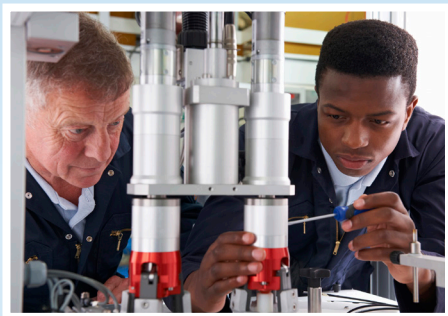


# THE VALUE OF CREDENTIALS FOR DISADVANTAGED WORKERS

Findings from the Sector Employment Impact Study

by Jean Grossman, Linda Kato, Tony Mallon, Sheila Maguire and Maureen Conway



For all inquiries, please contact:

The Aspen Institute  
One Dupont Circle, NW  
Suite 700  
Washington, DC 20036  
Phone: (202) 736-5800  
Fax: (202) 467-0790

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The Aspen Institute  
One Dupont Circle, NW  
Suite 700  
Washington, DC 20036

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# INTRODUCTION

Increasingly, attainment of a postsecondary credential is seen as a prerequisite to holding a quality job in the rapidly changing economy. Jobs typically requiring a postsecondary credential are projected to account for 44 percent of new jobs in the 2008-2018 time period.<sup>2</sup> In addition, the Obama administration seeks to “[lead] the world in the percentage of Americans with postsecondary degrees and/or industry-recognized certificates ... by 2020.”<sup>3</sup> The recently passed Workforce Innovation and Opportunity Act (WIOA) bipartisan, bicameral legislation reauthorizes the Workforce Investment Act (WIA) for six years, from 2015 through 2020. WIOA establishes as some of the core indicators “the percentage of participants who obtain recognized postsecondary credential, a secondary diploma or equivalent as well as measurable skills gains toward such a credential to be used to gauge the success of the wide range of publicly funded activities that focus on workforce development.

But even as policy makers have placed an increasing focus on training and preparing workers to obtain postsecondary credentials, questions remain about the value to various actors, especially for job seekers and workers who often invest time and money to obtain a credential with the hopes of improving their employment prospects and raising their earnings. This report begins to address this issue. Drawing on data from the randomized control trial of the Sectoral Employment Impact Study (SEIS)<sup>4</sup>, which included three sector-focused training programs, we explore whether individuals who obtain credentials work more and earn more over time than they would without such credentials. In Section 1, we describe sector-focused training programs, the individuals in the study. In Section 2, we describe the specific credentials provided to the program participants and explore the value of credentials using a statistical technique called instrumental variable (IV) and highlight three findings. Section 3 outlines conclusions and some essential caveats. All values stated in this report are in 2014 dollars, unless explicitly noted.

<sup>1</sup> We thank Chris King, senior research scientist and director, Ray Marshall Center for the Study of Human Resources at the University of Texas at Austin, and Burt Barrow, Amsterdam Professor of Public Service and Economics at The Trachtenberg School of Public Policy and Public Administration at George Washington University, for providing useful comments.

<sup>2</sup> Bureau of Labor Statistics, Employment Projections 2012-22, December 19, 2013 <http://www.bls.gov/news.release/pdf/ecopro.pdf> (accessed 12.14.2014)

<sup>3</sup> Employment and Training Administration. 2010, December 15. Training and Employment Guidance Letter No. 15-10: 1. Employment and Training Administration. 2012, January 13. Upcoming ETA Funding Opportunities. 1-2. [http://gov.georgia.gov/00/press/detail/0,2668,165937316\\_165937374\\_181836313,00.html](http://gov.georgia.gov/00/press/detail/0,2668,165937316_165937374_181836313,00.html) <http://crc.virginia.gov/>

<sup>4</sup> Sheila Maguire, Joshua Freely, Carol Clymer, Maureen Conway and Deena Schwartz. (2010). *Tuning In to Local Labor Markets: Findings from the Sectoral Employment Impact Study*. Philadelphia, PA: Public/Private Ventures.



# SECTION 1

## A REVIEW OF THE SECTORAL EMPLOYMENT STUDY (SEIS): ITS PROGRAMS, PARTICIPANTS AND IMPACTS

The Sectoral Employment Initiative Study (SEIS) is the first rigorous random assignment evaluation of sector-focused training programs that prepare low-income, unemployed, underemployed and underskilled workers for skilled entry-level positions, and connect them with employers seeking to fill such vacancies.<sup>5</sup>

The three sector-specific trainings programs selected for SEIS were:

- **Wisconsin Regional Training Partnership (WRTP)**, serving the Milwaukee area, which offered short-term training programs in the construction, manufacturing and health care sectors;
- **Per Scholas (PS)**, serving New York City, which offered computer technician training for entry-level jobs in repairing and maintaining personal computers, printers and copiers, as well as installing and troubleshooting computer networks;
- **Jewish Vocational Services (JVS)**, serving the Boston area, which offered medical billing and accounting training.

