



# **The Labor Market Returns to For-Profit Higher Education: Evidence for Transfer Students**

## **A CAPSEE Working Paper**

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## **Abstract**

This study examines the labor market gains for students who enrolled at for-profit colleges after beginning their postsecondary education in community college. We use student-level administrative record data from college transcripts, Unemployment Insurance earnings data, and progression data from the National Student Clearinghouse across full entry cohorts of community college students in two statewide systems between 2001 and 2006. We calculate the wage gains to attainment across different student transfer patterns. We find significant wage penalties to transfer to a for-profit college instead of a public or private nonprofit college. This earnings gap between higher education sectors is consistent but varies in size across subsamples of students. Importantly, it is only identifiable with a sufficient time window across which enrollment and earnings data are available. Students in for-profit colleges have lower opportunity costs in terms of foregone earnings while enrolled in college, but these do not sufficiently compensate for lower earnings growth post-college.

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# 1. Introduction

Approximately one in 10 college students are enrolled at a for-profit college. Two million students were enrolled at for-profit colleges in 2010, up from less than 400,000 in 2000 (U.S. Department of Education, National Center for Education Statistics [NCES], 2011; U.S. Government Accountability Office [GAO], 2010). Compared with public or private nonprofit colleges, for-profit colleges operate with a different organizational structure with respect to faculty hiring and pay, curricula, pedagogies, and student supports, as well as with a different set of financial constraints (Breneman, 2008). But the existence of for-profit colleges does not reflect unfettered market forces. Almost all students at for-profit colleges rely on federal aid: 94 percent of students at for-profit institutions receive federal aid, compared with 57 percent of students at public colleges and 70 percent of students at private nonprofit colleges (NCES, 2011). Effectively, for-profit colleges are government-funded. Moreover, recent evidence has found high levels of student debt at these colleges, perhaps in part because of unclear, misleading, or even fraudulent recruitment practices (Beaver, 2012; Belfield, 2013; GAO, 2010). For-profit institutions have also been criticized because the narrow focus of their programs may make their graduates more vulnerable to labor market changes (GAO, 1997). Thus, it is important to establish whether for-profit colleges are a good investment for students and taxpayers.

One approach is to compare the labor market returns to for-profit higher education with the labor market returns to enrollment at a public or private nonprofit college. Recent studies have shown a mix of negative and neutral results on relative wage gains across sectors. However, these studies relied on survey data and tended to have small samples of students in for-profit institutions. Further, the students in these studies were enrolled before the for-profit sector began to grow rapidly in the mid-2000s. There are also methodological challenges in identifying who attended a for-profit college (and for what proportion of their college career), as well as finding an appropriate comparison group and adjusting for selection into a for-profit institution.

In this paper, we estimate the labor market returns to students who initially attended community college. Many of these students subsequently transferred to another college, either to complete their intended award or to pursue a bachelor's degree. Our investigation compares the returns to those students who transferred to a for-profit college with the returns to those who transferred to either a public or a private nonprofit college. We estimate the returns using parallel datasets from two states that merge information from community college transcripts, records of attendance at all subsequent colleges, and earnings data reported as part of the Unemployment Insurance program. Our evidence only pertains to students who transfer into the for-profit sector (not all for-profit sector students), but it does allow us to address some of the empirical and methodological challenges in previous studies. The data includes large samples of students who enrolled in for-profit colleges during the mid-2000s, with earnings up to the last quarter of 2012. It also includes information on all colleges attended, allowing us to adjust for the intensity of enrollment in the for-profit sector. By using the community college transcript data, we are able to model for selection into the for-profit sector. The longitudinal nature of the data enables us to

examine how earnings patterns differ before, during, and after college. Further, with data from two statewide community college systems, we are able to evaluate whether there are general relationships independent of state policy or labor market contexts.

Our paper is structured as follows. First, we review the literature and methodological challenges related to estimating the returns to for-profit college attendance. Next, we describe the datasets and the method used in our analysis. We then present our main results on who transfers into the for-profit sector, the work–college trade-off, and the long-term labor market consequences of for-profit enrollment (followed by a series of subsample analyses and robustness checks). In our conclusion, we consider the implications of our findings and note areas for further investigation.

## **2. Background**

### **Differential Returns Across Sectors of Higher Education**

In theory, labor market returns net of tuition should not differ systematically between for-profit, public, and nonprofit colleges because market pressures should force colleges to match the quality of their competitors (Turner, 2006). However, several important market imperfections might lead to differences in returns across sectors (Cellini, 2010, 2012). First, competitive pressures are muted by barriers to entry into and exit from the higher education market (e.g., via accreditation systems and state regulations). Second, there are differences in program offerings across sectors, and, leaving aside malpractice in recruitment, students may not be perfectly informed as to which types of provision are optimal.

One clear difference in provision across sectors relates to input usage (Deming, Goldin, & Katz, 2012). Public colleges and for-profit colleges typically use a very different input mix. For-profit colleges hire more faculty on short-term contracts; invest less in physical plant and research activities; spend more on career counseling; and offer fewer noninstructional services, such as gyms. For-profit colleges also rely more heavily on distance or online learning pedagogies. Students may be unaware of which input mix and pedagogies are most effective at generating human capital and so (systematically) make suboptimal selections. Further, students may be credit-constrained and may select the cheapest sector instead of the one that maximizes net returns.

Differences in provision may also be a function of the efficiency of management or governance structures (Kinser, 2007). Unlike public institutions, which have to satisfy political and social demands (as well as more state and federal regulations), for-profit colleges can focus more directly on teaching students skills that have labor market value so that students can transition into the labor market more immediately. If we assume that tuition is equal across sectors, for-profit colleges might therefore yield higher labor market returns—at least in the short run—than public institutions.

Finally, differences in financing across sectors may affect labor market returns. Public institutions directly receive government subsidies, unlike private nonprofit and for-profit colleges. Also, public and private nonprofit colleges offer institutional aid to reduce tuition fees payable by their students; with this aid, students should be willing to accept lower labor market returns relative to students at for-profit colleges. However, all sectors indirectly rely on government funding insofar as their students are eligible for federal financial aid, and, as noted above, for-profit colleges rely the most on this source of funding.

Overall, it is unclear whether these differences in input usage, technology, management, and financing should lead us to expect lower or higher *net* returns to enrollment at a for-profit college. Cellini and Chaudhary (2012) argued that because for-profit colleges charge higher fees than public colleges, their students should experience higher *gross* labor market returns in compensation. However, for-profit colleges may allow students more flexible enrollment options—for example, by providing more evening classes that students can attend after work. Scheduling flexibility may reduce the opportunity cost of study in terms of foregone earnings. If so, assuming tuition is equal across sectors, for-profit college enrollees might be willing to accept a lower *gross* labor market return after college. Therefore, it is important to examine not only the returns to for-profit college after graduation but also the labor market effects while students are enrolled.

Implicit in the above discussion is the presumption that for-profit colleges and public and private nonprofit institutions serve similar students and offer similar programs. Yet, absent controls for student characteristics, we would expect to observe lower returns to the for-profit sector. For-profit institutions disproportionately serve students who are less prepared for college, including lower income and ethnic minority students as well as those who hold a high school equivalency diploma (Chung, 2012). By contrast, absent controls for course provision, we would expect to observe higher labor market returns at for-profit colleges. For-profit colleges are able to specialize in vocational subjects and provide fewer options in the humanities, and there is substantial evidence that the labor market returns to vocational programs are higher than the returns to humanities programs (Belfield & Bailey, 2011; Gill & Leigh, 2003).

### **Evidence on Labor Market Gains From For-Profit College**

Little attention was paid to the returns to for-profit higher education until recently. Earlier studies by Lyke, Gabe, and Aleman (1991) and Grubb (1993) focused on the returns to proprietary training programs at for-profit colleges. Using data from the High School and Beyond (HS&B) survey, Lyke et al. compared the short-term returns of for-profit graduates to the returns of both high school graduates and students who completed community college or a four-year degree. Students who completed a degree at a for-profit college had employment rates similar to those of high school graduates and earnings similar to those of community college graduates. Using the National Longitudinal Survey of the High School Class of 1972 (NLS-72), Grubb compared wage returns up to 14 years after high school graduation and found that

enrollment, certificates, or awards from for-profit colleges conveyed no earning benefits. These early studies highlight some of the empirical and methodological challenges in examining the returns to for-profit colleges. Both HS&B and NLS-72 had small samples of for-profit students (948 and less than 100, respectively) and high proportions of students who co-enrolled (40 percent for HS&B). Both studies emphasized the heterogeneity of programs and colleges within the for-profit sector but did not adjust for selection into each sector.

Recently, several studies have evaluated the returns to for-profit postsecondary education using sample surveys. Researchers have found mixed to negative returns from attending a for-profit college. Three studies used the Beginning Postsecondary Students Longitudinal Study (BPS). Deming et al. (2012) found that for-profit students had higher unemployment rates and lower earnings six years after initial enrollment. Lang and Weinstein (2012) found that students who earned associate degrees from for-profit colleges experienced no wage gains (whereas students who earned associate degrees at other institutions experienced positive gains) and that returns to certificates were nil across all sectors. However, in revised estimates, Lang and Weinstein (2013) found no difference in returns to certificates and associate degrees across students in for-profits and nonprofits. Using the National Education Longitudinal Study of 1988 (NELS:88), Chung (2009) also found no wage gains for associate degrees but found positive returns to certificates earned at for-profit colleges. Finally, using the National Longitudinal Survey of Youth 1997 (NLSY97), Cellini and Chaudhary (2012) identified comparable returns to completed awards across for-profit and public colleges and found that for-profit students were more likely to be employed after graduation. However, for-profit students who did not complete an award had lower returns than non-completers at public colleges.

The differences in the results of these studies may be explained by empirical and methodological differences. The studies used different ways of identifying for-profit students. Deming et al. (2012) included those students who started in a for-profit college. Lang and Weinstein (2012) also focused on students who initially enrolled at a for-profit institution but controlled for how long the students were enrolled there. Chung (2009, 2012) considered students who had ever enrolled at a for-profit college and those who completed an award. Cellini and Chaudhary (2012) identified for-profit status based whether the student had ever attended a for-profit college. The studies also used different approaches to address the challenges of selection bias. Deming et al. used propensity score matching. Lang and Weinstein used a maximum likelihood sample selection model as well as propensity score matching. Chung (2012) directly addressed selection bias by estimating a multinomial logit of for-profit college choice, including variables for tuition prices, relative earnings, and distance to college. Cellini and Chaudhary used an individual fixed-effects estimation strategy.

