0117**	-0.0014	-0.0012	0.0098*	0.0100*
	(0.0044)	(0.0044)	(0.0011)	(0.0010)	(0.0049)	(0.0049)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.042	0.042	0.014	0.014	0.053	0.053
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765
Panel B: No Group-Specific Linear Trend						
Semester	0.0178**	0.0177***	-0.0003	-0.0001	0.0167**	0.0168**
	(0.0062)	(0.0060)	(0.0016)	(0.0015)	(0.0072)	(0.0069)
Group-specific Trend						
Student Characteristics		x		x		x
Mean(Y)	0.042	0.042	0.014	0.014	0.053	0.053
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765
Panel C: Institution-Specific Linear Trend						
Semester	0.0114**	0.0115**	-0.0015	-0.0014	0.0096*	0.0098*
	(0.0044)	(0.0044)	(0.0012)	(0.0011)	(0.0050)	(0.0050)
Institution-specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.042	0.042	0.014	0.014	0.053	0.053
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765
Panel D: Excluding First and Last Calendar Years of Enrollment						
Semester	0.0168**	0.0168**	-0.0011	-0.0010	0.0148**	0.0149**
	(0.0060)	(0.0062)	(0.0012)	(0.0012)	(0.0065)	(0.0067)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.055	0.055	0.016	0.016	0.067	0.067
N	1,404,144	1,404,144	1,404,144	1,404,144	1,404,144	1,404,144
Panel E: Including Graduate Students						
Semester	0.0073*	0.0074*	-0.0013	-0.0013	0.0056	0.0058
	(0.0035)	(0.0036)	(0.0009)	(0.0008)	(0.0041)	(0.0041)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.033	0.033	0.012	0.012	0.042	0.042
N	4,215,816	4,215,816	4,215,816	4,215,816	4,215,816	4,215,816

Notes: This table presents the estimates of equation (2). The sample includes undergraduate students enrolled in the 17 institutions between 1990 and 2019. The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. All regressions control for institution and year fixed effects, along with group-specific linear time trends for Panels A, D, and E. Columns (2), (4), and (6) additionally controls for students' gender, race and ethnicity, as well as their fields of study in college. Panel B does not control for the group-specific linear time trend. Panel C controls for institution-specific linear time trend. Panel D excludes each student's first and last calendar years of enrollment. Panel E includes both undergraduate and graduate students in the sample. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table 2: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Partial	0.034*	-0.010	0.025	0.008**	487.869
	(0.018)	(0.006)	(0.021)	(0.004)	(374.167)
Full	0.068**	-0.014*	0.054*	0.012***	844.426**
	(0.023)	(0.008)	(0.027)	(0.003)	(340.975)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.250	0.089	0.339	0.548	54940.743
N	255,441	255,441	255,441	255,441	255,441

Notes: This table presents the estimates of equation (3). The sample includes college students who entered 17 institutions in Ohio between 1990 and 2015. I exclude students who spent fewer than four years or more than six years in college, those without information on their first job after college, and students from Antioch University due to its small sample size. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

