

Returns to Vocational Credentials: Evidence from Ohio's Community and Technical Colleges

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Growing importance of vocational credentials

Shift from access to completion

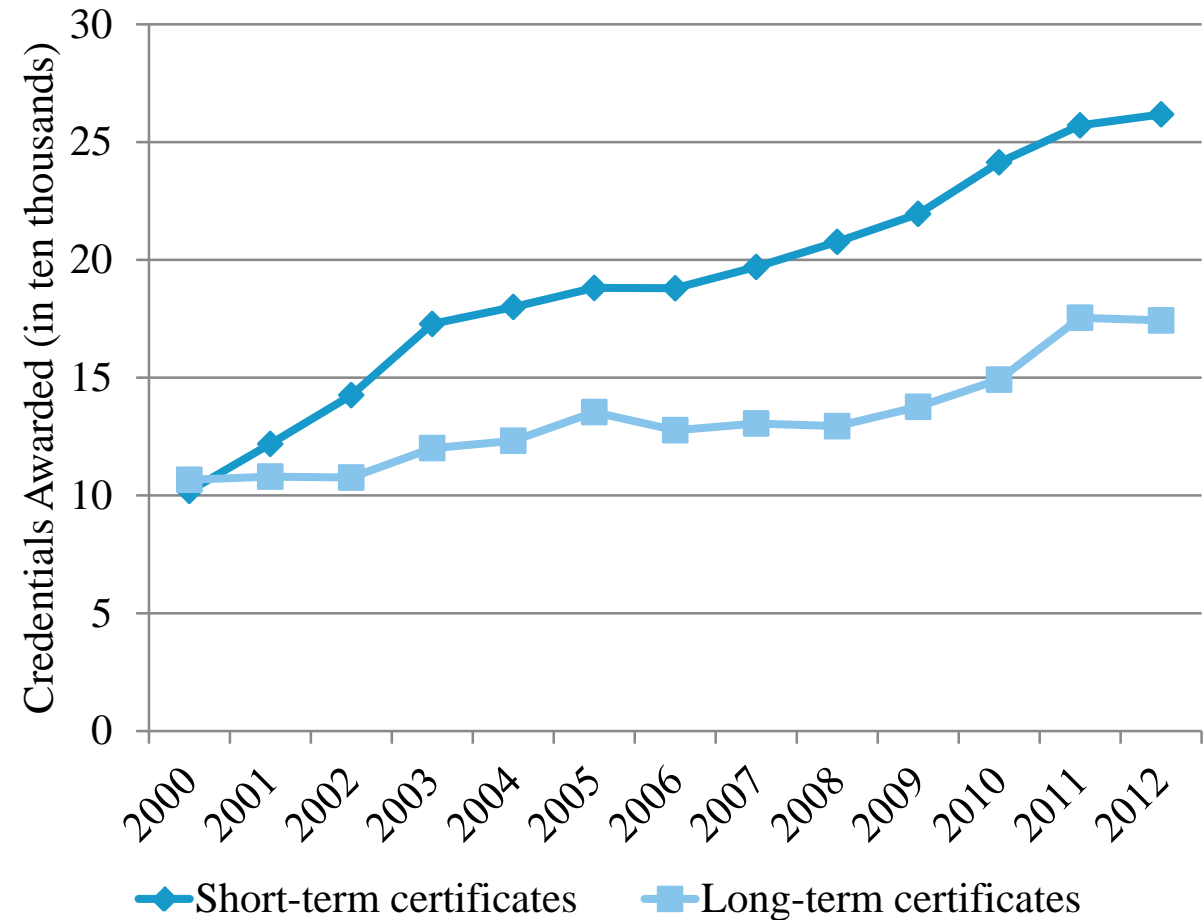
- 52% of students in lowest income quartile completed a credential in 1995-96, but declined to 46% for the 2003-04 cohort (College Board, 2013)

Influential paper raises concerns about labor market shortages:

- “[The U.S.] will need at least 4.7 million new workers with postsecondary certificates.” (Carnevale, Smith and Strohl, 2010)

Tremendous growth in [mostly vocational] certificates between 2000 and 2010

- Short-term certificate completions grew by 157 percent
- Long-term certificate completions grew by 63 percent from 2000 to 2012
- On the other hand, associate’s degree completions grew by 47 percent (not shown)



What do we know about the returns to community college credentials?

