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Labor Market Outcomes for College Graduates with an Associate Degree

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Labor Market Outcomes for College Graduates with an Associate Degree

By

Fatih Aktas

A Thesis

Presented to the Graduate and Research Committee

of Lehigh University

in Candidacy for the Degree of

Master of Arts

in

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This thesis is accepted and approved in partial fulfillment of the requirements for the Master of Arts in Comparative and International Education, College of Education, Lehigh University.

LABOR MARKET OUTCOMES FOR COLLEGE GRADUATES WITH AN
ASSOCIATE DEGREE

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Abstract

This research investigates the contribution of community colleges to U.S. college graduates' salary and participation in the labor market. Using a quantitative approach to a human capital framework, this study investigates annual salary and employment rate differences between only bachelor's degree holders and both an associate's and a bachelor's degree holders. Labor market expectations have led to increasing attention on community-college and four-year college graduates throughout the late 20th and early 21st centuries. This research tests these labor market expectations and asks whether degree-type contributes to annual salary and employment status in the labor market. The data from the 2008 National Survey of Recent College Graduates administered by the National Science Foundation was used to examine annual salary and employment rate differences. The analyses reported here show that degree type has a slight positive impact on annual salary and employment status. However, there are other factors such as gender, age, race/ethnicity that mediate the positive impact of having both an associate's degree and a bachelor's degree on annual salary and labor market participation. These findings suggest that examining background factors and educational history together rather than focusing only on the relationship between degree type and labor market outcomes is needed in further analyses.

Labor Market Outcomes for College Graduates with an Associate Degree

Introduction

According to the U.S. Department of Education, more than 30% of occupations in 2010 necessitated at least a bachelor's degree (McGrevey, 2012). Besides, 60% of occupations expect employees to have a post-secondary education in addition to skills from professional training (McGrevey, 2012). The world economy in the 21st century has many expectations for employees, such as having solid educational credentials with critical skills (McGrevey, 2012). These critical skills include: problem-solving, completing open-ended tasks, having an entrepreneurial spirit, and pursuing lifelong learning (McGrevey, 2012). In addition, drastic changes in the 21st century's labor market have made skills, education, and adequate training necessary for a skilled worker to keep up with labor market expectations (Stuart & Dahm, 1999). By virtue of fast technological changes, computers and other cutting-edge technologies have become increasingly important across workplaces, thus making a broader range and depth of skills a requirement (Stuart & Dahm, 1999). Since both technical skills and general education have become equally important in the labor market, it might be argued that a combination of both technical skills and general education can be more beneficial in the labor market.

Academics often focus on whether community colleges help students to build the technical skills required by a knowledge economy and to provide a successful path to four-year colleges (Bragg, D. D., 2001; Hoachlander, Sikora, & Horn, 2003). And yet, it is not clear what the labor market conditions are for college graduates with both an associate's degree and a bachelor's degree. Community colleges are in high demand

because of their perceived role in training the skilled workforce for the U.S. economy (Mihm-Herold, 2010; Bailey & Morest, 2004; Dougherty & Bakia, 1999; Orr, 1999). In this vein, there are studies showing economic returns of a two-year college education and the economic returns of a four-year college education in the labor market (Kane & Rouse, 1995; Monk-Turner, 1994). Yet, there are few labor market studies underlining the economic returns and employment status of college graduates who attend both a two-year college and a four-year university in their educational career. The relationship between annual salary and employment status of college graduates holding both an associate's degree and a bachelor's degree is an important analysis because of the practical implications of holding both of these two-degree types in the labor market.

This research estimates the contribution of community colleges to college graduates' labor market returns based on a U.S. community college sample. As underlined above, if college graduates can equip themselves with both technical skills and general education, these skills can lead to more career opportunities since possessing a wide range of skills in today's labor market is very desirable. Contrary to the Industrial Age, the Information Age and the knowledge-based economy require employers to be both decision makers and to put those decisions into practice. There are many implementations that have been ongoing to realize this goal. Many universities, for example, have been trying to engage with the labor market closely. In doing so, universities plan to provide various internship opportunities for their students (Kessler, Danko, & Grant, 2009). Similarly, some universities have made some changes in their curricula that conform to labor market expectations, aiming to enable students to be ready to meet labor market expectations before graduation (Barnett, Parry, & Coate, 2001).

Community colleges are a way to transfer to four-year college programs, such that graduates of some state public universities consist of 60% community college transfer students (Pusser & Levin, 2009). Those U.S. students who receive a higher education at both a community college and at a four-year college can gain the practical skills and theoretical knowledge related to their field. During their community college education, students can get more practical skills such as learning essential programming languages for their field or doing practical implementations. As community colleges usually have connections with industry, students have more opportunities to have a part-time employment, hence offering them practical skills and networks. As these students transfer to a four-year college, they gain theoretical foundations which is complimentary to their practical skills they gained from community colleges. In doing so, it is likely that students can connect the relation between the practical skills received during their community college education and the theoretical foundations of practical implementations that they learn in their college. Therefore, it might be asserted that students would be more successful in the labor market with the combination of a community college education and a four-year college education.

The main aim of this present study is to explore the contribution of two-year post-secondary schools to U.S. college graduates in the labor market. The data used in this quantitative research includes information from science, engineering, and health graduates. The reason why those three fields, in particular, are considered is that graduates of those three fields mostly represent individuals who have recently transitioned from school to the labor market (National Science Foundation, 2008). This

study investigates the relationship between earnings and community college and four-year college education.

This study can also be a good example for other post-secondary technical schools around the world. Technical and vocational education systems all around the world have similar problems and expectations (Borgen & Hiebert, 2002). In mapping out the current situation in the U.S., this research can illuminate the impact of earning an associate's degree and a bachelor's degree on college graduates. It is still questionable whether getting degrees from both a two-year post-secondary institution and a four-year college is perceived as being more effective in the labor market than getting a degree only from a four-year college. Thus, this research can lead to future studies to thoroughly examine current labor market expectations and give some policy recommendations on how to make two-year post-secondary institutions more appealing institutions.

Literature Review

The Function of Community Colleges in the U.S. Higher Education System

According to Kane and Rouse (1999), community colleges play a central role in the U.S. education system in terms of enrolment rates. Enrolment rates in colleges for students who are between 18-24 years old increased more than one third, and rose from 26 to 36 percent between 1980 to 1994 (Kane & Rouse, 1999; U.S. Department of Education, 1997, Tables 178 and 186, p. 188, 196); community colleges accounted for the advantage of almost half of this increase (U.S. Department of Education, 1997, Tables 178 and 186, p. 188, 196). While community colleges are mostly demanded by minority groups, first-generation college students, and disadvantaged students in terms of

income level and educational achievement level in high school, those groups are not overrepresented in traditional colleges (Bailey, T.R. & Alfonso, M., 2005). In connection to those demands, the main education policy of these schools is more likely to open a door to education for these populations and provide transition from a two-year post-secondary institution to a four-year of college.

Community colleges are mostly known as 'Democracy's Colleges' by its advocates (Ayers, 2005). Advocates of community colleges assume that these schools can actualize the "American dream"; these colleges make education possible for disadvantaged groups through their commitment to equality (Ayers, 2005). With this egalitarian understanding, the advocates purport that these schools provide opportunities for disadvantaged groups such as job training and act as a bridge to four-year college education (Ayers, 2005). Currently, these colleges serve many U.S. students, especially those who come from ethnic minority groups as well as white students. According to Knapp et al (2008), more than 45% of undergraduate students preferred to start their higher education in public community colleges in the 2006-2007 academic years. In addition to the huge public demand for community college education, the U.S. government has also urged students to start their higher education at community colleges. As cited by Kellogg and Tomsho (2009), President Obama made an announcement in July 2009 that there will be a \$12 billion support to help the nation's community colleges.