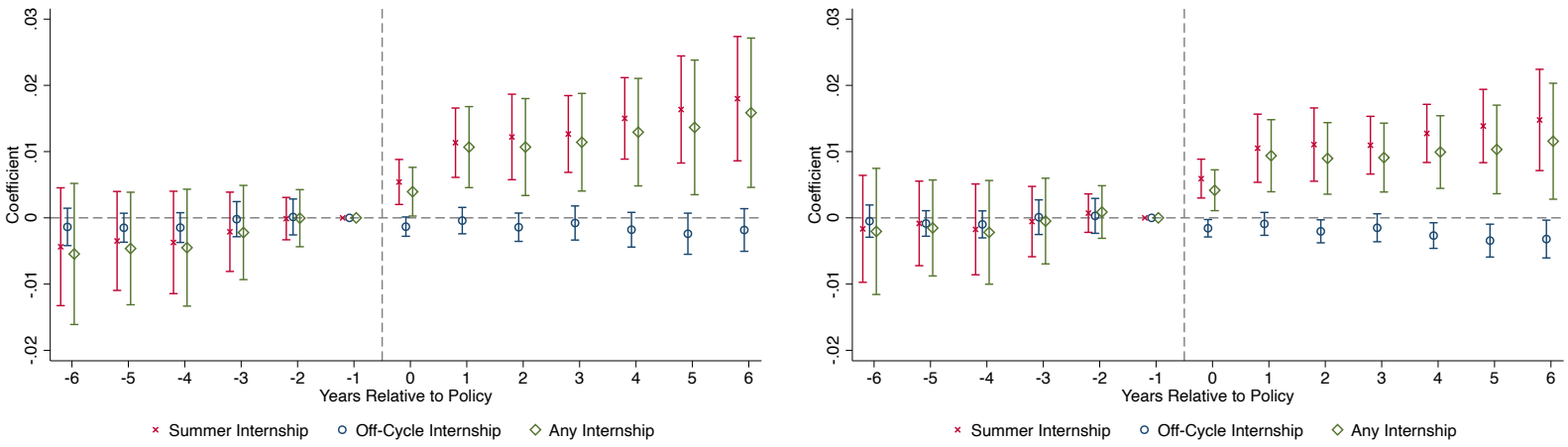
ONLINE APPENDIX

A Additional Figures and Tables

Figure A1: Effect of Switching to Semesters on Internship Participation: Individual-by-Year Level Analysis

