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Patterns and predictors of postsecondary re-enrollment in the acquisition of stackable credentials

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ABSTRACT

Using 15 years of student enrollment histories from administrative data spanning the 2004–05 through 2018-19 school years at all public colleges, universities, and technical/trade schools in the state of Ohio, we examine rates of re-enrollment in postsecondary education for individuals pursuing additional credentials following the receipt of a sub-baccalaureate certificate. We find that the majority of certificate recipients re-enroll to continue their progression toward stacking credentials. The likelihood of re-enrollment diminishes for certificate earners as they get further out from the term when their initial certificate was completed. Certificate earners re-enroll at an accelerated rate if they acquired their initial certificate at a community college, if they currently have low wages at their jobs, and following increases in local unemployment rates. Our findings lend support to sociological ideas about the role of institutional contexts, opportunity costs, and labor market opportunities in shaping non-traditional postsecondary pathways across the life course.

1. Introduction

The expansion of opportunities in higher education and the demand for college-educated workers has led to a dramatic increase in the rates of college attendance over the past three decades, with college enrollment in the United States hitting an all-time high in 2010 (McFarland et al., 2019). This expansion has been fueled in part by adult workers enrolling or re-enrolling in college at later ages (Denice 2017; Grawe 2018) and in part by the upskilling of the economy. The demand for more technical skills has encouraged the enrollment of students seeking occupational-specific training who in previous decades would have foregone college and directly entered the labor force after high school (Carnevale and Rose 2015; Rosenbaum et al. 2010). With postsecondary enrollment now spanning a wider array of ages, sociologists who study stratification across the life course have brought new insights into our understanding of educational attainment by directing our attention to the institutional contexts, opportunities, and costs that shape trends in college enrollment in the United States (Astone et al., 2000; Bozick and DeLuca 2011; Denice 2019; Elman and O'Rand, 2007; Roksa and Velez 2012).

In this study, we contribute to this growing body of research by examining pathways through higher education via the progressive attainment or "stacking" of multiple credentials. The U.S. Department of Labor defines stackable credentials as a "sequence of credentials that can be accumulated over time to build up an individual's qualifications and help that individual move along a career pathway to further education and different responsibilities, and potentially higher paying jobs" (U.S. Department of Labor 2010).

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A defining feature of stackable credential programs is their versatility. These programs allow students to earn a sequenced progression of occupation-specific credentials that begin with a sub-baccalaureate certificate, with common credits that count toward more than one credential in the pathway (Austin et al., 2012). Over time students have the opportunity to progress from a certificate to other certificates and/or an associate degree, and in some fields these pathways may extend to the bachelor's degree level or beyond. However, this progression may not always be continuous. The expectation is that some students will take breaks in between credentials and that many of those who take breaks will enter the labor force. In having multiple entry and exit points in the pathway, stackable credential programs provide additional opportunities for students to move through these educational sequences at their own pace and discretion. Students may respond to changing opportunities shaped by their local labor markets and the offerings at their local colleges.

While colleges have rushed to create and to offer stackable credentials and while many states have passed legislation to scale up their stackable credential offerings (Wilson 2016), little is known about whether and how these new postsecondary pathways are being utilized. In this study, we address this dearth in the literature by providing one of the first empirical studies that documents postsecondary enrollment histories for those students who first earn a sub-baccalaureate certificate. In doing so, we test hypotheses developed from studies of educational stratification across the life course regarding the role that institutional contexts, opportunity costs, and labor market opportunities play in shaping trajectories of school enrollment. Understanding such processes will be increasingly important to developing coherent, comprehensive theories about school enrollment in adulthood, especially as stackable credentials are poised to become a permanent fixture of the postsecondary landscape in the United States.

First, we provide a descriptive portrait of whether and how students who enroll in sub-baccalaureate certificate programs progress through the sequence of credentials that comprise a stack. While stackable credentials are designed to accommodate non-traditional students, it is unclear the extent to which students take advantage of the built-in flexibility that distinguishes these programs from traditional postsecondary degree pathways. Despite their increasing popularity, basic parameters that characterize enrollment trajectories have yet to be established. For example, it is not known how many students who complete a sub-baccalaureate certificate ever re-enroll to pursue additional credentials, and for those who do re-enroll, how long it takes them to re-enroll and what credentials/degrees they eventually complete. While previous researchers have documented the heterogenous and at times discontinuous enrollment trajectories of college students (Crosta 2014; Goldrick-Rab 2006), our study will be the first to document such trajectories for those who pursue stackable credentials.

Second, we test a series of hypotheses that will help us discern which educational and labor market factors are most salient in shaping students' decisions to re-enroll and persist through these new postsecondary pathways after first completing a sub-baccalaureate certificate, which is the foundational award within stackable credential sequences. To extend the growing body of sociological research on postsecondary education and the life course, we focus on the institutional contexts, opportunity costs, and labor market opportunities faced by students as they navigate their way through school and work. In doing so, we provide new information on the processes undergirding students' utilization of the flexibility provided to them by stackable credentials.

Our analysis is set in Ohio, one of only eight states that both requires postsecondary institutions to offer stackable credentials and provides funding to support stackable credentials (Wilson 2016). Besides being a leader in the stackable credential movement, Ohio also offers detailed administrative data on college students' enrollment histories collected by the Ohio Department of Higher Education. This study uses 15 years of administrative data spanning the 2004–05 through 2018-19 school years, covering enrollment and degree completion at all public colleges, universities, and technical/trade schools in the state. We examine trajectories of enrollment among students who begin their postsecondary careers with the completion of a sub-baccalaureate certificate. These data allow us to track students as they move within and across different programs and different institutions, and in and out of the workforce. To set the stage for our analysis, we first provide an overview of how stackable credential programs are intended to operate. We then summarize past research on the role of institutional contexts, opportunity costs, and labor market opportunities shaping postsecondary enrollment trajectories as a way to develop our hypotheses. Next, we describe our data and methods, and then present our findings. We conclude with further discussion of the implications of our findings for sociological perspectives on educational attainment among working adults.

2. The development of stackable credential pathways

Historically, state policymakers in Ohio and throughout the country have relied on community colleges and technical/trade schools to support the ever-evolving needs of their residents and the demands of local employers. Community colleges and technical/trade schools serve a student population that is typically comprised of non-traditional students, characterized by diversity in age, work experience, family responsibilities, and financial resources (McFarland et al., 2019). These institutions often act as an "on-ramp" into the higher education system for non-traditional students who are seeking occupation-specific training. In particular, community colleges now constitute a substantial segment of the postsecondary marketplace. In fall of 2016, 36 percent of college students were enrolled at community colleges (Ginder et al. 2019). However, completion rates remain low; more than two-thirds of those who enroll at community colleges do not end up completing a degree or a certificate (McFarland et al., 2019).