Sector-specific differences in labor market gains may reflect the samples of students in for-profit colleges and the precision of estimates using subsamples. Students take many pathways to accumulate human capital at the postsecondary level. There are high rates of co-enrollment and transfer, and the choice of awards has grown, with more students opting for certificates or diplomas. The for-profit sector in particular is heterogeneous, with some very large institutions and



many small proprietary colleges. Survey sample sizes may be insufficient to detect this heterogeneity; whereas there are 1,950 for-profit students in the BPS survey, there are only 438 in the NELS:88 and 226 in the NLSY97. With large variations in returns within the for-profit sector, estimates of labor market gains for subsamples of for-profit students are therefore likely to be imprecise (as found by Cellini & Chaudhary, 2012; Lang & Weinstein, 2012).

Lastly, to our knowledge, there has been no explicit consideration of the earnings gap at separate points before, during, and after college. It is unknown, therefore, whether for-profit colleges do allow students to combine study and work more flexibly and so reduce the opportunity cost of study.

### **3. Data and Method**

#### **Datasets**

We utilize parallel datasets from two statewide community college systems (CCS), referred to here as CCS-A and CCS-B. For CCS-A, our sample is composed of all award-seeking students who were first-time-in-college students at the system's 50+ colleges in the academic years from 2001–02 to 2004–05.<sup>1</sup> Across this period, transcript data are available for 233,220 students. This dataset includes full college transcripts (e.g., courses taken, grades earned, awards received, duration of study), basic personal information (e.g., age, sex, race/ethnicity), and financial aid received (loans and grants per semester).

We merged the college transcript data with student-level data from the National Student Clearinghouse (NSC). The NSC tracks students as they transfer to other Title IV–eligible colleges, which more than one third of all community college students do (NSC, 2012). The NSC dataset includes information on enrollment durations, awards obtained, and field of study at each institution subsequent to enrollment within CCS-A. Based on the name of the transfer institution, we identified its status as for-profit, public, or nonprofit using the Integrated Postsecondary Education Data System (IPEDS) classifications.<sup>2</sup>

Using Social Security numbers, we then merged the combined student dataset with earnings data obtained from the state's Unemployment Insurance records. The earnings data are collected on a quarterly basis from employers covered by Unemployment Insurance and include total earnings from all jobs. Data are available for the period from the first quarter of 1996 to the

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<sup>1</sup> We exclude students who were not in designated programs leading to awards (or curriculum programs) but were enrolled in customized training, personal enrichment courses, or other noncredit programs.

<sup>2</sup> Colleges that are not Title IV eligible are excluded. Cellini and Goldin (2012) estimated that for-profit colleges not eligible for Title IV funding represent one quarter to one third of the for-profit sector.

first quarter of 2012. All earnings are adjusted for inflation to be expressed in 2010 dollars using the quarterly Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).<sup>3</sup>

The dataset for CCS-B was constructed in the same way: student-level transcript data for 85,000 individuals from the state's 20+ community colleges were merged with NSC and Unemployment Insurance data. However, there are three significant differences between the two datasets that restrict our ability to exactly replicate our analyses in both states. First, CCS-B is considerably smaller than CCS-A, and sample size limitations preclude some subgroup analysis for the CCS-B data. Second, the data for CCS-B is for cohorts of students who entered community college in the fall from 2004 to 2006. By 2012, these students had two to three years less labor market experience than the students in CCS-A and so had less opportunity to generate earnings gains in the labor market after exiting college. Third, earnings data are not available for CCS-B prior to 2004, so we are only able to observe pre-college earnings for the 2005 and 2006 cohorts.

We focus on students who transferred after attending a community college, excluding students who enrolled at community college and either dropped out or completed an award but did not then attend another college. Thus, all the students in our sample initially attended a community college: *We are identifying the effect of for-profit attendance relative to public or private nonprofit attendance conditional on this prior enrollment at community college.* Our analysis contrasts with other studies, where the effects are identified based on where the student started, where they graduated, or if they ever attended a for-profit college.

Despite their distinct samples of students, the datasets address some of the empirical and methodological challenges noted in the previous section. We have a large sample of for-profit students who attended college recently, with detailed information on their prior academic background and the amount of time they spent in the for-profit sector. These students can be matched against students with similar academic paths, adjusting for selection into the for-profit sector and allowing for subgroup analysis. We have information on students' earnings before college and during college and thus are able to investigate differences in opportunity cost (forgone earnings) during their college enrollment. Also, for the earliest cohorts, the temporal gap between students' college attendance and our earnings measures allows us to evaluate the longer term effects of education across each sector.

Although the datasets are large and detailed, they have several shortcomings in terms of covariate controls. First, they include no direct information on student socioeconomic status or academic achievement prior to enrollment in CCS-A or CCS-B. In addition, our sample is mostly composed of degree-seeking students, whereas 54 percent of all students at for-profit colleges earn certificates (NCES, 2011). Finally, our sample is composed of students who have not followed a straightforward postsecondary education pathway—that is, who have not enrolled in a

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<sup>3</sup> Although our earnings dataset has low levels of imputation bias, misreporting, and nonresponse, coverage does not include independent contractors, military personnel, some federal personnel, and those working in the informal sector. Nationally, under-coverage is approximately 10 percent of the workforce. Workers who exit the state are also excluded from our dataset. Across the dataset, 91 percent of students had at least one earnings record. Of those with no earnings data, 14 percent were failed matches because of inconsistencies in Social Security numbers.

single institution, completed an award there, and exited into the labor market. Instead, students in our sample started at a community college, attended at least one other institution (consecutively, concurrently, or both), and may not have earned any award. However, a nontrivial proportion of all students now take nontraditional, heterogeneous pathways through college (NSC, 2012).

## **Descriptive Frequencies**

In Appendix Tables 1 and 2, we show descriptive statistics for students who began as first-time enrollees at a community college and subsequently transferred to another institution. For CCS-A, we have data on cohorts beginning between 2001–02 and 2004–05. For CCS-B, we have data for cohorts that began college between 2004 and 2006. For comparison, we also describe the sample of students who never transferred.

For CCS-A, of the 233,220 students in our sample, 40 percent (93,603) transferred. For CCS-B, the rate is 39 percent (23,870 of the 61,262 students). These students are classified as transferring to a for-profit if they ever enrolled at such a college; the remainder are classified next as transferring to a private nonprofit college if they ever did so; and then the residual are classified as transferring to a public college. (Students who transferred within CCS-A or within CCS-B are counted as transfer students within the public sector.) The majority of transfer students transferred to another public college, but we identified 12,679 in CCS-A and 5,842 in CCS-B who transferred to a for-profit college; these comprise 14 and 24 percent of all transfer students, respectively. Reassuringly, the characteristics of our for-profit sample—which had high proportions of female and ethnic minority students—are similar to those reported in Deming et al. (2012, Table 3) and elsewhere.

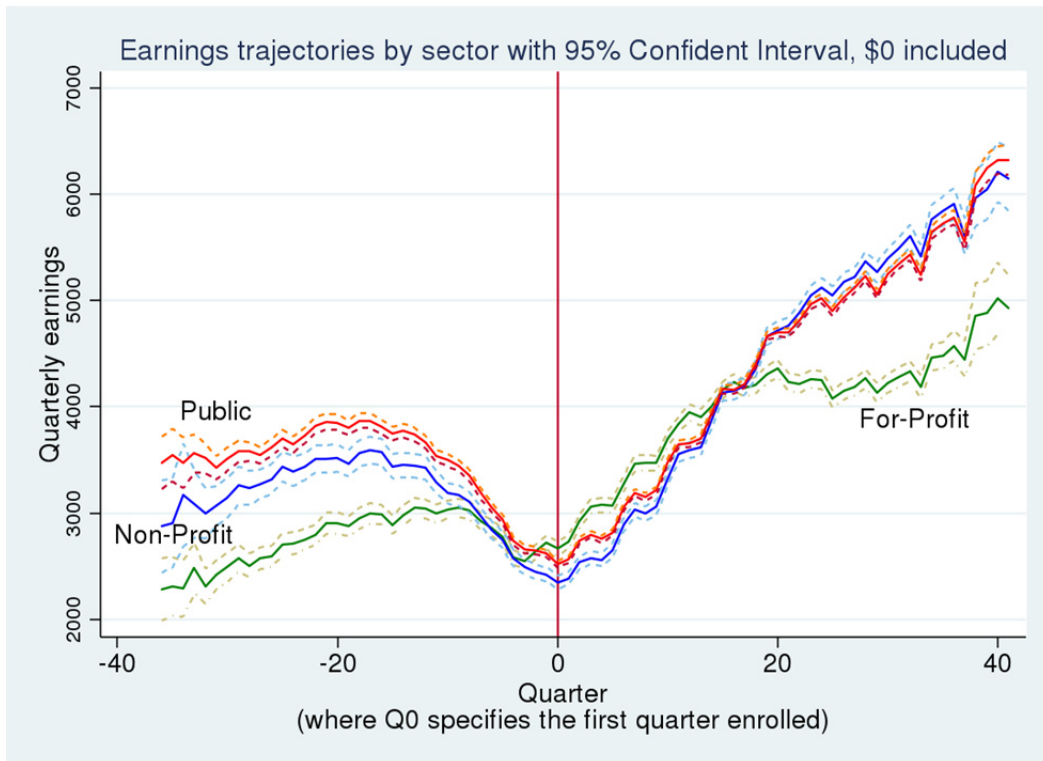
Across both their origin and transfer colleges, for-profit students accumulated less human capital. While enrolled in the community college system, for-profit transfer students earned fewer credits, had significantly lower point averages (GPA), and were less likely to obtain either an associate degree or another award. Thus, adjusting for prior college performance appears to be important. After transferring, the for-profit sample had lower rates of bachelor's degree attainment (especially in CCS-B). Compared with students in the other sectors, the for-profit students in CCS-A were less likely to intend to transfer (data on intentions are not available for CCS-B). In fact, their initial expectations of transfer were closest to those of students who never transferred. Their choice to transfer to a for-profit college may therefore have been an endogenous response to an unsatisfactory experience within the public system. However, unadjusted earnings levels in 2011 differed somewhat between the two systems. In CCS-A, the for-profit transfer students had notably lower earnings than students in the other sectors, despite having slightly more work experience 7–10 years after first enrolling. In CCS-B, the disparities in earnings across sectors are much smaller because the period for analysis is shorter, which is reflected in the lower absolute levels of earnings by 2011 and in the lower experience levels.

As a foretaste of our analysis, Figures 1 and 2 show earnings profiles by sector in CCS-A and CCS-B. For each student, we center the initial entry to community college at quarter zero.

