Challenges to Free Community College Education: Wag and Status Benefits for Sub-Baccalaureate Degree Earners

The underlying philosophy of the community college is to ensure access to higher education for all who can profit from it. However, since the beginning of the community college movement, one of the implied purposes of the colleges has been to provide occupationally oriented education that will lead to employment. (Hlavna 1992:47)

Terminal occupational education has been a significant part of community colleges' mission for over 70 years (Brick 1964, Cohen, Brawer and Kisker 2014). The drive to promote two-year degrees as education options originates from the idea of a mid-level labor market between the traditional high school graduate (blue collar) labor market and the college graduate (white collar) labor market. Grubb (1996) refers to these labor market participants as being “in the middle” (i.e. people who completed more education past high school but do not have baccalaureate degrees) and has suggested that there is a defined labor market for such people. Community colleges have developed terminal degrees as a way to generate student interest and because local corporations desire to have technically educated employees (Cohen, Brawer and Kisker 2014, Dougherty 1994). The ultimate goal of community college terminal degrees has been to provide more education options for more people (Griffith and Connor 1994).

President Obama has cited community colleges as a means of increasing the level of education credentials within the American workforce (Office of the Press Secretary 2009). In 2015, President Obama (2015) proposed providing two free years of community college for anyone who wanted to study and stated:

*Every American, whether they’re young or just young at heart, should be able to earn the skills and education necessary to compete and win in the 21st century economy. (para 33)*
President Obama based the plan on the work of Bill Haslam, Governor of Tennessee, who, a year earlier, signed a state bill into law providing supplemented community college tuition support for in-state high school students. Haslam stated:

*We think this is a must if Tennessee is going to compete for the jobs that will exist 10 years from now.... We have to have the people with the right training.*

Many politicians think that community college education, specifically terminal degrees, can positively affect graduates’ futures and the overall economic development of a community.

Educational credentials are the most common criteria used by employers for soliciting and screening résumés from applicants for open positions (Rivera 2011). Though some see community colleges as cheaper, quicker, and comparable alternatives to traditional baccalaureate degree educations (Heck 2010); community college degrees have not consistently been considered a means of comparable economic improvement. Some general uncertainty exists in the literature about the effect of community college credentials have upon wages (Grubb 2002b). Research indicates that some employers perceive community college students as being of lower quality than those students in four-year institutions (Van Noy and Jacobs 2012).

I propose that the uncertainty about the impact of community college credentials on wages is a function of social conditions within the power structure of corporations. Employers' human resource personnel implement minimal education requirements (normally a baccalaureate degree for top jobs) to limit the employment opportunities and salary potential available for graduates of community college programs. Credentials are considered fair mechanisms for discriminating among job applicants (Jencks 1972) because they are easily measurable indicators of competence (Rosenbaum 2001).

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1 From http://www.heraldcourier.com/news/local/haslam-signs-bill-that-gives-grads-two-years-of-community/article_02e589a0-dca4-11e3-8e2f-001a4bcf6878.html
The concept of excluding some individuals based on characteristics or qualifications is the basic premise of the theory of social closure. Murphy (1988) describes social closure as a process of subordination. Parkin (1979) extends this idea by positing that social closure is “the process by which social collectives seek to maximize rewards by restricting access to resources and opportunities to a limited circle of eligibles” (44). According to Parkin, the process of social closure occurs as a collective social action by focusing on social or physical attributes to justify an exclusion. In his view, exclusionary closure is the symbolic use of power downwards. Collins (1971) argued that educational requirements are exclusionary tactics used to maintain control at the senior level of a company. He argued that employers (mainly those who are educated) set up job requirements for open positions in their own favor and discriminate against those without similar credentials as ways to hire people with culturally similar backgrounds, suggesting that education requirements reinforce discrimination (Collins 1975:86). Present research, however, has suggested that credential increases have more to do with technological progress and the increased demand for more qualified employees (Goldin and Katz 2008).

The central theme in the arguments of President Obama, Governor Haslam, and many other politicians is that there is an economic benefit from additional years of education. Additionally, some sociologists have also suggested that there is a positive social benefit from increased education (Blau and Duncan 1967, Bozick et al. 2010, Sewell and Hauser 1972). The correlations among education and economic and social returns is the closest that it has ever been (Goldin and Katz 2008). If one accepts Grubb and Lazerson’s (2004) argument that the true benefit from human capital comes from degree completion, then one would have to assume that a community college degree would provide graduates with an economic benefit greater than that received by people with only some post-secondary experience and less than a baccalaureate
The purpose of this paper is to investigate whether there are limits to the employment positions and wages offered to community college graduates. This paper seeks to test the differences in economic and job prestige benefits from obtaining community college degrees. To do this, I use the economic theory of human capital and the sociological theory of status attainment to consider whether previously inconsistent findings may be the result of an unclear understanding of internal limits to opportunities.

Research suggests that there are overall positive wage returns from studying at community college even for students who do not complete a program (Belfield and Bailey 2011, Jacobson, Lalonde and Sullivan 2005b). Using the human capital argument, if one accepts that the difference in salaries between baccalaureate degree holders and associate degree holders is a function of increased educational experience as some have suggested (Kane and Rouse 1995), then associate degree holders should earn significantly more than those who do not have an educational credential. Summary statistics from government reports (Department of the Treasury 2012) and private organizations (Baum, Ma and Payea 2013) only that there are minimal salary differences based on educational levels between non-completers and associate degree earners. It is, therefore, useful to further investigate whether there is a mid-level labor market that provides a wage benefit advantage for community college graduates over students who pursue a post-secondary education and fail to receive a post-secondary credential.