The Reasons for Community College Attendance

There are many academic studies that underline the various reasons why U.S. students choose community colleges, why the transfer rates of students to four-year colleges vary, and which groups mostly prefer to start higher education at community

colleges. Research shows that the cost of attendance is one of the most prominent factors affecting enrollment decisions (Perna, 2005; Heller, 1999; Kane, 1999; St. John, 2003). In this vein, while tuition and enrollment rates have a negative relationship, financial aid and enrollment rates have a positive relationship (Perna, 2005; Kane, 1999; St. John, 2003). Therefore, most students from low-income and middle-income families prefer to start their higher education in community colleges because tuition fees in community colleges are at a more reasonable level compared to four-year college tuition fees.

In a similar way, many students prefer to start their education at community colleges because of those schools' open admission policy. In general, minority groups in diverse industrial societies are confronted with some educational problems, such as lower graduation rates and standardized test scores (Ogbu, 1990). Some scholars state that educational problems of minority groups mostly stem from cultural and language differences (Ogbu, 1990). Thereby, students from minority groups may have some difficulties passing required exams for entering four-year colleges because of their lack in English proficiency and not having the chance to get a good basic education. With the help of the open admission policy of community colleges, it is likely that many students who have some educational problems can access higher education. Similarly, those students can continue their higher education in four-year colleges after closing educational gaps during their community college education. As the research shows, the aim for students starting their education in community colleges is to protect their budget, to earn employment, and to gain and develop required skills for an ever changing labor market, or to transfer to a four-year institution (Mihm-Herold, 2010; Bryant, 2001; Johnson, Schwartz, & Bower, 2000; Kasworm, 2003; Keim, Stauser & Ketz, 2002).

One of the underlying reasons for the high demand for community college education stems from changing labor market policies in the Information Age. With the decline of assembly production jobs and the increase in the importance of technology in the labor market, the U.S. needs more skilled workers (Mihm-Herold, 2010; Feser, 2003; Grubb, 1996; Grubb & Lazerson, 2004; Hamm, 2004; Harkin, 2003; Herman & Gioia, 2003; Kletzer, 2005). Therefore, both education and training have become more significant in the knowledge-based economy (Mihm-Herold, 2010). In addition, the U.S. has been faced with a deep recession and the highest unemployment rates in 28 years (Mihm-Herold, 2010; Borbely, 2009). Thus, there is a huge human capital need in order to mobilize the local and national economies. Employees must have both required knowledge and skills for the knowledge-based market (Mihm-Herold, 2010; Houghton & Sheehan, 2000). Community colleges can make acquiring required skills for the knowledge-based economy possible. One of the most prominent philosophies of community colleges' ability to guide its students to employment is its occupationally-oriented education (Hlavna, 1992; Commission on the Future of Community Colleges [CFCC], 1988; Ogilvie & Raines, 1971). Parkland Community College, like many other community colleges, underlined its institutional mission as preparing "students for employment" and offering "opportunities for employed persons to increase their job competence" (Hlavna, 1992; Parkland College Catalog, 1990, p.15). To accomplish their goals, such as helping students become more prepared for the workforce and helping workers upgrade their skills, community colleges have closely engaged with business and industry (Hlavna, 1992).

Employers' Perspectives on College Education and Salary Returns to Two and Four-Year College Graduates

Some studies show that there is a positive relationship between labor market outcomes and the secondary education system's vocational specificity (Roksa & Levey, 2010; Allmendinger, 1989; Shavit & Muller, 1998). However, there are also other studies showing that vocational skills alone are not enough in the Information Age. Research suggests that employers want to have higher-skilled employees that have both technical expertise and general skills, such as being able to think critically and having written communication skills (Roksa & Levey, 2010; AACU, 2010; Autor, Levy & Murnane, 2003; Grubb & Lazerson, 2004). These kinds of skills may easily be gained with the help of a four-year college education. A survey conducted among employers from various industries found that social and critical thinking skills of bachelor's degree graduates were better than associate's degree graduates' social and critical thinking skills (Van Noy, 2011).

Additionally, Malcolm Grothe refers to his personal experience as a technical recruiter for the Boeing Company in his Ph.D. dissertation entitled, "The Community College Applied Baccalaureate Degree: Employers' and Graduates' Perspectives". According to Grothe (2009), although the technical requirements for the job necessitated a two-year technical degree, managers preferred to hire people who had a four-year degree. Besides, Grothe (2009) also underlined that even though employees had a four-year college degree, these employees needed to attend community or technical colleges to obtain a two-year technical degree in order to get a job, especially those who had social science degrees from four-year colleges. Also, according to national labor market

statistics, jobs requiring college degrees are increasing at a faster rate and these jobs are ranked among the highest paid jobs (Mihm-Herold, 2010; U.S. Department of Labor, 2002b). Research shows that employees having a bachelor's degree earn approximately \$13,000 more per year than employees having an associate's degree (Anonymous, 2009; U.S. Department of Labor, 2002). Although community colleges help students to build skills for the knowledge-based economy, having a bachelor's degree has become more significant to obtaining a job and increasing annual salary.

In addition to the above, it should not be forgotten that there are also some other factors affecting wage differences even if the education level is the same. For example, gender, race, and age play an essential role on annual salary. As Levine (2003) underlines, even if women and men have the same human capital qualities, there may still be some wage differences between men and women. While men with a bachelor's degree earned on average \$63,354 in 2001, women with a similar education level just earned \$36,913 in 2001 (Levine, 2003). Similarly, research shows that even if the wage gap between white and non-white is not as high as before, there is still at least a 10% wage difference between whites and non-whites who are observationally the equivalent to each other (Essaji, Sweeney, & Kotsopoulos, 2010)

As understood from the results of those studies, both general education and vocational education are equally important for students. Therefore, an alternative way might be to combine general education and occupational specificities instead of choosing either one (Roksa & Levey, 2010). Besides, it is still questionable what the financial benefit of having both an associate's degree and a bachelor's degree in the knowledge-based economy is. Theoretically, it is perceived that having both academic knowledge

from four-year colleges and practical skills from community colleges should provide benefits to college graduates; however, in practice, knowing the role of these graduates in the labor market is essential. Thus, it will be very informative if it is possible to analyze the labor market outcomes of college graduates who have an associate's degree and a bachelor's degree. However, there is an extreme gap in published research about this issue. While there are many studies underlining transfer rates from community colleges to four-year colleges and students' profiles in community colleges, there are not many studies that touch on employees who have a bachelor's degree in addition to their community college degree. Therefore, this research will shed light on the contribution of community college education to college graduates' transition to the labor market.

Challenges for Community Colleges

Another point that needs to be examined is the problems and expectations that exist in U.S. community colleges. One of the problems for community college education is that the probability of getting the baccalaureate degree for community college students is lower than traditional college students (Alfonso, 2006). In addition to this problem, another issue is that keeping track of transfer students is very difficult because, while some community college students can transfer to four-year colleges in two years, others may transfer in a longer time (The College Board, 2011). In light of those problems, it can be put forth that even if community colleges make higher education accessible to everyone, it does not mean that they can increase educational attainment, specifically one that will lead to a four-year college degree (Alfonso, 2006).