To be included in the study, programs must have been operating for at least three years, tracked outcomes for several years and showed wages at or above \$8 an hour (equivalent to \$10 in 2014 dollars). SEIS sought to determine whether sector-focused training programs could increase the earnings and employment of low-income workers and job seekers, including those with potential barriers to employment, such as irregular work histories, homelessness, criminal records, welfare receipt or education levels.

Programs included in the study served a range of disadvantaged job seekers. Table 1 shows the individuals who applied to the sector-focused programs during the study's enrollment period in 2003 and 2004. Half the applicants were women. Most applicants were non-white and relatively young; the average age was 32, the median was 30, and a little more than a quarter were under 25. While 34 percent were employed either full time or part time at the beginning of the study, only 10 percent had been employed full time during the entire 12 months prior to the baseline survey. On average, applicants had earned only \$9,872 in 2004 dollars (or \$12,341 in 2014 dollars) in the prior year. Nearly 40 percent had received public assistance (ever), including the 23 percent of participants who were on welfare at the time of enrollment. About one in five applicants had been convicted of a crime. Seven percent had been homeless in the year before applying to the program. In terms of education, 53 percent had a high school diploma only and another 22 percent had obtained a GED; 8 percent had an associate's degree and 9 percent had a bachelor's or master's degree.

<sup>5</sup> Sheila Maguire, Joshua Freely, Carol Clymer, Maureen Conway and Deena Schwartz. (2010). *Tuning In to Local Labor Markets: Findings from the Sectoral Employment Impact Study*. Philadelphia, PA: Public/Private Ventures.

A lottery was used to select which eligible program applicants would be included in the program group and which became part of the control group.<sup>6</sup> Two years later, applicants in both groups were re-contacted and surveyed. Table 1 shows that the two follow-up groups were comparable on all characteristics except three: Program group members were slightly more likely to be married and to be foreign-born and slightly less likely to have ever been incarcerated. These three variables are included in all analyses to control for these differences between the program and control groups.<sup>7</sup>

The study found that over this two-year period, the sectoral programs had had substantial positive impact on earnings across all types of participants. Table 2 presents the experimental impact estimates in 2014 dollars (Maguire et al. 2010, p. 11-13).<sup>8</sup> The experiment found that program group individuals earned more over the 24-month period, were more likely to obtain and maintain employment, and were more likely to be well paid – i.e., make almost \$13 an hour (in 2014 dollars) or more – than controls, particularly in the second year. Key outcomes include the following:

- The program group members earned \$5,295 or 18 percent more than controls, over the 24-month study period. Most of the increase occurred in the second year (\$396 per month, or 29 percent more) given that the program group was in training during the first year.
- Program group members were more likely to work than controls, working on average with 1.3 months more on average over the 24-month study period. During the second year, 52 percent of the program group was working all 12 months in the second year versus 41 percent of the controls.
- Program group members were more likely to work in jobs with higher wages and in jobs with benefits (such as health insurance and paid sick leave). For instance, program group members worked two more months than controls in jobs that paid at least \$13 an hour during the two-year study period.

<sup>6</sup> Throughout this paper, we use the term “program group” to mean the “treatment group.” It is the group of individuals who were offered the chance to enroll in the program.

<sup>7</sup> The follow-up survey sample included 1,014 respondents, 75 percent for the control group and 82 percent for the program group. To determine if the program and control groups were still comparable, we regressed being in the program group as a function of all the baseline characteristics in Table 1. None of the individual covariates were significant and the joint test that they were all zero could strongly be accepted, indicating that the two groups still were comparable. We also test the comparability of each characteristic individually using either a t-test or a chi-squared test. These tests showed that with the exception of three characteristics – being married, being foreign-born and having been incarcerated – the groups were the same. To be cautious, these and the other baseline variables were controlled for in all subsequent analysis.

<sup>8</sup> The findings in the earlier report are based on an “intent to treat” analysis, i.e., all participants assigned to the program group were included, even if they did not attend or complete the program. In this study, 7 percent of those offered a position in a sector-focused training program never attended, and 41 percent of those assigned to the control group received other job training services, including job-specific skills training, job search assistance, training in basic reading and math skills, internships, on-the-job training and GED classes.



**TABLE 1**  
**BASELINE CHARACTERISTICS OF SEIS FOLLOW-UP SAMPLE**

	Total	Control Group	Program Group
<b>Sample Size</b>	1014	485	529
<b>Gender</b>			
Male	47%	49%	46%
<b>Race/Ethnicity and Foreign-Born Status</b>			
African-American	60%	61%	59%
Latino	21%	23%	20%
White	12%	11%	13%
Other	6%	5%	7%
Foreign-born	23%	21%	26%**
<b>Age (average)</b>			
18 to 24	32.2	32.0	32.5
25 to 54	28%	29%	27%
55 and Older	70%	68%	71%
	2%	3%	1%
<b>Education</b>			
More than High School Diploma	18%	17%	19%
High School Diploma	53%	54%	53%
GED	22%	21%	22%
Less than High School Diploma	7%	7%	6%
<b>Other Characteristics</b>			
Married	18%	15%	20%**
Ever on Welfare	37%	36%	38%
On Welfare at Baseline	23%	23%	22%
Has Access to a Vehicle	45%	44%	47%
Average Number of Children in Household	1.2	1.2	1.3
Move in Last Two Years	43%	41%	44%
Completed Other Training Before Baseline	25%	27%	23%
Homeless in Year Prior to Baseline	7%	7%	7%
Ever Convicted of a Crime	22%	24%	20%
Formerly Incarcerated	17%	20%	15%*
<b>Employment History at Baseline</b>			
Average Months Employed Year Prior	6.8	6.7	6.9
Employed (Part-time or Full-Time at Baseline)	34%	33%	34%
Worked Full-Time all 12 Months Prior	10%	10%	11%
Avg. Months Working Full-Time Year Prior	3.5	3.4	3.5
Total Earnings Year Prior to Baseline (2004 \$)	\$9,872	\$10,171	\$9,599