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2 Some consider the opportunity cost of missed years of work and suggest that community college degree holders earn more than baccalaureate degree holders. Available at http://hechingerreport.org/many-community-college-grads-continue-to-out-earn-b-a-holders-a-decade-after-graduation/
Human Capital Theory

In 1958, Jacob Mincer proposed a single-equation based on the theory of rational choice model to explain earnings as a function of experience and education. The equation is as follows:

$$\ln Y_i = \ln Y_0 + \beta s_i + \gamma X_1 + \delta X_2^2 \ldots$$

In the model, $Y_i$ are earnings (annual, weekly or possibly hourly) for person $i$. $Y_0$ is the amount of the previous year’s earnings. The term, $s_i$, is the years of education completed by person $i$. The $X$’s are the years of experience that the person achieves. In Mincer’s (1974) view, employers are the purchasers of labor and the sellers of training. The power of this theory is that workers invest in their own human capital to maximize the present value of their lifelong earnings. Using compensating differences, Mincer noted that much of the differences in income inequality can be attributed to differences in personal investments in human capital. Furthermore, he noted that personal ability and access to opportunity provide residual variation in the model. Overall, he found stability in the curvilinear relationship between earnings and education and experience.

Since that early work, human capital theory has been refined and tested in multiple disciplines. The basic concept implies that when a person attends school, he or she receives education and training that increases his or her productivity and, thereby, his or her value (i.e. human capital) to employers (Becker 1993). Many economists have developed clear theoretical linkages between increased human capital and increased wages (Belfield 2000). The theory suggests that early investments in education can lead to a lifetime of benefits, both monetarily (wage differential) and socially (non-monetary returns). The theory can be more clearly delineated if we consider how a person’s allocation of time between work and leisure affects his or her employment (Mincer 1997).
The human capital approach to wage growth over a life cycle emphasizes the role of knowledge and skills attained in school and on a job. Workers face a tradeoff between current and future earnings. To attain human capital, the generally accepted economic model for human capital, based on the work of Becker (1993), Ben-Porath (1967), and Mincer (1997), is:

\[ Q_t = f(K_t, S_t, X_t; B) \]

In this model, \( Q_t \) is the person's overall investment in human capital during period \( t \), \( K_t \) is the beginning stock of human capital at \( t \), \( S_t \) is the fraction of time in period \( t \) devoted to the production of \( Q \). \( X_t \) includes purchased goods and services (i.e. education) used in the production of human capital. Lastly, \( B \), highlighted by (Becker 1993), indicates limits of the individual's intellectual and physical capacity. Employers interview the applicants who signal sufficient human capital. Using services like Careerbuilder.com, employers can sort applicants based on the levels of their previous experience and education, the two components of human capital theory. Employers do not even have to look at applications that do not meet the minimum assigned standards. In effect, this screening blocks applicants with lower education and experience levels from pursuing higher-level jobs.

Ultimately, the analysis in this present research considers if sub-baccalaureate and baccalaureate credentials have similar effects on wages. I propose that employers who seek to hire people into more prestigious, higher-paying jobs restrict access to applicants with sub-baccalaureate degrees because a baccalaureate degree has become a socially legitimized marker of sufficient post-secondary education (Kalmijn 1994). The traditional argument suggests that a baccalaureate degree signals sufficient human capital in the labor market. This legitimization of baccalaureate degree attainment as an education marker is the main premise for my argument that social closure based on educational credentials negatively affects college graduates with sub-
baccalaureate credentials. Many employers perceive applicants with community college credentials such as associate degrees as weaker job applicants than applicants with baccalaureate degrees (Van Noy and Jacobs 2012). Some employers restrict certain white-collar employment opportunities from job applicants who do not have baccalaureate degrees because they do not hold the minimum education requirement for the open positions. A degree from a community college serves as an apriori signal to potential employers of an inferior educational credential net of any human capital skill attainment or experience.

**Human Capital Returns**

Oreopoulos and Petronijevic (2013) and Paulsen (2001) summarized much of the recent human capital research on the substantial positive private returns from the personal investment in achieving post-secondary credentials. More specifically, Grubb (2002a, 2002b) and Belfield and Bailey (2011) summarized most of the early research work on human capital returns from community college education in macro assessments of national, state and local studies. According to Grubb’s (2002a) assessment, degree completion at community colleges has benefits that can materialize within a few years. Though positive returns have been established, the question remains whether associate degrees lead to better employment options (Grubb 2002b).

Much of the employment success that a person has after finishing postsecondary education relates to the type of degree received. Marcotte et al. (2005) found that people who graduated from community colleges had better earnings than people who only had a high school diploma. Specifically, Dadgar and Trimble (2015) found increased wages and salary returns that are consistent with the length of the programs of study (longer programs led to higher wages).
Jepsen, Troske and Coomes (2014) found positive economic returns for people with associate degrees or diplomas and almost no returns for those who completed certificate programs. Xu and Trimble (2014), however, found positive economic returns for people who study certificate programs. Other studies have found weak returns for certificate programs, but somewhat stronger returns for associate degrees (Dadgar and Trimble 2015, Liu, Belfield and Trimble 2015). Even attaining some post-secondary credit without a degree can have a positive effect on earnings (Belfield and Bailey 2011, Jacobson, Lalonde and Sullivan 2005b, Marcotte et al. 2005).

There are also effects that are the results of demographics and programs of study. Davies and Guppy (1997) found that the field of study had an effect on post-graduate earnings. After completing higher education, people with more specific and technical degrees do better financially than do people in other degree programs (Selingo 2013). Hodara and Xu (2014) found a positive effect on earnings from taking developmental reading and writing courses at community colleges. In contrast, taking developmental math courses decreased wage earnings. Research found that women gain higher returns from obtaining credentials (Dadgar and Trimble 2015, Jepsen, Troske and Coomes 2014, Liu, Belfield and Trimble 2015). In a pair of studies based on Washington state statistics, Jacobson, Lalonde, and Sullivan (2005a, 2005b) found that students in technically-oriented, science and engineering-based programs were more likely to have higher earnings than were people studying non-technical fields. Overall, wage returns for community college credentials vary by state and by program (Dadgar and Trimble 2015, Hodara and Xu 2014).