In recent decades, with growth in "middle skills jobs" that require less than a bachelor's degree such as electricians, dental hygienists, welders, and information technology specialists (Graf et al. 2018; Holzer 2015) and a recognition that even associate degree programs may not be responsive to the time constraints faced by many working students who need occupation-specific competencies in an expedited way, states and institutions have begun to introduce a broader range of sub-baccalaureate certificates upon which stackable credential pathways can be built. Taking about a year to complete, these certificates lay the foundation for the progression of course taking from entry-level to intermediate to advanced (Community Research Partners 2008).

As students cumulatively gain academic and technical skills by earning certificates, they also accumulate an increasing number of

college credits in their technical field. Stackable credential programs allow students to supplement these technical credits with the general education courses required for an associate and/or bachelor's degree should they desire to do so. Because stackable credential programs are largely aimed at workers in the sub-baccalaureate labor market, they typically eschew traditional liberal arts coursework and classroom attendance requirements in favor of the development and demonstration of occupation-specific competencies. With a more applied focus and with less seat time than traditional academic programs, stackable credential pathways that begin with the acquisition of a sub-baccalaureate certificate provide an attractive alternative for students who struggle with traditional academic topic areas and/or students who are balancing the demands of college alongside work and family obligations. Should students decide to permanently terminate their enrollment after receipt of a certificate, they will have still earned a credential that is intended to serve as a distinct marker of occupation-specific competencies (rather than a miscellaneous collection of college credits which in the past would have deemed them to be "college drop-outs").

Though research has not yet explored the many factors driving the attainment of certificates, we do know that the pace of their proliferation has been dramatic. Between 1984 and 2009, the proportion of adults who hold a certificate as their highest degree grew from less than two percent to almost 12 percent (Carnevale et al. 2012). Most certificate holders come from families facing economic constraints, with Black and Hispanic students considerably more likely to enroll in certificate programs than White and Asian students (Carnevale et al. 2012). Thus, certificates may act as an effective on-ramp to higher education for student populations that tend to have lower rates of educational attainment.

While Ohio is not alone in its efforts to offer stackable credentials, it has certainly been a leader in the area. In 2006 and 2007, several pieces of legislation (HB 66, Section 3333.162 and HB 119) were passed that called for a statewide system of stackable credentials. The legislation left discretion to the Ohio Board of Regents and the Ohio Department of Higher Education for determining the structure and implementation of the system to meet certain broad goals. The system was to be coordinated in a uniform way, to ensure the most effective interconnection of competencies, offered in specialized training programs, while supporting transferability of credits across and within institutions.

Fig. 1 presents a simplified diagram of a stackable credential pathway typical of the ones available to students in Ohio and across the country. Students are eligible to enroll in a sub-baccalaureate certificate program once they graduate from high school, represented by the box at the very bottom of the diagram. Other students will begin certificate programs after spending time in the labor force. This study focuses on students who complete a certificate program (the shaded box in Fig. 1), which is the foundation of a stackable credential pathway. By design, sub-baccalaureate certificates are intended to sharpen the skills of workers to advance their careers, and so there is an opportunity to transition into a certificate program from the labor force for out-of-school adults who are already working.

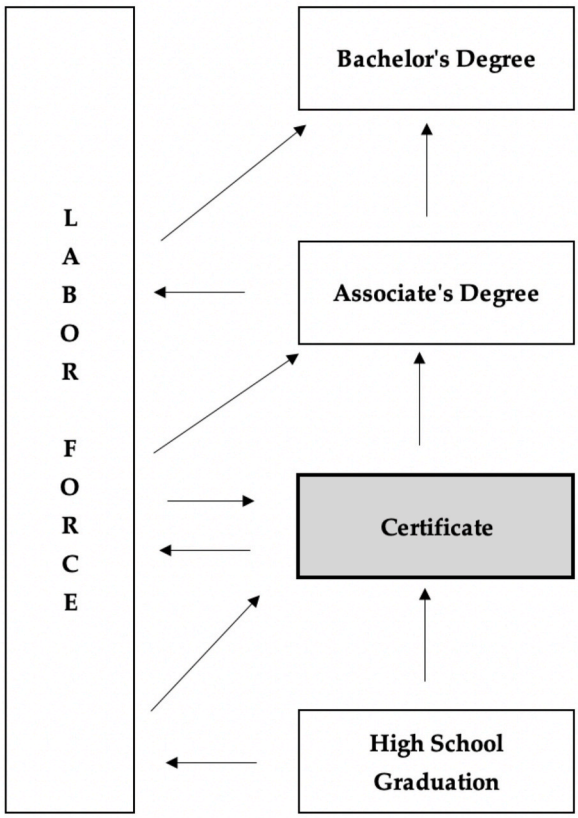

Fig. 1. Progression through a stackable credential pathway.

Upon completing a sub-baccalaureate certificate, students have an array of options, including the opportunity (1) to permanently enter the labor force; (2) to transition directly into the associate degree segment of the pathway; (3) to transition directly into another certificate program; (4) to enter the labor force for a period of time before continuing onto the associate degree segment of the pathway; or (5) to enter the labor force for a period of time before embarking on another certificate. Should students complete an associate degree they face a similar choice set as those described for students who first complete a certificate, with opportunities to enter the workforce and/or continue on to earn additional credits and certificates/degrees. For some fields of study there may be opportunities to continue on to a bachelor's degree, though that is less common and not typically the expectation. The heterogenous pathways shown in Fig. 1 reflect the intentionally built-in flexibility of stackable credentials, in contrast to the traditionally prescribed four continuous years of enrollment toward a bachelor's degree immediately after high school graduation.

Many students will enter stackable credential programs unsure of the direction of their careers, and so the options available at each step along the pathway provide an opportunity for students to exit higher education with a credential that theoretically should have value in the labor market. Some students will have sought the certificate to advance their skills for their job with no intention of ever completing anything beyond that, while other students will obtain a certificate as a way to "test the waters" of higher education.