Note: Stars indicate that the program group was not statistically the same as the control group on this characteristic. \* indicates that the level of significance is 0.10 or less, while \*\* indicates a 0.05 level of significance.

- Positive impacts were seen for all subgroups examined, namely subgroups defined by gender, race/ethnicity, criminal records, welfare receipt, youth/young adults and immigrants. The impacts were the largest for Latinos, foreign-born individuals, ex-offenders and women.

While each program included in the study employed a unique strategy, focused on different industries and occupations, and crafted its program to respond to local circumstances, through site visits, focus groups and interviews, researchers identified common elements shared by the three programs: a strong link to local employers that results in an understanding of the target occupation and connections to jobs; recruitment, screening and intake processes that result in a good match between the applicant, the program and the target occupation; individualized services to support training completion and success on the job; job readiness, basic skills and hands-on technical skills training offered through the lens of a specific occupation or sector; and strong organizational capacity with the ability to adapt.

**TABLE 2**  
**EXPERIMENTAL IMPACTS ON EMPLOYMENT AND EARNINGS**  
**TOTAL SEIS SAMPLE, ALL SITES**

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<b>Months Employed</b>		
24 Months		1.3***
<b>Hours Worked</b>		
24 Months		245***
<b>Ever Worked a Job Paying \$11 an Hour or More</b>		
24 Months		14%***
<b>Total Earnings</b>		
24 Months		\$5,295***

---

Asterisks (\*) indicate statistically significant differences between program and control groups. \*\*\*p < 0.01

These are impressive findings. They suggest that when well-designed sector-focused training programs work closely with an industry or sector to determine and teach the skills workers need to know to be employed in that sector, low-income workers can significantly benefit.

# SECTION 2

## THE VALUE OF CREDENTIALS: ANALYSIS OF THE SEIS DATA

The original study of SEIS indicated that these three sector-focus programs had substantial positive impacts on participants' earnings. This earnings impact undoubtedly is due, at least to some degree, to the technical or specific skills participants learned in the program. However, as we will see below, many of the participants also earned credentials that are valued by employers within their local labor markets. Perhaps the participants needed to earn these credentials to prove to or "signal" to the local employers that they indeed possessed the needed skills at the appropriate level of competence. If this were the case, the earning impacts would be mediated through the credential. In other words, for participants to benefit, earning a credential may be a necessary, indeed a critical signaling step.

### ANALYSIS APPROACH

Because many individuals (in the program group and controls) in the SEIS data set earned credentials during the study period, some might think that a simple way to investigate the value of a credential would be to compare the earnings of credential holders with other individuals who are like the credential holders demographically (similar age, education, race, etc.) who did not earn a credential. Unfortunately, this simple regression approach does not work because it is quite likely that credential holders are the most motivated individuals and they may well have earned more even without a credential. In other words, part of the earnings differences we observe between credential holders and non-holders is likely due to motivation or persistence, not just the credential.

To deal with the problem, we examine the role credentials have on earnings by using a statistical method designed to "cleanse" estimates of these motivational biases called Instrumental Variables (IV) (Angrist, Imbens, & Rubin, 1996; Heckman, 1996, 1997; Gennetian, Morris, Bos & Bloom, 2005)<sup>9</sup> Angrist et al. (1996) shows that experiments in which individuals are randomly assigned to a program or control group provide an ideal situation to use this technique if treatment status is correlated with the variable of interest, in this case a credential. Indeed, we will see below that treatment status is strongly correlated with credential holding. Intuitively, this technique compares the earnings of controls who did not earn a credential with the earnings of program individuals who would not have "naturally" earned a certificate. The difference in earnings between these two subgroups is then attributed to the difference in the rate of credentials.

<sup>9</sup> In particular, we will use the treatment status dummy as the instrument for having a credential per Heckman, James J. "Randomization as an Instrumental Variable," *Review of Economics and Statistics*, 1996, v78 (2, May), 336-341.

Below, we first describe how we collected data about credentials in the SEIS. Then we show that being in the program group is strongly correlated with having a credential. Next, we examine evidence that indicates that the impact of the sector training programs worked through helping participants earn a certificate when they otherwise would not have. Then we examine the impact of obtaining a credential on earnings, first overall and then by the type of credential. In each section, we lead with the main finding, and then provide our evidence.