Human capital theory does not explain all of the circumstances surrounding employment. For example, it does not account for the growing income inequalities in our country (Congressional Budget Office 2014). A large body of research by sociologists identifies
discrimination, class privilege, market structure and a variety of structural factors, all of which undermine the human capital argument that more education leads to better wages (Berg and Gorelick 1970, Breen and Jonsson 2005, Coleman 1988, Ginzberg and Berg 1972, Goldrick-Rab 2006, Granovetter 1974, Vallas 2012, Williamson 1981). Despite a considerable body of scholarship on college quality and choice (Haveman and Smeeding 2006, Karabel and Astin 1975), very little recent work has been done to investigate if exclusionary actions can affect community college students’ future education and employment.

**Status Attainment Theory**

Lee and Rojewski (2009) have suggested that status attainment theory is a relevant concept when considering students' occupational aspirations. In the tradition of Blau and Duncan (1967), status attainment theory proposes that occupational aspirations are products of social stratification and are dependent on social and demographic variables (Johnson and Morimer 2002). The theory suggests that structural factors play a significant role in individuals' choices and potential attainment. “Status attainment researchers assume that occupations differ in their levels of prestige or status reflecting in turn their importance to the functioning modern economy” (Kalleberg and Berg 1987:10). The theory relies on subjective measures of the importance people assign to certain employment positions. In an early use of the theory, Blau and Duncan (1967) examined structural forces in the labor market. They noted that, though some have suggested that each person is a product of his or her family background, the effects of a person’s background on occupational attainment are mediated by that person’s attained educational levels. Sewell and Hauser (1975) went further in applying the theory by incorporating an individual’s aspirations, academic ability, and other factors into a status
attainment model. Recent work stresses the role of social networks in building career aspirations (Bozick et al. 2010, Sewell et al. 2003, Walpole 2003). The recent research suggests that young people from affluent families are more likely to receive ample support from their social and family networks to do well in school and pursue their academic goals.

Status attainment theory is not without its critics (Burawoy 1977, Coser 1975). Some suggest that status attainment theory oversimplifies the complexities associated with a person’s understanding of their own social mobility (Jencks 1972). Particularly, some researchers see status attainment as an oversimplified supply and demand argument, where status or prestige is just a given component of an occupation (Kalleberg and Berg 1987). In this view (sometimes referred to as new structuralism), researchers should incorporate other factors such as race and gender into what become status outcomes. My research is an extension of that desire to develop an expanded view of factors that affect employment outcomes. In the context of social closure, a central observation of new structuralism is that job status is a function of credentials (Bills 1988).

There has also been some work on the relationship between community college students and socio-economic status. Many studies conclude that social status origins have an impact on college attainment (Walpole 2003). Status attainment among community college students has, however, not been as widely explored. Research studies reviewed by Pascarella and Terenzini (2005) indicate that when a person initially attends a two-year institution decreases subsequent occupational status. Older research works highlight differences in job status outcomes by degree earned, but additional research needs to be done to consider the effect of educational credential attainment on occupational status in the context of the present job market.
**Status Returns**

Venniker (2001) summarized many of the early research studies into the social benefits of increased education. In early research on community colleges, Monk-Turner (1983) examined the effect of attending a community college on job attainment 10 years after graduating from high school. Even when controlling for backgrounds, she found that former community college graduates held lower status than four-year college entrants. In addition, she found that community college entrants were half as likely to work in professional occupations and twice as likely to have blue-collar occupations. Anderson (1984) obtained similar findings while controlling for social backgrounds and high school performance. In later work, Monk-Turner (1991) reaffirmed the status difference with more recent data and suggested that community college attendance had a negative impact on a person’s future SES. She suggested that, early in their employment life cycle, community college students suffer an occupational and wage penalty that outweighs the opportunity costs of attending a four-year institution.

Since Monk-Turner’s work, Whitaker and Pascarella (1994) found that there was a small status-attainment disadvantage for students who complete an associate degree when compared to the status-attainment for students who complete a baccalaureate degree. The authors suggest that transferring to a four-year institution will negate any experiential disadvantage that comes from attending a community college. Terenzini, Cabrera and Bernal (2001), however, found that high school students have already developed a prior understanding of their own status attainment possibility based on their families’ present SES, and that understanding affects what type of higher education they pursue. Therefore, any differences between SES and educational attainment are difficult to disentangle.
Regarding careers, Levey (2010) found that community college graduates start on a much lower career path, and that job status and salary outcome differences between community college graduates and four-year institution graduates are neither increased nor eliminated even 15 to 20 years later (though some of the results are not significant). In somewhat similar findings, Smart (1986) found that higher educational institutional characteristics, student performance, and student experiences outside of the classroom all play significant roles in a person’s post-graduation occupational status. Applying the analysis of status to community colleges internationally, Anisef, Ashbury and Turrittin (1992) examined the results of a longitudinal survey of residents in Ontario, Canada and found that community college graduates found employment in positions that had lower occupational prestige than those obtained by graduates with baccalaureate degrees.

Institutional Effects

Many research studies highlight how institutional quality, specifically admissions selectivity, have a direct relationship with post-graduation earnings (Pascarella and Terenzini 2005). Kalleberg and Dunn (2015) found several community college characteristics (not related to personal student characteristics) had an effect on individual earnings separate from the effects of personal student characteristics. Additionally, the authors found that salaries for graduates were lower (significantly for males) if the college is located in an area with high unemployment. Stephan, Rosenbaum and Person (2009) and Person and Rosenbaum (2006) found that students at two-year public and private colleges had very similar backgrounds, but degree completion outcomes were much better for students at the private two-year colleges. Perhaps with some

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3 Canada has a similar community college system to what is in the U.S.
relevance to those outcomes, Laanan (2003) found that students from private two-year institutions came from higher socio-economic backgrounds, went to college further from home, and were more likely to live in on-campus housing facilities. Additionally, Anderson (1984) found that graduates from smaller, more academically selective, less vocationally oriented colleges (both two-year and four-year institutions) had higher socio-economic status attainment outcomes than peers from other types of institutions.