Negative quarters refer to time before enrollment. Positive quarters include those when students were enrolled in community college or a transfer college and after students terminated their higher education. Figures 1 and 2 include all students aged 18 and over with zero earnings (the pattern is very similar when those with zero earnings are excluded).

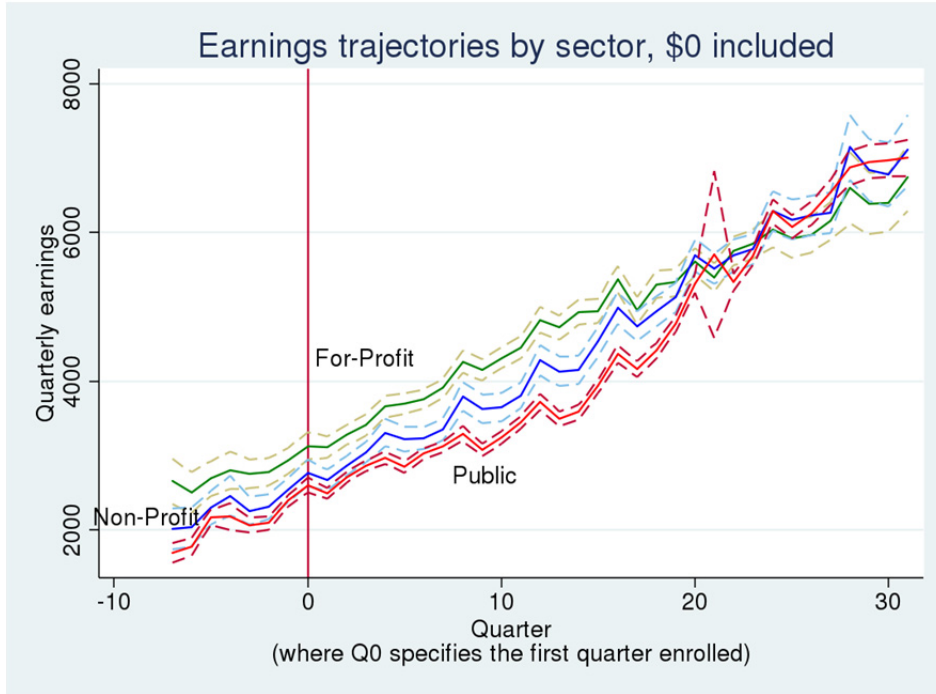
For CCS-A, earnings profiles of for-profit students appear distinct in three ways from those of students in either the nonprofit or public sectors. For-profit students had much lower earnings before entering college. They had higher earnings during their college years (some of which were while they were enrolled in CCS-A). And they had much lower earnings—with a much flatter trajectory—after they exited college. For CCS-B, the earnings profiles cover a shorter time window (before and after initial enrollment) and so show a different pattern. For-profit transfer students had higher earnings in the pre-college period and while enrolled. However, the for-profit students’ earnings then leveled off, while those of other transfer students continued to increase. This earnings plateau begins after approximately 20 quarters, which is very similar to the pattern for students in CCS-A.

**Figure 1: Earnings by Sector of Transfer College Before, During, and After College—CCS-A Sample**



*Note:* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-A from 2001–02 to 2004–05. Students with zero earnings are included after age 18.

**Figure 2: Earnings by Sector of Transfer College Before, During, and After College—CCS-B Sample**



*Note:* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-B in the fall from 2004 to 2006. Students with zero earnings are included after age 18.

## Method for Estimating Labor Market Returns

Our estimation strategy has three elements. We identify students who are likely to enroll in the for-profit sector conditional on their prior performance in community college. Next, we estimate the returns across the entire period before, during, and after college, exploiting the longitudinal nature of the datasets to observe how earnings fall when students are in college and rise as they leave. This allows us to identify the earnings penalty while in college by sector, which we predict will be lower for students in for-profit colleges. Next, we estimate the long-term returns after students' exit from postsecondary education. In doing so, we focus on the large unadjusted earnings gaps 20 or more quarters after full entry into the labor market that are shown in Figures 1 and 2. This analysis corresponds most closely with earlier research on returns at a point in time post-college (Deming et al., 2012). Finally, we perform extensive sensitivity testing and perform subgroup analysis for these estimates.

We begin by estimating a multinomial logit equation to determine student selection into each sector after initial enrollment in CCS-A or CCS-B:

$$Pr(SECTOR = FP, PR, P) = \alpha + \theta EDUC_{t-k} + \beta X_{t-k} + \gamma Z_{t-m} + \varepsilon \quad (1)$$

Subsequent to enrollment in a community college, students choose between the for-profit (*FP*), private nonprofit (*PR*), and public (*P*) sectors. This choice depends on a set of attributes, including prior college education (such as credits and GPA), *EDUC*; a vector of prior college

characteristics,  $X$ ; and precollege personal and ability-related characteristics,  $Z$ . Equation 1 identifies which factors influence the choice to enroll in the for-profit sector relative to other sectors.

Our main estimation approach looks at the entire college and work experiences of community college students:

$$Y_{iq} = \alpha + \beta DIP_{iq} + \theta CCS_{iq} + \gamma NSC_{iq} + \lambda POST\_SECTOR_{iq} + \delta(RACE_i * Q) + \varphi(AGED25_i * Q) + \sigma_i + \varepsilon_{iq} \quad (2)$$

We estimate an equation with all quarterly earnings (before, during, and after college) across each person as the independent variable. The equation includes individual fixed effects,  $\sigma_i$ ; these should control for all student attributes or characteristics that are unchanging (e.g., race/ethnicity, gender, ability). As a check to see if earnings grow differentially by race/ethnicity and age, we include interactions with absolute calendar quarter ( $RACE$ ,  $AGED25$ ). The key variables are indicators for the quarters when the student was enrolled and for the quarters after the student exited his or her terminal college. For quarters when students were enrolled—either in CCS-A or CCS-B or at a transfer college ( $CCS$  or  $NSC$ )—we anticipate lower earnings. For quarters after students left college, we expect that earnings will be higher but that they will differ by sector ( $POST\_SECTOR$ ). Finally, we include earnings in the four quarters preceding initial enrollment in community college; students may have been motivated to enroll because they experienced declining earnings ( $DIP$ ). In our initial fixed effects specification, we examine how post-college earnings gains vary by sector. In a follow-up estimation, we examine the interaction between the enrollment variables and the sector to see if the losses from being enrolled are lower for students in the for-profit sector.

Next, we estimate the returns to community college pathways using a standard Mincerian earnings equation:

$$\ln Y_t = \alpha + \lambda SECTOR_{t-j} + \theta EDUC_{t-k} + \beta X_{t-k} + \gamma Z_{t-m} + \delta EXP_t + \varphi EXP_t^2 + \varepsilon \quad (3)$$

Earnings  $Y$  at time  $t$  are a function of the postsecondary sector (for-profit, private nonprofit, or public) students enroll in after transfer,  $SECTOR$ ; prior college education,  $EDUC$ ; a vector of prior college characteristics,  $X$ ; precollege personal and ability-related characteristics,  $Z$ ; and work experience,  $EXP$ . The coefficients for  $SECTOR$  yield the earnings premium for attending a for-profit or private nonprofit sector college relative to the default of attending a public college, *conditional on initial attendance and performance at community college*. This Mincerian approach provides the more conventional set of estimates of the returns to education, and this approach has been found to be highly robust (Carneiro, Heckman, & Vytlačil, 2011; Rouse, 2007). However, given the college profiles of our sample, both omitted variable bias and selection bias may affect the  $\lambda$  coefficients (see, respectively, Arcidiacono, 2004; Black,

Kolesnikova, & Taylor, 2009). We therefore estimate several alternative specifications and perform a series of robustness checks.<sup>4</sup>

As a further specification check, we estimate earnings gaps using propensity score matching (Lang & Weinstein, 2012). This matching procedure may be used to determine the average effect of the treatment (transferring to a for-profit college) on the treated (individuals that are similar to the for-profit students). We first calculate a propensity score for each student, indicating their tendency to transfer into a for-profit based on their pretreatment characteristics. Using our preferred Mincerian model, we then compare earnings between for-profit and public transfer students with similar propensity scores (see Becker & Ichino, 2002). By imposing the common support and balance condition, propensity score models may offer an advantage over an ordinary least squares estimation. However, these models still assume ignorability conditional on observed covariates—that is, that we have controlled for all the confounding variables that may influence the choice of college sector.

In addition, we perform a series of tests using subsamples for the larger dataset of CCS-A. We test for the selection bias by sector. For-profit colleges may provide programs that are directed more toward labor market success than programs at private nonprofit or public colleges, where other values may be more prized. Thus, we look at the returns controlling for subject of study and at returns specifically for business and health majors. Next, we test for differences between students who earned an award after transferring and those who did not. We look at both bachelor's degrees and associate degrees obtained by transfer students. Relatedly, we compare the earnings of those students who transferred to four-year colleges only and those who transferred without a community college award. These tests are motivated by results from a study by Cellini and Chaudhary (2012), where wage penalties in the for-profit sector were strongest for non-completers. We also restrict the sample to those students who declared transfer as their intent or goal when initially enrolling in a CCS-A college.

We test that we have identified for-profit attendance correctly. This is important, given the multiplicity of colleges attended by students and the differences in durations at each college. We replace our binary measure with percentage of transfer semesters in the for-profit sector (both post-transfer and overall) and estimate the results using only those students who transferred once.<sup>5</sup> Finally, we use data on the entire cohort of CCS-A students to examine whether

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<sup>4</sup> In extensions of this analysis, we use the selection equation to ascertain which covariate controls are most salient for reducing omitted variable bias. We also perform a fixed effects estimation, as per Cellini and Chaudhary (2012). The full CCS-A transcripts yield strong ability controls, and the employment data allow us to control for prior wages and prior employment. However, it may be that the decision of which sector to transfer to depends on a student's performance in the public sector or on whether the student has secured employment already. We are unable to test for these endogenities directly.

<sup>5</sup> By including students in the for-profit group who may have spent more time as a transfer student at another institution, this classification reduces our precision in estimating the effect of for-profit enrollment. In our dataset, students on average transferred 1.7 times, and transfer students who ever attended a for-profit on average attended three schools. Among the students who transferred to a for-profit institution, 7 percent co-enrolled in the for-profit and nonprofit sectors for at least two weeks in at least two different institutions in any given period of time. In our sensitivity tests, we explore different definitions of a for-profit student.

transferring to a for-profit college is better than not transferring at all. Even if for-profit colleges yield lower labor market returns than other sectors, they may still serve as a valuable option for students who would otherwise have terminated their postsecondary education (as noted by Deming et al., 2012).