As underlined above, it is hard to keep track of transfer students. Besides, the survey used in this research provides comprehensive data about the profile of recent

college graduates. This survey makes examining the current labor market condition of recent college graduates possible by covering questions related to both community college attendance and highest degree types such as bachelor's, master's, doctoral, and professional degree in addition to asking a question about the survey participants' annual salary.

In sum, studies show us that being an expert in one field is not enough in the Information Age. The labor market expects employees to have both theoretical and practical backgrounds in their fields. On the other hand, post-secondary two-year technical schools currently have some problems in the educational field. These problems include lower than expected transfer rates to four-year colleges and negative perceptions about community colleges. Although those schools' main philosophy is to make education possible for everyone and to lead to high level of employment, it is not certain yet whether this aim is actualized or not. Therefore, by analyzing the income level and employment status of recent college graduates in the labor market, this study can generate a new direction to judge those schools' policies in a different way. In the theoretical framework part, theoretical foundations of this research will be explained in light of human capital theory.

Research Questions

- 1.** What is the financial benefit to one's annual salary of having an associate's degree and a bachelor's degree?
- 2.** What is the impact on one's employment status of having an associate's degree and a bachelor's degree?

Theoretical Framework

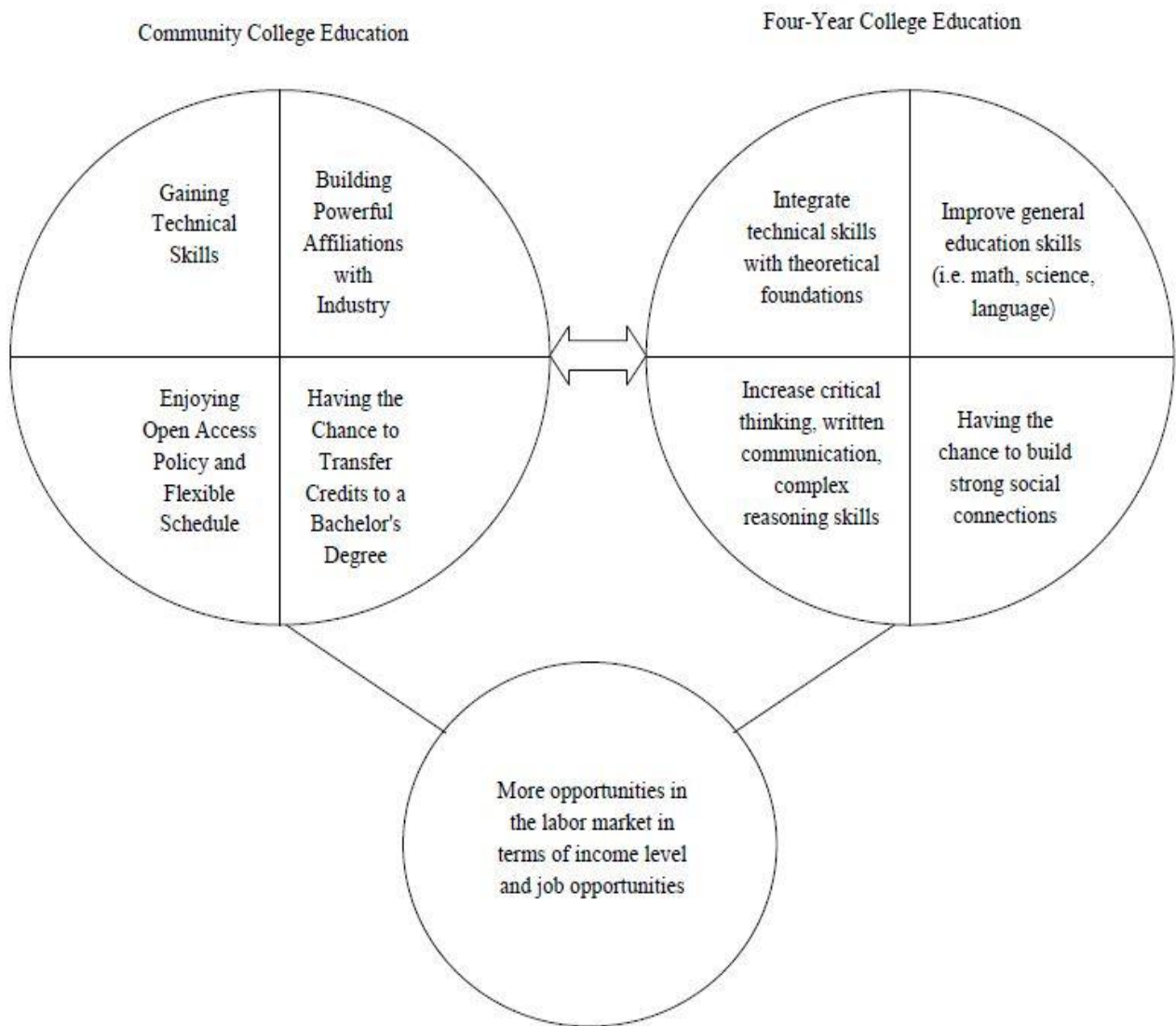
The theoretical explanation for the research is based on human capital theory. According to this theory, if individuals can improve their skills with the help of education by increasing their knowledge, these efforts will lead to the increased possibility of getting occupations and so as high economic return (Strayhorn, 2008). As Schultz (1961) underlines, "Human wealth consists of improvements in human effectiveness arising from the fact that man has developed capabilities that result from investments in man" (p.199). In connection with Schultz, Becker et al also claim that if individuals have less human capital, their returns will be less compared to individuals that have more human capital (Becker, Murphy, & Tamura, 1994). Based on human capital theory, any investment that helps to increase skills should return high payoffs.

As explained in the literature review, the knowledge-based economy needs a skilled workforce. Because of increasing global competition for the labor market, the United States needs to place more attention on its human capital in order to strengthen its skilled labor force (Mihm-Herold, 2010). A variety of labor force measures proves that long term unemployment and increasing joblessness are due to having low-level skills (Heckman, 1999). Human capital theory also highlights that, while high-skilled and highly educated workers have been awarded with increasing salaries, salaries for low-skilled and less educated workers have been decreasing (Heckman, 1999). To compete in a competitive labor market, heterogeneous skills are of prime importance. Thus, if a student gets his/her education both at a community college and at a four-year college, he/she will probably gain both technical skills and acquire general education background. By increasing his/her skills both in theory and practice, it is likely that he/she will earn

more than traditional college graduates and have more advantages in the labor market. These advantages result from the higher proportion of investments for his/her human capital.

Human capital theory is the assumed framework among education policymakers. The main purpose of this research is to test this framework. By testing this framework, it might be argued whether the practical implications of having both an associate's degree and a bachelor's degree has adequately been presented in the labor market and those two-degree type holders have a more advantageous condition in terms of annual salary and employment status. To explain the theoretical framework in a better way, the visual representation is presented as below:

Figure 1. The Visual Representation of the Theoretical Framework



The first circle shows that community colleges provide opportunities to students to improve themselves technically with the help of community colleges' powerful affiliation with industry. By getting technical knowledge from community colleges and having the chance to put technical knowledge into practice, community college students will be more familiar to the labor market. In addition, community colleges are one of the best schools especially for marginalized groups because those schools make open access policy and flexible schedule possible, and students can transfer community college credits to a bachelor's degree. With those advantages, college education can be less expensive because of community colleges' low tuition fees.