There is no consistent support for the presence of economic and status benefits for community college graduates. Some education is obviously better than no education. It is, therefore, impractical to compare high school graduates with people who studied post-secondary education. I propose that most of the monetary and job status benefits from degree attainment come more from credential signals sent to potential employers and less from the graduates’ increased educational knowledge. My proposal may partly explain the impact of institutional and field of study differences on wage outcomes. An acquired knowledge benefit from community college education (a key component of human capital theory) manifests itself in the positive wage benefits that even non-completers receive when compared to high school graduates. For example, attending a Computer Aided Design course learns skills that can be useful in employment even for people who do not have a degree in computers. Though some might disagree, there is no consistent support for suggesting that completion of an associate degree plays a major role the employment market. This paper takes a new direction from previous research in that I examine the differences between degree earners and non-degree earners taking into account occupational categories. Thus, I hypothesize two points:
1. All higher education degrees will have positive effects on graduates' wage outcomes relative to the wages of those who obtained some post-secondary education but did not earn a degree.

2. All higher education degrees will have positive effects on graduates' job status outcomes relative to the job status of those who obtained some post-secondary education but did not earn a degree.

Methods

This analysis incorporates data from Educational Longitudinal Study (ELS) with data from the 2000 U.S. Census. The ELS is a national representative study by the U.S. Department of Education’s Institute of Education Science (IES) of 16,190 10\textsuperscript{th} graders in public and private high schools in 2002 (National Center for Education Statistics 2015). The research team followed up with the students during their senior year in 12\textsuperscript{th} grade. After graduation, there are two additional survey follow-ups with the students in 2006 and 2012. In the two post-high school follow-ups, there is available information on the types of jobs and salaries the respondents had and the respondents’ family and living arrangements at those times.

For the analysis, I investigated the effect of degree earned on wage and job status outcomes based on self-reported data in 2012. I investigated the correlation between earnings, job status and the highest degree that each respondent had earned by eight years after high school. I do the analysis by using Ordinary Least Squares (OLS) multiple regression and fixed effects.
Variables

I used four groups of higher education credentials obtained as my independent variables: certificates, associate degrees, baccalaureate degrees, and graduate degrees. There are clear differences between the ability and motivation of students who pursue higher education and those who do not (Becker 1993, Cohen, Brawer and Kisker 2014). In the present study, I compared people with similar ages and control for many background characteristics in order to minimize any potential differences that could bias the results. The reference group included people who attended a higher education institution but did not get a degree by 2012. With this comparison, I was able to identify what benefit can be attributed to attaining an educational credential as opposed to just attaining human capital based on higher education.

I controlled for demographic variables, family and community socio-economic characteristics, post-secondary institutional characteristics, and personal higher education variables in the analysis. The demographic variables included race and gender. I used the respondent’s family SES as a measure of the socio-economic well-being of the family. Using 2000 U.S. Census data, I included the natural log of family income in 2000 by zip code area to consider the variable economic characteristics of the community where the respondent resided when he or she was in high school. I sought to control for institutional characteristics, so I added a variable if the respondent’s final institution was “highly selective” according to 2005 Carnegie Classifications of Institutes of Higher Education.\(^4\) I included a variable indicating whether the final institution was public or private. I also added some individual higher education variables, \(^4\) Data available at http://carnegieclassifications.iu.edu/downloads.php
including the respondents’ higher education grade point average (GPA), the number of higher education institutions that the respondent attended, and whether or not the individual attended a four-year institution. The final three variables examined the person’s present environment, including whether or not he or she had received public assistance between 2009 and 2012, whether or not the person is working fulltime at one occupation, and whether or not the individual was single in 2012. Table 1 identifies all variables as well as coding structures included in the models for this paper.

There are two dependent variables in this analysis. The first is the natural log of annual wages seven years after high school in 2011 (the year before the study concluded). This variable has been the established dependent variable in human capital models for many years (Mincer 1974). This natural log format makes outliers less influential in the model. Furthermore, one can interpret the results to discover the percentage change in wages. The second dependent variable is the occupational prestige scores as defined by the National Opinion Research Center 1989 rankings (Nakao and Treas 1990). The prestige scores come from personal interviews where respondents had to rank occupations. The values range from 1 to 100 with a score of 100 being the most prestigious job. Values are noted to 1/100 of a point.

I used a fixed effect regression analysis based on two-digit O*NET occupation codes for job categories, referred to a job families. O*NET is a program developed by the U.S. Department of Labor to provide available occupational information. There are 24 job families, and there were at least 20 respondents in my analysis in 23 of the job families (one family was not

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5 GPA is highly correlated with other standardized measures of academic ability like SAT or ACT scores. I chose this variable because not all community college students reported taking standardized test scores.
6 I included four-year attendance to consider if there were any effects on wages and prestige from just attending a college university.
7 More information available at https://www.onetonline.org/
present). There are six-digit occupational codes with specific occupation definitions, but I did not have enough respondents to use the expanded codes for fixed effects regression.

Analysis

Multivariate linear regression models present the dependent variable as a function of the independent and control variables. A common way to estimate parameters with a multivariate model is by using OLS regression. This approach establishes parameter values that minimize the differences in the observed responses. OLS assumptions are not practical for many types of analyses because estimators have strong potential for biased responses (Long and Kurlaender 2009). Furthermore student outcomes have unobserved student characteristics such as background and motivation for which general OLS models cannot account (Card 2001).