**Per Scholas'** computer technician training program provides disadvantaged people with the skills needed to succeed in jobs related to the repair and maintenance of personal computers, printers and copiers, as well as the installation and troubleshooting of computer networks. It offered participants the opportunity to take the A+ exam, an international information technology (IT) certification that verifies foundation-level skills for entry-level work in PC installation, preventative maintenance, networking, security and troubleshooting, and IT customer service skills. The A+ is sponsored by CompTIA, a non-profit trade membership association made up of IT businesses and professionals; the A+ was established in 1993 as a "vendor neutral" certificate to standardize the skills of IT's fast growing workforce. Today it is required for a range of occupations and is used by an increasing number of employers in hiring decisions across a wide range of employers including Dell, Intel, and Lenovo service techs and CompuCom and Ricoh.

**The Wisconsin Regional Training Partnership (WRTP)** is an association of employers and unions, which seeks to retain and attract high-wage jobs in Milwaukee, and create career opportunities for low-income and unemployed community residents. WRTP develops training programs (generally lasting between two and eight weeks) in response to specific employers' requests or to clearly identified labor market needs. Its short-term pre-employment training programs in the construction, manufacturing and health care sectors were included in the study. WRTP also provides training to incumbent workers.

**WRTP** offered participants the opportunity to prepare and sit for the state administered exam for Certified Nursing Assistant (CNA) and Certified Medical Assistant (CMA). CNA licensure is required for jobs in a range of institutional settings including the rapidly expanding and changing home-health care sector. The federal and state government mandate training requirements for service providers under Medicare and Medicaid with the federal government setting minimums for training and the state of Wisconsin requiring 120 hours. WRTP participants had an opportunity to earn several different certifications in the construction field, including in asbestos removal, utilities construction and general construction.

**Jewish Vocational Service-Boston (JVS)** is a community-based nonprofit that has provided workforce development services for more than 70 years, including operating one of three One-Stop Career Centers (One-Stops) funded by the Workforce Investment Act (WIA) in the Boston area. Its training programs in medical billing and accounting were included in the study. JVS provided participants with job-specific occupational skills through an intensive 5 ½-month training program and to supplement this training with a high level of support during and after the program. Most participants were women, many of them young women, funded through welfare reform dollars. Certificates of completion were provided for finishing these internally operated training modules. JVS worked closely with an advisory group of health care employers that (who) identified needed competencies and reviewed curriculum.

## COLLECTING CREDENTIAL DATA IN THE SEIS

Postsecondary credentials include an array of awards and degrees that require differing levels of formal academic and occupational training, lengths of study, and costs to learners.<sup>10</sup> These credentials are often awarded by for-profit and nonprofit colleges and technical schools. Others, like those in the SEIS study, are earned to short-term training programs operated by a range of organizations including nonprofits, and labor-management partnerships. Some of these credentials may be classified as “industry-recognized,” are defined by the U.S. Department of Labor as “either developed and offered by, or endorsed by a nationally recognized industry association or organization representing a sizable portion of the industry sector, or a credential that is sought or accepted by companies within the industry sector for purposes of hiring or recruitment which may include credentials from vendors of certain products.” This definition covers a wide variety of credentials across a broad array of industries.

Many of the individuals in the program group were offered the opportunity to prepare for and earn credentials. Among the three programs included in this study, two of them, WRTP and PS prepared participants for certifications and licenses that meet the USDOL definition of industry-recognized while the third, JVS, awarded a certificate for those participants who finished the program. Credentials offered through SEIS programs could be earned after relatively little training (5-15 weeks) and the training was delivered by the one of the three nonprofit SEIS organizations.

In the SEIS follow-up survey, respondents were asked about their employment histories and whether they had received any vocational, technical or business credentials since they applied to the program. Those who had were asked to identify the type of credential from among the following choices:

- A+/Networking/Computer Technician;
- Clerical/secretarial;
- Medical office;
- Accounting;
- Certified Nursing Assistant (CNA);
- Medical Assistant (CMA);
- Construction - Utilities; Construction - Asbestos; Construction - Other;
- Commercial Drivers’ License (CDL);
- Manufacturing;
- Other.

<sup>10</sup> The U.S. Census Bureau’s report, *Measuring Alternative Educational Credentials: 2012*, provides the first national estimates that show a sizable portion of the U.S. population holds alternative educational credentials independent of traditional college: 22 percent held a professional certification or license, and 9 percent held an educational certificate.

The Census uses definitions developed by the Interagency Working Group on Expanded Measures of Enrollment and Attainment (GEMEnA), that is developing national measures for education and training credentials. These definitions provide an initial framework under the umbrella term of credentials.

Based on discussions with program staff in the three cities, the following subset of credentials were designated as “industry-recognized” since they are sponsored by an industry, trade or professional association, and/or require passing an examination sponsored by an association or leading firm in that industry, trade or profession:

- A+/Networking/Computer Technician;
- Certified Nursing Assistant (CNA);
- Certified Medical Assistant (CMA);
- Construction - Utilities;
- Construction - Asbestos;
- Commercial Drivers’ License (CDL).

The other responses were designated as “program-generated/industry recognition unconfirmed.” This latter group included all the program completion certificates provided by JVS, and other credentials that were not sponsored by an industry, trade or professional association.