The versatile nature of stackable credentials is intended to allow students to advance at their own pace depending on their career goals, the needs of their employer, work/family obligations, and financial resources. Yet, with the exception of analyses done by Bailey and Belfield (2017) and Bohn and McConville (2018), so far there is little research that specifically tracks student movement through stackable sub-baccalaureate sequences. Bailey and Belfield (2017) used national and state data sources to determine the prevalence of stackable certificate receipt—which they estimated to include three to five percent of the college-educated population—but they were unable to estimate rates of progression through the different possible pathways shown in Fig. 1. Moreover, they were unable to document how long these pathways take to complete and where in the pathway students are most likely to exit. Bohn and McConville (2018) identified different degree sequences in California, and tracked their prevalence in different disciplines. However, their analysis was based only on community colleges, and so the role of multi-institutional attendance spanning different school types within stackable credential pathways is not possible with their data. Moreover, neither of these studies examined students' movement back and forth between college and the workforce nor did the authors examine timing in these transitions, and so how students utilize the versatile structure of these credentialing pathways has not yet been fully explored.

Therefore, a great deal can still be learned about whether and how students utilize the stackable options available to them. To address this gap in the research, the first goal of our study is to quantify the progress and duration of enrollment as students move through the pathways depicted in Fig. 1. The second goal is to understand the factors shaping these decisions.

3. Factors affecting progress through stackable credential pathways

Following guidance from past sociological research on the determinants of school enrollment among adults (Astone et al., 2000; Pallas 1993; Roksa and Velez 2012) we shift our attention away from traditional predictors used in models of student success at earlier stages of schooling such as parents' socioeconomic resources and indicators of cognitive ability (e.g., grades and standardized test scores), as these have little bearing on adult students who are focused on acquiring occupation-specific training in institutions that are relatively affordable and have few educational requirements other than a high school diploma or GED (Astone et al., 2000). Instead, we focus on the *immediate circumstances of adults' lives*, including the institutional contexts of the programs in which adults initiate their participation in higher education, the opportunity costs that come with attending college, and the potential opportunities available to them in the labor market. Specifically, we assess how these contexts, costs, and opportunities affect the decision to persist through stackable credential pathways for those who first complete a sub-baccalaureate certificate. In what follows, we briefly summarize past research on these three key factors as they relate to adults in higher education, and derive corresponding hypotheses that we will empirically test in our analysis.

3.1. Institutional context

Research in the sociology of education has long demonstrated that the type of institutions that students attend plays an important role in determining their academic achievement and progress. For example, at the primary and secondary levels, researchers have examined the effects of attending single-sex schools (Park et al. 2013), Catholic schools (Morgan 2001), charter schools (Sass et al., 2016), magnet schools (Bifulco et al. 2009), schools that incorporate career and technical education programs (Dougherty 2018), and large/small schools (Gottfredson and DiPietro 2010). At the postsecondary level, most of the research on school type focuses on the distinction between community colleges and four-year colleges, with research consistently showing that students who begin their enrollment at community colleges exhibit lower rates of overall attainment compared with their peers who begin their enrollment at four-year colleges (Long and Kurlaender 2009; Monaghan and Attewell 2015). We extend this focus of institutional effects to our study of stackable credentials. Specifically, we focus on two structural dimensions of postsecondary institutions that we hypothesize to affect progress through stackable credential pathways: school type and program type.

With respect to school type, stackable credential pathways can potentially incorporate attendance in up to three types of institutions: technical/trade schools (which only offer certificates), community colleges (which offer certificates as well as associate degrees), and four-year colleges and universities (which sometimes offer certificates and associate degrees, but are mostly focused on bachelor's degrees). These different types of institutions vary in their curricular alignment with other schools in the state system, their provision of opportunities and support for occupational training, and their commitment to bachelor's degree completion as a gauge of institutional success. Consequently, we anticipate that these different institutional contexts will shape how their students will progress

through stackable credential pathways.

Community colleges provide the most immediate access to stackable credential pathways because in most cases, students at community colleges have the opportunity to earn an initial certificate and a subsequent certificate/degree in the same field without having to transfer institutions. Whereas universities focus almost exclusively on bachelor's degrees, community colleges offer a variety of opportunities to earn an array of complementary credentials and degrees within the same institution.

Though bachelor's degrees are not the end-goal of most certificate seekers, students who start off at community colleges are still well-positioned to eventually earn one. Historically, a key reason that students who begin their college careers at community colleges have lower rates of bachelor's degree completion than their peers who begin college at universities is difficulty in transferring credits from a community college to a university in a seamless, efficient way (Giani 2019; Spencer 2019). However, in Ohio and across the country, the growth of articulation agreements – which increasingly specify the handling of credits earned as part of a certificate – have helped to attenuate these barriers (Boatman and Soliz 2018).

In contrast to community colleges, we expect that technical/trade schools might be less accommodating to students attempting to stack multiple certificates and degrees. Historically, technical/trade schools tend to serve students who do not seek associate or bachelor's degrees. As a result, technical/trade schools often lack the systematic articulation infrastructure that is now common among many community colleges. In Ohio specifically, technical/trade schools do not offer associate degrees, and so students at those schools who want to progress further along the pathway have to *transfer* to a community college to do so. This might be inconvenient, geographically prohibitive, and/or bureaucratically daunting for students at technical/trade schools. Our first hypothesis is thus:

H1. Adults who earn a certificate at a community college will be more likely to continue on in a stackable credential pathway than their peers who earn a certificate at a technical/trade school or a four-year college.

In addition to type of school, we look at differences in the types of certificate programs in which students first enroll. Given the nascent nature of the research base, it is not known whether certain fields of study are more or less to conducive to support progression through stackable credential programs. Therefore, the empirical foundation for developing predictions here is thin. Despite the dearth of research, we do know that fields of study vary considerably in their organizational structure with respect to their historical relationships with industry and their subsequent credentialing function to signal occupational competencies to employers. Accordingly, we expect that the degree to which fields of study have organized to develop clear pathways using certificates will accelerate or attenuate the rate at which students progress through stackable credential programs.

While there is not a systematic historical account of credentialing across industries, the awarding of credentials to perform medical tasks dates back to the Middle Ages (Scoville and Newman 2009). Within the modern era, health care has a long history of creating occupation-specific credentials that relate to the niche occupations that comprise the constellation of health care workers, such as licensed practical nursing certificates for nurses, patient care certificates for nursing assistants, and medical records technology certificates for receptionists in physician offices. Health care organizations were early to the stackable credential movement, with initiatives to rapidly upskill nurses to the bachelor's degree level driving efforts to scale stackable credential opportunities (Spencer 2008).

In contrast to the deeper foundation supporting health care programs, other fields are "newer" to stackable credentials (like manufacturing/engineering technologies) or feed into occupational structures that do not easily permit streamlined course/degree sequences (like business administration or information technology where certificate and associate degree holders typically work across industries). Consequently, there may have been less systematic organization from employers and associations to advocate for standardized systems of stackable credentials. Given the differences in degrees of "maturation" and industry support of stackable credentials across different fields of study, we predict:

H2. Adults who earn certificates in fields of study with established credentialing frameworks (e.g., health care) will be more likely to continue on in a stackable credential pathway than their peers who earn certificates in fields of study with more nascent credentialing frameworks (e.g., manufacturing, business administration, information technology).