I used two different approaches to examine the two hypotheses. For the analysis of the wage data, I used OLS, but I also modeled the results with an individual fixed-effect (FE) model to address the issue of individual effects based on the type of position that a person holds. There is potential for a correlation between an individual’s wages and the type of employment that he or she has, so this type of analysis is useful because this time-invariant variable will not bias coefficients. Overall, the coefficients represent the difference between each entity (the job category for this analysis) over time and the average for all the effects for that entity:

\[ Y_i - \bar{Y}_i = \beta_1 (Y_i - \bar{Y}_i) + \cdots \]

The fixed effect approach controls for unobserved heterogeneity between occupations in the results. The results are less interpretable than those obtained with OLS but control for omitted variable bias. Many researchers have used this type of approach for research studies on

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8 I also did the analysis using Weighted Least Squares regression and the results are consistent.
community colleges (Hodara and Xu 2014, Jacobson, Lalonde and Sullivan 2005a, Jacobson, Lalonde and Sullivan 2005b, Jepsen, Troske and Coomes 2014, Liu, Belfield and Trimble 2015, Xu and Trimble 2014). For the analysis of the status data, I do not use entity fixed effects because the dependent variable, occupational prestige, is based on the O*NET job family. This research is unique in that I control for many background variables including occupation. More recent work, Liu, Belfield and Trimble (2015) used financial aid as a proxy for family background, yet the results of this study indicate that community college students are less likely than university students to accept financial aid (71% for 4-year students and 44% for community college students). Furthermore, Liu, Belfield and Trimble (2015) use the first semester GPA as a proxy for academic ability but that variable does not account for issues that could arise during a student’s first semester at a college. In this analysis, all of the respondents were roughly the same age, a control that is different from many other studies that looked at students from all ages (Dadgar and Trimble 2015, Jacobson, Lalonde and Sullivan 2005b, Xu and Trimble 2015). Some previous research studies have controlled for the family economic situation (Dadgar and Trimble 2015, Kane and Rouse 1995), but no work has considered the communities from which the respondents grew up. I take into account the respondent’s residential zip code. As Cresswell (1996) states, “the effect of place is not simply a geographical matter. It always intersects with sociocultural expectations” (8).

The previous work on community colleges students and wages used fixed effects models that were general analyses of certain states. Many times, the researchers used fixed effects based on time and entity (the community college) (Hodara and Xu 2014, Jacobson, Lalonde and Sullivan 2005a, Jacobson, Lalonde and Sullivan 2005b, Jepsen, Troske and Coomes 2014, Liu, Belfield and Trimble 2015, Xu and Trimble 2014). This research differs from previous work
because I used a nationally representative study of respondents who were at community colleges and four-year institutions. Students transfer regularly, and it is therefore valuable to include students from community colleges and four-year institutions.

**Results**

Table 2 presents the average annual earnings of the respondents in 2011 and the average occupational prestige score. The results reveal that the average salary per credential is higher up to a baccalaureate degree at almost $34,000, with the average salary for graduate degree holders being about $3,500 lower. The lower average for graduate degree holders is partly because almost a quarter of the graduate degree holders were doctoral earners (medical and other fields), and their average salary was much lower ($24,261.20). The average salaries of the holders of diplomas to associate degree ranged from $20,405 to $25,142. Average salaries were several thousands of dollars apart for the other educational categories. Individuals who did not obtain a high school diploma earned the lowest average salary ($14,249), a value less than half of the average salary of graduate degree holders. According to the U.S. Department of Health and Human Services, this wage is about the poverty level for sole providers of families with two or more individuals in 2012.9

Average job prestige scores increased for each credential category (second column of Table 2). All categories had individuals with the lowest job prestige score of 27.1 (food preparation and serving related occupations) and one at the highest of 64.2 (healthcare practitioners and technical occupations). By far, graduate degree holders had the highest average prestige score. Their average of 56 was more than 7 points higher than the average of

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baccalaureate degree holders. Graduate degree holders were this high because medical professionals and lawyers, the two job families with the highest occupational prestige, made up more than half of all graduate degree holders. There was very little difference between the average job prestige of the diploma holders (approximately 1300 people) and the average job prestige score for respondents who did not attain a high school credential (approximately 330 people). Both groups had the most people in jobs with the lowest prestige scores. The average prestige scores for the people with some post-secondary education, a certificate, or an associate degree were also very similar. In fact, the median job prestige score were almost the same for all three groups. Some college and certificate students had a median prestige score (not in the table) of 37.7 (the score of office and administrative support), while the associate degree holders' median score was somewhat higher at 40.1 (the score of installation, maintenance and repair).

Table 3 includes the estimated coefficients and robust standard errors for the models tested. The first two sets of columns present the effects of higher education credentials on the natural log of wages with general OLS regression and with fixed effects. With the fixed effect model, there are 23 groups, and the group size ranged from 20 to 877 (average 264.1). The results are surprisingly very similar. Coefficient values stayed almost the same. Both models had very similar coefficients of determination (OLS $r^2 = 0.193$ and FE $r^2 = 0.229$). The rho coefficient in the fixed effect model indicates that only 6.9% of the variance in the model is due to differences in wages across occupations. In the wage model, graduate degrees and associate degrees led to no statistically significant differences in wages when compared to wages received by people with some post-secondary education and no credential. In contrast, there is a small significant impact on wages for certificate holders ($p<0.05$). Having a baccalaureate degree has stronger statistical significance when compared to people who have no credential ($p < 0.01$).
The control variables highlight the role of other factors that can affect wages. Being male had a statistically significant positive effect on earnings \((p < 0.01\) in the FE model), while there was almost no effect based on race. Family SES did not significantly correlate with the natural log of wages, but the natural log of mean family income for the respondent’s high school community was significantly positively correlated with the natural log of respondent’s wages in 2011. Additionally, graduating from a highly selective institution is positively associated with wages, but there was no significant difference between graduating from a public or private university and wages. The correlation between a person’s GPA and his or her natural log of wages is both positive and statistically significant \((p < 0.01)\). There was also a positive and statistically significant correlation between accepting financial aid \((p < 0.05)\) and the natural log of wages (a larger percentage of four-year students accept financial aid than community college students, figures noted earlier). Attending a four-year institution did not have a significant impact on wages, but the number of post-secondary institutions that a person attended is negatively correlated with the natural log of wages. Regarding the respondent’s situation at the time of the survey, people who had received public assistance in the immediate past and people who were single were statistically more likely to have lower wages than people who not on public assistance or married at that time \((p < 0.01)\). Finally, working fulltime is positively and significantly related to earning higher wages \((p < 0.01)\).