The second circle shows that by getting education in four-year colleges, students will have the chance to learn more about theoretical foundations of technical implementations that they learn during their community college education. In addition, students will have the chance to improve themselves in terms of general education skills by taking math/science/language courses. Also, students can equip themselves with critical thinking, written communication, and complex reasoning skills based on the theoretical foundation they receive from colleges. Lastly, students are able to build strong relations with the help of academic staffs and colleges' extracurricular activities. In the third circle, the advantages of the combination of community college education and four-year college education are explained. As understood from the circle, getting benefits of community colleges and four-year colleges should result in more opportunities in the labor market in terms of income level and job opportunities.

In sum, this research investigates whether college graduates with an associate's degree earn more than traditional college graduates because they have both theoretical

and practical background in their field upon graduation. In light of human capital theory, increased investments in education return in high payoffs. In connection to this topic of inquiry, this research also seeks to investigate that college graduates with an associate's degree have a better employment status compared to traditional college graduates.

Hypotheses

Hypothesis 1 postulates that having an associate's degree with a bachelor's degree is associated with high financial returns.

Hypothesis 2 postulates that having an associate's degree with a bachelor's degree has a positive impact on employment status.

The main reason behind these two hypothesis stems from the fact that, community college and four-year college attendance are likely to provide a broad range of skills, which is crucial for the twenty-first century labor market, to college graduates, thus leading to high financial returns and more employment opportunities in the labor market.

Method

Data Source

The data for this study was drawn from the '2008 National Survey of Recent College Graduates' (NSRCG) implemented by the 'National Science Foundation' (NSF). NSRCG's 2008 data covers questions about community-college attendance in addition to college, master, Ph.D., professional degree graduates. The 2008 NSRCG is definitely the most suitable data for the goals of this research because questions about community-college attendance are advantageous to the purpose of this study as other existing data covering this type of question is limited or not available. By asking questions about community-college attendance and holding degree types, such as associate's, bachelor's,

master's, Ph.D., professional degree, it is possible to analyze the profile of graduates spending their time in both community colleges and four-year colleges. Another prominent side of this data is the ability to make annual salary comparison possible among different degree holders. In doing salary comparison between graduates who hold both an associate's degree and a bachelor's degree versus graduates who just have a bachelor's degree, this data can show the contribution of having an associate's degree with a bachelor's degree in the labor market. Lastly, this data shows employment status of degree holders by asking questions on whether participants are employed or not. Thereby, the impact of having an associate's degree with a bachelor's degree in the labor market will become clear.

Measures and Sample

a) Measures

Control Variables

Age: Participants were asked to report their age. This variable ranged from 23 to 71 years of age.

Race/Ethnicity: This item was obtained by asking participants to report the ethnic groups to which they belong. It is a categorical measure and dummy coded (1= Asian, non-Hispanic ONLY, 2= White, non-Hispanic ONLY, 3= Under-represented Minorities).

Gender: This variable was coded that '0' indicates 'Female', '1' indicates 'Male'.

Reasons to attend community college: There are 6 different variables to measure the reasons behind community college attendance. These six variables were coded as 0=No, 1=Yes. These variables are: *'Reasons for attending community college: complete associates degree'*, *'Reasons for attending community college: complete credit towards a*

bachelor's degree', 'Reasons for attending community college: prepare for college', 'Reasons for attending community college: financial reasons', 'Reasons for attending community college: increase opportunities for promotion/advancement', 'Reasons for attending community college: acquire further skills in academic/occupation field'.

Independent Variables

Highest Degree Type: Participants were asked to report their highest education level: 1=*Bachelor's Degree*, 2= *Master's Degree*, 3= *Doctorate Degree*, 4=*Professional Degree*.

2-Year Associate Degree: This variable is an indicator of whether a participant has an associate degree. It was coded as 0=No, 1=Yes.

Dependent Variables

Labor Force Status: This item was assessed by asking participants their labor force status: 0= *Unemployed or Not in Labor Force*, 1= *Employed*.

Salary (Annualized and recoded for public use): This variable is an indicator of annual income of the survey participants. It is a continuous variable and ranges from 0 to 999998 ($M = \$174825.01$, $SD = 324910.196$). However, when the data was examined, it was clearly understood that people who are not in the labor force also reported their salary and most of them reported it as 999998. Therefore, the salary variable was limited within the range of 0 to 100 k ($M = \$47.51$ thousand or k , $SD = 24.02 k$) to increase the reliability of analysis results for the salary variable.

b) Sample

The National Science Foundation generally releases its 'National Survey of Recent College Graduates' on a biennial basis to include two academic years of bachelor's, master's, or Ph.D. graduates in science, engineering, and health (SEH) fields (Mooney & Foley, 2011). The reason specifically that those three fields-science, engineering, and health (SEH)- are chosen is that these graduates mostly represent individuals who recently transfer from school to the labor market (National Science Foundation, 2008). "SEH fields include biological/agricultural/environmental life sciences, computer and information sciences, engineering, and health" (Mooney & Foley, 2011, p.4). The survey includes individuals under the age of 76 who recently have bachelor's or master's degrees in a SEH field from a U.S. institution and were living in the United States during the survey process (National Science Foundation, 2008). The sample size for the survey was 18,000 which included 9,000 graduates per academic year. The survey had a 65.7% overall response rate. Although the overall sample size was 18,000, this study will not examine all of the participants. Public-use SPSS files covers the information of only 11,985 participants.

The main goal of this research was to examine the labor market conditions of graduates having both an associate's degree and a bachelor's degree versus graduates having just a bachelor's degree. Of people that participated in the survey, 6,300 participants held a bachelor's degree. Of these 6,300 participants, 888 people had both an associate's degree and a bachelor's degree. For making salary and employment status comparisons between associate's degree and bachelor's degree holders versus only bachelor's degree holders, people who had master's, Ph.D., or a professional degree in

addition to their associate's degree were not taken into consideration. Therefore, the final sample size for this research was 6,300. However, when the profile of community-college graduates was mapped out, people who had an associate's degree with a master's, Ph.D., or a professional degree were also be analyzed.

Table 1 provides descriptive information on demographic variables for all degree holders. Of 11,985 participants, 43.4% of the participants were male and 56.6% of the participants were female. Ages for the participants ranged from 23 to 71 years ($M = 28.43$ years, $SD = 6.64$). Among 11,985 participants, the highest degree type for 52.6% of the participants (6,300) was 'bachelor's degree'. While a master's degree was the highest degree type for 45.5% (5,454) of all the participants, 1.3% of the participants held the doctorate degree as the highest degree type. Only 0.6% of the participants had a professional degree as the highest degree type. In addition, 58.8% (888) of bachelor's degree holders and 40.0% (605) of master's degree holders had also an associate's degree. Besides, only 0.6% of doctorate and professional degree holders had an associate's degree in addition to their highest degree. In terms of employment status, 86.6% (10,383) of the participants were employed, 3.9% (471) of the participants were unemployed, and 9.4% (1,131) of the participants reported that they were not in labor force.