3.2. Opportunity costs of enrollment

While cost factors are often the purview of economists, sociologists have begun to acknowledge how different orientations toward school and toward work create financial trade-offs when students make decisions to enroll and to withdraw from college (Bozick and DeLuca 2011; Grodsky and Riegle-Crumb 2010). Economists typically couch these school-work tensions in an opportunity cost framework (see for example Perez-Arce 2015), such that individuals weigh the short-term loss of immediate earnings owing to full-time school enrollment (i.e., the opportunity costs of enrollment) against the longer-term gain in earnings owing to the acquisition of an advanced degree.

To date, sociological research on the enrollment trajectories of adults in higher education finds support for the contention that employment acts as an opportunity cost that factors in the decision to enroll/re-enroll. For example, Elman and O'Rand's (2007) analysis of the National Survey of Families and Households and Augustine's (2016) analysis of the National Longitudinal Survey of Youth show that holding a job is associated with a decrease in the probability of school enrollment among adults. Similar patterns were identified in a community-based sample of low-income, minority adults (Astone et al., 2000). Together, these studies suggest that employment poses an opportunity cost to those considering re-enrolling in school. We test whether these patterns detected in past studies are evident among certificate holders in Ohio. Our third hypothesis is thus:

H3. Adults who form attachments to the labor force after earning a certificate will be less likely to continue on in a stackable

credential pathway than their peers who do not form such attachments.

Additionally, we will explore the role that earnings play in shaping the decision to re-enroll. The aforementioned sociological studies of adult re-enrollment focused solely on employment status (Astone et al., 2000; Augustine, 2016; Elman and O'Rand, 2007), and so our inclusion of earnings extends this line of research. Certain jobs may be particularly lucrative, and so the need or desire to return to school to acquire additional training is likely diminished for high earners. For certificate earners who acquire well-paying jobs, returning to school could result in substantial foregone earnings – which are particularly important to low-income adults without savings or family wealth to rely on. Therefore, our fourth hypothesis is:

H4. The higher the earnings among adults who acquire employment after earning a certificate, the less likely they will be to continue on in a stackable credential pathway.

As mentioned previously, stackable credentials are intended to provide flexibility to working students so they can acquire career-relevant training through intermediate credentials in shorter periods of enrollment, and are oftentimes designed in ways that accommodate part-time enrollees, allowing for less disruption to employment. Therefore, the negative relationship between employment and enrollment observed in these broader studies of postsecondary education might not apply to adults in stackable credential pathways. Additionally, employment can serve to provide information on the need for additional education and job training. The demands of employers for specific knowledge and skills might serve as critical signals to potential job applicants and current workers for the type of education and training needed for both established and new tasks performed on the job. However, such signals may be irrelevant if employed certificate holders have substantial earnings from their jobs. Our analysis will examine whether these considerations attenuate the opportunity costs typically associated with forgoing employment to return to school.

3.3. Opportunities in the labor market

Signals about the skills needs of employers are not only sent via direct employment experiences, but from the broader labor market in which individuals are seeking work. In looking for employment, job seekers scan job postings, attend career fairs, meet with potential employers, and discuss job opportunities with their family and friends. For those in stackable credential programs, faculty and administrators are often on the frontlines of trying to connect them with employers, job training services, or both. Thus, the broader labor market *net of personal employment experiences* is crucial for sending signals about opportunities that we hypothesize should affect investments in schooling among adult learners who are equipped with certificates.

We situate our analysis on past research which looks at how postsecondary enrollment trends respond directly to changes in the local labor market. Most prior studies focus on local unemployment rates and find that when unemployment increases, youth in the region are more likely to enroll in college (Betts and McFarland 1995; Bozick 2009; Hillman and Orians 2013). Though the mechanism (s) driving this relationship are not empirically discernible in these studies, it is hypothesized that adults return to and/or stay in school when employment opportunities are limited for two reasons: because the opportunity cost of schooling is temporarily lowered, and potentially to build their human capital to take advantage of shifting needs in the labor market as it recovers. We expect to see similar dynamics among students progressing through stackable credentials, especially because the programs are designed to easily facilitate transitions into and out of school. When the labor market is strong, students in stackable credential programs can temporarily curtail enrollment to take advantage of expanding job opportunities knowing that they can easily return to school if and when they need to do so. Our last hypothesis is therefore:

H5. When the labor market tightens, adult certificate earners will be more likely to continue on in a stackable credential pathway than during times when the labor market is slack.

4. Data and methods

4.1. Study design and data

The data for our analysis come from three primary sources. First, we document college enrollment histories using student records compiled by the Ohio Department of Higher Education. Second, we link these enrollment histories with employment records of all workers in the state complied by the Ohio Department of Job and Family Services. Both enrollment and employment histories are maintained by the Center for Human Resource Research (CHRR) at the Ohio State University, who provided us access to these files for this analysis. Third, we augment these individual-level data by linking publicly available data on labor market conditions from the U.S. Bureau of Labor Statistics.

Postsecondary credentials in Ohio are offered at 53 Ohio Technical Centers (OTCs) spread across the state, as well as 38 public two-year and four-year colleges and universities in the state. OTCs are technical/trade schools that provide programs to prepare learners for certificates, industry-recognized certifications, and state licensures in skilled trades. The OTC system is closely connected to employers and can develop programs rapidly to meet their needs. There are 15 four-year colleges and universities, ranging from large, research-intensive, and selective institutions (such as the flagship Ohio State University and the University of Cincinnati) to broad-access institutions (such as Shawnee State University). Many of these universities grant certificates, representing about eight percent of all certificates awarded. There are 23 community colleges across the state, awarding shorter-term vocational degrees and certificates in similar fields to those offered by the OTCs, as well as more general associate degrees.

We are most interested in sample members' experiences after they earn a first certificate, so we limit the sample to certificate

earners whose information can be linked across all data sources. Since our data represent a census of all certificate earners, the sample is representative of college students in Ohio by design. There is very little missing data on any of our measures with one exception: The linking identifier in the data is not present for 15 percent of certificate earners at technical/trade schools because it was not consistently collected for technical/trade school students due to changing data management and reporting policies at the OTCs. However, a majority of OTC students have the identifier in any given cohort. At the community colleges and universities, 99 percent of students have the identifier. There are not substantial demographic differences between students with the linking identifier and those without. Therefore, while this restriction leads to smaller groups of students than actually graduated from technical/trade schools in some years, students who do appear are broadly representative of all graduates in the state.