## FINDINGS

### 1. Attending the sector-focused training programs greatly increased the likelihood of gaining a credential

Table 3 shows the distribution of credentials held by program and control group members. The data show that nearly half (46.5 percent) of all sample members obtained some type of credential. A quarter (109) of the credentials of the sample members were held by members of the control group, while three-quarters were held by program group members. Thus, **attending the sector-focused training programs greatly increased the likelihood of gaining a credential.** Sixty-seven percent of the program group members earned a credential, while 22 percent of the controls did, even though the two groups were indistinguishable in terms of motivation, ability and other characteristics. Of the 472 credentials held by sample members, 44 percent were industry-recognized credentials. The likelihood of earning an industry-recognized credential versus a program generated certificate did not differ greatly between the program and control groups – 45 percent of the program group’s credentials were industry-recognized, while 39 percent of the controls’ were.

Table 4 shows the distribution of specific credentials. For both groups, industry-recognized credentials are heavily weighted toward A+ certifications as program-generated credentials are primarily issued by JVS. It is important to remember that SEIS data is not a nationally representative sample that included individuals with all types of credentials but only includes credentials obtained by individuals who applied to three specific programs.

**TABLE 3**  
**CREDENTIALS BY PROGRAM AND CONTROL GROUP**

	Full Sample		Program Group Members		Control Group Members	
	Number	%	Number	%	Number	%
<b>Total Sample</b>	1,014	100%	529	100%	485	100%
<b>Earn Any Credential</b>	<b>472</b>	<b>47%</b>	<b>363</b>	<b>68%</b>	<b>109</b>	<b>22%</b>
Industry Recognized	208	44%	165	45%	43	39%
Program Generated	264	56%	198	54%	66	60%
<b>Did Not Earn a Credential</b>	<b>542</b>	<b>53%</b>	<b>166</b>	<b>32%</b>	<b>376</b>	<b>78%</b>

**TABLE 4**  
**CREDENTIALS BY PROGRAM AND CONTROL GROUP**

Credential Type	Full Sample		Program Group Members		Control Group Members	
	Number	%	Number	%	Number	%
<b>Industry Recognized</b>	208	100%	165	100%	43	100%
A+	127	61%	103	62%	24	56%
CNA	44	21%	31	19%	13	30%
CMA	23	11%	17	10%	6	14%
Construction - Utilities	17	8%	13	8%	4	9%
Construction- Asbestos	8	4%	6	4%	2	5%
CDL	3	1%	1	1%	2	5%
<b>Program Generated</b>	264	100%	198	100%	66	100%
Medical Office	92	35%	79	40%	13	20%
Accounting	45	17%	42	21%	3	5%
Construction-Other	33	13%	27	14%	6	9%
Manufacturing	18	7%	17	9%	1	2%
Clerical/Secretarial	17	6%	6	3%	11	17%
Other	120	45%	71	36%	49	74%

Note: Totals of all credentials types may add up to more than the total in each category (industry-recognized and program-generated) because some individuals reporting more than one type of credential.

**2. The earnings effect of sector-focus programs, at least the SEIS programs, appears to work through enabling participants to earn credentials.**

Given the large proportion of individuals in the program group that were able to earn credentials, perhaps the key to programs' benefits lies in their abilities to help people who otherwise would not be able to earn a credential to do so. And, if the effect on earnings works entirely through this signaling mechanism -- i.e., obtaining a labor-market valued credential -- signals to a local employer that the individual indeed is well trained in skills they need, then we should see that once we account for having a credential, there should be no additional earnings effect for being a member of the program group.

**TABLE 5**  
**RELATIONSHIP BETWEEN CREDENTIAL RECEIPT AND EARNINGS AND HOURS WORKED 24 MONTHS SINCE BASELINE**

<b>Variable</b>	<b>Earnings</b>	<b>p-value</b>
Program Status	\$1,192	0.523
Credential Status	\$8,159 ***	0.000
Sample size	1002	

Note: These estimates are derived from an OLS regression which controls for an individual's education, gender, race, being U.S.-born, prior work history, criminal background, and all the other variables in Table 1.

The regression results shown in Table 5 confirm this hypothesis. The effect of being a program group member is insignificant once we control for having a credential.

**3. The certificates earned by the program group members who were induced by the program to obtain a certificate, on average, increased their earnings by \$10,808 over the first two years after enrollment.**

If one ignores the experimental nature of this data and just compare the outcomes of people (in both groups) who earned a credential with those that did not, we find that those with credentials worked 15.8 months and made \$42,902 over the 24 months since random assignment (i.e., when they applied to one of the programs). Those who did not earn a credential worked 11.6 months and earned just \$27,530. While this approximate \$15,000 difference suggests that obtaining a credential leads to better outcomes in terms of earnings and work hours, simply comparing outcomes across these two groups is misleading because it does not account for the possibility that those who earn credentials could differ systematically from those that do not in many ways, such as education, work histories and demographic characteristics. The results shown in Table 5 shows that almost half of the raw \$15,000 earning difference is due to the differences in education, gender, race, foreign-born status, prior work history, and criminal background (i.e., all the other variables in Table 1) between the credential holders and the other individuals. Compared to individuals with similar socioeconomic characteristics who did not earn a credential, credential holders earned \$8,159 more over the two-year period.