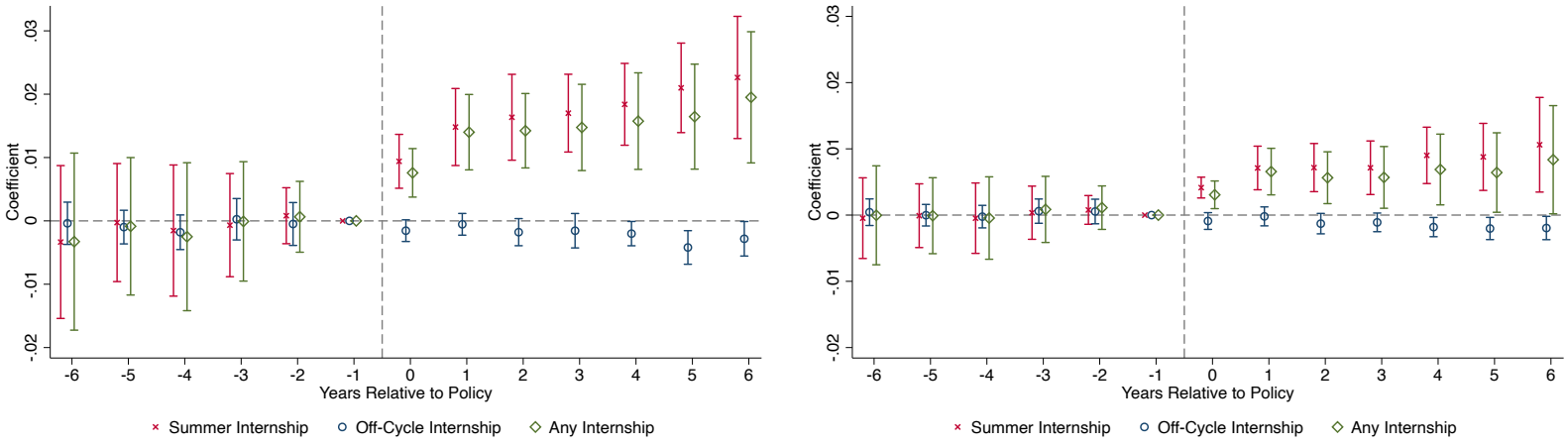
(a) No Group-Specific Linear Trend

(b) Institution-Specific Linear Trend



(c) Excluding First and Last Calendar Years of Enrollment

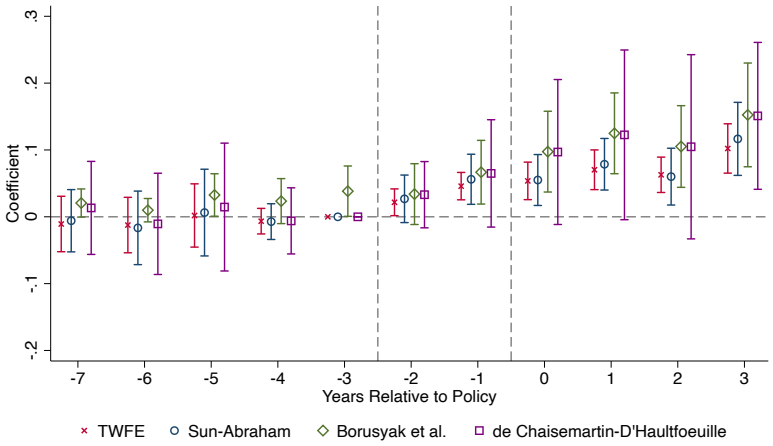
(d) Including Graduate Students



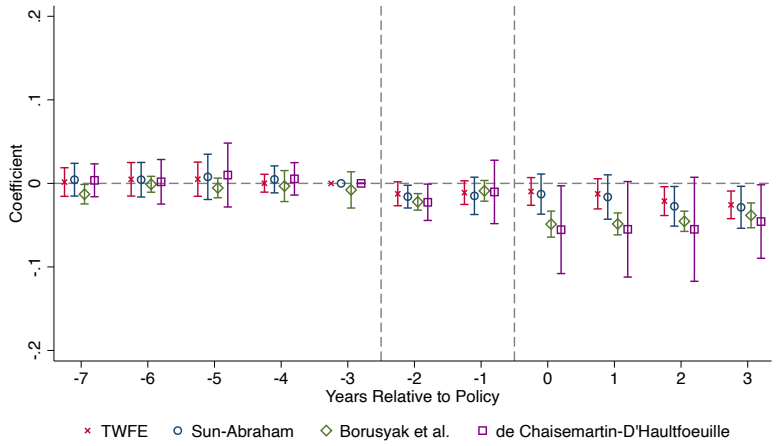
Notes: This figure presents the estimated coefficients, θ_k, of equation (1). The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. All specifications control for institution and year fixed effects, along with group-specific linear time trends for sub-figures (c) and (d). I normalize the coefficients to zero in the year immediately preceding the switch to semester systems. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level. Sub-figure (a) does not control for the group-specific linear time trend. Sub-figure (b) controls for the institution-specific linear time trend. Sub-figure (c) excludes the first and last calendar years of enrollment. Sub-figure (d) includes both undergraduate and graduate students in the sample.

Figure A2: Effect of Switching to Semesters on Internship Participation: Individual Level Analysis, Robust Estimators

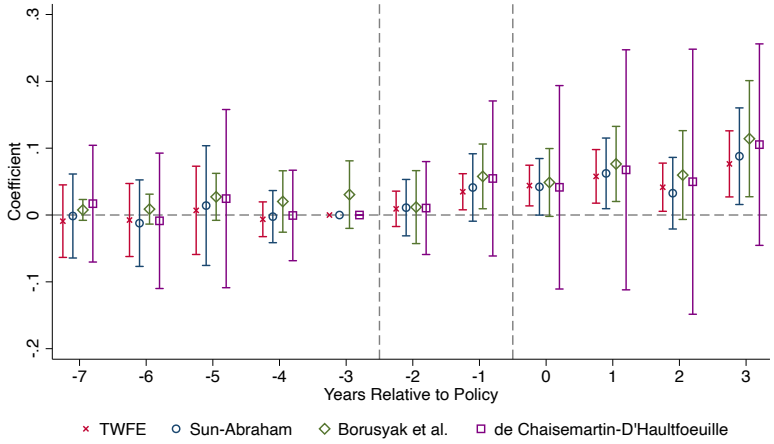
(a) Robust Estimators: Number of Summer Internships



(b) Robust Estimators: Number of Off-Cycle Internships



(c) Robust Estimators: Number of Internships



Notes: This figure overlays the event-study plots constructed using different estimators for the following outcomes: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, and (3) the total number of internships undertaken throughout college. The estimators include the staggered TWFE model , Sun and Abraham (2021), Borusyak et al. (2024), and De Chaisemartin and d'Haultfoeuille (2024). All specifications control for institution and year fixed effects, along with group-specific linear time trends. I normalize the coefficients to zero for the cohort that enter college three years prior to the switch. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level.