Studies making use of national samples find large returns to completing associate's degrees for both men and women (Kane and Rouse, 1995; Marcotte et al., 2005)

Studies making use of state data from Kentucky, California, Washington, Virginia, North Carolina, and Michigan find returns to shorter credentials (certificates) as well as associate's degrees (Bahr et al., 2015; Dadger & Trimble, 2015; Jepsen et al., 2014; Stevens, Kurlaender & Grosz, 2014; Xu & Trimble, 2016)

However, these studies also find heterogeneity in the returns across gender, certificate type and field of study (Bahr et al., 2015; Dadger & Trimble, 2015; Jepsen et al., 2014; Stevens, Kurlaender & Grosz, 2014; Xu & Trimble, 2016)

Ohio context

23 community and technical colleges enrolling approximately 150,000 students a year, on average, throughout the 90s and early 00s, with enrollment increasing by about 4 percent, per year

15 traditional community colleges and 8 technical colleges

Traditional community colleges offer both vocational and academic programs, while technical colleges focus on technical, vocational credentials

Technical colleges must maintain, “an appropriate range of career or technical programs designed to prepare individuals for employment in specific careers at the technical or paraprofessional level” (Ohio Board of Regents, 2001)

Data and sample

Administrative Data from Ohio Board of Regents

- Enrollment files
- Term by term credits and GPA
- 4th quarter wages from UI data

First time, full-time freshmen

1998, 1999, 2000 cohorts

Sample restricted to students who worked at least one 4th quarter while enrolled

Can follow students for up to 11 years

	No Credential	Short-term Certificate	Long-term Certificate	Associate Degree
Characteristic				
Female	0.51	0.46	0.75	0.63
Black	0.15	0.06	0.07	0.07
Hispanic	0.02	0.02	0.03	0.01
White	0.79	0.89	0.87	0.89
Asian	0.01	0.01	0.01	0.01
Age	23	24	24	21
Ohio resident	0.98	0.99	0.99	0.99
Educational intentions				
Some courses	0.08	0.05	0.05	0.03
Upgrade skills	0.11	0.1	0.13	0.06
Certificate	0.06	0.13	0.19	0.04
Associate degree	0.41	0.55	0.45	0.54
Transfer	0.34	0.17	0.17	0.32
N	34,371	687	709	10,258

Empirical strategy – Individual fixed effects

$$\ln(\text{wage})_{it} = \beta_0 + \beta_1(\text{Credential})_{it} + \beta_2(\text{Enroll})_{it} + \beta_3(X * \text{Time})_{it} + \beta_4(\text{Intent} * \text{Time})_{it} + \rho_i + \nu_t + \epsilon_{it}$$

Credential is a series of three binary variables coded “0” before the student has earned their highest credential and “1” after the credential is granted for each of the three credential types

X is a vector of student-level covariates

ρ_i , are fixed effects for each individual, while ν_t are fixed effects for quarter

Enroll is a set of binary variables, the first of which is meant to control for the opportunity cost of the student being enrolled. The second is meant to control for post school changes in earnings.

Intent is a set of variables controlling for academic intentions: a variable for degree intent, the number of credits the student earned in the first semester in which they were enrolled, and a variable indicating the student’s major.

Main findings

	(1)	(2)	(3)	(4)	(5)	(6)
	All Colleges		Community Colleges		Technical Colleges	
	Females	Males	Females	Males	Females	Males
Short certificate	0.055	0.411*	-0.0124	0.0695	0.074	0.549***
	(0.0868)	(0.213)	(0.131)	(0.0594)	(0.0815)	(0.0974)
Long certificate	0.217***	0.18	0.219**	0.0761*	0.230*	0.236
	(0.0688)	(0.107)	(0.0859)	(0.0409)	(0.115)	(0.727)
Associate degree	0.264***	0.212***	0.240***	0.176***	0.310***	0.232***
	(0.02)	(0.0237)	(0.0207)	(0.0298)	(0.0338)	(0.0397)
N	24893	21132	20008	17433	3380	2467

Heterogeneity across field of study

Field (Defined by CIP Code)	Short	Long	Associate
	Certificates	Certificates	Degrees
Computer and information sciences	0.253* (0.126)	NA	0.164*** (0.0573)
Personal and culinary services	0.397 (0.231)	NA	0.477*** (0.131)
Education	0.189 (0.350)	NA	0.0369 (0.0734)
Liberal arts, general studies	-0.449* (0.240)	NA	-0.00773 (0.0405)
Security, law enforcement, firefighting	0.653*** (0.122)	NA	0.139*** (0.0303)
Health professions	0.178 (0.127)	0.220** (0.0998)	0.503*** (0.0292)
Business, management, and marketing	0.0509 (0.165)	0.176 (0.109)	0.129*** (0.024)

Discussion and future questions

Heterogeneity across states and, within states across programs suggests that there are mitigating factors that affect the potential returns to vocational credentials

- Relevance of program to local labor markets
- The extent to which students are able to find employment related to the credential
- Program quality

What determines program “quality”?

- Extent of employer involvement?
- Availability of internship or other hands-on experiences?
- Course content?

Finally, how do licensing laws and industry certifications affect the return to these credentials?

Thank you!

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Appendix

Credentials completed in different fields

Field	Short Certificates	Long Certificates	Associate Degrees
Agriculture	15		121
Natural resources	54		198
Computer and information sciences	31	3	366
Personal and culinary services	17		76
Education	15	6	277
Engineering technologies	76	104	1,100
Family and consumer science	13	3	167
Liberal arts, general studies	11		1,277
Parks and recreation	34	1	58
Security, law enforcement, firefighting	46	3	634
Social sciences	11		25
Metal working, wood working	28	11	134
Health professions	186	490	2,663
Business, management, and marketing	128	67	2,136