Does it pay to attend a for-profit college? Horizontal stratification in higher education

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Abstract

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Mostly absent from the research investigating the economic returns to postsecondary education are examinations of the economic value of attending a for-profit institution, despite this sector's rapid growth over the past decade. Using the most recent available wave of the National Longitudinal Survey of Youth 1997, I find that individuals who pursued their postsecondary education at a for-profit college earn significantly lower weekly compensation than individuals who did not attend a for-profit college. This difference is robust to the addition of individual, regional, and employment controls, and it is particularly concentrated among 2-year degree holders, women, and those working in the management and professional fields. Implications for the horizontal stratification of higher education are explored.

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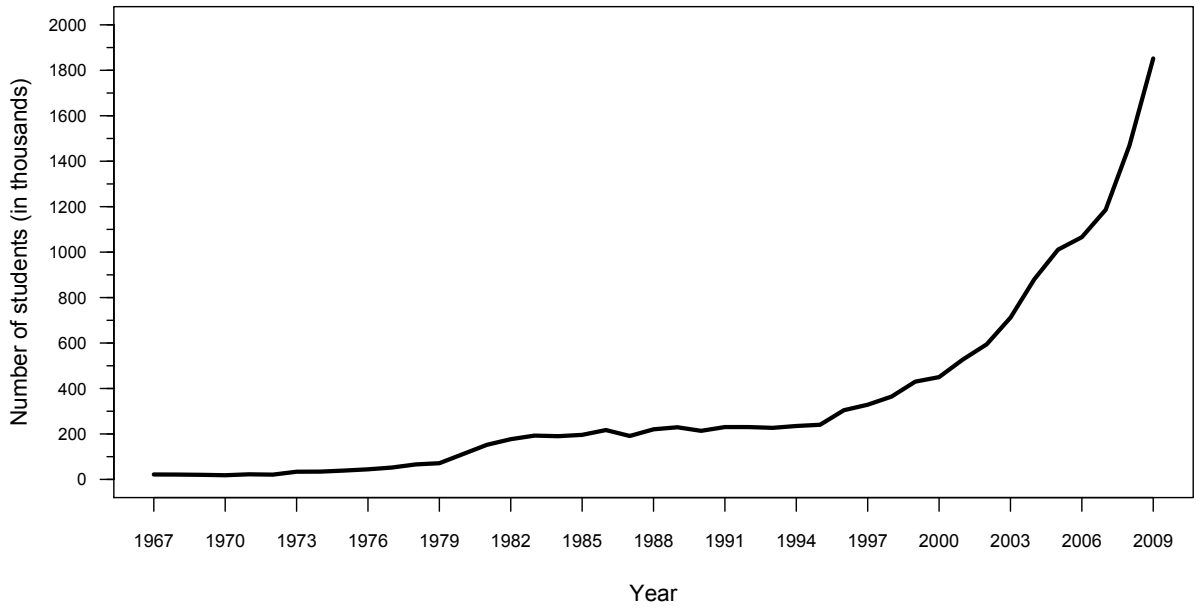
INTRODUCTION

Higher education both provides individuals with socioeconomic opportunities and reinforces structural patterns of inequality (Price, 2004; Hout & DiPrete, 2006), a tension especially underscored by the recent growth in size and scope of for-profit colleges in the United States. While some have heralded the for-profit sector's flexibility, enrollment of adult and other traditionally underserved learners, and tighter focus on practical skills (Jackson, 1978; St. John, 1991; Ruch, 2001; Morey, 2004), others point to the high levels of debt and low degree completion rates of the sector's students (Deming, Goldin, & Katz, 2011; GAO, 2011). Indeed, for-profit colleges have been the primary targets of proposed legislation related to how well colleges prepare their graduates for gainful employment (de Vise, 2011).

Much research has investigated the economic returns to postsecondary education (e.g., Behrman et al., 1996; Brewer & Ehrenberg, 1996; Brewer et al., 1999; Dale & Krueger, 2002; Brand & Halaby, 2006; Long, 2008; Hout, 2012), finding a substantial and growing positive relationship between completing college and earnings. Higher education in general is important for issues of employment and earnings inequality because of the rapidly changing labor market, which increasingly rewards greater educational attainment. The labor market has indeed undergone revolutionary change. Manufacturing as a share of all non-farm employment fell from 22 to 11 percent between 1970 and 2005, while over the same period the proportion of jobs in the information, financial, professional and business services, and education and health services industries has increased from 23 to 34 percent (Long, 2010). At the same time, the demand for college-educated labor has outpaced increases in supply, thereby ensuring a continued and widening wage gap between those with and those without a college education (Long, 2010; Carnevale et al., 2010).

President Obama confirmed as much in his 2012 State of the Union address when he remarked, "Growing industries in science and technology have twice as many openings as we have workers who can do the job." Today, approximately 60 percent of all jobs require at least some college (Carnevale et al., 2010). As globalization, its accompanying technological changes, and an increasingly information-dominated global economy have dictated a growing need for educated, skilled workers, the higher education market has also undergone profound change as new sectors—chief among them, the for-profit sector—have opened up to meet the increasing demand for the competitive labor market advantage garnered by a college degree (Morey, 2004; Machin & Van Reenan, 1998).

Figure 1. Growth of enrollment in for-profit postsecondary institutions, 1967-2009

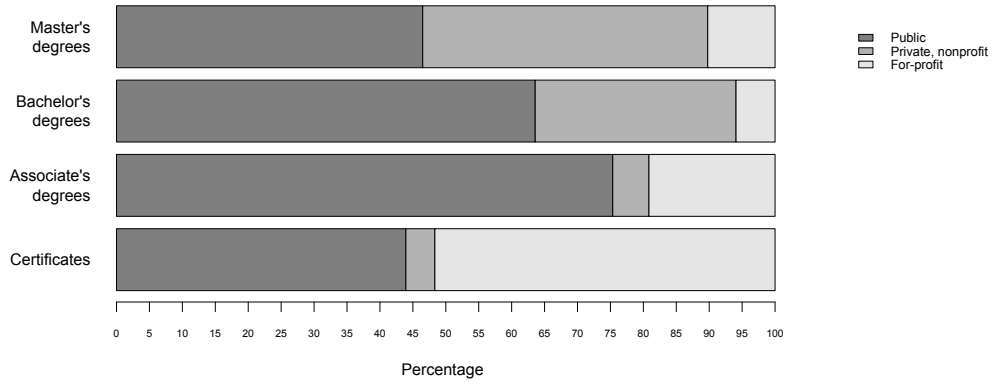


Source: Author's rendering of data from the National Center for Education Statistics' *Digest of Education Statistics, 2010*, Table 197.

As Figure 1 shows, enrollment in for-profit colleges has risen dramatically since the mid-1990s. Recent growth of the student population in for-profit colleges has dramatically outpaced

postsecondary enrollment as a whole. Enrollment in for-profit colleges has tripled over the last decade, compared to postsecondary enrollment's overall growth of 22 percent (Deming, Goldin, & Katz, 2011), and increased six-fold since 1986 (Bennett, Lucchesi, & Vedder, 2010). In the fall of 2008, the for-profit sector enrolled 9 percent of all college students, 12 percent of those enrolled at any point during the 2008-2009 academic year, and 14 percent of full-time equivalent students in all institutions of higher education eligible for federal financial aid (Bennett, Lucchesi, & Vedder, 2010).

Figure 2. Degrees conferred by degree-granting institutions, by institution type, 2009-2010



Source: Author's rendering of data from the National Center for Education Statistics' *Digest of Education Statistics, 2011*, Tables 284 & 291.

Students attending for-profit colleges largely earned certificates and associate's degrees, illustrated by Figure 2. In 2009-2010, for-profit schools produced over half of certificates and just under one-fifth (about 19 percent) of associate's degrees. At the same time, a nontrivial percentage of bachelor's degrees (about 6 percent) and master's degrees (10 percent) were earned at for-profit colleges as well. Degrees and certificates conferred by for-profit schools were concentrated in a number of areas. Of all the associate's degrees awarded by institutions of higher education, the for-profit schools awarded about half of those in computer and information

sciences, just over 36 percent each in business related fields and in security and protective services, and about a quarter in health professions (Snyder & Dillow, 2012, Table 292).

Despite the strong share of education credentials conferred by for-profit institutions and their surge in enrollment, we know very little about how the post-college earnings of for-profit students compare to the earnings of individuals who did not attend for-profit institutions. The present study contributes to the existing research on the returns to a college education by addressing this lack of attention to the economic value of enrolling in and completing a degree at for-profit institutions. Using the National Longitudinal Survey of Youth 1997, I ask the following two related research questions: (1) Is there a significant difference in the average weekly compensation between individuals who attended for-profit colleges and those who did not? (2) Do weekly earnings of individuals who attended a for-profit college differ depending on the academic credential, the occupational field in which one works, and other demographic traits of the students?

Research examining postsecondary education's horizontal stratification informs this research and its hypotheses (see Gerber & Cheung, 2008, for a review). Two main theoretical perspectives underlie much of the research investigating the differential economic returns to higher education by college quality and type, and similarly provide reason to think that attendance at for-profit colleges may negatively influence weekly earnings. Firstly, human capital theory proposes that people choose to attend college—and subsequently choose which college to attend—under the assumption that doing so will increase their lifetime earnings (Becker, 1975). Whether individuals who attend for-profit colleges earn as much as those with the same level of education who do not attend for-profit colleges depends on the relative efficiency with which for-profit colleges enhance their students' productivity. Secondly,

signaling theory recognizes that education can be thought of as an achieved status subject to the influences of numerous factors and to the interpretation of multiple actors (Bourdieu, 1977; Spence, 1973; Bowles & Gintis, 1976; Coleman, 1988). Under this perspective, for-profit colleges may provide their students with a less credible signal of productivity due to their lower admissions selectivity and yet unproven academic quality.

Much research has also noted the problem of endogeneity inherent in studying the returns to education. Students may self-select into higher education in general and certain kinds of colleges in particular based on observable as well as unobservable characteristics, thereby biasing the results of research examining the link between education and pecuniary returns. Efforts are made in an attempt to control for this issue in this study.

THE RISE OF FOR-PROFIT HIGHER EDUCATION

Despite this sector's rapid growth in enrollment and salience in the higher education market, most research exploring the connection between education and labor market outcomes continues to focus on two- and four-year nonprofit institutions. The increasing investment of college—in terms of rising college costs and the greater volume of education-related debt taken on by students and their families—coupled with the growing numbers of students enrolling in the for-profit sector makes continued investigation into which sectors of the higher education market benefit their graduates via gainful, secure employment all the more crucial.

Higher education has expanded dramatically in many highly developed countries; and the United States is no exception (Gerber & Cheung, 2008; Marcotte, Bailey, Borkoski, & Kienzl, 2005), even in the face of diminishing state and federal funding for public colleges and the rising costs and attendant loan volume for students and their families (Bailey, Badway, & Gumport,

2003; NASBO, 2011; Carey & Dillon, 2011). From 1970 to 2005, the share of the adult population that had completed four or more years of college rose from 11 to 28 percent (Long, 2010). In particular, for-profit schools have capitalized on the changing nature of the college population—becoming less "traditional" in terms of age and timing—thereby injecting institutional variety into the higher education market and accounting for much of the market's overall growth (Bennett, Lucchesi, & Vedder, 2010; Morey, 2004; Bailey, Badway, & Gumport, 2003).

The earliest proprietary, for-profit schools in the United States emerged in the mid-seventeenth century to fill a void left by the era's colleges in such subjects as commerce, accounting, and navigation (Bennett, Lucchesi, & Vedder, 2010). Proprietary colleges formalized and centered on a business curriculum during the nineteenth century, and experienced significant growth after World War II when the GI Bill, which provided veterans with federal financial aid, extended this aid to for-profit schools (Bennett, Lucchesi, & Vedder, 2010). The reauthorization of the Higher Education Act in 1972 permitted tuition subsidies, like the Pell grant, to be used by students attending for-profit institutions. Since then, these schools have flexed increasing muscle for legitimacy, accreditation, and federal funding (Morey, 2004). Prior to the 1990s, for-profit schools were traditionally owned by local, sole proprietors. In the 1990s, however, large publically traded companies began enrolling significant numbers of students (GAO, 2011). Today, in fact, the 15 largest operators enroll nearly 60 percent of the sector's students (Bennett, Lucchesi, & Vedder, 2010). Although the sector—as well as public perception—is dominated by these few big hitters (of which the University of Phoenix is perhaps the most well-known), the sector is quite diverse. A large part of the sector, for example, consists of career colleges that focus on associate's degrees and certificates (Deming, Goldin, & Katz,

2011), while others have increasingly set their sights on the core liberal arts curriculum of nonprofit institutions (Morey, 2004).

While for-profit colleges are praised for the ways in which they extend higher education's socioeconomic opportunities to traditionally underserved student populations, concerns persist that these institutions reinforce structural patterns of inequality through low completion rates, unproven academic quality, and high debt and default rates. On the one hand, for-profit colleges can cater to adult students seeking a more flexible relationship with their college, wherein they are able to pay just for the services they use and schedule that use around their work and family schedules (Morey, 2004). In terms of increased access, many students who would not be accepted at traditional, more selective institutions are attracted by the relative ease of enrolling in a for-profit institution (Morey, 2004). Early research confirms for-profit institutions' ability to extend access to higher education for historically disadvantaged groups (Jackson, 1978; St. John & Noell, 1989; St. John, 1991). Research has also found that students of color and those from lower socioeconomic backgrounds are more likely to persist in these institutions (St. John, Starkey, Paulsen, & Mbaduagha, 1995, p. 161). For-profit institutions are generally successful in terms of short-term student retention (Deming, Goldin, & Katz, 2011). For-profit students are more likely than their counterparts at nonprofit institutions to stay with their program through its first year. Deming and colleagues contend that this is likely due to for-profit students' ability to take courses that directly relate to their course of study and desired occupational field.