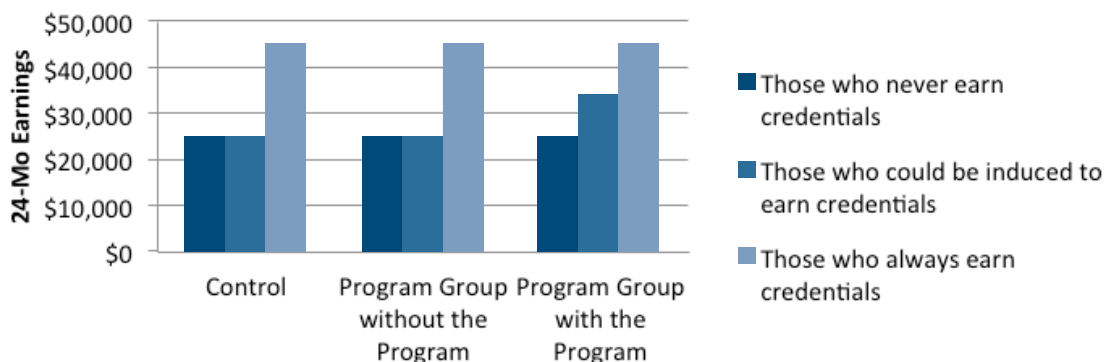


However, this estimate of approximately \$8,000 may *still* be a biased estimate of the impact of earning a credential. Simple regression analysis can only control for characteristics that are measured. Yet, the two groups of individuals may still be different on unmeasured characteristics such as persistence, motivation or aptitude. If motivated and persistent individuals are more likely to complete a credential, **and** these individuals, with or without credentials, would have earned more money than less motivated and persistent sample members, then some or even all of the \$8,000 is not due to the effect of the credential but simply due to the fact that they are more persistent and/or able.

In order to correct for this potential bias, as mentioned above, we use an *instrumental variables* (IV) method to adjust the credential impact estimate for the effects of these unmeasured motivational/ability biases. In particular, we will use the treatment status variable as the “instrument” for having a credential at follow-up. How does it work?

In a random assignment experiment, we know the two groups are, on average, the same in all characteristics, including those characteristics that make an individual more likely to earn a credential. Thus, the proportion of individuals in the two groups that earn credentials “naturally” – i.e., *because they are more motivated or persistent* – will be the same. Had the program group members not attended a sector program, about 22 percent of both groups (from Table 3) would have completed a credential and the average follow-up earnings of the program group and the control group would have been the same. But as we saw above, 69 percent of the program group members completed credentials by the follow-up. This higher rate of credential completion was not due to the group’s higher level of motivation or persistence (these are the same for the two groups by construction) but to the support the sector programs provided. Thus, if the program group on average earned more **and** the program’s effect on earnings works entirely through helping participants to earn credentials that are valued in the labor market, then we can attribute the difference in earnings to the difference in the proportion of the two groups that earned credentials. In particular, the difference in earnings would reflect how much more the individuals who would *not* have “naturally” earned a credential benefit from completing a credential. Figure 1 shows how without the program the earnings of the two groups would have been the same, while after the program they differ to the extent that some of the program groups are induced to complete credentials.

**Figure 1**  
**Hypothetical Earnings of Sample Members**  
**Under Different Conditions**



This IV estimate can be interpreted as the average program effect for individuals who were induced to get a credential by participating in the training if three conditions hold:

1. Attending sector-focused training programs increases every program group member’s likelihood of earning a credential. This seems quite plausible.
2. An individual’s likelihood of earning a credential did not affect their likelihood of being a program group member. This assumption is met by construction since being a member of the program group was determined by a lottery.
3. The impact of the sector-focused training program must work entirely through the credential. In other words, the other aspects of the programs, while supportive of earning a credential, do not imbue labor market benefits in and of themselves. Table 5 showed this.

The first column of Table 6 presents the IV estimate, our best estimate of the impact of enabling an economically disadvantaged individual to earn a credential. For comparison, the second column shows the experimental estimate found in Maguire et al. (2010) updated to 2014 dollars; and the third column reproduces results shown before in Table 5. As the other estimates do, the IV estimate controls for observed differences between credential obtainers and others, but in addition, to the extent our three assumptions hold, it controls for the unobservable differences between credential holders and non-credential holders (such as motivation). We see that among our sample of low-income workers, those that earned credentials who would not otherwise have done so without the program earned substantially more than they would have without the credential, namely \$10,810 over the full two-year period.

**TABLE 6**  
**THE EFFECTS OF CREDENTIAL RECEIPT ON EARNINGS**  
**OVER THE 24 MONTHS SINCE BASELINE**

Variables	(1) IV Estimate	(2) Experimental Estimate	(3) OLS Estimate
Credential Status	\$10,810 *** p=.004		\$8,159 *** p=.000
Program Status		\$4,859 *** p=.004	\$1,192 p=.523
Socio-economic controls added	x	x	x
Sample size	1002	1002	1002

Note: These estimates derived from an OLS regression in which an individual’s education, gender, race, U.S.-born, prior work history, criminal background, and all the other variables in Table 1.