## 4. Results

### Selection Into For-Profit Colleges

We begin by looking at selection into the for-profit and private nonprofit sectors after enrolling at community college. Given the marketing practices of for-profit colleges and prior evidence on differences in provision, we anticipate a greater proportion of female and minority students in the for-profit sector, as well as more working adults. However, we also expect performance in the original college to be important; whereas private nonprofit colleges may enroll students who have performed well in community college, for-profit colleges may represent a second chance for students who have not prospered.

In Table 1, we report results from a multinomial logit equation where students, having determined to transfer, have a choice between a for-profit and private nonprofit college relative to a public one. The results are similar across the two community college systems. Academic performance at the community college plays a very strong role in sector choice. Students in the for-profit sector accumulated far fewer credits before they transferred, were more likely to transfer without an associate degree, and had much lower GPAs at their college of first enrollment. Interestingly, students who took more online courses at the community college were more likely to switch to the for-profit sector. One possibility is that students who perform well in online courses may seek out colleges that offer more online options. Yet, the gradients for GPA are negative across all course delivery modes, so the effect appears as a comparative advantage in online courses influencing selection into the for-profit sector. More clearly, whereas prior college GPA is positively associated with transfer to the private nonprofit sector, the effect is much stronger for face-to-face courses than for online courses. Performing well in the classroom appears to motivate students to choose private colleges. Finally, for CCS-A, there are strong race/ethnicity differences, even after controlling for ability. Black and Hispanic students who initially attended CCS-A were substantially more likely to select into the for-profit sector.



**Table 1: Selection Into the For-Profit and Private Nonprofit Sectors Versus the Public Sector**

	CCS-A				CCS-B			
	Female		Male		Female		Male	
	For-profit	Private Nonprofit	For-profit	Private Nonprofit	For-profit	Private Nonprofit	For-profit	Private Nonprofit
CCS credits	-0.007*** [0.001]	0.001 [0.001]	-0.007*** [0.002]	-0.004*** [0.001]	-0.016*** [0.002]	-0.004*** [0.001]	-0.015*** [0.001]	-0.006*** [0.001]
CCS associate degree	0.033 [0.064]	0.242*** [0.051]	0.092 [0.115]	0.344*** [0.076]	-0.086 [0.118]	0.349*** [0.081]	0.017 [0.091]	0.021 [0.073]
CCS diploma	-0.802*** [0.170]	-0.213* [0.122]	0.184 [0.388]	0.349 [0.304]	4.014*** [1.262]	1.581 [1.541]	3.083*** [1.149]	-17.460*** [0.957]
CCS certificate	0.182 [0.134]	-0.034 [0.140]	-0.094 [0.270]	-0.101 [0.213]	0.381*** [0.148]	0.149 [0.115]	0.306** [0.126]	0.250** [0.104]
Proportion CCS courses online	0.547*** [0.104]	0.114 [0.090]	0.494*** [0.191]	0.445*** [0.140]	1.858*** [0.204]	1.218*** [0.181]	1.530*** [0.171]	1.146*** [0.156]
CCS GPA—online courses	-0.148*** [0.023]	0.060*** [0.022]	-0.124*** [0.038]	0.060** [0.031]	-0.171*** [0.034]	-0.004 [0.031]	-0.181*** [0.029]	0.002 [0.027]
CCS GPA—face-to-face courses	-0.138*** [0.031]	0.207*** [0.033]	-0.198*** [0.053]	0.151*** [0.043]	-0.759*** [0.052]	-0.132*** [0.046]	-0.684*** [0.042]	-0.036 [0.040]
Black	1.408*** [0.050]	0.335*** [0.046]	1.255*** [0.093]	0.334*** [0.082]	0.388** [0.171]	0.245 [0.165]	0.116 [0.160]	0.252 [0.167]
Hispanic	0.647*** [0.151]	-0.118 [0.136]	0.680*** [0.223]	-0.076 [0.191]	-0.383** [0.174]	-0.320** [0.159]	-0.070 [0.147]	-0.256* [0.143]
Enrolled after age 20	0.388*** [0.056]	-0.072 [0.047]	0.254** [0.099]	0.114 [0.071]	-0.273*** [0.096]	-0.140* [0.083]	-0.190** [0.077]	-0.145** [0.073]
Work experience	0.038*** [0.011]	0.025*** [0.009]	0.047** [0.022]	-0.015 [0.014]	0.077*** [0.019]	0.036** [0.016]	0.064*** [0.013]	0.039*** [0.012]
Work experience squared	-0.001*** [0.000]	-0.001*** [0.000]	-0.001** [0.001]	0.000 [0.000]	-0.002*** [0.001]	-0.001** [0.001]	-0.002*** [0.000]	-0.001** [0.000]
Observations	20,849		10,250		6,309		8,119	

*Note.* Multinomial logit estimation. Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-A in the academic years 2001–02 to 2004–05 or in CCS-B in the fall from 2004 to 2006. Model for CCS-A includes background characteristics (expected annual family contribution; average per semester of grants, loans, and total financial aid), first enrollment after age 20, work experience (squared), and college intentions/goals. Model for CCS-B includes other race, aid eligibility, first enrollment after age 20, and work experience (squared). Robust standard errors reported in brackets.

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

## Labor Market Returns Across Sectors Before, During, and After College

We show results using two quarterly earnings individual fixed effects models for all transfer students in Table 2. As per the specification in equation 2, model 1 establishes the results for earnings after all college enrollments, and model 2 shows how sector choices influence the opportunity cost of college. (For ease of comparison across coefficients, the dependent variable is earnings in dollars, although as shown in Appendix Tables 1 and 2, the absolute earnings of the CCS-B sample are lower than those of the CCS-A sample.) The results for the two models accord with human capital theory and are almost identical across the two community college systems.

Using model 1, we first identify an Ashenfelter dip. Earnings were lower by approximately \$320 for CCS-A students and \$620 for CCS-B students in the quarters one year before students enrolled in community college. These impacts are quite strong, given that many students in the sample had limited prior attachment to the labor force. Next, we see earnings which were generally lower while the students were in community college. For CCS-A, the earnings penalties are -\$137 for women and -\$35 for men; for CCS-B, the penalties are -\$453 and -\$465, respectively. Similarly, students experienced earnings penalties while attending their transfer college. For CCS-A, these penalties are significantly larger at -\$832 for women and -\$875 for men, which suggests greater time commitments at the transfer institution than at the community college. For CCS-B, both men and women experienced earnings penalties from attending a transfer college (-\$524 and -\$451 respectively), but only women experienced significantly larger penalties at the transfer college than at the community college.

Of central interest is the earnings gain after the completion of all postsecondary education. In the quarters after students terminated their college enrollments, all students experienced significant gains in earnings. However, the gains differed by sector. For CCS-A, students who exited from a for-profit college had earnings that were subsequently \$309 and \$511 higher per quarter, among women and men respectively. Yet students who exited from other sectors had much larger earnings boosts: \$1,081 among women and \$864 among men who exited from the nonprofit sector, and \$551 among women and \$562 among men who exited from the public sector. For CCS-B, the gaps follow the same pattern. In the quarters after exiting from a for-profit college, female and male students gained \$763 and \$473 in earnings per quarter respectively. By contrast, exiting from private nonprofit colleges yielded much higher gains of \$965 for women and \$962 for men, and exiting from public colleges yielded gains of \$1,129 and \$1,075 respectively. These sector differences are statistically significant (*F*-test, not reported)—except for the difference between male students in the for-profit and public sectors in CCS-A. These results are not driven by differences across racial/ethnic groups. Table 2 shows that the earnings growth for most groups of racial/ethnic minority students (except Black students in CCS-B) was relatively faster than the earnings growth for White students. Overall, the results suggest the lower effectiveness of the for-profit sector in generating human capital that is valuable in the labor market.

**Table 2: Returns to Transfer Across Sectors: Average Quarterly Earnings Fixed Effects**

	Model (1)				Model (2)			
	CCS-A		CCS-B		CCS-A		CCS-B	
	Female	Male	Female	Male	Female	Male	Female	Male
Ashenfelter dip	-326.7*** [8.628]	-311.6*** [12.15]	-614.0*** [34.18]	-624.9*** [29.88]	-325.3*** [8.623]	-311.2*** [12.15]	-602.9*** [34.32]	-618.4*** [30.47]
Quarters in CCS	-136.9*** [9.086]	-35.47*** [11.83]	-452.8*** [25.26]	-465.1*** [23.76]	-155.3*** [9.028]	-39.89*** [11.77]	-441.9*** [25.48]	-458.4*** [23.34]
Quarters in transfer college	-832.4*** [8.048]	-875.2*** [10.49]	-523.5*** [21.96]	-451.3*** [64.33]	-785.8*** [8.283]	-862.6*** [10.85]	-484.2*** [22.52]	-426.9*** [71.81]
Quarters in transfer college × for-profit					655.6*** [36.50]	593.3*** [66.79]	-72.21 [91.30]	125.7 [96.89]
Quarters in transfer college × nonprofit					-602.1*** [30.94]	-290.3*** [38.75]	-574.7*** [111.7]	-569.6*** [110.1]
For-profit transfer post quarters	309.2*** [34.65]	510.6*** [60.03]	762.8*** [82.75]	473.0*** [72.17]	87.17** [38.42]	338.7*** [66.33]	782.2*** [95.16]	452.7*** [80.58]
Nonprofit transfer post quarters	1,081*** [27.77]	864.4*** [39.20]	965.4*** [103.5]	961.7*** [90.09]	1,266*** [32.81]	946.5*** [44.48]	1,113*** [125.6]	1,101*** [105.0]
Public transfer post quarters	550.8*** [12.47]	561.7*** [16.80]	1,129*** [49.77]	1,075*** [64.25]	548.0*** [12.47]	560.9*** [16.80]	1,137*** [49.61]	1,081*** [62.84]
Quarter × Black	32.33*** [1.04]	19.07*** [1.40]	-41.16*** [10.75]	-2.598 [8.586]	32.32*** [1.04]	19.04*** [1.40]	-41.33*** [10.74]	-2.623 [8.586]
Quarter × Hispanic	6.04** [2.74]	0.27 [2.90]	40.44*** [8.421]	31.23*** [7.411]	5.83** [2.74]	0.23 [2.90]	40.05*** [8.431]	30.96*** [7.416]
Quarter × other race/ethnicity	31.28*** [2.297]	24.08*** [2.740]	55.84*** [9.734]	22.21*** [7.933]	31.17*** [2.296]	24.06*** [2.740]	55.57*** [9.717]	21.98*** [7.956]
Quarter × aged 25+	-43.67*** [1.06]	-62.18*** [1.60]	17.25*** [5.720]	23.52** [10.00]	-43.75*** [1.06]	-62.19*** [1.60]	16.97*** [5.725]	23.33** [9.931]
R <sup>2</sup>	0.039	0.029	0.079	0.009	0.040	0.030	0.080	0.009
Student observations	80,841	57,485	6,935	8,367	80,841	57,485	6,935	8,367
Quarter observations	2,796,928	1,988,239	176,944	214,566	2,796,928	1,988,239	176,944	214,566

*Note.* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-A in the academic years 2001–02 to 2004–05, with average non-missing quarterly earnings from Q1 2000 to Q1 2012, and all award-seeking, first-time-in-college students who enrolled in CCS-B in the fall from 2004 to 2006, with average non-missing quarterly earnings from Q1 2005 to Q4 2012 (adjusted for inflation to 2010 dollars). Quarters are calendar quarters. Ashenfelter dip is defined as the average quarterly earnings in four quarters before enrollment in CCS. Constant term included. Robust standard errors reported in brackets.