At the same time, students opting for for-profit higher education encounter a number of disadvantages that intimate the role these colleges play in maintaining and reproducing patterns of inequality. For instance, for-profit institutions are less successful than other sectors in helping

students complete a bachelor's degree (Bennett, Lucchesi, & Vedder, 2010). Furthermore, students at for-profit schools are known to take on higher average amounts of education-related debt and suffer the highest student loan default rates compared to their counterparts at nonprofits—and this rate has grown the most over the past several years in terms of absolute change (Bennett, Lucchesi, & Vedder, 2010). In the first decade of the twenty-first century, federal student aid increased by 325 percent ($7.6 billion to $32.3 billion) at for-profit institutions, compared to the 106 and 78 percent increases, respectively, at public and nonprofit private schools (GAO, 2011). For-profit schools also received nearly a quarter of all Pell grant disbursements and 26 percent of all federal student loan disbursements though they enroll 12 percent of all college students (Deming, Goldin, & Katz, 2011).

The high level of debt incurred by for-profit college students is cause for concern not simply because higher levels of debt naturally require more time and money to pay down but also because we do not yet conclusively know how the earnings of for-profit college students compare to their similarly educated counterparts who did not attend a for-profit college. Among the most pernicious consequences of debt is the possibility of defaulting on one's loans if well-paying employment becomes difficult to find. Bankruptcy policy makes it all but impossible to discharge educational loans, even during financial hardship (Atkinson, 2010). The only recourse then is to default on those loans. For-profit students were more likely to default on their loans than their counterparts at four-year public schools. In the years 2005 to 2008, the proportion of students at for-profit schools who defaulted within three years of entering repayment was about 10.5 percentage points higher than the proportion of students who graduated from four-year public schools (Deming, Goldin, & Katz, 2011).[1] It is likely that this gap is growing. Among

[1] Recently released data from the U.S. Department of Education show that the three-year cohort default rate for the FY 2009 cohort was 22.7 percent for for-profit institutions, 11 percent for public institutions, and 7.5 percent for

students who started school in 1996, the gap between students at for-profit schools and students at four-year public schools who defaulted within 6 years was about 6.7 percentage points (GAO, 2011). Indeed, for-profit students account for roughly 47 percent of all defaults on educational loans (Deming, Goldin, & Katz, 2011). Deming and colleagues further note that that the increasing default rate among for-profit students exceeds what is explainable by controlling for basic student characteristics such as race.

RETURNS TO HIGHER EDUCATION

Whether individuals choose to attend college because it genuinely enhances their productivity or acts as a signal of existing productivity, researchers have long noted a substantial and rising labor market premium associated with college attendance (Jencks, et al., 1979; Brewer, Eide, & Ehrenberg, 1999; Harmon et al., 2003; Long, 2010). In fact, the correlation between education and economic returns in the U.S. has never been higher (Goldin & Katz, 2007, pp. 71-85). During the recent Great Recession (December 2007 through June 2009), the least educated working-age individuals were four times more likely than college graduates to be unemployed, and college graduates experienced much shorter spells of unemployment (Hout, 2012). Furthermore, Hout notes that the difference between earnings of college and high school graduates has kept pace with the tuition increases of the last few decades, so the returns to a college education have been relatively stable.

As education—and particularly postsecondary education—in the United States has expanded dramatically during the twentieth century, "the division between the less- and the more-educated grew and emerged as a powerful determiner of life chances and lifestyles" (Fisher

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private, nonprofit institutions (U.S. Dept. of Education, 28 September 2012, "First official three-year student loan default rates published. Available here: http://www.ed.gov/news/press-releases/first-official-three-year-student-loan-default-rates-published).

& Hout, 2006, p. 247). Though some researchers have highlighted the opportunity equalizing potential ushered in by the wider availability of higher education in an increasingly skill-based labor market (Haveman & Smeeding, 2006; Machin & Van Reenen, 1998), others note that mass expansion of higher education and skill-biased technological change (SBTC) actually contribute to greater income-related inequality (DiPrete, 2007; Mouw & Kalleberg, 2010; Long, 2010; Carnevale et al., 2010), as has been the case in the U.S. (DiPrete, 2007, p. 613). This wage inequality did not, however, result from an increase in the earnings power of skilled workers, as SBTC theories predict. The increased pressure to attain higher education credentials that accompanies SBTC is less about enhancing one's earning power and more about preventing the decimation of that power experienced by the unskilled (Leicht, 2008). Far from being a story about the increasing returns to higher education, then, this involves increasing costs to not having a college credential and the persistent salience of social background in educational and occupational outcomes (Haveman & Smeeding, 2006; Goyette, 2008). Gerber and Cheung (2008) have recently remarked, "One's level of education is the single most important factor shaping labor market opportunities in modern societies" (p. 300).

At the same time, one's level of education is only part of the story. Even as more individuals choose to get a college degree, higher education serves to stratify students in other ways beyond level of educational attainment (Goyette, 2008). Researchers have examined the heterogeneous returns among those with the same level of attainment based on institutional as well as individual characteristics (e.g., Velez, 1985; Brewer, Eide, & Ehrenberg, 1999; Brand & Halaby, 2006; Monks, 2000; Long, 2010). At least two theoretical perspectives have been used to explain higher education's horizontal stratification.[2] While human capital theory focuses on

[2] An additional theoretical perspective—that certain educational institutions imbue their students with more valuable social capital through the social networks present in the school—also exists. This perspective is closely linked to

the efficiency with which colleges of varying type and quality enhance the productivity of their students (Becker, 1975), signaling theory focuses on the signal that attending college in general and the type of college in particular sends to employers about their prospective employees (Spence, 1973). Differences in economic returns by college quality or type may also be a methodological artifact; these studies may be biased by endogeneity such that individuals with higher innate ability or from more advantaged social backgrounds self-select into better educational institutions.

Human Capital Theory. Human capital theory is among the most common explanations of the relationship between education and earnings (Elman & O'Rand, 2004). This theory proposes that the gradation in earnings by education level reflects a rational choice by individuals to invest in their education (Becker, 1975). Since employers set an individual's earnings based on that individual's contributions to the firm's productivity, each additional year of education will "pay off" insofar as it increases that individual's ability to be productive (Becker, 1975; Shockey, 1989). Evaluation of the differential efficiency with which colleges enhance students' human capital has largely focused on institutional quality (Gerber & Cheung, 2008).

Because higher quality institutions generally cost more, the choice to attend a higher quality college must be motivated by the expectation that a higher quality college education will lead to higher earnings, under the rational choice assumption of human capital theory. Furthermore, if colleges operate as efficient firms, then cost differences should reflect quality

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human capital. Attending higher quality or more selective institutions may place one in the company of smart students; if there are peer effects, this may increase human capital accumulation (Monks, 2000).

differences (Wachtel, 1975). There is much evidence that colleges of varying quality indeed produce different educational attainment and employment outcomes.

College quality has a positive and increasing effect on a student's likelihood of completing a bachelor's degree (Long, 2010) and of attending graduate school (Eide, Brewer, & Ehrenberg, 1998). In following a college entry cohort for four decades, Brand and Halaby (2006) find that attending an elite college yields an advantage for further educational achievement and occupational status. Monks (2000) finds that graduates from highly or mostly selective colleges and universities earn significantly more than graduates from less selective institutions. Specifically, graduates from non- or less-competitive schools earn 5 percent less than graduates from competitive schools, 8 percent less than graduates from very competitive schools, and 15 percent less than graduates from highly or mostly competitive schools. The wage premium for attending an elite private college relative to a less- or non-competitive public institution increased during the 1980s and 1990s (Brewer, Eide, & Ehrenberg, 1999; Long, 2010) and continues to rise today (Hout, 2012).

In these studies, there is remarkable consistency in how researchers measure college quality. Most researchers define a high quality or elite college using some measure of selectivity, such as the average standardized test scores of the enrolled student body or an external rating system like Carnegie classification or Barron's Profiles of American Colleges (Brewer, Eide, & Ehrenberg, 1999; Monks, 2000; Brand & Halaby, 2006; Long, 2010). Other studies draw distinctions between types of institutions, such as whether the school is a two- or four-year institution or whether the school grants graduate degrees (Alba & Lavin, 1981; Velez, 1985; Monks, 2000; Marcotte et al., 2005), and these too find significant differences in employment outcomes based on the kind of institution one attends.

For instance, each year of community college enrollment leads to substantially lower returns compared to a year of enorllment in a bachelor's degree program (Gill & Leigh, 2000). Those who begin in two-year colleges are also significantly less likely to finish their degree than those who begin in four-year insitutions (Alba & Lavin, 1981; Velez, 1985). Still, earning a degree from a community college does generate some advantages for the graduate over those with only a high school diploma, pointing to the potential for human capital production in additional years of education. Marcotte and his colleagues (2005) find that a community college education has positive effects on earnings, particularly on annual earnings as opposed to hourly wages, among young workers. Men with an associate's degree earned nearly 15 percent more annually than their peers with only a high school education. Variation in the returns to education has also been found within the four-year college sector. Graduates from graduate degree granting universities have been found to earn about 14 percent more than their counterparts from liberal arts colleges (Monks, 2000). Graduates from privately controlled institutions earn nearly 5 percent more than those from public institutions.

Of particular importance to the for-profit sector, Monks (1997) find that those who complete college at a later age receive a significantly smaller initial increase in earnings than those who acquire their education earlier in life. Later schooling may be less costly than earlier enrollment, as older students often choose to attend college part-time so that they spend less time out of the labor force, and direct educational costs may be subsidized by their employer. In these ways, older graduates do not require as large of an education premium to invest in enhancing their human capital. Monks's findings also point to the ability of higher quality schools to impart greater human capital, as older students are more likely to attend lower quality institutions.

If differential returns to higher education do operate through this institutional quality mechanism, predictions for the relative earnings of for-profit college attendees are mixed. If, for instance, higher quality institutions are principally more effective at enhancing a student's human capital, for-profit graduates may encounter earnings that are not significantly different from those experienced by similar students at nonprofit institutions. For-profit institutions tend to focus on practical skills and concrete knowledge (Morey, 2004; Deming, Goldin, & Katz, 2011). Such a tight connection between what is learned in the classroom and what will be expected in their future jobs may make for-profit graduates attractive to employers and effective in their occupational roles. At the same time, the instructional quality at for-profit colleges is unproven (GAO, 2011). In this way, students who attend for-profit colleges may be walking away with lower human capital—and thus lower productive capacity and lower earnings—than their similarly educated counterparts who choose not to attend for-profit colleges.[3]

Signaling Theory. Education may well increase individual productivity, as human capital theory suggests; but it could also serve as a signal of greater productivity, and it is this signal—rather than the actual skills acquired—that is rewarded in the labor market (Spence, 1973; Arrow, 1973; Jaeger & Page, 1996). Some even claim that higher education is not especially effective at providing individuals with the skills needed on the job (Bowles & Gintis,

[3] Higher quality institutions may also be more effective than lower quality institutions at enhancing a student's social capital. If this is the case, for-profit schools may put their graduates at a disadvantage on the labor market. Students at for-profit institutions report diminished engagement resulting from lower satisfaction with their courses and a lower likelihood of believing that their education was worth the cost and loans relative to their counterparts at nonprofit public and private institutions (Deming, Goldin, & Katz, 2011). The narrowing of educational goals, brought on by treating higher education more as an industry governed by economic productivity, may better prepare graduates for the labor force in terms of human capital but may also sacrifice normative goals and social capital building (Persell & Wenglinsky, 2004). This has the effect of making graduates less aware of others, less able to make fewer connections that could be helpful in the search for gainful employment, and less interested and less able to participate in the political process or community affairs. However, the social capital producing function of higher education on its own is not fully considered here.

1976; Arum & Roksa, 2011). Employers value and reward educational attainment in part because higher education signals qualities that are initially unobservable to employers—such as perseverance, motivation, character, or symbolic knowledge and tastes—and that indicate greater potential productivity (Bourdieu & Passeron, 1977; Arkes, 1999). Employers may consider that a college that admitted an individual had access to their cognitive ability scores (e.g., SAT or ACT scores) and judged them capable of successfully completing its academic program. Individuals enter the labor market with variable levels of productivity. Since the labor market is fraught with uncertainty as employers cannot truly know the productivity of candidates and since acquiring this knowledge may be costly, employers rely on market signals of productivity, such as a college degree, to determine whether to hire workers and what to pay them (Weber, 1978; Spence, 1973; Arkes, 1999; Carenvale & Rose, 2011).

This perspective sees the expansion of higher education as driven by the supply of colleges available and of individuals wanting to attend, rather than being motivated by growing labor market demand for additional human capital or skills (Collins, 2002). College has come to be seen as a norm not only for those who are academically adept or socially elite, but also for everyone regardless of academic or social background (Goyette, 2008). As the number of people with college degrees increases, the occupational level for which a particular degree is considered adequate qualification is lowered, regardless of whether or not such knowledge and skills are truly necessary for sufficient or enhanced job performance (Collins, 2002). Indeed, over the past few decades, about 70 percent of the increase in requirements for postsecondary training has stemmed from skill upgrading demanded by occupational categories that did not previously require higher education (Carnevale et al., 2010). Many employees may actually be educationally overqualified for their current jobs (Korpi, 2003). In this way, college degrees

function more as a bureaucratic marker than an indication of actual skill or knowledge attainment (Korpi, 2003, p. 604; Collins, 2010).

In addition to the decoupling of education from job-relevant skills, the credentialing perspective points to higher education's reproduction function whereby dominant social groups use educational credentials to maintain their social privilege (Collins, 1971; Weber, 1978; Gamoran, 2001). Social reproduction theorists argue that education systematically rewards the cultural capital of the advantaged classes and devalues the capital of the lower classes (Bourdieu, 1996; Bowles & Gintis, 1976). Schools train advantaged students to take their positions at the top of the socioeconomic hierarchy while conditioning less advantaged students to accept their lower status, and so are centers for the production and maintenance of a cultural hegemony (Bowles & Gintis, 1976; Gramsci, 1971). Under the Weberian strain of credentialing theory, self-interested occupational groups and school and governmental officials institutionalize status honor in educational degrees (Weber, 1978; Brown, 2001). Whereas these capitalist groups operate largely independently under Weberian credentialing theory, Marxist theorists ascribe a more conspiratorial role to these groups (Gramsci, 1971; Brown, 2001). For both strains, the educational requirements for employment—far from being made necessary by the actual skills required by particular jobs—instead serve to select new members for elite positions who share an elite culture and, at lower levels of education, to hire employees who respect the elite values (Collins, 1971; Weber, 1978).