It is not surprising that the IV estimate is larger than the experimental estimate since not all participants earned certificates and some of the controls earned credentials too. However, somewhat surprisingly, this estimate is also larger than the column 3 estimate where motivation and other unobservable differences between credential holders and others are not controlled (\$8,159). How could this be? One potential explanation is that while some of the program group members who earned certificates would have done so even without the program, these three programs enabled individuals who, on their own without the programs' assistance, would not have had the ability or persistence to complete a credential. These individuals receive not only the typical benefit of having a credential but because, without the program, they would not have been on this higher trajectory they earn even more than they typically would have.

This means participants of sector-focused training programs who, on their own, would have underperformed given their age, education, race and other observable characteristics can obtain a credential and earn more money than they would have been able to obtain on their own.<sup>11</sup>

#### **4. Study participants who earned industry-recognized and program-generated credentials have similar and significant earnings gains.**

Up to this point, we have treated industry-recognized and program-generated credentials as the same, but perhaps their value differs. Thus, next we explore how earnings impacts differ between the two types of credentials among study participants. Because we do not have a nationally representative sample of low-income individuals, we cannot determine generically the value of industry-recognized or program-generated credentials. We have data on only individuals who applied to one of the three study programs during the evaluation period. Thus, we can estimate the impacts of the industry-recognized credentials and program-generated certificates obtained by study participants.

From Table 4, we know that approximately 60 percent of our designated "industry-recognized" credentials obtained by our sample members were A+ certifications. However, while we know if study participants earned one of six industry-recognized credentials, we cannot be sure that the other credentials were only non-industry-recognized. The "program-generated" designation is more precisely "program-generated or industry recognition unknown." Among the 264 program-generated certificates, 118 (45 percent) were given by JVS, a well-respected training organization in the Boston labor market, for program completion – i.e. program-generated. We know little about the other program-generated credentials.

In our next analysis, we compare the earnings of those with one of the six industry-recognized credentials with those of individuals who earned credentials from the other grouping, some of whose industry recognition is unconfirmed or are program-generated. This analysis tests the hypothesis that industry-recognized credentials are more valuable than non-industry-recognized credentials. Given that there is little research on how credentials affect the incomes of low-wage workers, this is a valuable step forward.

<sup>11</sup> Within the program group, there are individuals who would "naturally" earn a certificate. The earning of those individuals – those for whom the program has no effect on their likelihood of earning a certificate – are ostensibly ignored in IV analysis. The IV estimate is the effect of enabling someone who in the control group would not have earned a credential, to earn one with the program.

Table 7 presents the results of the instrumental variable analysis.<sup>12</sup> This analysis controls both for the observable and unobservable differences between industry-recognized certificate holders, program-generated certificate holders and non-certificate holders.

When we distinguish between the two types of certificate holders, we find that both types of credentials have similar and significant earnings gains over 24 months: \$10,802 for the industry recognized credential holders and \$11,237 for the program-generated group. We cannot statistically reject the hypothesis that the two types of credentials have the same impact on earnings in our sample. One possible explanation for these findings is that JVS completion certificates may function in much the same way as an industry-recognized credential does, at least in Boston. However, this finding is likely to be true only in the Boston area, since the organization works so closely with Boston’s health care employers.

**TABLE 7**  
**THE INSTRUMENTAL VARIABLES ESTIMATES OF THE IMPACT OF OBTAINING AN INDUSTRY-RECOGNIZED CREDENTIAL OR A PROGRAM-GENERATED CERTIFICATE ON EARNING OVER THE FIRST 24 MONTHS SINCE BASELINE**

<b>Outcome</b>	<b>Obtain Any Certificate</b>	<b>Obtaining an Industry-Recognized Certificate</b>	<b>Obtaining a Program-Generated Certificate</b>
Earnings Months			
1-24	\$10,810 *** p=.004	\$10,802 ** p=.049	\$11,237 ** p=.034
Socio-economic controls added	x	x	x
Sample size	1002	1002	1002

Note: These estimates derived from two stage least square IV regressions in which the three program group\*site status variables were used as the instrument for the two endogenous variables -- obtaining an industry-recognized or a program-generated certificate. In addition the regression include an individual’s education, gender, race, being U.S.-born, prior work history, criminal background and all the other variables in Table 1.

<sup>12</sup> To employ an IV strategy, one needs at least one variable, or instrument, that is correlated with the variable of interest – here earning a certificate – but is not correlated with the outcome – earnings or months employed. In our case, when we examine the effects of the two types of credentials, we needed at least two variables that were correlated with these credential variables (industry-recognized and program-generated) but were uncorrelated with unobserved factors that affect our outcomes (employment and earnings). Because the goals of the three programs were quite different, there was a variation in the percentage of participants that received each type of certificate across the three programs. Thus, we can use the three site-level program-status dummy variables as instruments for our two credential variables.