Table A1: Year of Switch to Semesters

Institution	Year
Hiram College	1996
Baldwin Wallace University	1998
University of Toledo	1998
Bluffton University	1999
Cleveland State University	1999
Youngstown State University	2000
Cedarville University	2002
Central State University	2005
University of Dayton	2005
Shawnee State University	2007
Otterbein University	2011
Ohio State University	2012
Ohio University	2012
University of Cincinnati	2012
Wright State University	2012
Antioch University	2013
Franklin University	–

Notes: This table presents the 17 colleges and universities in Ohio that are included in the analysis sample, along with the academic year in which they transitioned from quarter to semester systems.

Table A2: Summary Statistics

Variable	Mean	Std Dev	Num of Obs
Panel A: Student Characteristics			
Female	0.488	0.500	407,517
White	0.855	0.352	407,517
Black	0.086	0.281	407,517
Asian Pacific Islander	0.039	0.193	407,517
Hispanic	0.018	0.132	407,517
Duration of Study: $<$ 4 yrs	0.242	0.428	407,517
Duration of Study: 4 yrs	0.501	0.500	407,517
Duration of Study: 5 yrs	0.199	0.399	407,517
Duration of Study: 6 yrs	0.038	0.191	407,517
Duration of Study: $>$ 6 yrs	0.019	0.138	407,517
Field of Study: Biz & Econ	0.261	0.439	407,517
Field of Study: Engineering	0.141	0.348	407,517
Field of Study: Other	0.598	0.490	407,517
Panel B: Internship Uptake			
Number of Internships: Summer	0.207	0.566	407,517
Number of Internships: Off-Cycle	0.075	0.309	407,517
Number of Internships	0.282	0.704	407,517
Panel C: Post-Graduation Outcomes			
Enrollment in Advanced Degree Program in 1 Year	0.146	0.353	407,517
Enrollment in Advanced Degree Program in 3 Years	0.205	0.404	407,517
Enrollment in Advanced Degree Program at Any Time	0.338	0.473	407,517
Enrollment in Doctorate Degree Program at Any Time	0.070	0.255	407,517
Gap to 1st Job (in Months)	22.545	39.602	342,345
Starting Salary (in Thousands, 2010 Dollars)	54.765	25.778	342,345
Non-Entry Level	0.548	0.498	342,345
Occupation: Biz & Mgmt	0.242	0.428	342,345
Occupation: Eng & Math	0.151	0.358	342,345
Occupation: Sales & Adm	0.166	0.373	342,345
Occupation: Education	0.086	0.280	342,345
Occupation: Healthcare	0.074	0.262	342,345

Notes: This table presents the mean, standard deviation, and number of observations for the key variables. The sample includes college students who entered 17 institutions in Ohio between 1990 and 2015.

Table A3: Effect of Switching to Semesters on Summer Internship Participation: Individual-by-Year Level Analysis, by Characteristics of Internship Companies

	Publicly Traded		Outside of Ohio		Outside of the US	
	(1) Yes	(2) No	(3) Yes	(4) No	(5) Yes	(6) No
Semester	0.0018	0.0100**	0.0048*	0.0071***	0.0017**	0.0101**
	(0.0012)	(0.0034)	(0.0026)	(0.0023)	(0.0006)	(0.0039)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics	x	x	x	x	x	x
Mean(Y)	0.007	0.035	0.016	0.026	0.003	0.039
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765

Notes: This table presents the estimates of equation (2). The sample includes undergraduate students enrolled in the 17 institutions between 1990 and 2019. The outcome variables are as follows: (1) whether the student starts a summer internship at a publicly traded or private company; (2) whether the student starts a summer internship out of state or within Ohio; and (3) whether the student starts a summer internship outside of the U.S. or within the country. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A4: Effect of Switching to Semesters on Summer Internship Participation: Individual-by-Year Level Analysis, Excluding the Institutions Ever Under the 4-1-4 System or Trimester System

	Summer Internship		Off-Cycle Internship		Any Internship	
	(1)	(2)	(3)	(4)	(5)	(6)
Semester	0.0116**	0.0118**	-0.0022*	-0.0020*	0.0091	0.0094
	(0.0047)	(0.0047)	(0.0011)	(0.0010)	(0.0053)	(0.0053)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.042	0.042	0.015	0.015	0.054	0.054
N	2,125,103	2,125,103	2,125,103	2,125,103	2,125,103	2,125,103