This framework predicts that as more and more people achieve higher education, inequality simply shifts upward. Beyond whether or not one has earned a college degree, college type and field of study become prominent stratifiers in job placement (Goyette, 2008). Indeed, while college education has a generally positive relationship to income returns, this relationship

is even stronger for elite colleges (Haveman & Smeeding, 2006; Brewer, Eide, & Ehrenberg, 1999). Inequalities in educational, occupational, and other life outcomes by social background may be maintained through the type and purpose of the postsecondary institution a student attends (Goyette, 2008). The dichotomy between nonprofit and for-profit college may serve as new shorthand for employers distinguishing among candidates.

The evidence on the signaling effect of credentials in the labor market is mixed. Jaeger and Page (1996) found that the signaling component of educational attainment varies with the type of education, such that the return was greater for completion of post-graduate degrees relative to doing some post-graduate work. In their study of the returns to a community college education, Marcotte et al. (2005) found that individuals earned higher wages regardless of whether they actually completed their associate's degree. Completing the certificate resulted in no higher earnings than simply attending a two-year institution, suggesting that attending college at all serves as a signal. The results of this study point to positive economic returns from enrolling in and studying at an institution of higher education alone. Similarly, Kane and Rouse (1995) find the credentialing effects of both two-year and four-year college degrees to be generally small. For example, the average person who attended a two-year college, regardless of whether they completed an associate's degree, earned about 10 percent more than those without any college education. The wage or annual earnings differential for each year of credit was between 4 and 7 percent for men and between 7 and 10 percent for women.

In contrast, however, Grubb (1993) finds that most individuals who enroll in postsecondary education but fail to complete their credentials have earnings that are no higher than high school graduates. In addition to confirming the well-known returns to bachelor's degrees, Grubb (1993) finds that other credentials (e.g., associate's degrees and certificates) also

lead to higher earnings, albeit indirectly by granting individuals access to jobs where they accumulate more experience and on-the-job training. Once these are controlled for, the advantage actually disappears. Importantly, this signaling mechanism has not yet been tested for graduates of for-profit institutions on the labor market.

Colleges serve a double filter; colleges first select students from the applicant pool, and then decide whether to pass or fail their students (Arrow, 1973). Due to their typically lax admission criteria, for-profit colleges lose one of these two filtering functions. Additionally, their unproven academic quality threatens the integrity of the second function. In these ways, signaling theory predicts that a credential from a for-profit college delivers a less credible signal and thereby secures lower earnings for individuals choosing to pursue their higher education at these institutions.

In the present study as in others, absent additional data such as coursework, pre- and post-college standardized test performance, or employer surveys regarding perceived differences between job candidates with nonprofit and for-profit college backgrounds, signaling and human capital theories are to a large extent observationally equivalent (Harmon et al., 2003). Both theories suggest a positive overall correlation between earnings and education—human capital theory through enhancing productivity, and signaling theory due to a signal of existing productivity. Similarly, a positive or negative relationship between for-profit college attendance and earnings could indicate that these schools are more or less efficient at enhancing students' human capital, or that they serve as more or less credible signals of productivity, or both. Whether higher levels of education act as signals of or indeed imbue an individual with greater human or cultural capital, education fosters both socioeconomic mobility and reproduction of the current class structure (Hout & DiPrete, 2006).

Self-Selection. Alternatively, the differences in post-college earnings by educational level and type could be a methodological artifact given the potential endogeneity in the choice and ability to attend college and future earnings. Bourdieu (1996) has noted that most social sorting occurs before college enrollment, as students typically choose a postsecondary institution that values and instills similar aesthetic, political, and ethical attitudes as their own families, so that the positive relationship between education and earnings may actually be picking up on pre-college qualities. Recent research has questioned how much of the variation in earnings by education is due to the fact that colleges admit students in part based on characteristics that are related to future earnings (Dale & Krueger, 2002; Black & Smith, 2004; Brand & Halaby, 2006; Brand & Xie, 2010). This research highlights the limits of early return to education literature that failed to adequately control for systematic selection into elite colleges on the basis of observed and unobserved pre-college individual and family determinants of expected future earnings. Researchers continue to find substantial sorting based on ability, with higher ability students disproportionately attending higher quality schools, thereby exacerbating pre-existing inequality in human capital and biasing conventional estimates of school quality effects on labor market outcomes (Behrman, Rosenzweig, & Taubman, 1996; Dale & Krueger, 2002; Black & Smith, 2004).

A number of studies that employ sophisticated models question the argument that elite colleges yield a greater economic return than non-elite schools (Gerber & Cheung, 2008; Behrman et al., 1996; Brewer & Ehrenberg, 1996; Brewer et al., 1999; Dale & Krueger, 2002). They argue that the returns that have been found are due largely or completely to a complex set of variables that influence whether or not a student attends an elite college in the first place.

Research demonstrating a persistent positive effect of attending a selective college for disadvantaged students even when controlling for cognitive ability, however, complicate this issue of endogeneity. While Dale and Krueger (2002) find that students who attended more selective colleges actually earned about the same as students of comparable ability who attended less selective schools, they also find that students from low-income families did earn more if they attended more selective colleges.

Similarly, Brand and Halby (2006) find that the returns to attending an elite college for those who did attend are small by comparison to those that would have been achieved by otherwise equivalent students who attended non-elite institutions. In general, they find that attending an elite college results in a greater likelihood of receiving a bachelor's or advanced degree, greater occupational socioeconomic status throughout one's career (though this advantage declines over time), and a wage advantage that grows considerably from middle to late career. However, including pre-college academic and family controls reduces the magnitude of the effect of elite college attendance, although the positive effects on degree attainment and late career wages remain significant.

Brand and Xie (2010) find evidence supporting a negative selection bias, whereby individuals who are least likely to obtain a college education benefit the most from college, net of observed economic and non-economic factors known to influence college attendance. Without a college degree, individuals with a lesser likelihood of attending college possess limited human, social, and cultural capital and thus experience limited labor market prospects. On the other hand, individuals from more advantaged backgrounds can still rely on their advantaged resources in the labor market, even without a college degree.

However, a number of studies demonstrate that even when accounting for observable and unobservable student traits, the larger returns to a more selective institution remain robust. For instance, using data from both the National Longitudinal Study of 1972 and the High School and Beyond dataset, Brewer et al. (1999) find strong evidence of a significant economic return to attending an elite private institution, and a smaller premium for attending a middle-rated private school, as compared to a bottom-rated public school. These effects are robust to controlling for selection effects, though they find weaker evidence for the return to attending an elite public school as compared to a bottom-rated public school. Similarly, Monks (2000) controls for the college selection process by including attributes that are most visible to prospective students and employers—namely, the selectivity, control, and type of college attended—and still finds significantly higher earnings for graduates of more selective colleges and universities. A more recent study employs diverse statistical methods to demonstrate solid and fairly consistent evidence of the positive effects of college quality on college graduation and household income (Long, 2008).

While very little work has been done on the employment outcomes of for-profit students, some studies have attempted to address the endogeneity problem for this sector in terms of persistence in and completion of degree programs. Such studies that account for student characteristics find that for-profit schools have higher graduation rates for certificate programs, nearly equal rates for associate's degree programs, but lower graduation rates for bachelor's degree programs than nonprofit public and private schools (GAO, 2011). Specifically, for-profit students are between 12 and 19 percent less likely to complete a bachelor's degree (Deming, Goldin, & Katz, 2011). When Deming et al. limit the counterfactual sample to just non-selective nonprofit schools, a statistically significant 5 percent deficit for for-profit students remains. Such

restriction is important, given that for-profit schools likely draw their students from a qualitatively different population than selective non-profit schools. In addition to serving an older population and having lower academic criteria for admission, for-profit schools enroll a more racially heterogeneous population as compared to nonprofit private and public schools (Morey, 2004; Bennett et al., 2010).

As discussed above, much research has delved into the complexities of educational return differentials based on institutional type and quality, and sophisticated modeling strategies have been developed to deal with the endogeneity problem inherent in the college selection process. However, the for-profit higher education sector has largely been left out of these efforts. There are some notable exceptions. Deming, Goldin, and Katz (2011) employ the Beginning Postsecondary Student Survey and find that for-profit students in 2009 earn about $1800 to $2000 lower than they likely would have had they attended a public or nonprofit institution. Using the same survey and focusing on two-year degree earners, Lang and Weinstein (2012) find that students beginning associate's degree programs at for-profit colleges earn incomes about $3000 less than those who begain at public or nonprofit institutions, a statistically significant difference. Cellini and Chaudhary (2012) arrive at a different finding using the National Longitudinal Survey of Youth 1997. They find that invididuals who complete a two-year degree at public community colleges and private two-year colleges encounter similar earnings gains of about 15 percent post-degree. However, as the authors note, this study employs an imprecise definition of "private two-year college" and drops from its sample students who continue their education beyond an associate's degree, likely understating the effects of attending public and nonprofit colleges.

The present study advances the available literature on for-profit colleges by including in its sample individuals with any level of education, from less than a high school diploma to at least a bachelor's degree. In this way, I am able to compare the earnings of those who attend for-profit colleges to those who do not attend college at all. Given the dramatic growth of this sector over the past decade, as well as the extensive media and governmental attention paid to this sector lately, a better understanding of the returns garnered by graduates of this sector is needed.

Consistent with human capital and signaling theories, I hypothesize that attending college at all—regardless of the institutional type attended—will result in higher average weekly earnings as compared to those who earn only a high school degree. At the same time, given the unproven academic quality of for-profit colleges, I hypothesize that individuals who attend for-profit colleges earn less than their similarly educated counterparts who do not attend such colleges. I also hypothesize that the negative relationship between attending a for-profit college and earnings will be attenuated slightly by the inclusion of variables controlling for a student's social background and cognitive ability, consistent with the self-selection issue. I further expect that attending a for-profit college will be more salient to earnings for 2-year degree holders than for 4-year degree holders, given research that suggests 2-year degrees are not as valuable on the job market as 4-year degrees (Gill & Leigh, 2000; Velez, 1985; Alba & Lavin, 1981).

DATA, MEASURES, & METHODS

Data Description. To analyze the heterogeneous effects of education by college type on earnings, I employ the National Longitudinal Survey of Youth 1997 (NLSY97), a nationally representative longitudinal survey that tracks the educational and employment experiences of a cohort of individuals. The NLSY97 is based on a sample of youths born between 1980 and 1984.

The initial survey was administered in 1997 to 8,984 respondents in 6,819 households, and annually since, with the latest available follow-up conducted in 2009. The respondents were selected via a multi-stage stratified random sampling design. Although the NLSY97 suffers from attrition like any other large longitudinal sample, which explains a portion of the reduction in this study's sample, the NSLY has been very successful at following its cohort members over time (Neumark & Rothstein, 2003).

Table 1. Sample construction

Initial number of respondents in the NLSY97	8,984
Less those who were not interviewed in round 13 (2009 survey year)	-1,423
Less those who were still enrolled in school or serving in armed forces in 2009	-1,152
Less those with missing weekly compensation[a]	-966
Less those with no hours of work reported	-184
Less those with missing values on covariates[b]	-2397
Sample selected:	*2862*

Notes: [a]This includes one observation with an average weekly pay above $100,000, as this individual's earnings was a clear outlier. [b]This includes 4 observations determined to be outliers with a high degree of leverage.

Table 1 shows how this study's sample was constructed. I restrict my sample to respondents who were interviewed in the latest available round of data (round 13, administered in 2009), were not still enrolled in school at the time of the interview, were not currently serving in the armed forces, and did not have any missing data on either the dependent variable or the set of covariates used in the analysis.[4] Given the ages of the NLSY97 respondents in 2009 and the sample restrictions described above, I evaluate effects of attending a for-profit college on early career earnings.

[4] I investigated the sensitivity of the results. While the selected sample differs from the NLSY97 population (e.g., the sample is more educated, less nonwhite, and come from higher socioeconomic statuses; see Table A-3), these differences make sense given that this study is interested in the early career earnings of individuals who are no longer still in school. Additionally, I ran robust regression and multiple imputation analyses (see Table A-4) and found substantively similar results as the primary analyses presented below.

Variable Measurement. Table 2 presents summary statistics of the variables used in the main analysis.[5] The dependent variable in the models is the log of average weekly earnings. This follows the convention set by prior returns to education research (e.g., Cellini & Chaudhary, 2012). To construct this variable, I multiply an individual's hourly compensation by the average hours worked per week in 2009. In the NLSY97's 2009 round, respondents reported their wages and hours for up to nine jobs, so the resulting variable is the average weekly earnings over the particular number of jobs reported by each respondent. Logging weekly earnings allows easy interpretation of the coefficients, which can be read as increasing or decreasing earnings in terms of a given percentage (Monks, 2000). Additionally, because some individuals reported making $0.00 and the log of 0 is a not a real number, I added a small positive constant ($0.01) to all individuals before taking the logs (Brand & Xie, 2010).

The main independent variable of interest is a series of interaction terms measuring educational attainment and whether or not an individual attended a for-profit college in pursuit of their higher education. Although education is often measured as the number of years of formal schooling, Yakusheva (2010) notes that this continuous variable can be replaced with one or more indicator variables representing different degree levels. I extend this further by specifying the type of college one has attended. In this way, I include a series of dummy variable interaction terms, which indicate one's degree level and type of college attended. As can be seen in Table 2, roughly 7.5 percent of the sample attended a for-profit college in pursuit of some college, an associate's degree, or at least a bachelor's degree.

[5] I used NLSY97 sample weights for the descriptive statistics and regression analyses, which adjust for over-sampling and differential attrition (Musick, Brand, & Davis, 2012).