Is this telling us that all program-generated certificates are equally valuable to all industry recognized ones? No, these findings are not saying that all non-industry-recognized credentials have impacts of this magnitude. But it does indicate that for the individuals in our sample whose credential earning behavior was changed through participation in industry-recognized training programs, those that obtained one of the six industry-recognized credentials that we asked about earned no more than individuals who received a JVS completion certificate or some other credential obtained by sample members.

## CONCLUSIONS AND CAVEATS

This study is the first to estimate the causal impact on earnings from obtaining a credential for low-income job seekers. The results of this analysis indicate that obtaining the types of credentials available to our sample members, whether a certificate of completion from a well-regarded training organization such as JVS or an industry-recognized credential, boosts the earnings of low-income job seekers by about \$11,000 in 2014 dollars over two years. This is an important finding because low-income job seekers and workers – including those with barriers to employment such as welfare receipt, criminal backgrounds and refugee status -- are a particularly policy-relevant group of workers.

It is important to note that three quarters (77 percent) of credential holders in this study were program group members who participated in sectoral training programs offered by JVS, WRTP or Per Scholas – all well-respected training organizations that had strong, mature relationships with local employers. The \$11,000 earnings impact estimate is valid as long as the impact of these training organizations works entirely through their ability to enable its participants to earn credentials. Our test of this assumption (Table 5) confirmed this hypothesis. When the effect on earnings was compared between program participants and controls who did not gain a credential, on average, program participants without a credential earned about \$1,000 more over the two years than similar controls who also did not have a credential. But this figure was very imprecisely estimated since its likely range was minus \$13,000 to plus \$15,000.<sup>14</sup> Given this range, we cannot reject that being in the program but not getting a credential has no effect. However, if this extra non-credential-related advantage of the program were real, then perhaps the impact of earning a well-respected credential is somewhat smaller than \$11,000 but still likely substantial.

The results of our analyses *do not* support the conclusion that *all* industry recognized credentials or that a certificate of completion issued by *any* workforce development program will significantly impact participants' employment and earnings. There are three reasons that our findings of significant earnings impacts are not generalizable to all credentials:

1. JVS, WRTP and Per Scholas all collaborated closely with local employers in developing and implementing their training. The findings of this study may not characterize the impact of industry-recognized credentials or certificates of completion provided by less well respected organizations on the employment and earnings of low-income job seekers.
2. The number of different types of non-industry-recognized and industry-recognized credentials represented in the SEIS dataset is limited. Indeed, over 27 percent of the observed credentials were the A+ certifications (and 61 percent of all industry-recognized credentials) while 49 percent of the non-industry-recognized in this data set were from JVS. This limitation is particularly important given the proliferation and variety of credentials that industries and training programs are generating, for instance, for retail store sales associates or child care providers.

The SEIS data set did not include credentials awarded from educational institutions, such as community colleges or private colleges. Instead, this study points to the significant role that nonprofit organizations can play in working with employers and offering industry-relevant credentials. As such, we cannot speak to the influence that the type of institution (educational or nonprofit) that awards the certificate has on the size of the impact.

In addition to examining the earnings impacts of credentials in our sample as a whole, we also assessed whether different types of credentials have varied benefits. We found that the earnings over time of sample members with industry-recognized credentials were statistically similar from those of job seekers with non-industry-recognized credentials, including program-generated certificates of training completion. We hypothesize that, at least in the three study labor markets, credentials from organizations with strong reputations among local businesses may play the same informational role in the local labor market that industry-recognized credentials (such as A+ or asbestos removal) plays at a national level. But this hypothesis needs testing.

## FURTHER RESEARCH

As all good research, these findings beget more questions. What attributes are being signaled to an employer by the credential? A level of skill? Persistence? Motivation? How do those signals influence the employment process? What is the mechanism through which a credential overcomes the common employment and earning barriers experienced by women, minorities and the formerly incarcerated? While we do not have answers to these questions, this research shows that earning a credential provides low-income job seekers with some combination of skills and/or endorsement that is valued by employers. And that this benefit can be achieved either through a well-regarded industry-recognized credential or a certificate provided by a training provider with a strong reputation. The following questions are of particular interest:

- Do trusted training organizations in other local labor markets provide credentials that have similar value to employers as the JVS credential? Assuming the presence of similar organizations, what leads to their credibility with local businesses?
- Credentials attained by sample group members were concentrated in IT, construction, manufacturing and health care. How does the value of industry-recognized credentials vary across occupations and industries and local labor markets? What is the variation between licensed and unlicensed occupations/fields?
- Does receipt of an industry-recognized credential improve employment outcomes regardless of a candidate's gender, race/ethnicity or criminal background? For instance, does professional certification of a female job candidate in certain industries show similar job prospects for a male candidate without certification? What role can credentials play in compensating for deficits in education and work experience?

Answers are needed to these questions for the workforce development field to most effectively improve job prospects for low-income job seekers. In addition, answers to these questions would shed light on employers' hiring decisions and thus, would help more workforce development efforts better prepare their participants for employment. Perhaps most notably, these answers would benefit the economic opportunities of low-income job seekers and make certain that their investments in postsecondary credentials are valuable in the labor market.