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

Next, we use the results from model 2 to examine whether students in for-profit colleges were able to work more intensively while studying—that is, if the opportunity cost of being in college was lower for these students. Model 2 follows the same specification as model 1, but it includes interaction terms for quarters enrolled in a transfer institution by sector. These results are given in the right panel of Table 2, and the pre- and post-college earnings effects are very close to those for model 1. The interaction terms show that the opportunity cost of attending college differs by sector. For CCS-A, there remains a significant cost to being enrolled in a transfer college, but the interaction terms show this cost to be much lower for students in for-profit colleges. Net, the forgone earnings from enrollment in a for-profit college were -\$130 for women and -\$269 for men, or about one quarter the size of the loss for students in public colleges (and one tenth that of students in nonprofit colleges). For CCS-B, there is a clear earnings penalty from being enrolled at a public (for male students) or private nonprofit transfer college. The net wage penalties of students who transferred to for-profit colleges were -\$301 for male students and -\$556 for female students, or about one third of the size of the penalties students at private nonprofit colleges experienced. Thus, there is evidence that for-profit colleges do offer students a chance to work more intensively while enrolled. Interestingly, the losses students experienced while enrolled in for-profit colleges were similar in magnitude to those they experienced when enrolled in community colleges, suggesting that students may have a threshold opportunity cost for being in college.<sup>6</sup>

### **Labor Market Returns Across Sectors After Exiting Postsecondary Education**

We now turn to the longer term effects of college attendance on earnings. In Table 3, we report the results from a basic Mincerian earnings equation for transfer students. This specification follows the general Mincerian approach to identifying earnings differences, so we report coefficients rather than absolute dollar amounts. In addition to controlling for background characteristics and work experience before and after college, we control for an array of pre-transfer variables, including college fixed effects (and student intentions/goals for CCS-A). Academic performance at community college was especially important in determining transfer (as shown in Table 1), so we control for pre-transfer awards, overall GPA, and credits accumulated. We report results for both community college systems, although we emphasize that the window for identifying earnings gains is much shorter for CCS-B than for CCS-A and that the sample for CCS-B is much smaller (with those missing earnings excluded).

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<sup>6</sup> In a third specification, we include an interaction term for each sector with enrollment in the community college system. This interaction term shows earnings gaps across students while in community college by transfer status. For CCS-A, these interaction terms are not statistically significant. For CCS-B, both students who intended to transfer to for-profits and students who intended to transfer to private nonprofit colleges earned more while enrolled in community college than did students who intended to transfer to public colleges.

**Table 3: Returns to Transfer Across Sectors: Log Average Quarterly Earnings in 2011**

	CCS-A		CCS-B	
	Female	Male	Female	Male
CCS GPA	0.150*** [0.008]	0.147*** [0.010]	0.215*** [0.018]	0.221*** [0.015]
CCS credits	0.002*** [0.000]	0.001*** [0.000]	-0.003*** [0.001]	-0.003*** [0.000]
Relative to CCS credits but no award				
CCS certificate (pre-transfer)	-0.152*** [0.045]	-0.151*** [0.048]	0.215*** [0.018]	0.221*** [0.015]
CCS diploma (pre-transfer)	0.180*** [0.043]	-0.283*** [0.091]	-0.003*** [0.001]	-0.003*** [0.000]
CCS associate degree (pre-transfer)	0.114*** [0.019]	-0.013 [0.027]	0.215*** [0.018]	0.221*** [0.015]
Relative to public college transfer				
Transfer to for-profit college	-0.054*** [0.029]	-0.070** [0.029]	0.184*** [0.042]	0.183*** [0.036]
Transfer to private nonprofit college	0.052*** [0.014]	-0.004 [0.022]	0.121*** [0.041]	0.086** [0.036]
Background characteristics	X	X	X	X
College fixed effects	X	X	X	X
Intent/goal	X	X		
$R^2$	0.127	0.143	0.074	0.075
Observations	41,566	24,682	6,756	5,391

*Note.* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-A in the academic years 2001–02 to 2004–05 and in CCS-B in the fall from 2004 to 2006. Table shows log average of non-missing quarterly earnings in 2011 (adjusted for inflation to 2010 dollars). Background characteristics include race/ethnicity (four dummy variables); years of work experience and square of years of work experience; and first enrollment after age 20. Background characteristics for CCS-A also include expected family contribution (annual) and average per semester of grants, loans, and total financial aid. Background characteristics for CCS-B also include aid eligibility. College variables are dummy variables for each CCS college; for CCS-B, variables also include college-level proportion applying for financial aid, college size, percent female, and percent minority. For CCS-A, intent dummy variables include intent to earn associate degree, intent to transfer to four-year college, and intent to enroll in occupational program (omitted category: intent to earn high school diploma). Goal dummy variables include goal of associate degree, goal of transfer to four-year college, and goal of enhancing job skills (omitted category: goal of personal enrichment). Robust standard errors reported in brackets.

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

Straightforwardly, transfer students in both college systems with higher GPAs had higher earnings. Some CCS-A awards were associated with higher earnings, but these coefficients must be interpreted cautiously because community colleges awards do not represent the full extent of the educational attainment of transfer students (and the returns to credits are net of awards). In Table 3, we show the effect of transferring to a for-profit or private nonprofit college relative to transferring to a public college.

The results differ across CCS-A and CCS-B. For students in CCS-A, the for-profit effect is clearly negative. For female students, transfer to a for-profit college was associated with earnings that were 5.4 percent lower than transfer to a public college and 10.6 percent lower than transfer to a private nonprofit college. For male students, transfer to a for-profit college was associated with earnings that were 7 percent lower than those of students in the both the public and private nonprofit sectors (between which sectors there was no statistically significant difference). These earnings gaps, controlling for prior college performance, appear to be substantively important and contribute to the evidence that there is a labor market penalty associated with attending a for-profit college.<sup>7</sup> For students in CCS-B, both men and women who transferred to a for-profit college earned 18 percent more than students who transferred to a public college. Compared with students who transferred to the nonprofit sector, women who transferred to for-profits earned 6 percent more, and men who transferred to for-profits earned 10 percent more.

This discrepancy is in large part explained by the shorter window for analysis for the CCS-B sample. For-profit enrollment offsets some of the earnings loss from enrollment in other sectors, and this effect persists for at least 20 quarters after initial enrollment (see Figure 2). As a direct test of this explanation, we re-estimate the specifications for CCS-A using the same cohorts (2004–06) and time window as is available for CCS-B. These results are reported in the second panel of Appendix Table 3, alongside the results for CCS-B from Table 3. For CCS-A, the negative and statistically significant effect for male students transferring to for-profit colleges remains. However, the coefficient for female students in CCS-A is not statistically significant. Thus, with a shorter window, the penalties from enrolling at a for-profit institution are underestimated compared with estimations over the longer time horizon.<sup>8</sup>

## Specification and Robustness Checks

Although Mincerian earnings estimates are typically robust, our sample of students is not a conventional one, though many students apart from those in our sample also follow

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<sup>7</sup> That said, these gaps do not appear to be compounded by differences in employment rates, as found by Deming et al. (2012). We estimate a comparable model to that in Table 2 where the outcome is employment in 2011. Employment rates across all sectors are high, and the only group with a statistically significant advantage is male students who transfer to private nonprofit colleges; otherwise, for-profit students have post-transfer employment rates that are comparable to those in other sectors. Details are available from the authors.

<sup>8</sup> Moreover, results using shorter time windows are less robust. In the third and fourth panels of Appendix Table 3, we report estimation results for CCS-A using short time windows but for different cohorts. These results show both positive and negative effects of transferring to a for-profit college.

nontraditional paths through postsecondary education (see the discussion in Altonji, Blom, & Meghir, 2012). Therefore, we perform a series of specification and robustness checks. We report these checks for both community college systems where possible but again emphasize the larger samples and longer windows for earnings data of the CCS-A sample.

First, we perform propensity score matching to yield an alternative counterfactual group of students. We match students based on both personal characteristics and prior college performance and compare the earnings of for-profit students with those of students in the public sector within the matched pairs. The for-profit and public groups reach balance on all of the precollege characteristics.<sup>9</sup> Appendix Figures 1–4 show the overlap of propensity scores. There are fewer public transfers to match against the for-profit transfers as the propensity scores increase. (For four of the for-profit students in CCS-A, there are no matches from the public group; these students are dropped in the propensity score estimation.) The four figures also show that as the propensity score increases, the wage penalty of for-profit students grows (although there is a sharp wage gain at the tail of the female distribution in CCS-B).

For CCS-A, Table 4 shows results similar to those in Table 3. The earnings penalty for transferring to a for-profit college persists and is similar in magnitude to the ordinary least squares (OLS) results (7 percent for female students and 9 percent for male students). This finding holds if matching is pooled across genders. The results for CCS-B are consistent with Table 3 but show slightly higher gains from for-profit college for female and male students.

**Table 4: Returns to Transfer to a For-Profit College Relative to a Public College**

	CCS-A		CCS-B	
	Female	Male	Female	Male
Transfer to for-profit college relative to public college	-0.063** [0.026]	-0.091** [0.041]	0.210*** [0.055]	0.252*** [0.069]
$R^2$	0.147	0.189	0.124	0.104
Observations	11,091	3,852	2,167	1,687

*Note.* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-A in the academic years 2001–02 to 2004–05 and CCS-B in the fall from 2004 to 2006. Table shows log average of non-missing quarterly earnings in 2011 (adjusted for inflation to 2010 dollars). Specification includes variables as per Table 3. Robust standard errors reported in brackets.

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

<sup>9</sup> We use nearest-neighbor matching with a caliper of 0.05. Less than 1 percent of the sample is off-support. A balance check table is available from the authors.