The result of linking across these sources is a longitudinal panel data set tracking 115,239 students across 15 years, from the 2004-05 school year through the 2018-19 school year. For this analysis, time is broken up into quarters (Quarter 1 = January–March … Quarter 4 = September–December) which are roughly equivalent to academic terms. In Ohio, the fall term typically begins in the third quarter of the calendar year and the spring term typically begins in the first quarter of the calendar year. Technical/trade schools offer courses on a more varied schedule with start dates throughout the year. Students are included in the analysis from the first quarter after they are observed earning a sub-baccalaureate certificate. Students exit the analysis when they re-enroll in college. Re-enrollment, the primary outcome of interest, occurs when a student is observed attempting at least one course at a college or university or beginning a course at a technical/trade school after receipt of their first sub-baccalaureate certificate.

We anchor our analysis in the period in which students make the decision to continue their enrollment after earning their first certificate, because this is the critical transition point that differentiates the acquisition of terminal certificates from progress toward stacking credentials. The data are necessarily right-censored at the second quarter of 2019 which is the end of the 2018-19 school year (and the last quarter in the data set), meaning some students who will eventually re-enroll are not observed doing so. In the analysis we condition on the quarter in which each student earned their first certificate so that comparisons are *within* groups of students at the same point in time relative to their first certificate.

4.2. Measures

To test our hypotheses, we create measures that correspond to our key constructs: the institutional contexts of the programs in which adults initiate their participation in higher education, potential opportunity costs imposed by re-enrollment, and potential opportunities available in the labor market. Descriptive statistics for these measures, along with the demographic composition of the

Table 1
Descriptive statistics for students first earning sub-baccalaureate certificates in Ohio; 2004–05 through 2018-19 school years.

	% or mean
Institutional context measures	
Type of school	
Community college	73.5
Technical/trade school	16.4
Four-year college or university	10.1
Field of study	
Health care	41.9
Business administration	14.8
Manufacturing and engineering technology	10.5
Information technology (IT)	3.5
All others	29.3
Opportunity cost measures (averaged by person-quarter)	
Cumulative quarters worked since certificate	8.8
Earnings in previous quarter ($1,000s)	5.4
Labor market opportunity measures (averaged by person-quarter)	
Unemployment rate in county (%)	6.3
Net job growth in local industry in past year (%)	0.8
Demographic characteristics	
Gender	
Men	58.6
Women	41.4
Race/ethnicity	
Asian	1.5
Black or African American	11.9
Hispanic/Latino	1.8
White	77.0
Age group at the time of first certificate	
Young adult (under age 25)	37.0
Adult learner (age 25 and over)	63.1

N = 115,239.
Data Source: 2005–2019 Student-Level Higher Education Information files from the Ohio Longitudinal Data Archive, Center for Human Resource Research.

sample, are displayed in Table 1.

Institutional context is measured by two time-invariant variables that are linked with the type of school where the student first earned their certificate and the field of study in which this certificate is earned. We classify schools into three types: technical/trade schools, community colleges, and four-year colleges and universities. Field of study denotes the discipline in which the student earned their first certificate using the Classification of Instructional Programs (CIP) codes. We classify certificates into one of four common fields of study: health care, manufacturing, information technology (IT), and business administration.

Opportunity costs of enrollment are conceptualized in terms of individual connections to the labor market and returns from current employment, both of which are time-varying in our data. First, we indicate the person's cumulative work history, measured by counting the number of quarters worked since the first certificate was earned. We use quarters worked to measure several concepts: attachment to the labor force, tenure at work, and general success in maintaining stable employment. Second, we measure gross earnings during the most recent quarter. This captures whether the individual is currently working and puts a dollar value on the time that they might consider should they terminate employment to re-enroll in college.

Labor market opportunities are measured based on the availability of jobs in as local a manner as possible given our data. First, we measure time-varying county-level unemployment rates from the U.S. Bureau of Labor Statistics. These rates are collected for each month. To align with the structure of our data, we created quarterly averages for each county and for the state. We linked these quarterly averages with sample members using the county in which sample members earned their first certificate, or statewide averages for four percent of certificate earners where the county could not be matched because they had earned a certificate at a multi-location technical/trade school. Second, we include time-varying job growth in the county using the Quarterly Census of Employment and Wages. This is measured as a year-over-year net percent growth in jobs (e.g., first quarter 2015 job growth from the base quarter of first quarter 2014). For employed individuals we measure growth within their subsector, the three-digit North American Industry Classification System (NAICS) code of their primary employer. For non-employed individuals, we measure growth for all industries in the county.

4.3. Empirical approach

In our analysis we first employ descriptive tabulations to examine students' rate of re-enrollment in postsecondary education after having earned a certificate, and their eventual completion of additional degrees in a stack. Then, to formally test our hypotheses regarding institutional context, opportunity costs, and labor market opportunities, we estimate two event history analysis regression models. The first event history model (model 1 below) predicts the rate of re-enrollment across all certificate holders while including baseline factors that are time-invariant for each certificate holder. The second event history model (model 2 below) predicts the rate of re-enrollment for a certificate holder, including individual fixed effects so that comparisons are made within an individual across time periods. Both specifications track events in discrete time for each individual i and quarter t since earning a certificate as follows:

$$ReEnr_{it} = \nu QtrsWorked_{it} + \omega \text{Earnings}_{it-1} + \mu Unemp_{c(i)t-1} + \pi JobGrowth_{c(i)t-1} + \boldsymbol{\delta}_t + \boldsymbol{\beta X}_i + \varepsilon_{it} \quad \left(model\ 1\right)$$

$$ReEnr_{it} = \nu QtrsWorked_{it} + \omega \text{Earnings}_{it-1} + \mu Unemp_{c(i)t-1} + \pi JobGrowth_{c(i)t-1} + \boldsymbol{\delta}_t + \boldsymbol{\gamma}_i + \varepsilon_{it} \quad \left(model\ 2\right)$$

The outcome $ReEnr_{it}$ is an indicator of having re-enrolled in college and attempting at least one course. The data are structured so that $ReEnr_{it}$ equals 0 for each individual until the quarter in which they re-enroll. In that quarter, $ReEnr_{it}$ equals 100, scaled so that coefficient estimates are differences in percentage points. After that period, the individual is no longer considered, and there are no more observations in the estimation data set for that individual. Both models include a vector of indicators $\boldsymbol{\delta}_t$ representing the number of quarters since the receipt of the certificate.