Table 2. Summary statistics of study sample

	Mean/Percent	SE
Educational attainment & college type		
Has not finished high school or GED (%)	4.21	0.39
Completed GED or high school (%)	25.76	0.87
Completed some college, attended for-profit college (%)	3.71	0.37
Completed some college, did not attend for-profit college (%)	23.57	0.85
Completed a 2-year degree, attended for-profit college (%)	2.12	0.29
Completed a 2-year degree, did not attend for-profit college (%)	5.52	0.47
Completed a 4-year or graduate degree, attended for-profit college (%)	1.75	0.26
Completed a 4-year or graduate degree, did not attend for-profit college (%)	33.36	0.97
Logged average weekly compensation	6.31	0.02
Age	27.00	0.03
Female (%)	48.46	1.01
Black (%)	12.17	0.52
Hispanic (%)	10.40	0.50
Mixed race, non-Hispanic (%)	0.85	0.20
Non-black, non-Hispanic (%)	76.58	0.73
ASVAB	53.57	0.56
High school GPA	2.90	0.01
Household net worth (in $10k)	10.61	0.31
Total education-related debt (in $1k)	4.04	0.18
Mother has at least 4 years of college (%)	22.91	0.87
At least half of peers aspired to attend college (%)	89.71	0.59
Lives in MSA in 2009 (%)	94.95	0.45
Lives in the northeast (%)	15.91	0.75
Lives in the north central (%)	27.82	0.92
Lives in the south (%)	34.55	0.95
Lives in the west (%)	21.72	0.83
Number of weeks unemployed in 2009	2.26	0.13
Work experience (years worked since age 16)	8.48	0.05
Tenure in current job (in years)	3.17	0.05
N	2862	

Notes: All means are weighted by NLSY97 sample weights; *n* value is not weighted. College major and occupation are also included in the models; their descriptive statistics can be found in Tables A-1 and A-2, respectively.

The background individual-level measures used in this study have been shown to be significant predictors of educational attainment and earnings (Monks, 2000; Dale & Krueger, 2002; Black & Smith, 2004; Brand & Halaby, 2006; Brand & Xie, 2010). An individual's background is measured by nine variables in the model: age, sex, race, socioeconomic status, the amount one borrows in education-related loans to finance their higher education, their mother's level of education, educational aspirations of their childhood peers, cognitive ability, and high school achievement Sex is coded as a dummy variable, where female=1. Race is coded as a

series of dummy variables, indicating individuals who are black, Hispanic, mixed race (non-Hispanic), or non-black, non-Hispanic (the final variable will serve as the referent category throughout the analyses). Socioeconomic status is operationalized as the net worth (in 10,000 dollars) of the individual's household during the initial few years of the NLSY survey period. Education-related loan volume is the cumulative amount one borrowed (in 1,000 dollars) from governmental sources[6] during their time in college. I include this measure of debt to control at least partly for the direct costs of pursuing postsecondary education. Mother's education is a dummy variable indicating whether she has attended at least four years of college. The educational childhood aspirations of one's childhood peers is measured as a dummy variable, where 1=at least half of an individual's peers aspired to college.

An individual's score on the Armed Services Vocational Aptitude Battery (ASVAB) measures cognitive ability. This exam was administered to most participants in the first round of the NLSY and tests individuals on mathematical reasoning, word knowledge, and reading comprehension. While ASVAB scores are imperfect measures of ability, they are commonly used in the literature as a measure of cognitive aptitude and intelligence (e.g., Kane & Rouse, 1995; Monks, 2000; Belley & Lochner, 2007). High school achievement is measured as the student's overall high school grade point average. Including measures of ability as proxies for unobserved selection effects should reduce the estimated education coefficients so that these coefficients capture the effect of education alone since ability is controlled for (Harmon et al., 2003).

The model also includes variables controlling for the employment experiences of individuals. Whether or not one resides in a metropolitan statistical area, the region of the

[6] The federal and state governments are the primary source of education loans for college students (Baum & Payea, 2011).

country one lives in, and the occupational field one works in are all measured by dummy variables. Additionally, I include the number of weeks one is unemployed during 2009, one's work experience (measured as the number of years worked since age 16), and one's tenure (number of years) in their current job. The inclusion of occupational field dummies should absorb the portion of the effect of education on earnings that comes from occupational mobility (Psacharopoulos & Patrinos, 2004), while experience and tenure should control for the additional human capital one gains on-the-job. Finally, to capture and control for possible variation in the skills acquired during college, I include a series of dummy variables indicating the subject in which one majored. Prior research has demonstrated the utility of such inclusion. For instance, students specializing in engineering, business-related, math, and science fields encounter higher than average returns, while those specializing in the humanities net lower than average returns (Gerber & Cheung, 2008).

Methods. For the main analysis, I employ a similar statistical model as that which has been consistently used in research investigating the relationship between education and earnings (Mincer, 1974; Brewer, Eide, & Ehrenberg, 1999; Yakusheva, 2010):

$$lnW_i = \beta_0 + \beta_1 \boldsymbol{X_i} + \beta_2 \boldsymbol{C_{ij}} + \mu_i, \quad (1)$$

where the logged wages ($\ln W_i$) are regressed on a vector of individual characteristics ($\boldsymbol{X_i}$) and a vector of education measures ($\boldsymbol{C_{ij}}$), with a normally distributed error term (μ_i). Human capital and signaling theories underlie equation 1. Controlling for individual and family characteristics, an additional educational credential as well as the kind of institution where a postsecondary credential is earned either raises an individual's human capital or provides a signal to employers

that the individual has higher ability. This additional human capital and/or signal is rewarded in the labor market via higher wages (Long, 2010).

There is concern that the regression equation suffers from omitted variable bias, particularly if an individual or family trait is omitted that affects both earnings and college attendance (both in general and type). However, the models include a rich set of controls, some of which (e.g., the individual's high school performance, mother's level of education, the aspirations of one's peers to attend college) proxy for the individual's and family's taste and ambition for education, thereby minimizing such bias (Brand & Halaby, 2006; Brand & Xie, 2010).

After running regressions on the full sample, the samples are split by academic credential, gender, race, and occupational field to determine whether the returns to college type differ for subgroups of the overall sample. Each of these subsamples includes only those who have completed at least some college.[7] Finally, in order to adjust for potential heterogeneity and the endogeneity problem (self-selection into certain college types) highlighted by prior research (Brand & Halaby, 2006; Brand & Xie, 2010), I compare the regression estimates to results obtained from propensity score matching, which is more fully described below.[8]

FINDINGS

Not only are individuals who choose to attend for-profit colleges statistically different from those who do not attend these schools in terms of individual and family characteristics,

[7] In this way, individuals who have not completed high school, who have acquired their GED, and who have finished high school are excluded from these auxiliary analyses.

[8] Other methods used by researchers to deal with this issue include an instrumental variable approach (Behrman et al., 1996). However, there is some evidence that IV estimation may further bias estimates of the effect of education on earnings. IV estimates are often higher than OLS estimates, though it is unclear whether this is due to measurement error or weak instrumentation (Psacharopoulos & Patrinos, 2004; Heckman & Urzua, 2009).

individuals who choose for-profit colleges in pursuit of associate's degrees make significantly less in weekly earnings than those who do not. This difference in earnings exceeds what can be explained by self-selection into college and into a particular type of college, and is robust to the inclusion of regional, employment, and field of study controls. Furthermore, the penalty for attending a for-profit college is particularly concentrated among women, those from lower socioeconomic status, and those working in professional or managerial occupations.

Table 3. Descriptive statistics among individuals who have attended college by whether or not they attended a for-profit institution

	Has attended a for-profit college	Never attended a for-profit college	Difference
Logged average weekly compensation	6.15	6.49	-0.34**
Total education debt (in $1k)	9.66	5.26	4.40***
Female (%)	55.40	52.37	3.03
Black (%)	20.93	9.80	11.13***
Hispanic (%)	13.80	8.12	5.68**
Mixed race, non-Hispanic (%)	1.79	0.91	0.88
Non-black, non-Hispanic (%)	63.48	81.16	-17.68***
Age	27.16	26.96	0.20‡
ASVAB	50.23	63.32	-13.09***
High school GPA	2.83	3.12	-0.29***
Household net worth (in $10k)	10.07	13.01	-2.94*
Mother has at least 4 years of college (%)	20.94	31.26	-10.32**
At least half of peers aspired to attend college (%)	91.88	93.14	-1.26
Has completed some college	48.93	37.74	11.19**
Has 2-year degree	28.01	8.85	19.16***
Has 4-year degree	17.46	43.79	-26.33***
Has graduate degree	5.60	9.62	-4.02*
Number of weeks unemployed in 2009	3.35	1.60	1.75**
Work experience (years worked since 16)	8.59	8.54	0.05
Tenure in current job (in years)	2.71	3.25	-0.54
N	240	1698	

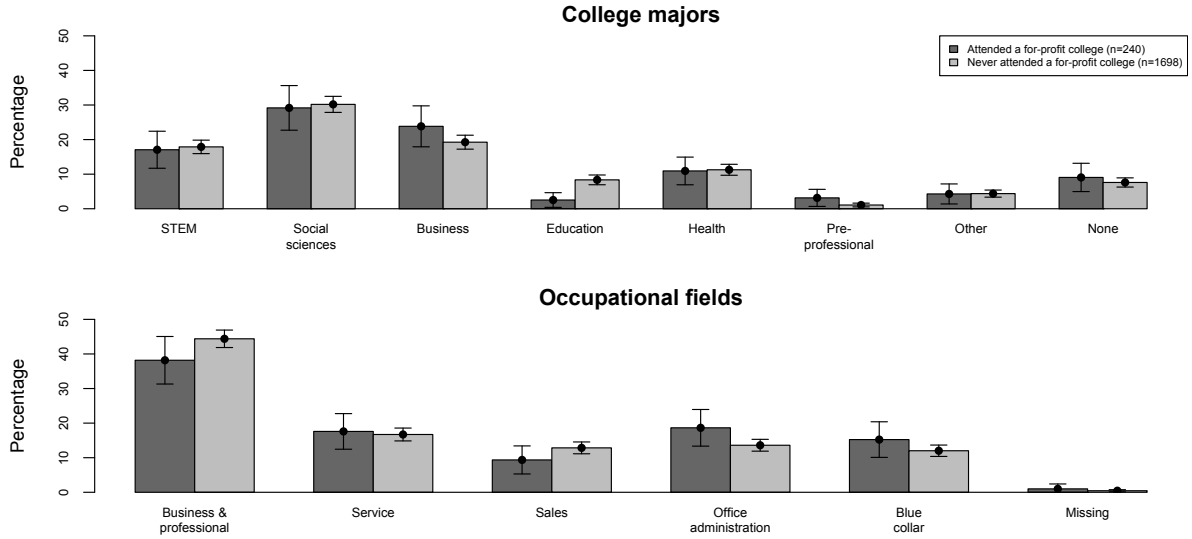
Notes: All means are weighted by NLSY97 sample weights; *n* value is not weighted. Statistical significance of each difference is indicated by: ***p<0.001, **p<0.01, *p<0. 05, ‡p<0.10.

Table 3 makes evident how individuals who attend for-profit colleges are different from those who attend public and nonprofit private colleges. For-profit students are significantly more likely to be black and Hispanic, come from families of lower socioeconomic status, and have less

educated mothers. For-profit students also have, on average, lower cognitive ability (as measured by the ASVAB), and they tend to perform less strongly in high school. These students take on over $3700 more in education-related loans, and are more likely than students who did not attend for-profit colleges to complete some college (without earning a degree) or to complete a 2-year degree, but much less likely to complete a 4-year or graduate degree. For-profit students were also more likely to be unemployed for more weeks in 2009. This table also provides an unadjusted difference in weekly earnings between those who attend for-profit colleges and those who do not; that is, without controlling for individual characteristics or employment experiences, for-profit students earn about 34 percent less per week after leaving school compared to those who do not attend for-profit colleges. These descriptive findings support what prior research has also found (Morey, 2004; Bennett et al., 2010; Deming et al., 2011).

Despite these differences, however, students who attend for-profit colleges do not major in subjects or enter into occupational fields that are very different from students who do not attend for-profit colleges. Prior research on for-profit colleges notes that these institutions tend to focus on particular areas of study—namely, those more rooted in practical skills (Morey, 2004). More recently, however, for-profit colleges have increasingly set their sights on the traditional curriculums of public and private nonprofit schools (Morey, 2004). The top panel in Figure 3 bears both these assertions out. While for-profit students are no more or less likely to major in such fields as science and math, the social sciences and humanities, or health, they are significantly more likely in the pre-professional fields (about 2 percentage point difference) but less likely to major in education (about 6 percentage point difference). Both differences are statistically significant at conventional levels.

Figure 3. College majors and occupation fields among individuals who have attended college, by whether or not they attended a for-profit institution



Note: All means are weighted by NLSY97 sample weights.

The bottom panel of Figure 3 similarly shows hardly any substantively important or statistically significant differences in the occupational fields entered into by individuals who have attended a for-profit college as compared to those who have not attended a for-profit college. For-profit students are only significantly more likely than students who have never attended a for-profit college to work in office and administrative support occupations; this difference of about 5.46 percentage points is significant at conventional levels. The overall finding of no occupational difference suggests that the lower earnings incurred by for-profit students is not attributable to the occupational fields in which they work. These students then may be occupying lower paid or ranked positions in the same or similar fields as those who attend public or nonprofit private institutions.

Table 4 presents the reduced-form estimates of the relationship between an individual's logged weekly earnings and their level of educational attainment and college type attended. Without controlling for any individual, family, or contextual factors, those who earn a bachelor's

degree or higher by attending a for-profit college earn significantly more than those with only a high school education. However, those who complete some college at a for-profit institution and those who obtain an associate's degree by attending a for-profit college appear to earn no more or no less than those with only a high school education. In this way, attending a for-profit college appears to pay off (in terms of significantly higher earnings than ending one's education after high school) only if a for-profit student can continue on and complete at least a bachelor's degree.