Table 1. *Descriptive Statistics of Demographic Variables for All Degree Holders*

<i>Participant's Characteristics</i>	<i>% (N)</i>	<i>M (SD)</i>	<i>Range</i>
Gender			
Male	43.4 (5,201)		
Female	56.6 (6,784)		
Age		28.43 (6.64)	23-71
Race/Ethnicity			
Asian, non-Hispanic ONLY	14.7 (1,765)		
White, non-Hispanic ONLY	47.9 (5,741)		
Under-represented Minorities	37.4 (4,479)		
Highest Degree Type			
Bachelor's	52.6 (6,300)		
Master's	45.5 (5,454)		
Doctorate	1.3 (159)		
Professional Degree	0.6 (72)		
2-Year Associate Degree	12.6 (1,511)		
Bachelor's	58.8 (888)		
Master's	40.0 (605)		
Doctorate	0.6 (9)		
Professional Degree	0.6 (9)		
Labor Force Status			
Employed	86.6 (10,383)		
Unemployed	3.9 (471)		
Not in Labor Force	9.4 (1,131)		
Annual Salary		47.51 (24.02)	0-100

Note: $N = 11,985$

Table 2 provides descriptive information on demographic variables for bachelor's degree holders. Among all bachelor's degree holders, 44.6% (2,807) of them were male and 55.4% (3,493) of them were female. Ages for the bachelor's degree holders ranged from 23 to 67 years (mean age = 26.22, $SD = 5.15$). While 84.3% of bachelor's degree holders were employed, 11.1% of them were not in the labor force and 4.6% of them were unemployed.

Table 2. *Descriptive Statistics of Demographic Variables for Bachelor's Degree Holders*

<i>Participant's Characteristics</i>	<i>% (N)</i>	<i>M (SD)</i>	<i>Range</i>
Gender			
Male	44.6% (2,807)		
Female	55.4% (3,493)		
Age		26.22 (5.15)	23-67
Race/Ethnicity			
Asian, non-Hispanic ONLY	13.8% (871)		
White, non-Hispanic ONLY	50.5% (3,183)		
Under-represented Minorities	35.7% (2,246)		
2-Year Associate Degree	14.1% (888)		
Labor Force Status			
Employed	84.3% (5,310)		
Unemployed	4.6% (289)		
Not in Labor Force	11.1% (701)		
Annual Salary		41.35 (20.60)	0-100

Note: $N = 6,300$

Table 3, in particular, gives information about participants holding both an associate's degree and a bachelor's degree. Among all the participants having both an associate's degree and a bachelor's degree, 41.9% (372) of them were male and 58.1% (516) were female. Ages ranged from 23 to 67 years ($M = 31.27$, $SD = 8.02$). When examining racial/ethnic background, 50.1% (445) of them were "White, non-Hispanic ONLY," 42.2% (375) of them belonged to "Under-represented Minorities," and 7.7% (68) of them belonged to "Asian, non-Hispanic ONLY." In terms of employment status, while 88% (781) of both associate's and bachelor's degree holders were employed, 6.8% of them were not in the labor force, and 5.3% (47) of them were unemployed. When analyzing the reasons why bachelor's degree holders need to attend community colleges, 76.4% of graduates said that they attended community colleges to complete their associate's degrees. The other reasons for community college attendance included completing credit towards a bachelor's degree (73.5%), financial reasons (62.5%),

preparing for college (55.7%), acquiring further skills in an academic/occupation field (47.9%), and increasing opportunities for promotion/advancement (33.1%).

Table 3. *Descriptive Statistics for Participants Holding both an Associate's Degree and a Bachelor's Degree*

<i>Participant's Characteristics</i>	<i>% (N)</i>	<i>M (SD)</i>	<i>Range</i>
Gender			
Male	41.9 (372)		
Female	58.1 (516)		
Age		31.27 (8.02)	23-67
Race/Ethnicity			
Asian, non-Hispanic ONLY	7.7 (68)		
White, non-Hispanic ONLY	50.1 (445)		
Under-represented Minorities	42.2 (375)		
Labor Force Status			
Employed	88.0 (781)		
Not-Employed	5.3 (47)		
Not in Labor Force	6.8 (60)		
Reasons to Attend Community College			
Complete Associate's Degree	76.4 (678)		
Complete Credit Towards a Bachelor's Degree	73.5 (653)		
Prepare for College	55.7 (495)		
Financial Reasons	62.5 (555)		
Increase Opportunities for Promotion/Advancement	33.1 (294)		
Acquire Further Skills in Academic/Occupation Field	47.9 (425)		
Annual Salary		44.05 (21.02)	0-100

Note: *N* = 888

Table 4 shows some of the descriptive information on demographic variables for the only bachelor's degree holders without having an associate's degree. Among all of them, 45.0% (2,435) of them were male and 55.0% (2,977) of them were female. Ages for the bachelor's degree holders without having an associate's degree ranged from 23 to 62 years ($M = 25.39$, $SD = 3.93$). While 83.7% of the only bachelor's degree holders without having an associate's degree were employed, 11.8% of them were not in the labor force and 4.5% of them were unemployed.

Table 4. *Descriptive Statistics for Participants Holding a Bachelor's Degree without an Associate's Degree*

<i>Participant's Characteristics</i>	<i>% (N)</i>	<i>M (SD)</i>	<i>Range</i>
Gender			
Male	45.0 (2,435)		
Female	55.0 (2,977)		
Age		25.39 (3.93)	23-62
Race/Ethnicity			
Asian, non-Hispanic ONLY	14.8 (803)		
White, non-Hispanic ONLY	50.6 (2,738)		
Under-represented Minorities	34.6 (1,871)		
Labor Force Status			
Employed	83.7 (4,529)		
Not-Employed	4.5 (242)		
Not in Labor Force	11.8 (641)		
Annual Salary		40.88 (20.49)	0-100

Note: $N = 5,412$

The overall summary of tables estimates that bachelor's degree and master's degree holders are more likely to have an associate's degree in addition to their highest degree earned as compared to doctorate and professional degree holders. Also, descriptive statistics show that among under-represented groups, the percentage of those holding both an associate's degree and a bachelor's degree is higher than the percentage of those holding only a bachelor's degree. These percentages seem to be consistent with community college literature which reveals that under-represented minorities perceive community colleges as appropriate institutions for higher education. Likewise, the most common reasons for community college attendance among both associate's degree and bachelor's degree holders are to complete an associate's degree, to complete credit towards a bachelor's degree, and financial reasons.

Procedures

The sampling process consisted of a two-stage process. In the first step, a sample of institutions was chosen, then, during the second step, graduates were chosen among

sampled institutions. According to the National Science Foundation's technical report for the NSRCG 2008, the sample for the first step was collected with the help of the Integrated Postsecondary Education Data System (IPEDS) provided by the National Center for Education Statistics (NCES) and the 'Probability proportional to size' (PPS) technique was used. At the end of these two steps, information from 18,000 graduates was collected. To solve the missing data problem, some important items such as U.S. residency could be deduced by using a logical imputation technique.

According to the National Science Foundation's technical report related to the 2008 National Survey of Recent College Graduates (National Science Foundation, 2012), there were both sampling and non-sampling errors in estimations. Sampling errors stemmed from the fact that some estimates in the survey tables covered a sample of individuals instead of covering all the population of the survey (National Science Foundation, 2012). To measure sampling error, the NSCRG team used the variance or standard error. In addition to sampling errors, there were also non-sampling errors deriving from non-response, coverage errors, reporting errors, and data processing errors (National Science Foundation, 2012). To minimize non-sampling errors' effects on the data, weighting adjustments and imputation were used by the NSRCG team, also the National Science Foundation controlled and provided training to the data-processing staff during data collection and tried to minimize the uncertainty of the data, such as using telephone interviews (National Science Foundation, 2012).

Analysis Plan

These variables were helpful in finding answers for target research questions. By analyzing the relationship between educational history (associate's degree/bachelor's

degree) and salary, it was likely to reveal the community college education's contribution to college graduates in the labor market. Similarly, by comparing graduates' personal background, the profile of community college students was presented.

Hypothesis 1: Having an associate's degree with a bachelor's degree is associated with high financial returns.