The measure $QtrsWorked_{it}$ counts the number of quarters worked since the first certificate. It is calculated by totaling the weeks worked and dividing by 13 (i.e., the average number of weeks in a quarter), so it may take on fractional values. $Earnings_{it-1}$ is the gross earnings in thousands of current dollars in the prior quarter, including zero if the individual did not work. The time-varying measure $Unemp_{c(i)t-1}$ is defined as the unemployment rate (expressed as a percent) in the past quarter $t-1$ in the county $c(i)$ where the student i earned their first certificate. $JobGrowth_{c(i)t-1}$ is expressed as a percent and captures the net job changes for the prior quarter relative to a base one year before that, in the county and industry relevant to the individual.

In model (1), there are time-invariant observable factors β_1 as predictors, but no fixed effects. These time-invariant observable factors include indicators for school type and field of study of the initial certificate, and indicators for gender, race/ethnicity, and age groups. In model (2), a vector of individual fixed effects $\boldsymbol{\gamma}_i$ conditions out any time-invariant factors unique to a particular student i. Standard errors in both models are robust and allow for correlations within an individual's set of quarter observations.

Parameters in model (1) and model (2) have slightly different interpretations. Model (1) compares *across* all certificate earners over time, and therefore applies to all certificate earners regardless of whether they re-enrolled. Model (2) compares *within* certificate earners over time, and therefore applies only to certificate earners who re-enrolled at some point after the first quarter. Those who re-enroll right away or never re-enroll have no variation in the outcome. The fixed effects in model (2) are a comprehensive way to control for any personal characteristics that are constant across time that may affect re-enrollment. Both models account flexibly for the time in quarters since earning a certificate, including anything constant across individuals within the same length of time from earning their first certificate. Thus, the coefficients can be interpreted in terms of how the independent variables are associated with deviations from the overall averages by quarter after first certificate receipt.

5. Results

5.1. Rates of re-enrollment and time to re-enrollment

First, we examine sample members' rate of re-enrollment in postsecondary education after having earned a certificate, and their eventual completion of additional degrees in a stack. Table 2 displays the proportion of our sample who first re-enroll by the number of quarters that have passed since earning their certificate. The columns of the table show the first four quarters after certificate receipt, and then the final two columns sum up all re-enrollments observed five or more quarters out, and then all re-enrollments at any span of time after certificate receipt.

Focusing on the top line for all students, we find that the majority of certificate earners do in fact re-enroll (61 percent). About half of re-enrollment events occur immediately, with a large majority of returning students doing so within one or two quarters after the initial certificate was earned. The table's additional rows report the rates of stacking additional credentials for each re-enrollment group within a column (quarter), and conditional on being in that re-enrollment group. Among the students who re-enrolled at any point, 17 percent earned an additional certificate, 31 percent earned an associate degree, and 11 percent earned a bachelor's degree. A small group of students contributed to more than one category by earning multiple stacked degrees.

Rates of stacking were slightly higher among those who re-enrolled after taking less time after earning their first certificate, but this was not consistently the case across degree types. Among students who re-enrolled in the first quarter, 33 percent would go on to earn an additional certificate (higher than the overall average of 31 percent), while nine percent would go on to earn a bachelor's degree (lower than the overall average of 11 percent). The rates of degree completion declined significantly in the later (and much smaller) re-enrollment groups. These declines were not driven by the fact that some students were not observed for five quarters; that truncation applies to only a few certificate earning cohorts toward the later years of the time series, and removing certificate earners from those quarters does not materially change the magnitude of estimates or patterns conveyed in Table 2.

5.2. Factors associated with rates of re-enrollment

The descriptive statistics in Table 2 provide tentative evidence for our first two hypotheses regarding institutional context. Table 2 reports outcomes for two subgroups expected to have the highest rates of re-enrollment: community college certificate earners and health care certificate earners. Those who earned certificates at community colleges were more likely to re-enroll than the overall average, with 66 percent returning to schooling after their certificate, versus 61 percent overall. Health care students were slightly more likely to ever re-enroll overall and had the highest rate of immediate re-enrollment (31 percent, slightly higher than the overall average of 29 percent).

To formally test our hypotheses regarding institutional context, opportunity costs, and labor market opportunities), we examine the parameter estimates from our two event history models (shown in Table 3). The reported coefficients are all significant at $p < .01$. The coefficients represent percentage point changes in the rate of re-enrollment, driven by a unit change in the independent variable. To test our hypotheses related to institutional context (H1 and H2), we examine the coefficients in model 1. To test our hypotheses related

Table 2
Rates of re-enrollment and postsecondary attainment by timing of re-enrollment.

	Quarter since first certificate earned					Ever re-enrolled
	1	2	3	4	5+	
All certificate earners						
First re-enrolled in this quarter (row %)	29.3	19.1	2.0	2.2	8.5	61.0
Among those who re-enrolled in qtr. (column %)						
Stacked additional certificate	19.1	16.7	12.5	13.5	9.9	16.7
Stacked associate degree	32.8	34.3	26.8	25.9	20.1	31.1
Stacked bachelor's degree	9.2	12.3	11.9	13.4	14.5	11.2
Certificate earners at community colleges						
First re-enrolled in this quarter (row %)	29.5	22.8	2.3	2.5	8.8	65.9
Among those who re-enrolled in qtr. (column %)						
Stacked additional certificate	17.0	17.9	11.3	13.9	8.7	15.9
Stacked associate degree	43.5	37.9	30.7	30.1	25.5	38.2
Stacked bachelor's degree	8.7	7.0	10.0	9.5	9.9	8.3
Certificate earners in health care						
First re-enrolled in this quarter (row %)	30.5	16.6	2.8	2.7	11.9	64.5
Among those who re-enrolled in qtr. (column %)						
Stacked additional certificate	16.3	14.6	9.3	9.8	8.4	13.8
Stacked associate degree	28.5	29.3	29.3	27.7	23.5	27.8
Stacked bachelor's degree	7.2	6.6	8.4	7.1	6.6	7.0

N = 115,239.
Data Source: 2005–2019 Student-Level Higher Education Information files from the Ohio Longitudinal Data Archive, Center for Human Resource Research.
Notes: The percents for "first re-enrolled" sum to the far right column across the row. The percents for "Earned …" omit a category where the student did not earn any credential within four years, and they may overlap, e.g. a student can earn a certificate and an associate degree.

Table 3
Parameter estimates from discrete-time event history regression models predicting rates of re-enrollment after initial certificate receipt.