The final set of columns in Table 3 present the results of the impact of degree on occupational prestige using OLS regression. The F statistic for the model is statistically significant \((F = 99.55)\), and the coefficient of determination \((r^2)\) suggests that the model accounts for about 19% of the variance in the dependent variable. All credentials were statistically significant and positively correlated with increased job prestige (all were \(p < 0.01\), except for
certificates, which was $p < 0.05$). A negative correlation exists between being female and job prestige ($p < 0.01$), but there was no relation with any of the race or ethnicity variables and job prestige. Graduating from a highly selective institution was significantly correlated with having jobs with increased prestige ($p < 0.01$), but there was no significant correlation between institutional control (being public or private) and a respondent’s job prestige. The coefficients for higher education GPA, receiving financial aid, and the number of post-secondary institutions attended were all positive and statistically correlated with increased job prestige ($p < 0.05$). Interestingly, the number of post-secondary institutions attended is negatively correlated with the natural log of wages, but the variable positively correlated with job prestige. Being single and having made previous use of public assistance negatively affect job prestige, while working fulltime positively affected job prestige. All three of the 2012 situational variables were statistically significant ($p < 0.01$). The value of the model intercept for the job prestige model was only about 2 points higher than the value for the lowest job prestige in the model (27.1).

**Discussion and Implications**

The present analysis examined the impact of higher education credentials on wages. Specifically, I investigated, in a comparison of people who studied in higher education but did not earn a credential, whether or not community college credentials (certificates and associate degrees) improved wages and job prestige. In general, my findings were different from previous studies (Belfield and Bailey 2011, Grubb 2002a, Grubb 2002b). Previous research suggests that community college students earn more than high school graduates and less than baccalaureate degree holders. I found no positive wage benefits and only small benefits in prestige for associate degree holders and a small wage and status benefits for certificate earners. The results of this
present study challenges some of the assumptions of human capital theory as a rationale for promoting community college education. This research contributes to the present body of literature by utilizing more recent data and by controlling for the respondents' backgrounds, abilities, and employment.

Though there were no significant wage benefits from obtaining associate degrees, there were positive wage benefits for receiving certificates. The positive effect from certificate programs is logical because many people who study in certificate programs get specific vocational training for occupations that are more technically-oriented. Often these employment fields have credential or entry test requirements (Weeden 2002). Also, almost half of the certificate earners in this study were in health related fields (47%), and these jobs are in high demand.\(^\text{10}\) Therefore, a wage benefit is understandable. Xu and Trimble (2015) also found positive returns from certificate programs, but the results of this study contrast with the findings of Liu, Belfield and Trimble (2015) and Dadgar and Trimble (2015), which suggest wage returns from certificate programs are much weaker than the returns from associate degree programs. The studies from Liu, Belfield and Trimble (2015) and Dadgar and Trimble (2015) have large-scale, single-state analyses of all students who study in community colleges. I was able to replicate their results (except for the institutional effects), but there are many other factors that are necessary to consider when establishing the effect of any credential on wages. The additional controls in this study are one reason why the findings in this present research contrast with many of the established research on community college education.

Though the results indicate that there are no significant positive wage benefits from having only an associate degree when compared with the benefits of attending college without

completing a credential, I am not suggesting that all associate degrees are worthless. There are specific occupations that require associate degrees. Many good jobs for associate degree holders are technical in nature (DeZube 2016); however, almost one third of the people in this study whose highest level of credential was an associate degree studied liberal arts or general studies (30%). Another 13% of the associate degree earners studied business. Furthermore, only around one third of associate degree earners are in positions that require an associate degree (32%). It is important to question Grubb and Lazerson’s (2004) assertion that completing a community college credential leads to a human capital benefit. I propose that there is a middle labor market between that market occupied by high school graduates and the market occupied by college and university graduates, as Grubb (1996) suggests. In contrast to Grubb, I do not think associate degree credentials define the primary condition for entry to jobs within this labor market. The positions in the labor market are based on a vocational knowledge that is not necessarily related to associate degree attainment.

It is important to recognize that the analysis in this research study was different because I used a fixed effects model based on the type of job people were doing eight years after high school and not on their post-secondary institution. Many researchers suggest that the value in community college does not just come from the receipt of a degree, but that it can materialize from just the experience of studying in higher education (Jacobson, Lalonde and Sullivan 2005a, Kalleberg and Dunn 2015, Marcotte et al. 2005). It can be, therefore, useful to control for occupations when examining the effect of credentials earned on wages. In the present political environment, especially with the current strong emphasis on promoting terminal degrees at community colleges, it is essential to consider the value of credentials especially in different occupations.
Though my results did not indicate a significant effect on wages from having an associate degree, they did indicate that earning community college credentials had positive effects on job prestige ratings. The results of the study indicate that job prestige improves with increased educational credentials. The contradiction between the null effect on wages and the positive effect on job prestige ratings is logical. Although the higher average job prestige rating is statistically significant for community college degree holders, the improvement only amounts to between one or two points on a 100-point scale of job prestige. Additionally, job prestige ratings are subjective measures based on personal opinions and do not always measure the well-being associated with a position. Occupational prestige ratings are often used as a measure of SES, but the scale has some substantive differences from other measures of socioeconomic well-being (Nakao and Treas 1994). There have been criticisms that the occupational prestige ratings do not appropriately reflect occupations commonly held by women (Hauser and Warren 1997). Certificate and associate degree programs can help improve a person’s occupational prestige, but the improvements may be small and may not be reflective of better overall employment.

With the present political emphasis on higher education outcomes, it is practical to address wage and job status findings for community college degree holders. There are limitations in the benefits to the benefits that can be gained from community college degrees. Some of the benefits from community college credentials are related to the nature of the degree particularly if it is vocational and related to occupations that are in high demand. General studies associate degrees have very limited benefits for people who do not complete baccalaureate degrees. It is necessary to pivot the discussion from opening community colleges through President Obama’s plan for free community college education for everyone to developing policies that provide
targeted pathways where community college students who want to study can find themselves working toward employment in useful occupations that they enjoy.