Notes: This table presents the estimates of equation (2). The sample excludes Otterbein University, which used the 4-1-4 system between 2011 and 2014, Franklin University, which remained on the trimester system from 1984 to 2022, and University of Dayton, which used the trimester system from 1990 to 2004. The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. All regressions control for institution and year fixed effects, along with group-specific linear time trends. Columns (2), (4), and (6) additionally controls for students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A5: Effect of Switching to Semesters on Students' Characteristics: Individual Level Placebo Analyses

	(1) Female	(2) Minority	(3) Biz & Econ	(4) Engineering	(5) Other Majors
Partial	-0.002	-0.001	-0.001	0.012	-0.011
	(0.005)	(0.006)	(0.010)	(0.008)	(0.008)
Full	0.007	0.011*	0.006	0.005	-0.011
	(0.008)	(0.006)	(0.010)	(0.009)	(0.015)
Group-Specific Trend	x	x	x	x	x
Mean(Y)	0.475	0.132	0.249	0.164	0.587
N	255,441	255,441	255,441	255,441	255,441

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) whether the student is female, (2) whether the student is a racial minority, (3) whether the student studies business and economics majors, (4) whether the student studies engineering majors, and (5) whether the student studies majors other than business, economics, or engineering. All regressions control for institution and year fixed effects, and group-specific linear time trends. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A6: Effect of Switching to Semesters on Occupation of the First Job: Individual Level Analysis

	(1) Biz & Mgmt	(2) Eng & Math	(3) Sales & Adm	(4) Education	(5) Healthcare
Partial	0.011***	0.000	0.001	0.001	-0.002
	(0.003)	(0.002)	(0.004)	(0.002)	(0.003)
Full	0.011**	0.008**	0.002	-0.002	-0.003
	(0.004)	(0.003)	(0.004)	(0.002)	(0.003)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.238	0.165	0.161	0.087	0.066
N	255,441	255,441	255,441	255,441	255,441

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables include whether their first job is in the occupation of business and management, engineering and mathematics, sales and administration, education, or healthcare. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A7: Effect of Switching to Semesters on Gap to the First Job and Enrollment in Advanced Degrees: Individual Level Analyses

	Gap to 1st Job	Enrollment in Advanced Degree			Doctorate
	(1)	(2)	(3)	(4)	(5)
	In Months	In 1 Year	In 3 Years	Ever	Ever
Partial	0.560	0.007	0.006	0.001	-0.004
	(0.409)	(0.006)	(0.007)	(0.005)	(0.003)
Full	-0.125	-0.000	-0.001	0.003	-0.006
	(0.393)	(0.006)	(0.006)	(0.007)	(0.004)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	21.385	0.154	0.217	0.335	0.072
N	255,442	300,911	300,911	300,911	300,911

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. I include students without information on their first job after college for columns (2)–(5). The outcome variables are (1) the gap between college graduation and the first job in months, (2) whether students enroll in advanced degree programs within one year of college graduation, (3) within three years of college graduation, (4) ever, and (5) whether they ever enroll in doctorate degree programs. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A8: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis, Robustness

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Panel A: No Student Characteristics					
Partial	0.035*	-0.010	0.025	0.011*	673.415
	(0.019)	(0.006)	(0.022)	(0.006)	(412.590)
Full	0.068**	-0.015*	0.054*	0.013**	934.617**
	(0.023)	(0.008)	(0.027)	(0.005)	(375.479)
Group-Specific Trend	x	x	x	x	x
Student Characteristics					
Mean(Y)	0.250	0.089	0.339	0.548	54940.743
N	255,441	255,441	255,441	255,441	255,441
Panel B: Undergraduate Students with a Study Duration of 4 Years					
Partial	0.037*	-0.006	0.032	0.005	139.071
	(0.018)	(0.007)	(0.020)	(0.006)	(320.356)
Full	0.077***	-0.009	0.068**	0.013**	379.165
	(0.021)	(0.010)	(0.025)	(0.004)	(347.078)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.274	0.085	0.359	0.528	53956.293
N	174,714	174,714	174,714	174,714	174,714
Panel C: All Undergraduate Students, Regardless of Duration of Study					
Partial	0.025	-0.006	0.019	0.004	463.180
	(0.016)	(0.005)	(0.020)	(0.005)	(342.305)
Full	0.063**	-0.010	0.053*	0.013**	906.936***
	(0.026)	(0.007)	(0.030)	(0.005)	(300.459)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.219	0.079	0.299	0.548	54756.057
N	342,039	342,039	342,039	342,039	342,039