Table 4. Results of the effects of an individual's educational attainment and college type attended on their logged average weekly compensation in 2009

Educational attainment & college type (referent: completed high school or GED)	
Has not finished high school or GED	-0.51***
	(0.11)
Completed some college, attended for-profit college	-0.06
	(0.12)
Completed some college, did not attend for-profit college	0.19**
	(0.06)
Completed a 2-year degree, attended for-profit college	-0.07
	(0.15)
Completed a 2-year degree, did not attend for-profit college	0.59***
	(0.10)
Completed a 4-year or graduate degree, attended for-profit college	0.69***
	(0.16)
Completed a 4-year or graduate degree, did not attend for-profit college	0.62***
	(0.05)
N	2862

Notes: Standard errors are in parentheses. Intercept not shown. Data are weighted. Statistical significance is indicated as follows: ***p<0.001, **p<0.01, *p<0.05, ‡p<0.10.

Table 5 presents the regression coefficients of the effects of an individual's background, education level, and college type attended on their average weekly compensation. In terms of demographic factors, we can see that women consistently make less than comparable men at a rate that remains statistically different from zero despite what else is controlled for in the models. Socioeconomic status (as measured by household net worth) increases one's weekly earnings.

Noteworthy is the observation that there is no significant racial difference in earnings across nearly all models. This fits with research that finds that racial differences in earnings are at least partly explained by students' socioeconomic background and academic performance (Rumberger & Thomas, 1993). It is not surprising that the effect of prior academic achievement, as measured here by one's high school grade point average, remains significantly different from zero across all models (albeit marginally so in model 5) since prior research has found that high school GPA is a positive and statistically significant predictor of earnings (French et al., 2010).

Table 5. Results of the effects of an individual's background, educational attainment, and college types attended on their logged average weekly compensation in 2009

	Model 1	Model 2	Model 3[a]	Model 4[a]	Model 5[b]
Education & college type (referent: completed high school or GED)					
Has not finished high school or GED	-0.48***	-0.42***	-0.43***	-0.26**	-0.28**
	(0.11)	(0.11)	(0.11)	(0.10)	(0.10)
Completed some college, attended for-profit college	-0.01	-0.06	-0.09	-0.02	-0.07
	(0.12)	(0.11)	(0.11)	(0.11)	(0.12)
Completed some college, did not attend for-profit college	0.19**	0.11‡	0.09	-0.03	0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.08)
Completed a 2-year degree, attended for-profit college	-0.14	-0.23	-0.27‡	-0.26‡	-0.33*
	(0.15)	(0.15)	(0.15)	(0.14)	(0.16)
Completed a 2-year degree, did not attend for-profit college	0.60***	0.50***	0.49***	0.30***	0.23*
	(0.10)	(0.10)	(0.10)	(0.09)	(0.12)
Completed a 4-year or graduate degree, attended for-profit college	0.67***	0.56***	0.53**	0.45**	0.36*
	(0.16)	(0.16)	(0.17)	(0.15)	(0.17)
Completed a 4-year or graduate degree, did not attend for-profit college	0.59***	0.40***	0.38***	0.36***	0.29**
	(0.06)	(0.07)	(0.07)	(0.07)	(0.10)
Background characteristics					
Age	0.05**	0.05***	0.05***	-0.02	-0.03‡
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Sex (female)	-0.40***	-0.42***	-0.42***	-0.41***	-0.39***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Race (referent: non-black, non-Hispanic)					
Black	-0.16*	-0.09	-0.07	0.06	0.06
	(0.06)	(0.07)	(0.07)	(0.06)	(0.06)
Hispanic	0.05	0.08	0.04	0.05	0.05
	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)
Mixed race, non-Hispanic	0.16	0.20	0.18	0.28	0.27
	(0.22)	(0.22)	(0.22)	(0.20)	(0.20)
Household net worth (in $10k)	0.004**	0.004*	0.004*	0.003*	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Total education-related debt incurred from govt. sources (in $1K)	0.005‡	0.004	0.003	0.004‡	0.004‡
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Mother has at least 4 years of college	0.06	0.04	0.03	0.08	0.08

	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
At least half of peers aspired to attend college	0.05	0.03	0.04	0.01	0.002
	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)
Cognitive ability (ASVAB)		0.003**	0.003**	0.001	0.001
		(0.001)	(0.001)	(0.001)	(0.001)
High school GPA		0.15***	0.16***	0.09*	0.08‡
		(0.05)	(0.05)	(0.04)	(0.04)
Lives in MSA			0.29**	0.25**	0.25**
			(0.09)	(0.09)	(0.09)
Employment controls					
Number of weeks unemployed in 2009				-0.05***	-0.05***
				(0.003)	(0.003)
Work experience (years worked since age 16)				0.19***	0.20***
				(0.04)	(0.04)
Experience^2				-0.007*	-0.007**
				(0.003)	(0.003)
Tenure in current job (in years)				0.17***	0.16***
				(0.03)	(0.03)
Tenure^2				-0.02***	-0.02***
				(0.003)	(0.003)
N	2862	2862	2862	2862	2862

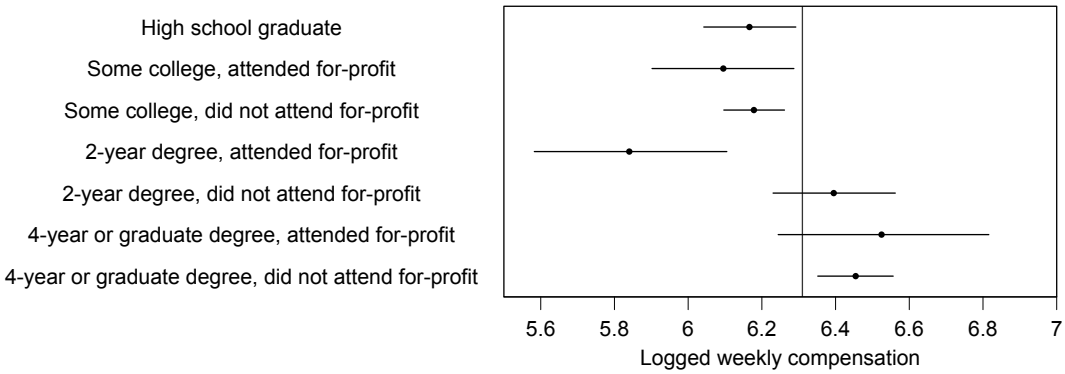
Notes: Standard errors are in parentheses. Intercept is not shown. Data are weighted. [a]Models 3 and 4 includes additional controls for region of the country (dummies for northeast, north central, and west, with south as the referent), not shown. [b]Model 5 includes controls for regions (as in models 3 and 4), as well as additional controls for college major and occupational field, not shown. Statistical significance is indicated as follows: ***p<0.001, **p<0.01, *p<0.05, ‡p<0.10.

Turning to the effect on weekly earnings by college type, we can see that attending a for-profit college affects individuals at each level of education differently. While the weekly earnings of individuals who complete some college by attending a for-profit college do not differ significantly from those with a high school education across all five models, for-profit attendees with an associate's degree actually earn less (by about a statistically significant 33 percent in the final model with the full set of controls) than those with a high school diploma. Bachelor's or graduate degree holders who attended a for-profit college earn significantly more than their high school educated counterparts across all five models.

When only age, race, sex, and socioeconomic indicators are included in the model (model 1), attending a for-profit college and earning no degree or an associate's degree results in earnings that are no different from high school graduates, while attending a for-profit college and

obtaining at least a bachelor's degree results in about 67 percent higher average weekly earnings compared to high school graduates. Adding the full bevy of background characteristics and regional controls (as in models 2 and 3) does not change the null effect of attending a for-profit college for individuals with some college or an associate's degree. This suggests that the self-selection of academically weaker individuals and individuals of color or from lower socioeconomic statuses into for-profit colleges (Bennett, Lucchesi, & Vedder, 2010; GAO, 2011) cannot fully explain the lack of earnings gains for attending a for-profit institution as opposed to not attending college at all. Furthermore, when occupational and field of study controls are added to the model (models 4 and 5), the earnings of for-profit attendees with associate's degrees become significantly less than those with only a high school diploma. Thus far, it appears that attending a for-profit college in pursuit of higher education at levels below the bachelor's degree equips individuals with either less productive capacity or a less credible signal of productivity.

Figure 4. Predicted logged weekly compensation by education level and college type



Notes: Points represent predicted values of logged weekly compensation derived from model 5 in Table 5, while lines represent 95% confidence intervals around those point estimates. All other covariates set at their means. Vertical line is set at the sample mean (6.31).

Figure 4 presents the results in Table 5 another way by plotting the predicted logged weekly earnings by education level and college type. Attending a for-profit college and failing to

earn a credential results in earnings that are not significantly different than the average high school graduate's earnings. In addition to earning significantly less than similarly educated individuals who did not attend for-profit colleges, associate's degree holders who attended a for-profit college appear to make no more in weekly earnings than the average high school graduate in this sample. Furthermore, while the predicted value of attending a for-profit college in pursuit of at least a bachelor's degree is not significantly different than that of obtaining at least a bachelor's degree from a public or nonprofit college, there is much greater variation on the former's estimate. Indeed, the predicted logged weekly earnings of a bachelor's degree or higher among for-profit attendees is not significantly different from either the sample's average (which includes those who did not attend college at all) or from those with only a high school diploma.

These findings are more suggestive of signaling theory than of human capital theory. According to human capital theory, continuing one's education beyond high school should result in higher productivity and thus higher earnings (Becker, 1975; Shockey, 1989). However, this appears not to be the case. The traditional signals offered by a college degree—having the motivation and elite values to be accepted into and successful at a college (Collins, 1971; Weber, 1978; Bourdieu, 1996)—appear to be failing individuals who attend for-profit colleges.

Furthermore, that the penalty for attending a for-profit college is greater for two-year degree holders versus four-year degree holders is not surprising. While a high school diploma, college attendance, a bachelor's degree, and a graduate degree are associated with higher pre-college abilities, an associate's degree is not (Arkes, 1999). Furthermore, Carnevale and colleagues (2010) provide estimates of the average lifetime earning by educational level, finding that high school graduates earn about $1.8 million, those with some college earn $2.24 million, and those with two-year degrees earn $2.25 million, while those with a four-year degree earn

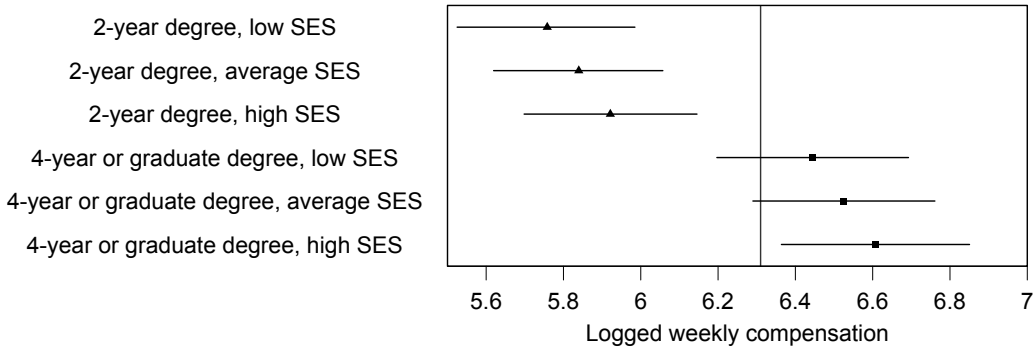
$3.4 million. The substantially higher earnings for bachelor's degree holders over associate's degree holders, as well as the lack of much difference between the earnings of associate's degree holders and those with only some college or even a high school degree, suggest that four-year degree holders are in relatively greater demand than workers with less education, including those with a two-year degree (Carnevale et al., 2010).

Not only are the returns to a two-year degree not as high as the returns to a four-year degree, community colleges (where most individuals earn their associate's degree) provide education to economically disadvantaged students and those with relatively weaker academic performance, serve as a principal skill upgrading mechanism for those already in the workforce as a result of their universal admissions policies and flexible curriculums, and enroll a relatively large share of students affected by state and federal financial aid (Alba & Lavin, 1981; Velez, 1985; Marcotte et al., 2005). Given the potential signal that a two-year degree holder is not as qualified as an individual who has received a four-year degree, coupled with the large numbers of individuals pursuing their two-year degrees at for-profit institutions whose quality and productivity enhancing capability are yet unproven, employers may be particularly attentive to *where* individuals obtained their four-year degrees as they seek to hire employees they believe will be most qualified for and productive on the job.

We can also look at the differential effects of attending a for-profit college on earnings by socioeconomic status (SES). Figure 5 shows the predicted logged weekly compensation for associate's and bachelor's degree holders from families with varying levels of net worth. The low SES category includes those coming from families with a net worth two standard deviations below the average, while the high SES individuals come from families with a net worth two standard deviations above the average. While there is a clear pattern wherein individuals from a

lower socioeconomic status are more negatively affected by attending a for-profit college in pursuit of their degree, the differences within each educational level are not significantly different from one another. At the same time, associate's degree holders from even the high SES category earn significantly less than bachelor's or graduate degree holders from the lowest SES category.

Figure 5. Predicted logged weekly compensation by degree level and socioeconomic status, among those who attended for-profit colleges only

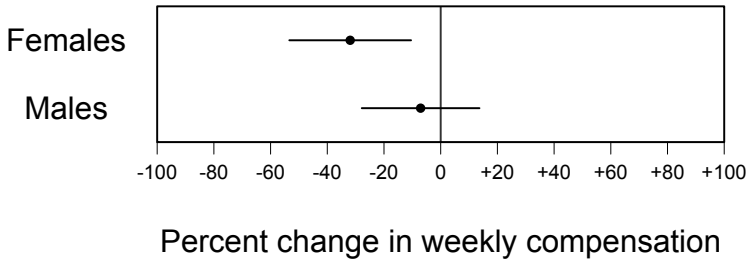


Notes: Dots represent predicted values of logged weekly compensation derived from model 5 in Table 5, while lines represent 95% confidence intervals around those point estimates. All other covariates set at their means. Vertical line is set at the sample mean (6.31).