To analyze this hypothesis, *Independent Samples t-test* statistical technique was employed. By comparing annual salaries of these two independent samples (college graduates with an associate's degree versus college graduates without associate's degree), it was clear whether graduates having both an associate's and a bachelor's degree earn more than traditional college graduates or not. The indicator of income was annual salary for individuals and the salary outcome variable ranged from 0 to 100 k ($M = \$47.51 k$, $SD = 24.02 k$) in the sample.

In addition to employing *Independent Samples t-test* technique for the first hypothesis, blockwise multiple linear regression was employed to examine how annual salary of graduates holding a bachelor's degree differs based on holding an associate's degree, gender, race/ethnicity, and age. As independent variables, educational history (people who have an associate's degree with a bachelor' degree versus people who just have a bachelor's degree), gender, race/ethnicity, and age were chosen. The regression equation for annual salary was as follows:

$$\text{Annual Salary} = \beta_0 + \beta_1 * \text{Gender} + \beta_2 * \text{Age} + \beta_3 * \text{Race/Ethnicity}$$

$$\text{Annual Salary} = \beta_0 + \beta_1 * \text{Gender} + \beta_2 * \text{Age} + \beta_3 * \text{Race/Ethnicity} + \beta_4 * \text{Educational History}$$

Hypothesis 2: Having an associate's degree with a bachelor's degree has a positive impact on employment status.

To analyze the second hypothesis, a chi-square test and binary logistic regression were employed. To determine employment status of college graduates, the 'labor force status' variable was used. By conducting a chi-square test, the study examined whether there was any relation between labor force status and educational history.

In addition to employing a chi-square test, binary logistic regression was also employed to examine what other factors might have an impact on labor force status. The general goal of regression method (multiple/logistic) is to get more comprehensive information about the relationship between several independent variables and a dependent variable. In using the regression method, the relation between 'labor market status' and 'having an associate's degree with a bachelor's degree' was articulated.

Binary logistic regression was conducted to determine whether predictor variables-- *educational history, gender, age and race/ethnicity*--significantly predict an individual's *employment status*. The equations of labor market status are included as follows:

Labor Force Status: $\beta_0 + \beta_1 * \text{Educational History}$

Labor Force Status= $\beta_0 + \beta_1 * \text{Educational History} + \beta_2 * \text{Gender} + \beta_3 * \text{Age} + \beta_4 *$

Race/Ethnicity

As a result, if the first hypothesis -- ' Having an associate's degree with a bachelor's degree is associated with high financial returns'-- is confirmed based on *independent samples t-test* statistical analysis and multiple regression method, this result will contribute to a better understanding of the differences in annual income. If the first hypothesis is not confirmed, the variables used for the first hypothesis will probably not be enough to analyze the differences in annual income of students who have post-

secondary degrees and those who do not. Similarly, if the second hypothesis -- 'Having an associate's degree with a bachelor's degree has a positive impact on employment status'-- is confirmed based on a chi-square test and binary logistic regression method, the differences in the labor market status of students who have post-secondary degrees and those who do not will become articulate. If the second hypothesis is not confirmed, more variables that are not covered in the '2008 National Survey of Recent College Graduates' (NSRCG) are needed.

Results

This research mainly focuses on the two research questions. The first one is "What is the financial benefit to one's annual salary of having an associate's degree and a bachelor's degree?" The second one is "What is the impact on one's employment status of having an associate's degree and a bachelor's degree?"

In order to examine differences in annual salary between bachelor's degree holders with an associate's degree and only bachelor's degree holders, an independent samples *t*-test was conducted. Based on Levene's test for homogeneity of variances, $F(1, 5308) = 0.1, p = .75$, a *t*-test assuming homogenous variances was calculated. The results of this test indicated that there was a significant mean difference in annual salary between the two groups, $t(5308) = -3.97, p \leq .001$. These results suggest that individuals holding both an associate's degree and a bachelor's degree ($M = \$44.05$ thousand or $k, SD = 21.02 k$) earn more annual salary than individuals holding a bachelor's degree only ($M = \$40.88 k, SD = 20.49 k$). The size of this effect ($d = .15$), as indexed by Cohen's (1988) coefficient *d*, was found to have a small effect size.

Table 5. *Independent Samples t-Test for Annual Salary*

	Degree Holders		<i>t</i>	<i>df</i>
	Only Bachelor's	Both Associate's and Bachelor's		
Annual Salary	40.88 (20.49)	44.05 (21.02)	-3.97***	5308

Note. *** $p \leq .001$. Standard deviations appear in parentheses below means.

In addition to an independent samples *t*-test, multiple regression using the hierarchical (blockwise) method was conducted to examine how the benefit of having an associate's degree with a bachelor's degree to one's annual salary differs based on gender, age, and race/ethnicity. Blockwise multiple regression with participants' annual salary as a dependent variable included two models: control variables (gender, age, and race/ethnicity) were added to Model 1, then participants' degree level (having an associate's degree with a bachelor's degree or not) were added to Model 2. It should be noted that participants' annual salaries were analyzed as a continuous variable. Therefore, multiple regression was an appropriate technique for examining the first hypothesis.

Table 6 presents the result of participants' annual salaries in two models. Model 1 where gender, age, and race/ethnicity were added was significant, $F(4, 5305) = 91.41, p < .001, R^2 = .064$, meaning that this model explained 6.4% of the variance in the dependent variable. Adding the participants' degree level (having both an associate's and a bachelor's degree versus only bachelor's degree) in Model 2 with the overall model remaining significant, $F(5, 5304) = 73.47, p < .001, R^2 = .065$. In Model 1, when examining the control variables, some expected results that were associated with higher annual salary included being male ($\beta = .16, p < .001$) and being older ($\beta = .19, p < .001$). Holding constant the effects of gender and age variables, belonging to under-represented minorities had a predicted annual salary that was significantly higher by 1.21 units ($\beta =$

.03, $p < .05$). Similarly, holding constant the effects of gender and age variables, being Asian had a predicted annual salary that was statistically significantly higher by 4.90 units ($\beta = .08$, $p < .001$). Adding the participants' degree level in Model 2, salaries of participants holding both an associate's degree and a bachelor's degree was 1.09 units ($\beta = -.02$, $p = .20$) less than participants holding only a bachelor's degree.

Table 6. *Blockwise Multiple Regression Analysis for Graduates Having a Bachelor's Degree*

	B	SE	β
Step 1			
Gender	6.60	.55	.16***
Age	.75	.05	.19***
Under-Represented Minorities versus White or Asian	1.21	.60	.03*
Asian versus White or Under-Represented Minorities	4.90	.87	.08***
F		91.41***	
R ²		.064	
Step 2			
Gender	6.58	.55	.16***
Age	.78	.06	.20***
Under-Represented Minorities versus White or Asian	1.22	.60	.03*
Asian versus White or Under-Represented Minorities	4.86	.87	.08***
Degree Type (Holding both an associate's and a bachelor's degree)	-1.09	.85	-.02
F		73.47***	
R ²		.065	

Note. *** $p \leq .001$, * $p \leq .05$

For the second research question—"What is the impact of having an associate's degree with a bachelor's degree on one's employment status?"—as a beginning step, a chi-square test of independence was performed to examine the relation between holding an associate's degree with a bachelor's degree and employment status. The relation between these two variables was significant, $X^2(2, N = 6300) = 20.51$, $p < .001$. In other

words, employment status was associated with having an associate's degree with a bachelor's degree. As shown in Table 7, while 83.7% of only bachelor's degree holders were employed, 88% of bachelor's degree holders with an associate's degree were employed. In addition, only bachelor's degree holders were more likely not to be in the labor force (11.8%) compared to bachelor's degree holders with an associate's degree (6.8%) in this sample.