New Jersey provides financial support for the best of those community college graduates who come from disadvantaged backgrounds and want to pursue a bachelor’s degree. Scholarships can help defray the costs of pursuing a bachelor’s degree. These types of financial incentives for top academic students can have a ripple effect that benefits all students in the community colleges. Instead of providing free community college for all as President Obama (2015) proposes, providing bachelor’s degree scholarships for top community college students can help improve the likelihood that community college students can earn bachelor’s degree credentials. Targeted financial assistance can be more cost-effective and useful for the people who want to pursue higher education.

It is important for employers and community college leaders to work together to develop curricula that best meet the needs of the local workforce. When there are targeted programs focused on local labor market opportunities, students are better situated to compete for better, higher-paying jobs. There are many examples of targeted community college programs. In order to help improve the quality of the workforce, the BMW plant in Spartanburg, SC offers college scholarships at Spartanburg Community College and part-time jobs for students studying in fields related to automobile manufacturing (Brooks 2013). When Giti tires planned to open a factory in Chester, SC, they worked with the local community college, York Technical College, to develop a curriculum to train employees even before the factory was built (Staff 2014). In both cases, the community colleges developed programs to provide good jobs for people in the community.

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11 Available at: http://www.njstars.net/
“[E]ducation has emerged as the great divider between persons with good jobs and those with bad jobs” (Kalleberg 2011:57). Community colleges can work to eliminate that divide by providing higher education to the disadvantaged. It is important for business leaders to raise the value of that education by developing distinct opportunities for community college graduates. Targeted programs can help improve the value of community college degrees and have the potential for encouraging student interest in community colleges enrolment. The middle-level labor market can expand by providing relevant opportunities that will be open to workers with appropriate sub-baccalaureate credentials.

References


Table 1: Variable coding sources and scheme

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coding scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables</strong></td>
<td></td>
</tr>
<tr>
<td>Natural log of 2011 wages</td>
<td>The natural logarithm of 2011 respondent's annual wages</td>
</tr>
<tr>
<td>Job prestige</td>
<td>NORC occupational prestige scores for job family</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
</tr>
<tr>
<td>Highest degree attained</td>
<td>1 = Certificate</td>
</tr>
<tr>
<td></td>
<td>1 = Associate's</td>
</tr>
<tr>
<td></td>
<td>1 = Bachelor's</td>
</tr>
<tr>
<td></td>
<td>1 = Graduate</td>
</tr>
<tr>
<td></td>
<td>(The reference group is some post-secondary education)</td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>1 = man</td>
</tr>
<tr>
<td></td>
<td>0 = woman</td>
</tr>
<tr>
<td>Race</td>
<td>1 = Black or African American</td>
</tr>
<tr>
<td></td>
<td>1 = Asian, Pacific Islander, or Native American</td>
</tr>
<tr>
<td></td>
<td>1 = Mixed race</td>
</tr>
<tr>
<td></td>
<td>1 = Hispanic, race specified or not</td>
</tr>
<tr>
<td></td>
<td>(The reference group is White)</td>
</tr>
<tr>
<td>Family socio-economic status</td>
<td>composite value between -2 and 2 based on parent's educational level, occupational status, and income</td>
</tr>
<tr>
<td>Natural log of 2000 mean income for zip code</td>
<td>Natural log of mean family income for people within the respondent's residential zip code in 2000 U.S. Census</td>
</tr>
<tr>
<td>Institutional selectivity</td>
<td>1 = Last institution was highly selective by 2005 Carnegie classification</td>
</tr>
<tr>
<td></td>
<td>0 = Last institution was not highly selective by 2005 Carnegie classification</td>
</tr>
<tr>
<td>Public last institution</td>
<td>1 = respondent's last institution attended was public</td>
</tr>
<tr>
<td></td>
<td>0 = respondent's last institution attended was private</td>
</tr>
<tr>
<td>Higher ed GPA</td>
<td>Respondent's cumulative higher education Grade Point Average on a 4.0 scale</td>
</tr>
<tr>
<td>Received higher ed. financial aid</td>
<td>1 = respondent received financial aid from first post-secondary inst.</td>
</tr>
<tr>
<td></td>
<td>0 = respondent did not received financial aid from first post-secondary inst.</td>
</tr>
<tr>
<td>Attended a 4-yr institution</td>
<td>1 = respondent attended a 4-year post-secondary institution</td>
</tr>
<tr>
<td></td>
<td>0 = respondent did not attend a 4-year post-secondary inst.</td>
</tr>
<tr>
<td>Variables</td>
<td>Coding scheme</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Number of institutions attended</td>
<td>The number of higher education institutions that the student attended</td>
</tr>
<tr>
<td>Received public assistance in the past year</td>
<td>1 = received public assistance between 2009 and 2012</td>
</tr>
<tr>
<td>presently works fulltime</td>
<td>0 = presently not working at a fulltime job at a single job</td>
</tr>
<tr>
<td>Single</td>
<td>1 = presently single</td>
</tr>
<tr>
<td></td>
<td>0 = presently married</td>
</tr>
</tbody>
</table>

Table 6.2: Respondents’ average wages and job prestige by degree earned

<table>
<thead>
<tr>
<th>Degree</th>
<th>Avg. 2011 annual earnings</th>
<th>Avg. job prestige score</th>
<th>number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>no diploma</td>
<td>14,249.15</td>
<td>36.24</td>
<td>340-320</td>
</tr>
<tr>
<td>Diploma</td>
<td>20,405.44</td>
<td>37.77</td>
<td>1300-1310</td>
</tr>
<tr>
<td>Some college</td>
<td>21,186.40</td>
<td>41.10</td>
<td>3880-3930</td>
</tr>
<tr>
<td>Certificate</td>
<td>23,544.62</td>
<td>42.59</td>
<td>1190-1220</td>
</tr>
<tr>
<td>Associate's</td>
<td>25,142.03</td>
<td>44.75</td>
<td>1010-1040</td>
</tr>
<tr>
<td>Bachelor's</td>
<td>33,853.75</td>
<td>48.93</td>
<td>3780-3840</td>
</tr>
<tr>
<td>Graduate</td>
<td>30,362.93</td>
<td>56.06</td>
<td>1140</td>
</tr>
<tr>
<td>Total</td>
<td>26,082.53</td>
<td>44.77</td>
<td>12640-12800</td>
</tr>
</tbody>
</table>
Table 3: Effects of degree earned on wages and job prestige for higher education attendees