Since a number of prior studies have found significant differences in the returns to education across demographic groups and occupational fields (Card & Krueger, 1992; Monks, 2000; Mouw & Kalleberg, 2010), I perform separate regression analyses by sex, race, and occupational field to get at the possible interactions of these characteristics and attending a for-profit college. This strategy allows the coefficients to vary by demographic group (Monks, 2000). These auxiliary analyses include in their samples only those who have completed at least some college, and the series of dummy variables indicating attainment and type of college attended is replaced here with a single dummy variable specifying whether an individual

attended a for-profit college. Figures 6 through 8 illustrate the results of these subsample regressions.

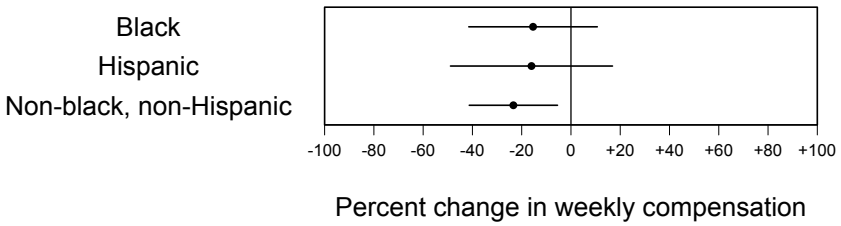
Figure 6. Effect of attending a for-profit college on average weekly compensation in 2009 among college-goers, by gender



Notes: Figure illustrates the results of separate regression analyses by gender. Each regression included the same set of background, region, and employment controls as model 5 in Table 5. Dots represent the coefficients obtained from these separate regressions for each gender (n=1046 for females, n=892 for males). Lines represent the 95% confidence intervals around those coefficients. Full results available from author upon request.

The penalty for attending a for-profit college is not evenly distributed by either sex or race. As Figure 6 shows, females who attend a for-profit college make statistically less than female college-goers who do not attend a for-profit college. While the coefficient for having attended a for-profit college is negative for both sexes and not significantly different from one another, the coefficient for males is not significantly different from zero. This may be at least partly a function of the overall penalty women encounter on the job market. Women with the same educational attainment as men earn about a quarter less over a lifetime (Carnevale, Rose, & Cheah, 2011). Women have to acquire a doctorate in order to earn as much as men with a bachelor's degree. It is less likely that education differentially enhances one's human capital depending on gender than where females and males pursue their degree acts as a variable signal of ability.

Figure 7. Effect of attending a for-profit college on average weekly compensation in 2009 among college-goers, by race



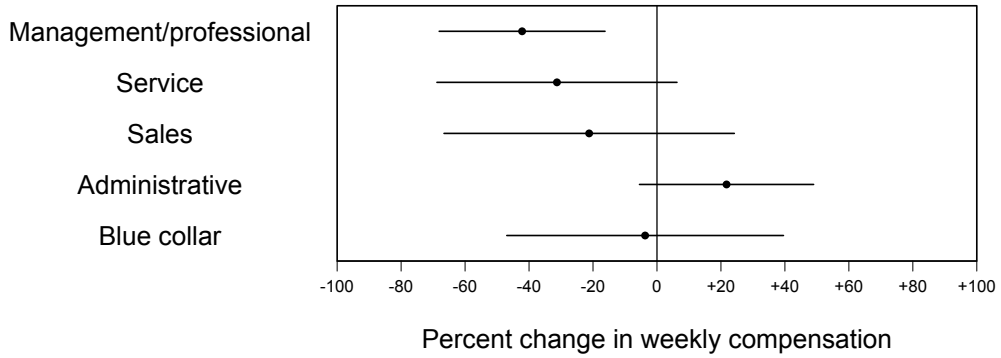
Notes: Figure illustrates the results of separate regression analyses by race. Each regression included the same set of background, region, and employment controls as model 5 in Table 5. Dots represent the coefficients obtained from these separate regressions for each racial category (n=645 for black, n=509 for Hispanic, n=1690 for non-black, non-Hispanic). Lines represent the 95% confidence intervals around those coefficients. Full results available from author upon request.

Turning to Figure 7, non-black, non-Hispanic individuals face a statistically significant penalty for attending for-profit colleges as compared to attending public and other nonprofit colleges, whereas the penalty for black and Hispanic individuals is not significantly different from zero. This finding is perhaps not surprising. On average, blacks have higher returns to education than whites (Card & Krueger, 1992; Henderson, Polacheck, & Wang, 2011). In times of economic downturn, research has shown that whites are more negatively impacted by the worsened labor market and economic conditions than blacks (Henderson et al., 2011; Knieser et al., 1978). Additionally, according to signaling theorists, employers may perceive that individuals of color pay proportionately higher direct and indirect costs to obtain their signals of productivity (i.e., academic credentials) and thus reward them with higher wages for more schooling (Spence, 1973; Belman & Haywood, 1991).

Finally, attending a for-profit college in pursuit of higher education appears to have different effects on one's earnings depending on the occupational field one enters, as illustrated by Figure 8. While those working in the management/professional, service, sales, and blue collar occupations appear to earn less on average if they attended a for-profit college as compared to if they had not, the effect of attending a for-profit college actually appears to be positive for

administrative workers. Furthermore, only for the management and professional occupations is the negative effect of attending a for-profit college statistically significantly different from zero (though not significantly different from the effects for service, sales, or blue collar occupations). This supports prior work finding that the earnings of individuals in professional and managerial occupations are especially affected by where one went to college (Karabel & McClelland, 1987).

Figure 8. Effect of attending a for-profit college on average weekly compensation in 2009 among college-goers, by occupational field



Notes: Figure illustrates the results of separate regression analyses by occupational field. Each regression included the same set of background, region, and employment controls as model 5 in Table 5. Dots represent coefficients from separate regressions for each occupational field (n=802 for management/professional, n=352 for service, n=232 for sales, n=303 for administrative, n=237 for blue collar). Lines represent the 95% confidence intervals around those coefficients. Full results available from author upon request.

Propensity Score Matching Analysis. Given the potential bias resulting from students' self-selection into college in general and college type in particular based on their socioeconomic background and cognitive ability, I estimate the effect of attending a for-profit college experienced by those who receive the treatment using propensity score matching as a robustness check to the OLS results (Brand & Halaby, 2006; Brand & Xie, 2010; Lang & Weinstein, 2012). Unlike OLS regression, propensity score matching does not rely on the assumption of linearity and highlights the support problem (Brand & Halaby, 2006; Black &

Smith, 2003). By restricting the analysis to the region of common support, we only make inferences where we have sufficient data on both treatment and control cases.

This analytical approach is not without its limitations. A key assumption of propensity score matching is that observables can account for the selection process into treatment (Dehejia & Wahba, 2002). In other words, like linear regression, matching does not account for selection into the treatment on unobservables (Brand & Halaby, 2006). Until more is known about what influences an individual to enroll in a for-profit college, as opposed to a public or private, nonprofit institution or not enrolling in college at all, the covariates used in this study to estimate one's propensity to attend a for-profit college are likely to miss some variation. Additionally, after individuals are matched, unmatched control observations are discarded. Thus, while this methodological approach allows us to apply a quasi-experimental lens to our analysis, we do lose a number of observations.

The propensity score is the probability of receiving a treatment (here, attending a for-profit college) given pretreatment characteristics (Rosenbaum & Rubin, 1983). I use logit models to calculate propensity scores for the overall sample of college-goers as well as for two subsamples: associate's degree holders and bachelor's degree holders. Because the outcome variable must be binary, and because the study's full sample includes individuals who did not attend for-profit colleges because they did not attend college at all (and including these individuals would likely confound the results), I restrict this sample to those who have attended at least some college. Descriptive statistics of the variables used in the logit models are presented in Table 6, and the results of the logistic regression for the overall college-going sample are presented in Table 7.

Table 6. Descriptive statistics of covariates used in propensity score calculation, full sample of college-goers

	Mean	SE
Attended a for-profit college (%)	10.82	0.73
Female (%)	52.70	1.21
Black (%)	11.01	0.59
Hispanic (%)	8.73	0.55
Mixed race, non-Hispanic (%)	1.01	0.26
Non-black, non-Hispanic (%)	79.24	0.83
Family net worth (in $10k)	12.69	0.41
Mother has at least 4 years of college (%)	30.15	1.13
ASVAB	61.90	0.60
High school GPA	3.09	0.01
N	1938	

Note: All means are weighted by NLSY97 sample weights; *n* value is not weighted.

The covariates used to predict for-profit college attendance are rooted in the prior literature. The opportunity to pursue higher education is unequally distributed across the population (Hout, 2012; Raftery & Hout, 1993; Lucas, 2001). Coming from a family of lower SES, for instance, is expected to increase the odds of attending a for-profit college among those who do attend college at all since socioeconomically advantaged parents may not only encourage their children to attend college but are also able to coach them on how and where to apply (Lucas, 2001). Additionally, ability (as measured by one's score on the ASVAB), prior academic achievement (high school grade point average), sex, and race have been shown to enter into both the decision to attend college after high school and the decision of which college to attend (Thomas, 2000; Turley, Santos, & Ceja, 2007).

Once assignment to treatment has been conditioned on the observables by the logistic regression, I estimate the Average Treatment Effect on the Treated (ATT), which can be expressed as follows:

$$\tau|(T = 1) = E[(Y_T - Y_{\sim T})|T = 1], \quad (2)$$

where T=1 if an individual attended a for-profit college. The value of τ provides an estimate for the mean effect experienced by those who receive the treatment.[9] In this way, the ATT provides a comparison of the earnings of for-profit attendees to what they would have experienced had they not attended a for-profit college (but instead attended a public or private, nonprofit college). Table 8 displays the effect estimates for the three samples.

Table 7. Logit model predicting attending a for-profit college, full sample of college-goers

Constant	0.60 (0.42)
Female	0.34* (0.15)
Black	0.47** (0.18)
Hispanic	0.38‡ (0.20)
Mixed race, non-Hispanic	0.77 (0.68)
Family net worth (in $10k)	-0.002 (0.006)
Mother has at least 4 years of college (%)	-0.27 (0.19)
ASVAB	-0.008** (0.003)
High school GPA	-0.83*** (0.15)
N	1938

Notes: Data are weighted. Standard errors are in parentheses. Statistical significance is indicated as follows: ***p<0.001, **p<0.01, *p<0.05, ‡p<0.10.

The results of the propensity score analyses generally corroborate the findings presented above. The effect of attending a for-profit college on weekly earnings is generally negative. Individuals who pursue their postsecondary education by attending a for-profit college make, on average, about 21 percent less in weekly earnings than comparable individuals who did not attend a for-profit college. However, looking at the associate's degree holders and bachelor's degree holders separately, we can see that the negative effect is wholly concentrated among the associate's degree holders. For-profit attendees with an associate's degree make about 59 percent less than comparable public or nonprofit attendees with an associate's degree. While this

[9] To perform the propensity score matching and compute the ATT, I use the Matching package in R (Sekhon, 2011).

negative effect is statistically significant at conventional levels, the effect of attending a for-profit college among bachelor's degree holders is not significantly different from zero.

Table 8. Average effect of attending a for-profit college

	Sample sizes		
	Attended a for-profit (treatment)	Did not attend for-profit (control)	ATT
Full sample of college-goers	240	791	-0.21*
			(0.10)
AA degree-holders	62	71	-0.59*
			(0.29)
BA degree-holders	38	79	0.14
			(0.15)

Notes: ATT=average treatment effect for the treated. Matching results come from one-to-one matching with replacement. Standard errors are in parentheses. Statistical significance is indicated as follows: ***p<0.001, **p<0.01, *p<0.05, ‡p<0.10.

CONCLUSION

Although pursuing higher education should be related to higher earnings (Behrman et al., 1996; Brewer & Ehrenberg, 1996; Brewer et al., 1999; Dale & Krueger, 2002; Brand & Halaby, 2006; Long, 2008; Hout, 2012), it is clear from the present study that where one pursues that education is also important for how much one earns. In investigating the heterogeneous returns to a college education by college type, this study has found that attending a for-profit institution and completing some college or an associate's degree results in earnings that are not significantly different from the average earnings of a high school graduate.

Both human capital theory and signaling theory provide useful perspectives for understanding the lower earnings of individuals who attend for-profit colleges. For-profit colleges may be less efficient or effective at transmitting job-related skills and at enhancing the productive capacities of their students (Becker, 1975; Shockey, 1989). If wage differences are

primarily due to human capital differences (namely, education plus experience), the fact that the lack of a difference between attending a for-profit college and a high school diploma persists with the introduction of both educational level and years of experience on the job provides evidence that this is the case. Many have also raised doubts about the instructional quality of for-profit colleges (GAO, 2011), thereby again pointing to the more limited ability of for-profit institutions to enhance students' human capital.

On the other hand, for-profit colleges may provide a less credible signal to employers of a potential employee's productivity or cultural capital (Weber, 1978; Spence, 1973; Arrow, 1973). Employers, as purchasers of labor, use whether one pursued their higher education at for-profit colleges or not as a signal of that individual's productivity. Due to for-profit schools' typically lax admission criteria and unproven quality (Morey, 2004; Bennett et al., 2010), employers may regard a degree for a for-profit college as a less credible signal of ability, motivation, general language and communication skills, or upper or middle class preferences, attitudes, and behaviors (Collins, 1971; Bourdieu & Passeron, 1977; Bourdieu, 1996; Weber, 1978), and so decide to pay them less or hire them for lower paying positions. Alternatively, given the relative newness of for-profit colleges—at least in terms of their scale—employers may lack the information necessary to make accurate estimates of degree-holders from for-profit institutions. As new applicants enter the labor market, employers' conditional probabilistic beliefs about the applicants' productivity are modified (Spence, 1973). Perhaps it is the case that not enough for-profit students have yet entered the labor market, and so employers are still tinkering with their assessment of the signal provided by a for-profit credential.

These possible explanations are not mutually exclusive, and indeed for-profit college students may earn less than their nonprofit college counterparts due to both lower human capital

and less credible signaling. Even though this study cannot adjudicate between human capital and signaling theories to identify the precise mechanism through which college type influences earnings, this study does demonstrate that self-selection into college in general and college type in particular by observable traits such as cognitive ability and socioeconomic background does not fully explain the lack of a consistent earnings gain from attending a for-profit college as compared to not attending college at all.