	Model 1		Model 2	
	Coefficient	(SE)	Coefficient	(SE)
Institutional context measures				
Type of school				
Community college (reference)	–	–	–	–
Technical/trade school	−1.156**	(0.050)	–	–
Four-year college or university	−3.241**	(0.045)	–	–
Field of study				
Health care (reference)	–	–	–	–
Business administration	−0.249**	0.055	–	–
Manufacturing and engineering technology	−0.805**	(0.069)	–	–
Information technology (IT)	1.191**	(0.150)	–	–
All others	0.401**	0.054	–	–
Opportunity cost measures				
Cumulative quarters worked since certificate	0.039**	(0.002)	0.041**	(0.002)
Earnings in previous quarter ($1,000s)	−0.064**	(0.005)	−0.039**	(0.006)
Labor market opportunity measures				
Unemployment rate in county (%)	0.248**	(0.013)	0.210**	(0.008)
Net job growth in local industry in past year (%)	0.005**	(0.002)	0.003**	(0.001)
Controls for time-invariant characteristics	Demographics and cohort		Person fixed effects	
Controls for quarters since earning certificate	Included		Included	
N	1,15,239		1,15,239	
Total person-quarter observations	12,85,072		12,85,072	

*p < .05 **p < .01.
Data Source: 2005–2019 Student-Level Higher Education Information files from the Ohio Longitudinal Data Archive, Center for Human Resource Research.
Note: All standard errors (SE) are robust and clustered at the individual level.

to opportunity costs (H3 and H4) and labor market opportunities (H5), we examine the coefficients in model 2.

In model 1, the descriptive comparisons from Table 2 regarding our predictions about institutional context are largely confirmed, but with some additional nuance. Our first hypothesis (H1) is that adults who earn a certificate at a community college will be more likely to continue on in a stackable credential pathway than their peers who earn a certificate at a technical/trade school or a four-year college. In the model, students who earned their certificates at community colleges serve as the reference group. The estimated coefficients indicate students who earned their certificates from technical/trade schools have quarterly rates of re-enrollment that are 1.2 percentage points lower than certificate earners from community colleges, and that students who earned their certificates from universities have quarterly rates of re-enrollment that are 3.2 percentage points lower than certificate earners from community colleges.

Our second hypothesis (H2) is that adults who earn certificates in fields of study with established credentialing frameworks (e.g., health care) will be more likely to continue on in a stackable credential pathway than their peers who earn certificates in fields of study with more nascent credentialing frameworks (e.g., manufacturing, business administration, information technology). We find that this is partially true. In the model, health care certificate earners serve as the reference group. The coefficients corresponding to business administration and manufacturing/engineering certificate earners are negative, indicating that were less likely than health care certificate earners to re-enroll. However, despite having less clearly articulated stackable pathways, information technology certificate holders were more likely to re-enroll than health care certificate holders, conditional on the other variables included in this model.

Next, we examine the role of opportunity costs, for which our analysis yields mixed results. Our third hypothesis (H3) – adults who form attachments to the labor force after earning a certificate will be less likely to continue on in a stackable credential pathway than their peers who do not form such attachments – is not confirmed. In fact, the opposite is the case: Accumulated work histories upon completion of a certificate are associated with a *higher* likelihood of re-enrollment. Each additional quarter employed after earning a certificate is associated with an 0.039 percentage point increase in the probability of re-enrollment.

While sustained employment appears to encourage re-enrollment, this signal is offset if sample members have high earnings at their current job. The coefficients for wages in the past quarter indicate a negative relationship with re-enrollment. All else being equal, an additional $1000 in earnings decreased the probability of re-enrolling by around 0.05 percentage points. This supports our fourth hypothesis (H4), which contends that the higher the earnings among adults who acquire employment after earning a certificate, the less likely they will be to continue on in a stackable credential pathway.

Lastly, we tested the hypothesis (H5) that when the labor market tightens, adult certificate earners will be more likely to continue on in a stackable credential pathway than during times when the labor market is slack. We find mixed support for this hypothesis. First, as expected, rates of re-enrollment increase when local rates of unemployment increase. The magnitude of the effect is sizeable: A six percentage-point increase in the unemployment rate in their county (the sample mean, and about the size of the spike observed in the Great Recession) is associated with a 1.2 to 1.4 percentage point increase in the quarterly rate of re-enrollment. This is relative to the quarterly mean rate of re-enrollment of 5.5 percent. In contrast, local job growth in one's industry had a *positive*, but smaller relationship with rates re-enrollment. For about ten percent of quarters observed, the rate of net job growth over the past year in the county was higher than five percent. Even in those relatively high-growth situations, the estimated effects on re-enrollment (about 0.02

percentage points) would be less than the effect of a single quarter of additional work or a $500 increase in earnings.

6. Discussion and conclusion

Using 15 years of student-level enrollment histories from administrative data spanning the 2004–05 through 2018-19 school years at all public colleges and technical/trade schools in the state of Ohio, we provide one of the first examinations of enrollment trajectories in the acquisition of stackable credentials. A central characteristic of stackable credentials is that after completing an initial sub-baccalaureate certificate, students have the option to continue their enrollment to earn additional credits toward another certificate or to an associate degree in a way that best comports with their career goals, their job constraints, and their family obligations. Stackable credentials are versatile by design, allowing students to immediately re-enroll after completing a certificate or to return at a later point without penalty. To better understand the contours of enrollment trajectories through this new model of postsecondary education and training, we document rates of progression from completing a sub-baccalaureate certificate to re-enrollment as well as factors associated with rates of re-enrollment.

Our descriptive analysis of these trajectories yielded two findings of note. First, the majority of students who earn a certificate go on to attempt additional credits in pursuit of a second certificate or degree (61 percent), with the lion's share of re-enrollees doing so within two quarters of completing their first certificate. For those students who continue on immediately, we speculate that the ease of continuation through the pathway (which is a distinct design feature of stackable credentials) as well as the "momentum" gained from earning the first certificate serves to expedite a swift transition to the pursuit of an additional credential.

Second, the probability of completing a second certificate or a degree diminishes the longer students wait before re-enrolling after earning their first certificate. This highlights that while stackable credentials are designed to support longer-term, discontinuous spells of enrollment that might fit with the evolving circumstances of students' careers and the emerging needs of their employers, most students utilize these programs over a shorter time frame. Very few students re-engage with the higher education system beyond the first year after completing a certificate. Moreover, it appears that the longer students wait to re-enroll, the less likely they are to acquire additional certificates or degrees, should that be their ultimate goal.