Table 7. *Employment Status of Bachelor's Degree Holders*

		Labor Force Status			Total	X ²
		Employed	Unemployed	Not In Labor Force		
2-Year Associate's Degree	NO	4529 83.7%	242 4.5%	641 11.8%	5412 100.0%	
	YES	781 88.0%	47 5.3%	60 6.8%	888 100.0%	20.512***
	TOTAL	5310 84.3%	289 4.6%	701 11.1%	6300 100.0%	

Note. *** $p < 0.001$

In addition to a chi-square test of independence, additional analysis was conducted based on a binary logistic regression using employment status as a dichotomous dependent variable (0= *unemployed or not in the labor force* and 1= *employed*) with the rest of variables used as predictors. In using binary logistic regression, the effect of associate's degree, gender, age, and race/ethnicity on college graduates' employment status was tested.

The model including employment status as a dichotomous variable and associate's degree as a predictor was a significant fit to the data $\chi^2_{(1)} = 11.12, p = .001$. The results showed that having an associate's degree with a bachelor's degree was a significant

predictor of being employed, $b = .35$, Wald $\chi^2 (1) = 10.39$, $p = .001$. The predicted odds of being employed for bachelor's degree holders with an associate's degree is 1.42 times as high as the odds of being employed for bachelor's degree holders without having an associate's degree. In other words, having an associate's degree with a bachelor's degree is likely to increase the chance of being employed by 42%.

Table 8. *Logistic Regression Analysis for Employment Status of Participants Holding a Bachelor's Degree*

Predictor	B	SE	Wald's χ^2	df	p	Exp (B) [95% CI]	95% C.I.for EXP(B) Lower-Upper
Associate's Degree with Bachelor's Degree (1=Yes, 0=No)	.35	.11	10.39	1	.001	1.42	1.15-1.76
Test			χ^2	df	p		
Overall Model Evaluation							
Likelihood ratio test			11.12	1	.001		

Note: $R^2 = .00$ (Cox & Snell), $.00$ (Nagelkerke)

In addition, another binary logistic regression was conducted to see how the impact of having an associate's degree on employment status varies when control variables are entered into the equation. The model including associate's degree, gender, age, and race/ethnicity was a significant fit to the data, $\chi^2 (5) = 84.80$, $p < .001$. Also, the Hosmer and Lemeshow (H-L) χ^2 test of goodness of fit was statistically significant, $p = .71$, indicating that the model adequately fits the data.

The results showed that having an associate's degree with a bachelor's degree was not a significant predictor of being employed, $b = .14$, Wald $\chi^2(1) = 1.44$, $p = .23$. Similarly, belonging to under-represented minorities was also not a significant predictor

of being employed, $b = -.096$, Wald $\chi^2(1) = 1.47$, $p = .23$. Nevertheless, gender, age, and being Asian were significant predictors for employment status.

Holding constant all of the other predictors, the predicted odds of being employed for male participants were 1.22 times as high as the odds of being employed for female participants among college graduates ($b = .20$, Wald $\chi^2(1) = 7.55$, $p = .01$, odds ratio =1.22, 95% confidence interval (CI) [1.06,1.40]). Employment status was predicted by participants' age ($b = .03$, Wald $\chi^2(1) = 12.13$, $p < .001$, odds ratio =1.03, 95% CI [1.01, 1.05]), suggesting that, with all other predictors held constant, the predicted odds of being employed increased by a factor of 1.03 as ages increased by one unit. In addition, controlling for all of the other predictors, the odds of being employed for Asians were 0.51 times lower than the odds of being employed for white participants or under-represented minorities ($b = -.67$, Wald $\chi^2(1) = 50.83$, $p < .001$, odds ratio =0.51, 95% CI [0.42,0.61]).

Table 9. *Logistic Regression Analysis for Employment Status of Participants Holding a Bachelor's Degree*

Predictor	B	SE	Wald's χ^2	df	p	Exp (B)	95% C.I. for EXP(B) Lower-Upper
Associate's Degree with Bachelor's Degree (1=Yes, 0=No)	.14	.12	1.44	1	.23	1.15	0.91-1.45
Gender (1=Male, 0=Female)	.20	.07	7.55	1	.01	1.22	1.06-1.40
Age	.03	.01	12.13	1	.00	1.03	1.01-1.05
Under-Representative Minorities (0=White or Asian, 1=Under-Represented Minorities)	-.096	.08	1.47	1	.23	.91	0.78-1.06
Asian (0=White or Under-Represented Minorities, 1=Asian)	-.673	.09	50.83	1	.00	.51	0.42-0.61
Test			χ^2	df	p		
Overall Model Evaluation							
Likelihood ratio test			84.80	5	.00		
Goodness-of-fit test							
Hosmer & Lemeshow			5.41	8	.71		

Note: $R^2 = .01$ (Cox & Snell), $.02$ (Nagelkerke)

Table 10 presented logistic regression results predicting employment status by adding control variables such as gender, age, and race/ethnicity. The model including gender, age, and race/ethnicity was a significant fit to the data, $\chi^2_{(4)} = 23.36, p < .001$. Also, the Hosmer and Lemeshow (H-L) χ^2 test of goodness of fit was statistically significant, $p = .58$, indicating that the model adequately fits the data.

Employment status was predicted by participants' age ($b = .04, p = .01$, odds ratio [OR]=1.05, 95% CI [1.01,1.08]), suggesting that, with all other predictors held constant, the predicted odds of being employed increased by a factor of 1.05 as ages increased by

one unit. In addition, the odds of being employed for Asians were .33 times lower than the odds of being employed for white participants or under-represented minorities ($b = -1.12, p < .001$, odds ratio [OR] =0.33, 95% CI [0.18, 0.60]).

Table 10. *Logistic Regression Analysis for Employment Status of Participants Holding both a Bachelor's Degree and an Associate's Degree*

Predictor	B	SE	Wald's χ^2	df	p	Exp (B) [95% CI]	95% C.I.for EXP(B) Lower-Upper
Gender (1=Male, 0=Female)	.24	.22	1.19	1	.28	1.27	0.83-1.93
Age	.04	.02	7.51	1	.01	1.05	1.01-1.08
Under-Representative Minorities (0=White or Asian, 1=Under-Represented Minorities)	.03	.23	.01	1	.90	1.03	0.66-1.61
Asian (0=White or Under-Represented Minorities, 1=Asian)	-1.12	.31	12.83	1	.00	0.33	0.18-0.60
Test			χ^2	df	p		
Overall Model Evaluation							
Likelihood ratio test			23.36	4	.00		
Goodness-of-fit test							
Hosmer & Lemeshow			6.60	8	.58		

Note: $R^2 = .03$ (Cox & Snell), .05 (Nagelkerke)

Discussion and Conclusion

Two main questions were addressed in this research. (1) What is the financial benefit of having an associate's degree with a bachelor's degree to one's annual salary? (2) What is the impact of having an associate's degree with a bachelor's degree on one's employment status? Age, gender, and ethnicity were also used as control variables.