Signaling, skill-upgrading, and stratification processes appear to be operating at a level beyond simply how much education one acquires. Not only does attending a for-profit college not result in the same earnings premium experienced by those who do not attend for-profit institutions, those who attend for-profit colleges come from more disadvantaged backgrounds. The concentration of disadvantaged students in educational institutions that lead to lower earnings underscores higher education's social reproduction function (Weber, 1978; Gramsci, 1971; Bowles & Gintis, 1976; Hout, 2012). Social reproduction theorists argue that, not only are educational credentials divorced from the actual skills demanded by particular jobs, they confer upon individuals who acquire them an essential and permanent status identity that in turn grants them access to higher status and better paying positions (Bourdieu, 1996; Bourdieu & Passeron, 1977; Weber, 1978; Collins, 1971; Brown, 2001). Given the rising numbers of individuals choosing to obtain a college degree regardless of academic or social background (Goyette, 2008), qualitative differences among postsecondary educational institutions may preserve the social class structure (Collins, 1971; Weber, 1978). As explored in this paper, this reproduction function seems to be borne out by the earnings differential between nonprofit and for-profit college attendees, especially for women and for two-year degree holders.

One possible explanation for similar earnings among four-year degree holders who

attended either for-profit or nonprofit colleges, despite what social reproduction theory would anticipate, is that the demand for workers with college educations is outpacing—and will continue to outpace—the supply (Bound, Lovenheim, & Turner, 2009; Long, 2010; Carnevale et al., 2010; Carnevale & Rose, 2011). Indeed, research points to a possible economic premium of enrolling in and studying at a postsecondary institution at all (Marcotte et al., 2005), and completion of any four-year degree is a "watershed event" in one's life course and occupational trajectory (Stevens et al., 2008, p. 131). Once individuals attain four-year degrees, social background has very small effects on occupational position (Hout, 1988). In this way, it may be that the college wage premium in general overtakes a potential for-profit penalty in an economic climate where too few American workers are equipped with the skills necessary to fill attractive jobs in new growth sectors like healthcare, technology, and business services (Carnevale et al., 2010; Goldin & Katz, 2008).

At the same time, students at any college degree level who choose to attend for-profit colleges under the assumption that this way of investing in their education lowers the incurred costs (e.g., tuition, time, the disutility of coursework as compared to on-the-job experience) of gaining skills or a credential may be underestimating those costs and overestimating the potential returns. The penalty of lower earnings resulting from attending a for-profit college found in this study at the "some college" and associate's degree levels is likely exacerbated by the higher average education-related debt taken on by for-profit college students and the lower rates of bachelor degree completion at for-profit colleges (Deming et al., 2011).

While this study offers compelling evidence on the negative relationship between attending a for-profit college and earnings, more can be done. For instance, in future research I propose a longer-term view of returns (as opposed to the cross-sectional analysis offered here).

Given the restrictions placed on the sample (i.e., to be included in the sample, respondents had to be no longer enrolled in school), there is reason to believe that this study underestimates the negative effect of attending a for-profit college. For-profit colleges serve on average an older student population. Research also shows that those who complete college at a later age receive a significantly lower earnings premium than those who graduate at a younger age (Monks, 1997; Elman & O'Rand, 2004; Taniguchi, 2005). Intuitively, earnings are lowest early in the career for all workers. Since earnings inequalities grow throughout a career, as some individuals are promoted or receive additional skill training (Rosenfeld, 1992; Tomaskovic-Devey et al., 2005), a longitudinal approach could allow clearer identification of whether human capital or signaling are the primary drivers of the difference between for-profit and nonprofit college attendees.

Due to the relative youth of the NLSY97 cohort, this is likely missed. While the NLSY97 is useful in that it includes individuals who advanced to college relatively recently and thus were more likely than nationally representative large datasets with older cohorts to have attended for-profit colleges, the young age of the NLSY97 respondents also means the study was able to look at only early life course earnings. Whether or not the wages of for-profit attendees and those who did not attend for profit colleges converge, diverge, or march in step farther out than a few years from the traditional college remains to be seen. Such longitudinal investigation will require data on more individuals who have attended college in this growing sector.

Qualitative methodology that is able to more directly assess employers' attitudes toward the for-profit sector (e.g., audit studies) might provide further information as to the mechanism driving differences in earnings. Similarly, this study looked at the effect of *attending* a for-profit college—not the effect of holding a degree from a for-profit college, *per se*, and so future research should look specifically at the effect on earnings of obtaining a degree from a for-profit

college. Finally, earnings are not the only pertinent benefit to education. Other research has found positive relationships between education and improved life satisfaction, better health, and greater participation in community and political activities (Ross & Wu, 1995; Milligan et al., 2003; Brand, 2010). Investigation into whether and how attending a for-profit college impacts non-pecuniary outcomes would thus be worthwhile.

As the for-profit postsecondary education sector continues to grow and be shaped by public discourse and governmental regulation, additional research will be necessary. The present study and others demonstrate that for-profit colleges provide educational opportunities to traditionally underserved populations, particularly students of color and from lower socioeconomic backgrounds (Deming et al., 2011). However, the challenge to for-profit colleges—and the researchers who study them—will be to critically examine whether they also constitute stratification generating institutions given their higher sticker price, the higher debt volume and default rates of their students, and, as the present study finds, the lower earnings garnered by their students.

REFERENCES

Alba, R., & Lavin, D. E. (1981). Community colleges and tracking in higher education. *Sociology of Education, 54*(4): 223-237.

Arkes, J. (1999). What do educational credentials signal and why do employers value credentials? *Economics of Education Review, 18*: 133-141.

Arrow, K. J. (1973). Higher education as a filter. *Journal of Public Economics, 2*: 193-216.

Arum, R.; Roksa, J. (2011). *Academically Adrift: Limited Learning on College Campuses*. Chicago, IL: University of Chicago Press.

Atkinson, A. (2010). Race, educational loans, and bankruptcy. *Michigan Law Journal, 16*(1).

Aud, S., Fox, M. A., & KewalRamani, A. (2010). *Status and Trends in the Education of Racial and Ethnic Groups.* Washington, D.C.: U.S. Department of Education, National Center for Education Statistics.

Bailey, T., Badway, N., & Gumport, P. J. (2003). *For-Profit Higher Education and Community Colleges.* Stanford, CA: National Center for Postsecondary Improvement, Stanford University.

Baum, S., Payea, K. (2011). "Trends in Student Aid, 2011." *Trends in Higher Education Series*. New York, NY: College Board Advocacy & Policy Center.

Becker, G. S. (1975). *Human Capital: A Theoretical Analysis with Special Reference to Education*. New York, NY: Columbia University Press.

Becker, S. O.; Ichino, A. (2002). Estimation of average treatment effects based on propensity scores. *The Stata Journal, 2*(4): 358-377.

Behrman, J. R., Rosenzweig, M. R., & Taubman, P. (1996). College choice and wages: Estimates using data on female twins. *Review of Economics and Statistics, 78*(4): 672-685.

Belley, P., Lochner, L. (2007). The changing role of family income and ability in determining educational achievement. Working Paper No. 13527. Cambridge, MA: National Bureau of Economic Research.

Bennett, D. L., Lucchesi, A. R., & Vedder, R. K. (2010). *For-Profit Higher Education: Growth, Innovation and Regulation.* Washington, D.C.: Center for College Affordability and Productivity.

Black, D. A., & Smith, J. A. (2004). How robust is the evidence on the effects of college quality? Evidence from matching. *Journal of Econometrics, 121*(1-2): 99-124.

Bound, J.; Lovenheim, M.; Turner, S. (2009). Why have college completion rates declined? An analysis of changing student preparation and collegiate resources. Working Paper No. 15566. Cambridge, MA: National Bureau of Economic Research.

Bourdieu, P. (1996). *The State Nobility: Elite Schools in the Field of Power.* Stanford, CA: Stanford University Press.

Bourdieu, P.; Passeron, J. C. (1977). *Reproduction in Education, Society and Culture*. Newbury Park, CA: Sage Publications.

Bowles, S.; Gintis, H. (1976). *Schooling in Capitalist America: Educational Reform and the Contradictions of American Life*. New York, NY: Basic Books.

Brand, J. E. (2010). Civic returns to higher education. *Social Forces, 89*: 417-434.

Brand, J. E., & Halaby, C. N. (2006). Regression and matching estimates of the effects of elite college attendance on educational and career achievement. *Social Science Research, 35*: 749-770.

Brand, J. E., & Xie, Y. (2010). Who benefits most from college? Evidence for negative selection in heterogeneous economic returns to higher education. *American Sociological Review, 75*(2): 273-302.

Brewer, D. J., Eide, E. R., & Ehrenberg, R. G. (1999). Does it pay to attend an elite private college? Cross-cohort evidence on the effects of college type on earnings. *Journal of Human Resources, 34*(1): 104-123.

Brown, D. K. (2001). The social sources of educational credentialism: Status cultures, labor markets, and organizations. *Sociology of Education, 74*(Extra Issue): 19-34.

Card, D.; Krueger, A. B. (1992). School quality and black-white relative earnings: A direct assessment. *Quarterly Journal of Economics, 107*: 151-200.

Carey, K., & Dillon, E. (2011). *Debt to degree: A new way of measuring college success*. Washington, D.C.: Education Sector.

Carnevale, A. P.; Smith, N.; Strohl, J. (2010). *Help Wanted: Projections of Jobs and Education Requirements through 2018*. Washington, DC: Center on Education and the Workforce, Georgetown University.

Carnevale, A. P.; Rose, S. J. (2011). *The Undereducated American.* Washington, DC: Center on Education and the Workforce, Georgetown University.

Carnevale, A. P.; Rose, S. J.; Cheah, B. (2011). *The College Payoff: Education, Occupations, Lifetime Earnings*. Washington, DC: Center on Education and the Workforce, Georgetown University.

Cellini, S. R. (2012). For-profit higher education: An assessment of costs and benefits. *National Tax Journal, 65*(1): 153-180.

Cellini, S. R., Chaudhary, L. (2012). The labor market returns to a for-profit college education. NBER Working Paper #18343. Cambridge, MA: National Bureau of Economic Research.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*(Supplement: Organizations and Institutions): S95-S120.

Collins, R. (1971). Functional and conflict theories of educational stratification. *American Sociological Review, 36*: 1002-1019.

Collins, R. (2002). Credential Inflation and the Future of Universities. In S. Brint, *The Future of the City of Intellect: The Changing American University* (pp. 23-46). Stanford, CA: Stanford University Press.

Dale, S. B., & Krueger, A. B. (2002). Estimating the payoff of attending a more selective college: An application of selection on observables and unobservables. *Quarterly Journal of Economics, 107*(4): 1491-1527.

Dehejia, R. H., Wahba, S. (2002). Propensity score matching methods for non-experimental causal studies. *The Review of Economics and Statistics, 84*: 151-161.

Deming, D., Goldin, C., & Katz, L. (2011). The for-profit postsecondary school sector: Nimble critters or agile predators? *Draft Paper*. Cambridge, MA: Harvard University & National Bureau of Economic Research.

de Vise, D. (2011, June 1). Federal 'gainful employment' rule tightens oversight of for-profit colleges. *The Washington Post*. Available here: http://www.washingtonpost.com/local/education/federal-gainful-employment-rule-tightens-oversight-of-for-profit-colleges/2011/06/01/AGSiAqGH_story.html.

DiPrete, T. (2007). What Has Sociology to Contribute to the Study of Inequality Trends? A Historical and Comparative Perspective. *American Behavioral Scientist, 50*(5): 603-618.

Eide, E., Brewer, D. J., & Ehrenberg, R. G. (1998). Does it pay to attend an elite private college? Evidence on the effects of undergraduate college quality on graduate school attendance. *Economics of Education Review, 17*(4): 371-376.

Elman, C.; O'Rand, A. M. (2004). The race is to the swift: Socioeconomic origins, adult education, and wage attainment. *American Journal of Sociology, 110*(1): 123-160.

Fischer, C. S., & Hout, M. (2006). *Century of Difference: How America Changes in the Last One Hundred Years*. New York, NY: Russell Sage Foundation.

French, M.; Homer, J.; Robins, P. K. (2010). What you do in high school matters: The effects of high school GPA on Educational attainment and labor market earnings in adulthood. Mimeo, University of Miami, Department of Economics.

Gamoran, A. (2001). American Schooling and Educational Inequality: A Forecast for the 21st Century. *Sociology of Education, 74*(Extra Issue): 135-153.

Gerber, T. P., & Cheung, S. Y. (2008). Horizontal stratification in postsecondary education: Forms, explanations, and implications. *Annual Review of Sociology, 38*: 299-318.

Gill, A. M., Leigh, D. E. (2000). Community college enrollment, college major, and the gender wage gap. *Industrial Labor Relations Review, 54*: 163-181.

Goldin, C.; Katz, L. F. (2007). Long-run changes in the U.S. wage structure: Narrowing, widening, polarizing. Working Paper No. 13568. Cambridge, MA: National Bureau of Economic Research.

Goldin, C.; Katz, L. F. (2008). *The Race between Education and Technology*. Cambridge, MA: Harvard University Press.

Government Accountability Office (GAO). (2011). Postsecondary education: Student outcomes vary at for-profit, nonprofit, and public schools. *Report to Congressional Requestors #12-143*. Washington, D.C.: U.S. Government Accountability Office.

Goyette, K. A. (2008). College for Some to College for All: Social Background, Occupational Expectations, and Educational Expectations over Time. *Social Science Research, 37*: 461-484.

Gramsci, A. (1971). *Selections from the Prison Notebooks.* New York, NY: International Publishers.

Grubb, W. N. (1993). The varied economic returns to postsecondary education: New evidence from the class of 1972. *Journal of Human Resources, 28*(2): 365-382.

Harmon, C.; Oosterbeek, H.; Walker, I. (2003). The returns to education: Microeconomics. *Journal of Economic Surveys, 17*(2): 115-155.