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, and group-specific linear time trends. Panels B and C control for students' gender, race and ethnicity, as well as their fields of study in college. Panel B only includes undergraduate students who graduate on time. Panel C includes all undergraduate students, regardless of their duration of study. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A9: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis, Heterogeneity by Gender

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Panel A: Male Students					
Partial	0.024	-0.007	0.017	0.005	749.293
	(0.017)	(0.006)	(0.019)	(0.005)	(439.814)
Full	0.058**	-0.011*	0.048*	0.017***	1020.289***
	(0.025)	(0.005)	(0.025)	(0.005)	(300.472)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.245	0.080	0.325	0.621	59287.068
N	134,071	134,071	134,071	134,071	134,071
Panel B: Female Students					
Partial	0.046**	-0.013*	0.033	0.012***	199.589
	(0.020)	(0.006)	(0.025)	(0.004)	(325.116)
Full	0.079***	-0.018	0.062*	0.008	638.912
	(0.025)	(0.012)	(0.035)	(0.006)	(422.683)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.256	0.099	0.355	0.467	50139.589
N	121,370	121,370	121,370	121,370	121,370

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, group-specific linear time trends, students' race and ethnicity, as well as their fields of study in college. Panel A includes only male students, and Panel B includes only female students. Students' gender are predicted based on their names. The standard errors are clustered at the institution level.

Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A10: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis, Heterogeneity by Race

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Panel A: White Students					
Partial	0.031*	-0.011*	0.020	0.009*	487.782
	(0.017)	(0.006)	(0.021)	(0.005)	(412.022)
Full	0.065**	-0.014*	0.050*	0.010***	697.286**
	(0.024)	(0.008)	(0.028)	(0.003)	(286.627)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.245	0.088	0.333	0.548	54953.622
N	221,761	221,761	221,761	221,761	221,761
Panel B: Minority Students					
Partial	0.055*	-0.000	0.055	-0.000	496.125
	(0.027)	(0.011)	(0.033)	(0.014)	(903.549)
Full	0.086***	-0.012	0.073**	0.023	1952.724*
	(0.023)	(0.007)	(0.026)	(0.018)	(985.826)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.284	0.095	0.379	0.545	54855.949
N	33,680	33,680	33,680	33,680	33,680

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. Panel A includes only white students, and Panel B includes black, Hispanic, Asian, and Pacific Islander students. Students' race and ethnicity are predicted based on their names and locations. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A11: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis, Heterogeneity by Fields of Study

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Panel A: Business and Economics Majors					
Partial	0.065**	-0.004	0.061**	0.011	973.845*
	(0.025)	(0.013)	(0.025)	(0.012)	(514.820)
Full	0.110***	-0.015	0.095***	0.028**	1760.007***
	(0.020)	(0.019)	(0.023)	(0.010)	(572.163)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.320	0.104	0.424	0.613	57878.628
N	63,623	63,623	63,623	63,623	63,623
Panel B: Engineering Majors					
Partial	0.026	-0.010	0.015	-0.004	-495.487
	(0.023)	(0.008)	(0.025)	(0.007)	(452.883)
Full	0.082***	-0.014**	0.068**	0.009	1158.135*
	(0.024)	(0.006)	(0.024)	(0.012)	(588.070)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.374	0.094	0.468	0.753	67001.733
N	41,922	41,922	41,922	41,922	41,922
Panel C: Other Majors					
Partial	0.029*	-0.011	0.017	0.013*	744.602
	(0.014)	(0.008)	(0.019)	(0.007)	(434.070)
Full	0.047**	-0.011	0.036	0.009	502.871
	(0.017)	(0.008)	(0.023)	(0.006)	(400.892)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.186	0.081	0.267	0.463	50320.621
N	149,896	149,896	149,896	149,896	149,896

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. Panel A includes students who study business and economics majors. Panel B includes students who study engineering majors. Panel C includes students who study majors other than business, economics, or engineering. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.