<table>
<thead>
<tr>
<th></th>
<th>natural log of wages OLS regression</th>
<th>Robust Standard Errors</th>
<th>ln wages reg. w/ job fixed effects</th>
<th>Robust Standard Errors</th>
<th>Job prestige regression</th>
<th>Robust Standard Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate earner</td>
<td>0.15 **</td>
<td>0.06</td>
<td>0.12 *</td>
<td>0.05</td>
<td>1.23 **</td>
<td>0.55</td>
</tr>
<tr>
<td>Associate's earner</td>
<td>0.05</td>
<td>0.05</td>
<td>0.03</td>
<td>0.04</td>
<td>1.75 **</td>
<td>0.54</td>
</tr>
<tr>
<td>Bachelor's earner</td>
<td>0.18 **</td>
<td>0.04</td>
<td>0.15 **</td>
<td>0.03</td>
<td>3.08 **</td>
<td>0.40</td>
</tr>
<tr>
<td>Graduate deg. Earners</td>
<td>-0.02</td>
<td>0.05</td>
<td>-0.02</td>
<td>0.07</td>
<td>9.12 **</td>
<td>0.50</td>
</tr>
<tr>
<td>Male</td>
<td>0.20 *</td>
<td>0.02</td>
<td>0.15 **</td>
<td>0.04</td>
<td>-0.69 *</td>
<td>0.27</td>
</tr>
<tr>
<td>Black</td>
<td>-0.03</td>
<td>0.04</td>
<td>-0.04</td>
<td>0.04</td>
<td>0.81</td>
<td>0.46</td>
</tr>
<tr>
<td>Asian/Pacific/Native American</td>
<td>-0.12</td>
<td>0.05</td>
<td>-0.13 *</td>
<td>0.06</td>
<td>0.83</td>
<td>0.45</td>
</tr>
<tr>
<td>Mixed race</td>
<td>0.09</td>
<td>0.05</td>
<td>0.06</td>
<td>0.05</td>
<td>-0.12</td>
<td>0.66</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.08</td>
<td>0.04</td>
<td>-0.07</td>
<td>0.05</td>
<td>-0.64</td>
<td>0.45</td>
</tr>
<tr>
<td>Family SES</td>
<td>0.01</td>
<td>0.02</td>
<td>0.01</td>
<td>0.02</td>
<td>0.34</td>
<td>0.22</td>
</tr>
<tr>
<td>Natural log of 2000 mean income for zip code</td>
<td>0.12 **</td>
<td>0.04</td>
<td>0.11 **</td>
<td>0.04</td>
<td>0.59</td>
<td>0.45</td>
</tr>
<tr>
<td>Highly Selective Last Inst.</td>
<td>0.14 **</td>
<td>0.03</td>
<td>0.11 **</td>
<td>0.03</td>
<td>1.46 **</td>
<td>0.35</td>
</tr>
<tr>
<td>Public Last Institution</td>
<td>-0.02</td>
<td>0.03</td>
<td>-0.04</td>
<td>0.02</td>
<td>0.11</td>
<td>0.29</td>
</tr>
<tr>
<td>Higher Education GPA</td>
<td>0.10 **</td>
<td>0.02</td>
<td>0.09 **</td>
<td>0.02</td>
<td>2.15 **</td>
<td>0.20</td>
</tr>
<tr>
<td>Received financial aid</td>
<td>0.07 *</td>
<td>0.03</td>
<td>0.06 *</td>
<td>0.02</td>
<td>0.59 *</td>
<td>0.28</td>
</tr>
<tr>
<td>Attended a 4-yr inst.</td>
<td>0.01</td>
<td>0.04</td>
<td>0.00</td>
<td>0.06</td>
<td>1.61 **</td>
<td>0.43</td>
</tr>
<tr>
<td>Number of PS institutions attended</td>
<td>-0.06 **</td>
<td>0.01</td>
<td>-0.06 **</td>
<td>0.01</td>
<td>0.38 *</td>
<td>0.16</td>
</tr>
<tr>
<td>Received public assistance in past</td>
<td>-0.52 **</td>
<td>0.05</td>
<td>-0.47 **</td>
<td>0.05</td>
<td>-3.31 **</td>
<td>0.46</td>
</tr>
<tr>
<td>presently works fulltime</td>
<td>0.61 **</td>
<td>0.03</td>
<td>0.54 **</td>
<td>0.05</td>
<td>2.16 **</td>
<td>0.28</td>
</tr>
<tr>
<td>Single</td>
<td>-0.21 **</td>
<td>0.03</td>
<td>-0.19 **</td>
<td>0.03</td>
<td>-1.54 **</td>
<td>0.29</td>
</tr>
<tr>
<td>Constant</td>
<td>8.08 **</td>
<td>0.45</td>
<td>8.29 **</td>
<td>0.42</td>
<td>29.30 **</td>
<td>5.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>n 6100</th>
<th>n 6080</th>
<th>n 6740</th>
</tr>
</thead>
<tbody>
<tr>
<td>F stat average group size</td>
<td>60.26</td>
<td>264.1</td>
<td>99.55</td>
</tr>
<tr>
<td>r²</td>
<td>0.193</td>
<td>154.64</td>
<td>0.188</td>
</tr>
<tr>
<td>rho</td>
<td>0.229</td>
<td>0.069</td>
<td></td>
</tr>
</tbody>
</table>

* p < 0.05, ** p < 0.01