Haveman, R., & Smeeding, T. (2006). The role of higher education in social mobility. *The Future of Children, 16*(2): 125-150.

Heckman, J. J.; Urzua, S. (2009). Comparing IV with structural models: What simple IV can and cannot identify. NBER Working Paper #14706. Cambridge, MA: National Bureau of Economic Research.

Henderson, D. J.; Polachek, S. W.; Wang, L. (2011). Heterogeneity in schooling rates of return. *Economics of Education Review, 30*(6): 1202-1214.

Hout, M. (2012). Social and economic returns to college education in the United States. *Annual Review of Sociology, 38*.

Hout, M., & DiPrete, T. A. (2006). What we have learned: RC28's contributions to knowledge about social stratification. *Research in Social Stratification and Mobility, 24*(1): 1-20.

Jackson, G. A. (1978). Financial aid and student enrollment. *Journal of Higher Education, 49*(6): 548-574.

Jaeger, D. A., & Page, M. E. (1996). Degrees matter: New evidence on sheepskin effects in the returns to education. *Review of Economics and Statistics, 78*(4): 733-740.
James, E., Alsalam, N., Conaty, J. C., & To, D.-L. (1989). College quality and future earnings: Where should you send your child to college? *American Economic Review, 79*(2): 247-252.
Jencks, C., Bartlett, S., Corcoran, M., Crouse, J., Eaglesfield, D., Jackson, G., et al. (1979). *Who Gets Ahead? The Determinants of Economic Success in America.* New York, NY: Basic Books.
Kane, T. J., & Rouse, C. E. (1995). Labor-market returns to two- and four-year college. *American Economic Review, 85*(3): 600-614.
Karabel, J.; McClelland, K. (1987). Occupational advantage and the impact of college rank on labor market outcomes. *Sociological Inquiry, 57*(4): 323-347.
Kniesner, T. J.; Padilla, A. H.; Polachek, S. W. (1978). The rate of return to schooling and the business cycle. *Journal of Human Resources, 13*: 265-277.
Korpi, W. (2003). Welfare-State Regress in Western Europe: Politics, Institutions, Globalization, and Europeanization. *Annual Review of Sociology, 29*: 589-609.
Lang, K.; Weinstein, R. (2012). "Evaluating student outcomes at for-profit colleges." Working Paper No. 18201. Cambridge, MA: National Bureau of Economic Research.
Leicht, K. T. (2008). Broken Down by Race and Gender? Sociological Explanations of New Sources of Earnings Inequality. *Annual Review of Sociology, 34*: 237-255.
Long, M. C. (2008). College quality and early adult outcomes. *Economics of Education Review, 27*(5): 588-602.
Long, M. C. (2010). Changes in the returns to education and college quality. *Economics of Education Review, 29*(3): 338-347.
Loury, L. D., & Garman, D. (1995). College selectivity and earnings. *Journal of Labor Economics, 13*(2): 289-308.
Lucas, S. R. (2001). Effectively maintained inequality: Education transitions, track mobility, and social background effects. *American Journal of Sociology, 106*(6): 1642-1690.
Machin, S., & Van Reenen, J. (1998). Technology and Changes in Skill Structure: Evidence from Seven OECD Countries. *The Quarterly Journal of Economics*: 1215-1244.
Marcotte, D. E., Bailey, T., Borkoski, C., & Kienzl, G. S. (2005). The returns of a community college education: Evidence from the National Education Longitudinal Survey. *Educational Evaluation and Policy Analysis, 27*(2): 157-175.
Milligan, K.; Morreti, E.; Oreopoulos, P. (2003). Does education improve citizenship? Evidence form the U.S. and U.K. NBER Working Paper #9584. Cambridge, MA: National Bureau of Economic Research.
Monks, J. (1997). The impact of college timing on earnings. *Economics of Education Review, 16*(4): 419-423.
Monks, J. (2000). The returns to individual and college characteristics: Evidence from the National Longitudinal Study of Youth. *Economics of Education Review, 19*(3): 279-289.
Morey, A. I. (2004). Globalization and the Emergence of For-Profit Higher Education. *Higher Education, 48*: 131-150.
Mouw, T., & Kalleberg, A. L. (2010). Occupations and the structure of wage inequality in the United States, 1980s to 2000s. *American Sociological Review, 75*: 402-431.
National Association of State Budget Officers (NASBO). (2011). *State Expenditure Report: Examining Fiscal 2009-2011 State Spending*. Washington, D.C.: National Association of State Budget

Officers.
Neumark, D., & Rothstein, D. (2003). School-to-career programs and transitions to employment and higher education. Working Paper No. 10060. Cambridge, MA: National Bureau of Economic Research.
Obama, B. The White House, Office of the Press Secretary. (2012). *Remarks by the president in state of the union address*. Washington, D.C.: Retrieved from: http://www.whitehouse.gov/photos-and-video/video/2012/01/25/2012-state-union-address-enhanced-version#transcript.
Perna, L. W. (2000). Differences in the decision to attend college among African Americans, Hispanics, and Whites. *Journal of Higher Education, 71*(2): 117-141.
Persell, C. H., & Wenglinsky, H. (2004). For-profit post-secondary education and civic engagement. *Higher Education, 47*: 337-359.
Price, D. V. (2004). *Borrowing Inequality: Race, Class, and Student Loans.* Boulder, CO: Lynne Rienner Publishers, Inc.
Psacharopoulos, G.; Patrinos, H. A. (2004). Returns to investment in education: A further update. *Education Economics, 12*(2): 111-134.
Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology, 25*: 111-163.
Raftery, A. E.; Hout, M. (1993). Maximally maintained inequality: Expansion, reform, and opportunity in Irish education, 1921-1975. *Sociology of Education, 66*: 41-62.
Rosenbaum, P. R.; Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1): 41-55.
Rosenfeld, R. (1992). Job mobility and career processes. *Annual Review of Sociology, 18*: 39-61.
Ross, C. E.; Wu, C. (1995). The links between education and health. *American Sociological Review, 60*: 719-745.
Ruch, R. S. (2001). *Higher Ed, Inc. The Rise of the For-Profit University*. Baltimore, MD: Johns Hopkins University Press.
Rumberger, R.; Thomas, S. (1993). The economic returns to college quality, major, and performance. *Economics of Education Review, 12*:1-19.
Sekhon, J. S. (2011). Multivariate and propensity score matching software with automated balance optimization: The Matching package for R. *Journal of Statistical Software, 42*(7): 1-52.
Shockey, J. W. (1989). Overeducation and earnings: A structural approach to differential attainment in the U.S. labor force (1970-1982). *American Sociological Review, 54*(5): 856-864.
Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics, 87*(3): 355–374.
Snyder, T. D.; Dillow, S. A. (2012). *Digest of Education Statistics 2011* (NCES 2012-001). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.
St. John, E. P. (1991). The impact of student financial aid: A review of recent research. *Journal of Student Financial Aid, 21*(1): 18-33.
St. John, E. P., & Noell, J. (1989). The effects of student financial aid on access to higher education: An analysis of progress with special consideration of minority enrollments. *Research in Higher Education, 30*: 563-581.

St. John, E. P., Starkey, J. B., Paulsen, M. B., & Mbaduagha, L. A. (1995). The influence of prices and price subsidies on within-year persistence by students in proprietary schools. *Educational Evaluation and Policy Analysis, 17*(2): 149-165.

Stevens, M.L.; Armstrong, E. A.; Arum, R. (2008). Sieve, incubator, temple, hub: Empirical and theoretical advances in the sociology of higher education. *Annual Review of Sociology, 34*: 127-151.

Taniguchi, H. (2005). The influence of age at degree completion on college wage premiums. *Research in Higher Education, 46*(8): 861-881.

Thomas, S. (2000). Deferred costs and economic returns and to college quality, major and academic performance: an analysis of recent graduates in Baccalaureate & Beyond. *Research in Higher Education, 41*(3): 281-313.

Tomaskovic-Devy, D.; Thomas, M.; Johnson, K. (2005). Race and the accumulation of human capital across the career: A theoretical model and fixed-effects application. *American Journal of Sociology, 111*(1): 58-89.

Turley, R. N. L.; Santos, M.; Ceja, C. (2007). Social origin and college opportunity expectations across cohorts. *Social Science Research, 36*: 1200-1218.

Velez, W. (1985). Finishing college: The effects of college type. *Sociology of Education, 58*(3): 191-200.

Wachtel, P. (1975). The returns to investment in higher education: Another view. In *Education, Income, and Human Behavior*, Ed. F. Thomas Juster. Cambridge, MA: National Bureau of Economic Research.

Weber, M. (1978). *Economy and Society*. Berkeley, CA: University of California Press.

APPENDIX

Table A-1. College majors in study sample

Constructed categories	NLSY major codes included in the newly constructed category	Percentage of sample[1]
Science & math	Agriculture/natural resources; archaeology; architecture/environmental design; biological studies; computer/information science; engineering; mathematics; physical sciences; sciences/applied sciences	12.85 (0.68)
Social sciences & humanities	Anthropology; area studies; communications; criminology; economics; English; ethnic studies; fine and applied arts; foreign languages; history; home economics; interdisciplinary studies; philosophy; political science and government; psychology; sociology; theology/religious studies; liberal arts; human services, general; social work; geography; international relations and affairs	21.10 (0.83)
Business	Business management; hotel/hospitality management	13.89 (0.71)
Education	Education	5.42 (0.46)
Health	Nursing; nutrition/dietetics; other health professions	8.24 (0.55)
Pre-professional	Pre-dental; pre-law; pre-med; pre-vet	0.91 (0.20)
Other	None (includes those who did not have to declare a major at their school); automobile/automotive mechanics technology/technician; electrical/electronics maintenance and repair technology; transportation and materials moving; security and protective services; legal support services; other field (includes those listed as other or uncodable in the raw data)	3.65 (0.37)
Missing/unknown	N.A.	33.93 (0.95)

Notes: All means are weighted by NLSY97 sample weights. [1]Standard deviations in parentheses. Percentages may not add up to 100.0 due to rounding.

Table A-2. Occupational fields in study sample

Constructed categories	2002 Census codes included in this category	Percentage of sample[1]
Management, business, finance, and professional occupations	0010-0950; 1000-3540	33.17 (0.96)
Service occupations	3600-3950; 4000-4160; 4200-4650	19.53 (0.79)
Sales occupations	4700-4960	11.90 (0.66)
Office and administrative support occupations	5000-5930	13.56 (0.68)
Blue collar occupations (including construction, extraction, installation, maintenance, production, transportation, and material moving)	6000-6940; 7000-7620; 7700-8960; 9000-9750	21.05 (0.82)
Missing/unknown	N.A.	0.80 (0.17)

Notes: All means are weighted by NLSY97 sample weights. [1]Standard deviations in parentheses. Percentages may not add up to 100.0 due to rounding.

Table A-3. Comparing the study sample to those excluded from the sample

	Sample	Excluded	Difference
Female (%)	48.46	48.91	-0.45
Black (%)	12.17	17.64	-5.47***
Hispanic (%)	10.40	14.54	-4.14***
Mixed, non-Hispanic (%)	0.85	1.66	-0.81**
Non-black, non-Hispanic (%)	76.58	66.16	10.42***
Age	27.00	26.73	0.27***
ASVAB	53.57	47.81	5.76***
High school GPA	2.90	2.84	0.06***
Family net worth (in $10k)	10.61	7.55	3.06***
Mother has at least 4 years of college (%)	22.91	19.01	3.90***
At least half of peers aspired to attend college (%)	89.71	81.45	8.26***
Lives in northeast	15.91	16.43	-0.52
Lives in north central	27.82	22.02	5.80***
Lives in west	21.72	22.17	-0.45
Lives in south	34.55	39.38	-4.83***
Lives in MSA	94.95	94.84	0.11
Number of weeks unemployed in 2009	2.26	4.41	-2.15***
Work experience (years worked since 16)	8.45	6.86	1.59***
Tenure in current job (in years)	3.17	2.20	0.97***
N	2862	--[a]	

Notes: All means are weighted by NLSY97 sample weights; *n* value is not weighted. [a]Given missing values across variables, a single *n* for those excluded from the sample is not available. Statistical significance of difference indicated by: ***p<0.001, **p<0.01, *p<0. 05, ‡p<0.10.
In general, the sample included in this study is more educated, less nonwhite, and comes from families with higher levels of net worth and education. Given that I excluded those still enrolled in school, some of these differences make sense; those still in school are likely younger and have not had as much experience in the labor market yet.

Table A-4. Sensitivity analyses

Educational attainment & college type (referent: completed high school or GED)	Results from Table 5, Model 5	Robust regression results	Multiple imputation results
Has not finished high school or GED	-0.28**	-0.23**	-0.22**
	(0.10)	(0.07)	(0.06)
Completed some college, attended for-profit college	-0.07	-0.03	-0.04
	(0.12)	(0.09)	(0.09)
Completed some college, did not attend for-profit college	0.01	0.03	0.10
	(0.08)	(0.06)	(0.06)
Completed a 2-year degree, attended for-profit college	-0.33*	-0.004	-0.02
	(0.16)	(0.12)	(0.13)
Completed a 2-year degree, did not attend for-profit college	0.23*	0.20*	0.27**
	(0.12)	(0.09)	(0.10)
Completed a 4-year or graduate degree, attended for-profit college	0.36*	0.30*	0.44**
	(0.17)	(0.13)	(0.15)
Completed a 4-year or graduate degree, did not attend for-profit college	0.29**	0.29***	0.41***
	(0.10)	(0.07)	(0.08)
N	2862	2862	5255

Notes: Standard errors are in parentheses. Intercepts are not shown. Data are weighted. As in model 5 from Table 5, all above models also include controls for level of educational attainment, background, region, college, major, and occupation, not shown. R's `mice` package was used to run the multiple imputation. As can be seen, overall interpretation of the robust regression results and the results derived after multiple imputation of missing data are substantively similar. Statistical significance is indicated as follows: ***p<0.001, **p<0.01, *p<0.05, ‡p<0.10.