One possible explanation for the earnings gap is that students in the for-profit sector were less likely to complete an award, perhaps partly because they transferred with fewer credits. In Table 5, we re-estimate the OLS model of Table 3 but separately identify students who obtained a bachelor's degree. For CCS-A, compared with students who transferred into the public system but did not obtain a bachelor's degree, for-profit students who failed to earn a bachelor's degree did have lower earnings (4 percent and 6 percent lower for female and male students, respectively). However, students in the for-profit sector who earned a bachelor's degree had earnings as high as those of bachelor's degree holders in the other sectors. This result—that the earnings penalty was clustered among those who failed to complete an award—corresponds with evidence from Cellini and Chaudhary (2012). For CCS-B, there are statistically significant gains for female students who transferred to for-profit colleges regardless of whether they earned a bachelor's degree. These results also show an earnings penalty for having a bachelor's degree from other colleges, which is most likely attributable to the relatively short follow-up period.

Exploiting the size of our dataset for CCS-A, we report a series of additional sensitivity checks in Table 6. The adverse effect of for-profit transfer varies across subsamples. Columns 1–2 show that the earnings gap appears greater when the sample is restricted to students who transferred to a four-year institution and to students who initially declared an intent to transfer. Notably, there is a large penalty for female students who graduated in either health or business majors, although this penalty is also observable for students in private nonprofit colleges. Finally, we split the sample according to associate degree receipt prior to transfer. For-profit students reported lower earnings regardless of whether they earned an associate degree before transfer.

In drawing conclusions from our findings, one important consideration is whether the student's status in the for-profit sector has been accurately measured.<sup>10</sup> In our sensitivity tests, we explore different definitions of a for-profit student. We re-estimate the OLS equation, replacing the sector dummies with a single variable representing percentage of time after transfer in the for-profit sector. This variable is strongly negative and statistically significant.<sup>11</sup> Thus, the proportion of time in, as well as ever having attended, the for-profit sector is negatively associated with subsequent earnings.

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<sup>10</sup> Including students in the for-profit group who may have spent longer as a transfer student at another institution reduces our precision at estimating the effect of for-profit enrollment. In our dataset, students on average transferred 1.7 times, and transfer students who ever attended a for-profit on average attended three schools. Among the for-profit transfer students, 7 percent co-enrolled in the for-profit and nonprofit sectors for at least two weeks in at least two different institutions in any given period of time.

<sup>11</sup> Within CCS-A for female students, the coefficient is -0.134 ( $p < .01$ ), and for male students, the coefficient is -0.142 ( $p < .01$ ). For CCS-B, the coefficient is 0.167 ( $p < .01$ ) and 0.182 ( $p < .01$ ) respectively.



**Table 5: Returns to Bachelor's Degrees and Transfer Across Sectors: Log Average Quarterly Earnings in 2011**

	CCS-A		CCS-B	
	Female	Male	Female	Male
Relative to public college transfer but no bachelor's degree				
Transfer to for-profit college—no bachelor's degree	-0.036* [0.020]	-0.057* [0.032]	0.144*** [0.047]	0.162*** [0.040]
Transfer to private nonprofit college—no bachelor's degree	0.064*** [0.019]	0.041 [0.028]	0.189*** [0.051]	0.060 [0.046]
Transfer to for-profit college and bachelor's degree	0.418*** [0.032]	0.436*** [0.064]	0.366*** [0.098]	0.218** [0.087]
Transfer to private nonprofit college and bachelor's degree	0.408*** [0.022]	0.249*** [0.035]	-0.136 [0.088]	0.009 [0.063]
Transfer to public college and bachelor's degree	0.450*** [0.016]	0.366*** [0.020]	-0.302*** [0.099]	-0.168** [0.076]
CCS awards, GPA, and credits	X	X	X	X
Background characteristics	X	X	X	X
College fixed effects	X	X	X	X
Intent/goal	X	X		
$R^2$	0.146	0.155	0.079	0.077
Observations	41,566	24,682	5,391	6,756

*Note.* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-A in the academic years 2001–02 to 2004–05 and CCS-B in fall from 2004 to 2006. Table shows log average of non-missing quarterly earnings in 2011 (adjusted for inflation to 2010 dollars). Specification includes variables as per Table 2. Robust standard errors reported in brackets.

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

**Table 6: Log Average Quarterly Earnings in 2011: Alternative Specifications and Subsamples for CCS-A**

	Transferred to a Four-Year College	Declared Intent to Transfer	Completed Health or Business Majors	Earned Associate Degree Before Transfer	Did Not Earn Associate Degree Before Transfer	Earned Bachelor's Degree	Did Not Earn Bachelor's Degree
Female							
For-profit transfer	-0.210*** [0.020]	-0.067*** [0.018]	-0.165*** [0.063]	-0.100** [0.045]	-0.040** [0.019]	-0.051 [0.034]	-0.007 [0.023]
Private nonprofit transfer	-0.061*** [0.015]	0.061*** [0.014]	-0.153*** [0.042]	-0.109*** [0.030]	0.085*** [0.016]	-0.061*** [0.022]	0.108*** [0.024]
$R^2$	0.132	0.120	0.120	0.101	0.139	0.108	0.137
Observations	30,808	41,566	3,656	7,209	34,357	13,685	20,549
Male							
For-profit transfer	-0.168*** [0.033]	-0.077*** [0.029]	-0.027 [0.156]	0.073 [0.078]	-0.080** [0.031]	0.043 [0.067]	-0.049 [0.037]
Private nonprofit transfer	-0.062*** [0.023]	-0.004 [0.022]	-0.081 [0.114]	-0.081 [0.053]	0.005 [0.024]	-0.131*** [0.035]	0.046 [0.033]
$R^2$	0.130	0.139	0.281	0.132	0.152	0.109	0.173
Observations	17,596	24,682	554	3,478	21,204	7,956	13,109

*Note.* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-A in the academic years 2001–02 to 2004–05. Table shows log average of non-missing quarterly earnings in 2011 (adjusted for inflation to 2010 dollars). Specification includes variables as per Table 2. Robust standard errors reported in brackets.

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

Finally, we extend our analysis to include all students who start in the community college system. That is, we see if there are gains to transferring to the for-profit sector as opposed to not transferring at all. Again using the CCS-A sample, we re-estimate the OLS model for all students and report the earnings premiums from transfer relative to non-transfer in Table 7.

Unsurprisingly, students who transferred to either public or private nonprofit colleges had higher earnings, either because they obtained a bachelor's degree or simply because they had more credits. Only female students experienced gains from transferring into the for-profit sector, earning 11 percent more than non-transfer students did. For male students, we cannot identify any earnings gain from transferring to a for-profit college versus not transferring.

**Table 7: Returns to Any Transfer: Log Average Quarterly Earnings in 2011 for CCS-A**

	Female	Male
Relative to no transfer		
Transfer to for-profit college	0.101*** [0.016]	-0.007 [0.028]
Transfer to private nonprofit college	0.246*** [0.014]	0.066*** [0.022]
Transfer to public college	0.189*** [0.009]	0.066*** [0.012]
CCS-A awards, GPA, and credits	X	X
Background characteristics	X	X
College fixed effects	X	X
Intent/goal	X	X
$R^2$	0.129	0.157
Observations	90,831	56,281

*Note.* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-A in the academic years 2001–02 to 2004–05. Table shows log average of non-missing quarterly earnings in 2011 (adjusted for inflation to 2010 dollars). Specification includes variables as per Table 2. Robust standard errors reported in brackets.

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

## 5. Discussion and Conclusion

In response to the growth of for-profit postsecondary education, there has been a blossoming of research to estimate its impact on students. Little of this evidence has been encouraging, with many studies finding lower academic attainment and earnings among students who enroll in for-profit colleges, despite their higher tuition and fees. Looking over a sufficient time period, our inquiry affirms this general conclusion for students who transfer to for-profit colleges. Although these transfer students followed a complicated path through their postsecondary education, we identify a statistically significant wage penalty from enrolling in a for-profit institution. This penalty appears consistent across subgroups of students, although it is greatest for for-profit students who did not complete an award. Given that the for-profit institutions in our sample are likely to be the most stable and largest, the penalty from enrollment across the entire for-profit sector is likely to be even larger. Importantly, these results are only evident if we look over a long enough time period. Over a window of only a few years, the gaps between sectors are not precisely identified.

Nevertheless, we find differences in the opportunity cost of attending college across sectors, suggesting that there is a trade-off between earnings while enrolled and long-term earnings. Our results for both community college systems show that for-profit students can earn more while studying. For students who are credit-constrained, the for-profit sector may therefore be an attractive option. However, insofar as attending a for-profit college leads to lower accumulation of human capital, this option is a false economy. The results from Table 2 can be used to calculate present value earnings returns over the decade after first enrollment. CCS-A students forgo earnings while attending their transfer college; per quarter, the loss is \$200 for for-profit students, \$830 for public college students, and \$1,270 for nonprofit students. After leaving college, earnings gains per quarter are \$210 for for-profit students, \$560 for public college students, and \$1,110 for nonprofit students. Assuming six quarters in college and employment for the rest of the decade, the present value net earnings gains are \$5,400 for for-profit students, \$12,300 for public college students, and \$26,700 for private college students (discount rate, 5 percent). Following the same calculations for CCS-B, the present value net earnings gains are \$16,500, \$31,600, and \$28,100 respectively, affirming that for-profit students gain least over the longer term. Extended over a working life, the differences become much greater—and of course, these figures do not account for the higher tuition prices at for-profit colleges. Policies that ease credit constraints may encourage more students to take a longer horizon when deciding on their choice of college.

Given the high rates of transfer by college students and the large number of colleges to choose from, our results prompt investigation into what factors motivate students to enroll at a particular institution. Students may be poorly informed about what college is the right fit for them, or unaware of the many ways in which provision may differ across higher education sectors. Policies to increase the comparative information available to students therefore hold promise.

Our analysis shows the many differences in student characteristics across sectors and highlights the role of for-profit colleges as a preferred destination for students who have not had success at the community college level. One motivator to switch to the for-profit sector may be the perceived convenience of online learning. Evidence on the quality of online pedagogy may therefore be needed to explain the earnings disadvantages of for-profit students.