Next, we tested some emerging ideas within the sociology of education and the life course regarding potential factors that may shape certificate earners' decisions to continue their education. These included the institutional contexts of the programs in which adults initiated their participation in higher education, the opportunity costs that come with attending college instead of working, and the potential opportunities available in the labor market. We find evidence that all three factors are relevant to progress through stackable credential pathways, but in more nuanced ways than our hypotheses originally anticipated.

In terms of institutional context, we expected that sample members who earned their initial certificates at community colleges would progress through stackable credential programs at a faster rate than sample members who earned certificates at technical/trade schools or at four-year colleges and universities. Our analyses confirmed this hypothesis. While discerning the underlying reasons driving these observed differences across school type are beyond the scope of this paper, based on other studies we speculate that community colleges tend to attract students who are more geared toward developing occupational competencies in pursuit of a degree, compared with technical/trade school students who tend to seek a one-shot skill upgrade (Deil-Amen and Turley 2007; Holland and DeLuca 2016). Community colleges also offer more degree options without the need to transfer. For students at technical/trade schools who do desire a college degree, they may face additional hurdles in terms of their ability to transfer credits due to the lack the systematic credit articulation infrastructure at technical/trade schools that is common among community colleges and universities (Taylor and Jain, 2017).

Another key dimension of the institutional context that we expected to shape rates of re-enrollment was the field of study in which sample members earned their first certificate. Specifically, we expected that sample members who earned certificates in health care programs would have higher rates of re-enrollment than their peers pursuing certificates in other fields of study because health care programs have more established, distinct pathways for students to acquire credits en route to stackable credentials. This was not entirely borne out in our data. Health care certificate holders are indeed more likely to re-enroll than business and engineering certificate holders, but less likely to re-enroll than certificate holders in all other fields. Despite having a more developed credentialing infrastructure, health care programs are not consistently outpacing other fields in terms of sustaining enrollment across stackable pathways. We speculate that health care certificates may have more "stand alone" marketability in the labor market than other fields, without the need for augmentation with additional training. Future research will need to explore how these field of study differences emerge, and whether these differences are consequential in the long run.

For working-age adults who represent the primary population to which stackable credentials are targeted, enrolling in college requires a time investment that comes at a cost to those who are employed. Beyond direct costs like tuition, there are significant costs in the form of foregone experience, tenure, and earnings in the labor market, which accumulate for workers who have to temporarily suspend employment or move to part-time to allow for class attendance and coursework. Because stackable credentials were specifically designed to support the needs of working students, it is less clear whether these potential opportunity costs will diminish the probability of pursuing multiple degrees within a stackable credential pathway.

Our analysis partially supports the proposition that employment acts as an opportunity cost that competes with schooling. All else being equal, higher wages deter re-enrollment in college. However, as time goes on, students who build up a stronger connection to the labor force (via cumulative weeks worked) tend to re-enroll at higher rates. Therefore, while lucrative jobs may diminish the need or desire to return to school, longevity in the labor market is not necessarily incompatible with re-enrollment. This accords with the design of stackable credentials pathways, which are intended to provide flexibility to working students so they can acquire career-relevant training at multiple stages in one's career. However, as noted earlier, very few certificate earners re-enroll after one year,

and so the long-term role of cumulative work histories in encouraging pursuit of additional credentials is of less practical relevance.

Lastly, we used county-level rates of unemployment and job growth to gauge the role of labor market opportunities in shaping rates of re-enrollment. We hypothesized that when the labor market tightens, adults will be more likely to continue on in a stackable credential pathway than during times when the labor market is slack. This prediction finds mixed support in our data. Similar to other analyses which indicate that students return to and/or stay in school when employment opportunities are limited (Betts and McFarland 1995; Bozick 2009; Hillman and Orians 2013), we find that rates of re-enrollment are substantially elevated when unemployment rises. However, we also find that certificate earners are more likely to re-enroll when there is job growth in the industry in which they are employed. Though only speculative, it is possible that this growth is concentrated in positions that require upskilling, and hence signaling the need to return to school for additional credentials. That our findings regarding labor market opportunities are mixed suggests that how workers evaluate the necessity of additional schooling to maintain their position in the labor market and/or to take advantage of new job opportunities is not a straightforward assessment. Future research on the postsecondary enrollment decisions of adults needs to be mindful of these complexities.

While our study has many strengths, including complete postsecondary enrollment histories for students spanning 15 years and an inquiry focused on an understudied trend within higher education, our findings should be considered in light of their limitations. First, all of our findings, including those in our multivariate models, are correlational. While our multivariate findings regarding the effects of institutional contexts, costs, and opportunities on rates of re-enrollment are robust across model specifications, we cannot unequivocally state the relationships we identify are causal in nature.

Second, while we focus specifically on students progressing through postsecondary pathways with options to accrue additional credits (per the model we use to frame our analysis in Fig. 1), the programs themselves may not be explicitly designed as stackable by the institutions who provide them. For example, after earning a certificate at a particular school, there may not be a direct pathway to a second certificate or to an associate degree within the same field of study of the certificate at that school. At present, data sources that permit the assessment of individual enrollment histories, such as the data we use from Ohio, lack consistent programmatic information to identify which schools and programs have clearly defined stackable credential pathways available. To more comprehensively understand the utilization and efficacy of stackable credentials in future analyses, the accompanying research infrastructure will require the development and availability of such programmatic data.

Third, our study was based on data from a single state that has been on the forefront of developing and implementing stackable credential pathways. Further, our analysis used administrative data maintained by the Ohio Department of Higher Education, which does not include enrollment data on for-profit colleges. The omission of for-profit colleges is unlikely to alter the broader patterns observed in our analysis because for-profit schools enroll less than five percent of Ohio's postsecondary students (Center for Responsible Lending 2019) and because for-profit schools do not develop stackable credential pathways in conjunction with schools in the broader state system. However, given the distinct differences between the outcomes of students attending public colleges and students attending for-profit colleges (Deming et al., 2012), it less clear whether our findings will convey to adults seeking credentials in the for-profit sector. Future research will be needed to ascertain whether the dynamics we observed in the Ohio public system translate to different states and sectors.

Despite these limitations, our analysis contributes new information to the growing research base on sub-baccalaureate certificates as "launching pads" toward the acquisition of stackable credentials. Overall, we find that the built-in flexibility of stackable credentials permits students to progress through higher education in a sequenced way that can ultimately result in additional credentials or an associate degree – particularly if they initiate their enrollment at a community college. Certificate holders employed in low-wage jobs and/or living in areas with high rates of unemployment are the most likely to utilize stackable credentials, thus highlighting the salience of costs and opportunities involved in school-work decisions among adults in the "new landscape" of postsecondary education who are attempting to establish the requisite human capital for stable careers.

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