Descriptive statistics showed that under-represented minorities were more likely to have both an associate's degree and a bachelor's degree, suggesting that under-

represented minorities regard community colleges as starting point for higher education as other research underlines. For question 1, the human-capital framework was tested to determine whether having an associate's degree with a bachelor's degree is associated with high financial returns based upon labor market expectations. *T*-test results suggested that bachelor's degree holders with an associate's degree earned more than those bachelor's degree holders without an associate's degree. However, after controlling for age, gender, and ethnicity, degree type was no longer significant, suggesting that factors other than degree type played a key role in earned income. These findings for Question 1 did not confirm the human-capital framework and showed that only having degrees from a community college and a four-year college does not lead to high financial returns. Background factors such as gender, age, and race/ethnicity were significant determinative factors for annual salary.

The results for Question 1 were somewhat consistent with previous research reported in the community college literature regarding the economic impact of having an associate's degree on labor market opportunities. In their research, Gill and Leigh (2003) found that policies for promoting community colleges as a starting point for college careers seem to have little negative impact on the labor market. Although this study did not put any time limit on community college attendance, the results also proved that holding an associate's degree had a relatively negative impact on labor market opportunities as understood from annual salary differences. Similarly, Kolesnikova (2009) discovered that there is a salary gap between people who have a prior associate's degree and those who do not. These results seem to be consistent with this study's findings.

Regarding Question 2, results for chi-square test showed that graduates holding both an associate's degree and a bachelor's degree were more likely to be employed. Logistic regression indicated that holders of an associate's degree with a bachelor's degree were likely to have 42% more of a chance of being employed. However, when control variables were added, the impact of having an associate's degree with a bachelor's degree on employment status was reduced and no longer statistically significant. These results were similar to the findings for Question 1. These results may suggest that degree type on its own had little positive impact on employment status; however, there were other factors such as gender, age, race/ethnicity that might limit the positive impact of having an associate's degree on labor market participation. As understood from these findings, analysis results for Question 2 also did not confirm the human-capital framework and instead demonstrated that employment rate in the labor market is determined by degree type and other background factors such as gender, age, and race/ethnicity rather than being solely dependent on degree type.

Education is one of the most important factors for economic development, and many governors in the United States see community colleges as a prime target for higher education (Snyder, 2011). The reason behind this expectation may stem from the fact that community colleges provide required technical skills needed in a knowledge-based economy. As Secretary of Education Arne Duncan has underlined, two million jobs offering good salaries and requiring high-skills in the U.S. are vacant due to the fact that there are not skilled workers for these jobs (Snyder, 2011). Therefore, supporting community colleges is seen as an important way to increase U.S. educational output and the number of skilled workers (Business Higher Education Forum & Emtect Solutions,

2010). The community college system is seen as an important path for students and adults to enter into either the workplace or four-year colleges (Business Higher Education Forum & Emtect Solutions, 2010). However, as the findings of this research showed although community college education and associate's degree as a degree type had little positive impact on annual salary and employment status, it was unlikely to make community college education more appealing without examining other personal factors such as gender, age, and race/ethnicity.

The results of this research recommend that policy makers and those working to promote community college education among U.S. students should take into consideration the profile of possible community college attendees when they determine education policies. This present study suggests that the human capital framework on its own cannot explain the bulk of annual salary gap and employment rate differences between only bachelor's degree holders and both associate's and bachelor's degree holders. Marginalized groups may benefit from community colleges since these schools are perceived as one of the appropriate higher education institutions serving marginalized communities. In addition, since some positive effects of having an associate's degree become negative when gender, age, and race/ethnicity variables are added, it is necessary to investigate those variables thoroughly to determine the future directions of education policies. Further research is recommended to examine factors arising from personal background and educational history together rather than only focusing on the relation between degree type and labor market outcomes. By examining these kinds of variables in details and taking necessary actions to eliminate negative points stemming from

personal background, community colleges can become more attractive institutions and can better serve the purpose of their mission as 'Democracy's Colleges'.

In addition, the findings of this research can serve as a good example for other post-secondary schools around the world. Technical education systems all around the world have similar problems more or less (Hiebert & Borgen, 2002). For example, Turkey has similar problems in technical education even if the structure of technical education systems in the United States and Turkey is not exactly the same. Among those similar problems, we can count low employment rates of technical school graduates in Turkey. By examining this research, education policymakers in Turkey and all around the world can put more emphasis on the personal profiles of post-secondary school participants to implement the required policy changes for making post-secondary institutions more attractive.

Limitation of the Study

While there are different kinds of variables in the survey, it is not possible to analyze information from all these variables by using public use data of the 2008 NSRCS. As it is common for all federal agencies, the National Center for Science and Engineering Statistics is also restricted by the Privacy Act of 1974 (National Science Foundation, 2012). Therefore, it is necessary to execute a licensing agreement to access micro-data files at the National Science Foundation's offices in Arlington, Virginia, or at the academic institution where the research has been conducted.

Restricted data exist that examines both college graduates' profiles and colleges' profiles in detail. This data documents more particular questions about racial background of recent college graduates, location of schools, and parents' education level. It would be

a more comprehensive study if it were possible to access restricted data in this research. For example, it would be very informative to analyze the relationship between having an associate's degree and parents' education level. Similarly, mapping out the racial backgrounds of college graduates in detail, instead of limiting it to three different categories, would be more helpful. However, it was planned to use public use data of the 2008 NSRCG in this research. Thus, this study will not be able to analyze restricted data.

In addition, one more limitation in this research is that it is not possible to compare annual salaries and the employment status of only associate's degree holders versus only bachelor's degree holders. The reason it is not possible is that the highest degree type variable in the public use data starts from a bachelor's degree. Therefore, survey participants have a minimum of a bachelor's degree. The research would be more comprehensive if it were possible to see annual salary and employment rate differences between only associate's degree holders and only bachelor's degree holders.

Implication of the Research to the Field of Comparative and International Education

This research traces the transition from post-secondary education to college education in the U.S. context in connection with mapping out labor market status of graduates having degrees both from colleges and post-secondary schools. As mentioned before, there has been little international research focusing on labor-market status of college graduates with an associate's degree while there are many research projects either focusing on returns of post-secondary education or returns of college education. By analyzing labor-market conditions in this research, one will better understand post-secondary education's contributions to college graduates in United States.

From the 'Comparative and International Education' perspective, the result of this research is likely to set a good example for other post-secondary institutions in the world. Technical and vocational education globally serves similar goals more or less (Borgen & Hiebert, 2002). In general, these schools aim to reach out to marginalized groups and provide educational and vocational supports to people (Hiebert & Borgen, 2002). Broadly speaking, these schools worldwide are perceived as less desirable (Amundson & Morley, 2002). Nevertheless, due to recent technological developments and emerging trends, advocates aim to take these schools into full consideration and to make them more desirable options in higher education (Hiebert & Borgen, 2002). The United States is one of the leading countries for technological developments in the world, and, thus, analyzing U.S. community colleges' contribution to college graduates can foreshadow some of the facets of possible labor market expectations. By analyzing these expectations, the results of this research can lead to other international research examining the role of post-secondary institutions worldwide in their contribution to employment status and annual salary.

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Fatih Aktas grew up in Gaziantep, Turkey and attended Firat University. After graduating from department of computer teaching in 2010, Fatih got Fulbright Scholarship for his master's education. In 2011, Fatih began a master's degree at Lehigh University. While at Lehigh, he pursued a Master of Arts degree in the department of Comparative and International Education with a concentration in International Relations and Political Science. During his master's education at Lehigh, his main research interests include the transition from higher education to the labor market, labor force participation among college graduates, education systems of the Middle East, particularly Qatar, the relationship between STEM education and innovation, and ICT's use in classrooms. Upon completion of his Master of Arts degree at Lehigh, Fatih is planning to continue his academic career by pursuing a doctorate program in the field of education.