## References

- Altonji, J. G., Blom, E., & Meghir, C. (2012). Heterogeneity in human capital investments: High school curriculum, college major, and careers. *Annual Review of Economics*, 4, 185–223.
- Arcidiacono, P. (2004). Ability sorting and the returns to college major. *Journal of Econometrics*, 121(1–2), 343–375.
- Beaver, W. (2012). Fraud in for-profit higher education. *Society*, 49(3), 274–278.
- Becker, S. O., & Ichino, A. (2002). Estimation of average treatment effects based on propensity scores. *Stata Journal*, 2(4), 358–377.
- Belfield, C. R. (2013). Student loans and repayment rates: The role of for-profit colleges. *Research in Higher Education*, 54(1), 1–29.
- Belfield, C. R., & Bailey, T. (2011). The benefits of attending community college: A review of the evidence. *Community College Review*, 39(1), 46–68.
- Belfield, C. R., Liu, V., & Weiss, M. J. (2013). *The medium-term labor market returns to community college awards: Evidence from North Carolina* (CAPSEE Working Paper). New York, NY: Center for Analysis of Postsecondary Education and Employment.
- Black, D., Kolesnikova, N., & Taylor, L. (2009). Earnings functions when wages and prices vary by location. *Journal of Labor Economics*, 27(1), 21–47.
- Breneman, D. W. (2008). New players, different game: Understanding the rise of for-profit colleges and universities (review). *Review of Higher Education*, 31(3), 355–356.
- Carneiro, P., Heckman, J. J., & Vytlačil, E. J. (2011). Estimating marginal returns to education. *American Economic Review*, 101(6), 2754–2781.
- Cellini, S. R. (2010). Financial aid and for-profit colleges: Does aid encourage entry? *Journal of Policy Analysis and Management*, 29(3), 526–552.
- Cellini, S. R. (2012). For-profit higher education: An assessment of costs and benefits. *National Tax Journal*, 65(1), 153–179.
- Cellini, S. R., & Chaudhary, L. (2012). *The labor market returns to a for-profit college education* (NBER Working Paper No. 18343). Cambridge, MA: National Bureau of Economic Research.
- Cellini, S. R., & Goldin, C. (2012). *Does federal student aid raise tuition? New evidence on for-profit colleges* (NBER Working Paper No. 17827). Cambridge, MA: National Bureau of Economic Research.
- Chung, A. S. (2009). *Effects of for-profit training on earnings*. Unpublished manuscript.

- Chung, A. S. (2012). Choice of for-profit college. *Economics of Education Review*, 31(6), 1084–1101.
- Deming, D. J., Goldin, C., & Katz, L. F. (2012). The for-profit postsecondary school sector: Nimble critters or agile predators? *Journal of Economic Perspectives*, 26(1), 139–164.
- Gill, A. M., & Leigh, D. E. (2003). Do the returns to community colleges differ between academic and vocational programs? *Journal of Human Resources*, 38(1), 134–155.
- Grubb, W. N. (1993). The long-run effects of proprietary schools on wages and earnings: Implications for federal policy. *Educational Evaluation and Policy Analysis*, 15(1), 17–33.
- Kinser, K. (2007). Dimensions of corporate ownership in for-profit higher education. *Review of Higher Education*, 30(3), 217–245.
- Lang, K., & Weinstein, R. (2012). *Evaluating student outcomes at for-profit colleges* (NBER Working Paper No. 18201). Cambridge, MA: National Bureau of Economic Research.
- Lang, K., & Weinstein, R. (2013). *The wage effects of not-for-profit and for-profit certifications: Better data, somewhat different results* (NBER Working Paper No. 19135). Cambridge, MA: National Bureau of Economic Research.
- Lyke, R. F., Gabe, T., & Aleman, S. R. (1991). *Early labor market experiences of proprietary school students*. Washington, DC: Library of Congress, Congressional Research Service.
- National Student Clearinghouse Research Center. (2012). *Reverse transfer: A national view of student mobility from four-year to two-year institutions* (NSC Signature Report No. 3). Herndon, VA: National Student Clearinghouse.
- Rouse, C. E. (2007). The earnings benefits from education. In C. R. Belfield & H. M. Levin (Eds.), *The price we pay: The social and economic costs to the nation of inadequate education* (pp. 99–124). Washington, DC: Brookings Institution Press.
- Turner, S. E. (2006). For-profit colleges in the context of the market for higher education. In D. W. Breneman, B. Pusser, & S. E. Turner (Eds.), *Earnings from learning: The rise of for-profit universities* (pp. 51–68). Albany, NY: State University of New York Press.
- U.S. Department of Education, National Center for Education Statistics. (2011). *Digest of education statistics*. Retrieved from [http://nces.ed.gov/programs/digest/d11/tables/dt11\\_345.asp](http://nces.ed.gov/programs/digest/d11/tables/dt11_345.asp)
- U.S. Government Accountability Office. (2010). *For-profit colleges: Undercover testing finds colleges encouraged fraud and engaged in deceptive and questionable marketing practices* (Report No. GAO-10-948T). Retrieved from <http://www.gao.gov/assets/130/125197.pdf>
- U.S. Government Accountability Office, Health, Education, and Human Services Division. (1997). *Proprietary schools: Millions spent to train students for oversupplied occupations* (Report No. HEHS 97-104). Retrieved from <http://www.gao.gov/assets/230/224276.pdf>

## Appendix

**Appendix Table 1: Descriptive Frequencies for CCS-A Entrants, 2001–02 to 2004–05**

	Female students transferring to:				Male students transferring to:			
	For-profit College	Public College	Nonprofit College	Never Transfer	For-profit College	Public College	Nonprofit College	Never Transfer
Quarterly earnings in 2011								
<i>M</i>	\$5,103	\$6,507	\$7,050	\$5,546	\$6,510	\$7,545	\$7,573	\$7,279
<i>SD</i>	\$3,968	\$4,548	\$5,256	\$3,952	\$6,222	\$6,130	\$6,409	\$6,370
Race/ethnicity								
Black	64.5%	24.0%	25.7%	27.9%	48.7%	17.3%	20.2%	22.2%
Hispanic	1.8%	2.2%	1.9%	2.0%	2.7%	2.2%	2.1%	2.2%
White	30.1%	68.3%	68.3%	65.7%	44.1%	74.8%	73.1%	71.0%
Other	3.6%	5.5%	4.1%	4.4%	4.4%	5.6%	4.7%	4.6%
Years worked	11.0	10.6	10.2	15.2	9.5	9.2	8.2	12.8
CCS-A credits	28.9	32.8	35.2	34.1	22.7	29.9	30.2	27.3
CCS-A GPA	2.70	3.05	3.17	3.03	2.62	2.90	2.98	2.88
Award obtained								
Associate before transfer	11.0%	14.9%	20.3%	16.2%	7.0%	12.2%	14.7%	9.9%
Other award before transfer	2.9%	3.2%	2.4%	8.1%	4.6%	3.0%	2.4%	9.1%
Associate after transfer	10.9%	14.5%	17.5%	11.4%	9.5%	13.4%	14.0%	7.6%
Bachelor's after transfer	11.7%	34.2%	37.1%	0.0%	8.6%	34.6%	34.8%	0.0%
Semesters at transfer college	4.40	11.04	4.88	0.00	3.73	10.50	5.02	0.00
Intent: Transfer to four-year	28.8%	33.4%	34.5%	22.3%	33.3%	36.6%	39.0%	22.5%
Goal: Transfer	8.3%	13.6%	15.6%	5.4%	9.7%	15.2%	15.9%	5.9%
Observations	9,270	37,445	10,564	82,666	3,409	27,626	5,289	56,951
Missing earnings observations	2,097	8,531	2,397	14,949	947	6,984	1,502	10,759

*Note.* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-A from 2001–02 to 2004–05. Transfers to for-profit colleges include any student who has ever enrolled at a for-profit college; transfers to nonprofit colleges include any student who has ever enrolled at a nonprofit college but has not enrolled at a for-profit college; transfers to public colleges include students who only ever enrolled at public colleges.



**Appendix Table 2: Descriptive Frequencies for CCS-B Entrants, 2004–2006**

	Female students transferring to:				Male students transferring to:			
	For-profit College	Public College	Nonprofit College	Never Transfer	For-profit College	Public College	Nonprofit College	Never Transfer
Quarterly earnings in 2011								
<i>M</i>	\$4,955	\$4,945	\$5,218	\$5,715	\$5,020	\$5,331	\$5,403	\$5,775
<i>SD</i>	\$4,025	\$4,172	\$4,007	\$4,230	\$3,886	\$23,818	\$4,243	\$10,049
Race/ethnicity								
Black	23%	18%	17%	18%	28%	24%	23%	23%
Hispanic	6%	7%	4%	5%	6%	6%	4%	5%
White	62%	64%	70%	68%	59%	60%	65%	64%
Other	29%	25%	23%	24%	34%	30%	27%	28%
Years worked	3.6	3.7	3.6	4.0	4.3	4.4	4.7	4.9
CCS-B credits	31.8	62.5	58.5	38.3	33.7	62.4	56.6	38.5
CCS-B GPA	1.21	2.37	2.29	1.61	1.32	2.39	2.32	1.65
Award obtained								
Associate before transfer	6%	21%	27%	12%	9%	25%	26%	13%
Other award before transfer	9%	26%	31%	19%	12%	29%	30%	20%
Associate after transfer	6%	1%	3%	0%	7%	2%	3%	0%
Bachelor's after transfer	9%	51%	39%	0%	11%	50%	41%	0%
Semesters at transfer college	7.8	5.8	4.6	0.00	7.8	5.7	4.7	0.00
Observations	2,521	6,205	1,901	16,568	3,321	7,598	2,324	20,824
Missing earnings observations	1,215	3,062	880	7,527	1,666	3,676	1,029	9,348

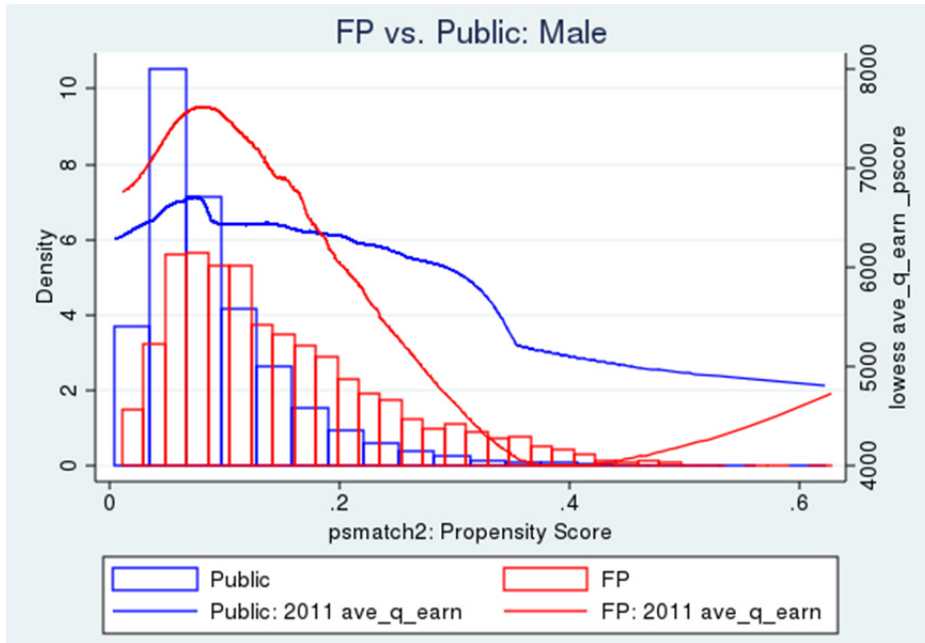
*Note.* Sample includes all award-seeking, first-time-in-college students who enrolled in CCS-B in the fall from 2004 to 2006. Transfers to for-profit colleges include any student who has ever enrolled at a for-profit college; transfers to nonprofit colleges include any student who has ever enrolled at a nonprofit college but has not enrolled at a for-profit college; transfers to public colleges include students who only ever enrolled at public colleges.

**Appendix Table 3: Estimates as per Table 3 for CCS-A Using the Same Window as for CCS-B**

	CCS-B 2004–06 Cohort, 2011 Returns		CCS-A 2004–06 Cohort, 2011 Returns		CCS-A 2002–04 Cohort, 2009 Returns		CCS-A 2006–08 Cohort, 2011 Returns	
	Female	Male	Female	Male	Female	Male	Female	Male
CCS GPA	0.215*** [0.018]	0.221*** [0.015]	0.148*** [0.015]	0.122*** [0.012]	0.140*** [0.011]	0.116*** [0.016]	0.020* [0.011]	0.023 [0.015]
CCS credits	-0.003*** [0.001]	-0.003*** [0.000]	-0.001*** [0.001]	0.000 [0.000]	-0.000 [0.000]	-0.002*** [0.001]	-0.002*** [0.001]	-0.003*** [0.001]
Relative to CCS credits but no award								
CCS certificate (pre-transfer)	0.215*** [0.018]	0.221*** [0.015]	-0.285*** [0.102]	-0.123 [0.077]	-0.012 [0.061]	-0.061 [0.085]	-0.071 [0.104]	-0.184 [0.136]
CCS diploma (pre-transfer)	-0.003*** [0.001]	-0.003*** [0.000]	-0.490** [0.199]	0.162** [0.078]	0.267*** [0.062]	0.028 [0.136]	0.216** [0.104]	0.121 [0.137]
CCS associate degree (pre-transfer)	0.215*** [0.018]	0.221*** [0.015]	-0.060* [0.036]	0.025 [0.027]	0.135*** [0.024]	0.158*** [0.035]	0.046 [0.032]	0.086** [0.040]
Relative to public college transfer								
Transfer to for-profit college	0.184*** [0.042]	0.183*** [0.036]	0.011 [0.042]	-0.181*** [0.026]	-0.107*** [0.022]	-0.076** [0.038]	-0.072** [0.031]	0.168*** [0.053]
Transfer to private nonprofit college	0.121*** [0.041]	0.086** [0.036]	-0.012 [0.029]	-0.028 [0.020]	-0.013 [0.017]	0.035 [0.027]	-0.006 [0.022]	-0.005 [0.031]
Background characteristics	X	X	X	X	X	X	X	X
College fixed effects	X	X	X	X	X	X	X	X
Intent/goal			X	X	X	X	X	X
$R^2$	0.074	0.075	0.129	0.122	0.118	0.122	0.178	0.165
Observations	6,756	5,391	12,519	20,727	24,747	13,799	19,792	12,273

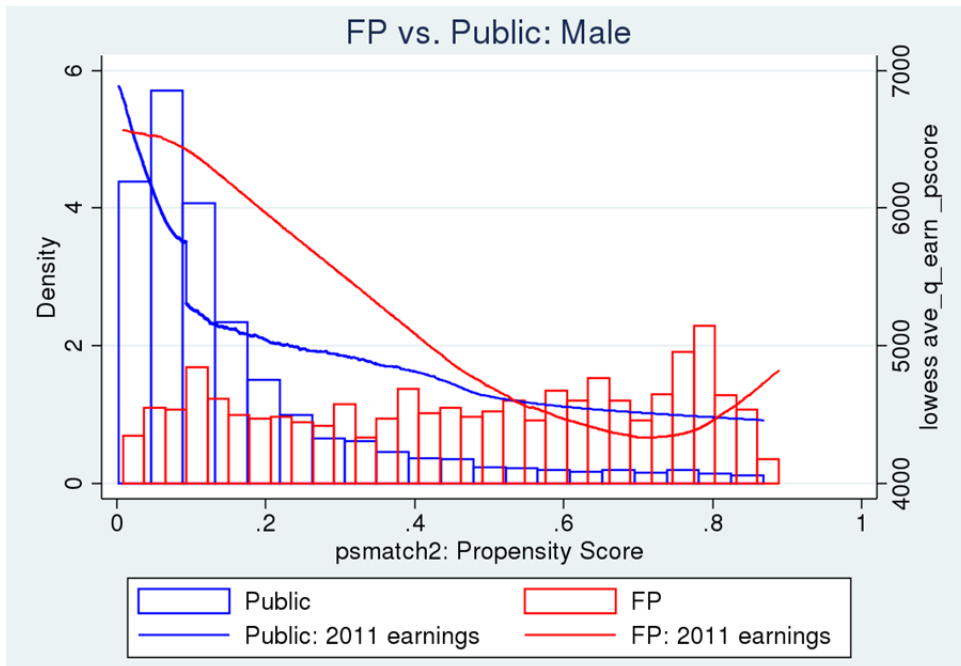
\* $p < .1$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

**Appendix Figure 1: Propensity Score Matching: Transfers to For-Profit and Public College From CCS-A Among Male Students**



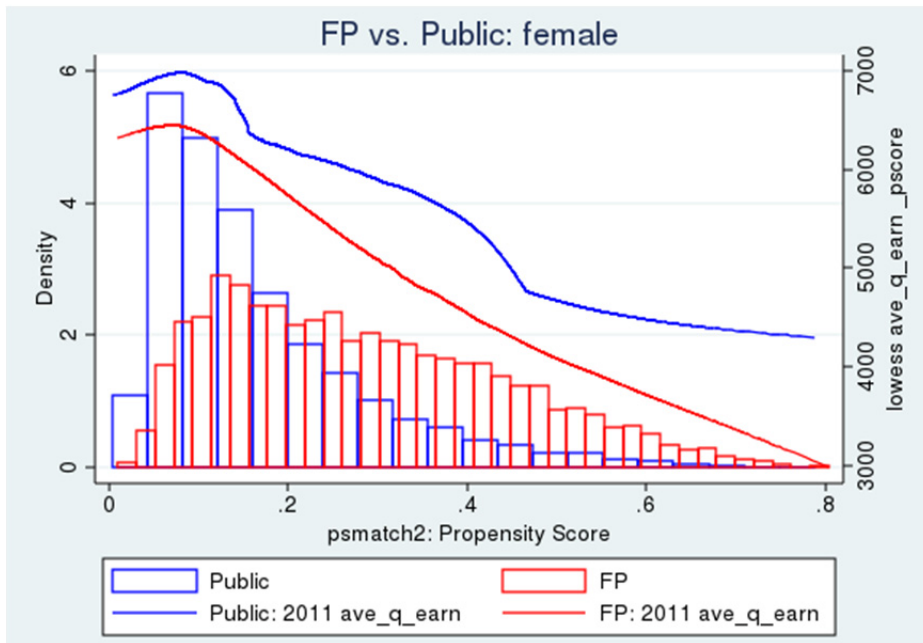
*Note.* Sample includes all award-seeking, first-time-in-college, male students who enrolled in CCS-A in the academic years 2001–02 to 2004–05.

**Appendix Figure 2: Propensity Score Matching: Transfers to For-Profit and Public College From CCS-B Among Male Students**



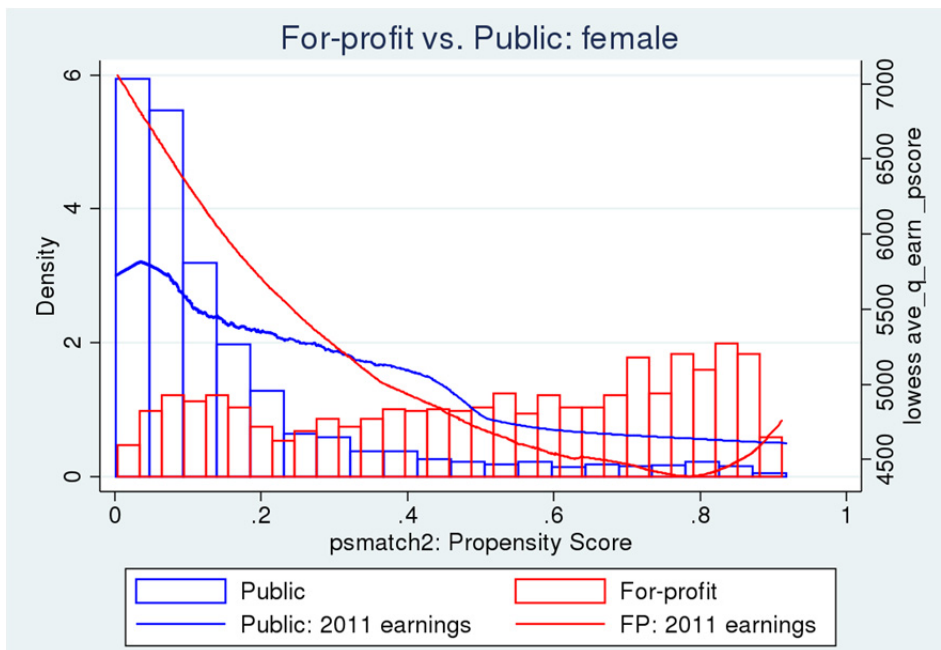
*Note.* Sample includes all award-seeking, first-time-in-college, male students who enrolled in CCS-B in the fall from 2004 to 2006.

**Appendix Figure 3: Propensity Score Matching: Transfers to For-Profit and Public College From CCS-A Among Female Students**



*Note.* Samples include all award-seeking, first-time-in-college, female students who enrolled in CCS-A in the academic years 2001–02 to 2004–05.

**Appendix Figure 4: Propensity Score Matching: Transfers to For-Profit and Public College From CCS-B Among Female Students**



*Note.* Samples include all award-seeking, first-time-in-college, female students who enrolled in CCS-B in the fall from 2004 to 2006.