2020

A Comparative Study of the Influence of Credential Attainment on Employment Outcomes in Rural and Urban Localities

Carrie S. Douglas
douglascs@vcu.edu

A Comparative Study of the Influence of Credential Attainment on Employment Outcomes in Rural and Urban Localities

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, Public Policy and Administration at Virginia Commonwealth University.

by

Carrie Sterling Douglas
Bachelor of Arts, Randolph-Macon College
Master of Public Administration, Virginia Commonwealth University
Director: Dr. Elsie Harper-Anderson, Ph.D.
Associate Professor of Urban and Regional Planning and Director of Public Policy and Administration Ph.D. Program
L. Douglas Wilder School of Government and Public Affairs

Virginia Commonwealth University
Richmond, Virginia
August 2020

Acknowledgements

As someone who was born and raised in a rural community, on Virginia's Eastern Shore, I have a personal interest in this topic. I am eternally grateful for my many teachers, friends, and family members, on the Eastern Shore and beyond.

I would like to thank my dissertation committee members, Dr. Ivan Suen, Dr. Myung Jin, and Dr. Victor Chen, for their support. A special thanks goes to my dissertation chair, Dr. Elsie Harper-Anderson, for the countless hours that she spent providing me with guidance and feedback for this study.

I am grateful for my colleagues at the Virginia Community College System, particularly Brian Long, Dr. Cat Finnegan, Dr. Lori Dwyer, Joe Holicky, and Dr. Yolanda Crewe, for their guidance and suggestions as I developed this study and analyzed the data. I also appreciate all of the employer representatives who took the time to participate in my interviews.

I also thank my parents and in-laws, Pat and Jody Hopkins, Bill and Cheryl Sterling, and Vicki and Manning Douglas, for all of their love and encouragement, as well as the childcare assistance that they provided on evenings that I spent in class or at the library.

Finally, I want to thank my husband, Chris, and my children, Anne Parker, Sterling, and Emma, for all of their love, support, and patience as I pursued this degree.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

By Carrie Sterling Douglas

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2020

Major Director: Dr. Elsie Harper-Anderson, Ph.D.
Associate Professor of Urban and Regional Planning and Director of Public Policy and Administration Ph.D. Program
L. Douglas Wilder School of Government and Public Affairs

The significance of credentials has heightened considerably in recent decades with numerous federal and state policy initiatives aimed at increasing credential attainment. Various public workforce programs support these efforts, including the federal Workforce Investment Act (WIA), which provided training to job-seekers from 1998 through 2015. Scholars point to human capital theory to explain how education investments yield economic gains. Screening, signaling, and credentialist theories provide a framework for examining the ways that credentials are used in labor markets. The literature on rural labor markets suggests that conditions are very different from their urban counterparts, with significant challenges existing in terms of unemployment, educational attainment, and access to supportive services. As such, this study sought to uncover whether differences exist in the influence of credentials on employment and earnings for rural and urban job-seekers.

This mixed-methods study used WIA administrative data for Virginia residents to examine the role of credential attainment in influencing the likelihood of employment and the

amount of earnings, with a comparison between outcomes for rural and urban participants. Quantitative data was analyzed using binary logistic regression and ordinary least squares regression. Furthermore, qualitative data was collected through interviews with both rural and urban employers to identify any differences in their preferences for credentialed job-seekers.

Findings indicated that credentials were influential in predicting employment and earnings, with gains observed for both rural and urban job-seekers. The level of such gains varied, however, based on rurality, as well as the type of credential earned. The results also suggest that credential supply influences employer demand for credentials, and both are subject to change based on economic conditions.

Chapter 1: Introduction

Statement of the Problem

Credentials are becoming increasingly necessary for job-seekers to be seriously considered for employment opportunities. Educational institutions, public policy-makers, government programs, and non-profit foundations frequently use credential output as a success measure, and more funds are being dedicated to credentialing initiatives. As employers have placed greater emphasis on credential attainment in their hiring decisions, demand for credential training has increased among people from all walks of life.

The economic divide between rural and urban America is vast, and in rural parts of the country, many people have a more difficult time accessing the credentials that have become so highly regarded. Furthermore, globalization and other economic challenges have weakened rural labor markets, making it difficult for rural residents to secure gainful employment. Programs like the Workforce Investment Act (WIA), which was reauthorized in 2015 as the Workforce Innovation and Opportunity Act (WIOA), attempt to address these concerns by providing people who are most in need of employment assistance with the necessary training to earn a credential in a locally high-demand field. While performance data demonstrates overall success with these strategies, questions remain about whether the relationship between credential attainment and employment outcomes may differ for job-seekers in rural labor markets versus those in urban ones.

This study examined employment and earnings for individuals who received a credential as a result of WIA training to assess whether the impact for rural residents was different than that of their urban counterparts. Since employer perceptions of job-seeker qualifications are critical to the hiring process, this study also examined the role that credentials play in employer decision-

making in rural and urban labor markets. Employing a mixed methods approach, this research included quantitative data consisting of WIA participant records and qualitative data collected through employer interviews.

Overview of the Literature

Despite relatively consistent data supporting the linkage that credentials have with employment and earnings, scholars have various theories about why credentials influence employment outcomes and how employers use them to make hiring decisions. The tenets of human capital theory suggest that credentials rightfully demonstrate a job candidate's ability to perform critical work tasks (Becker, 1962; Becker, 1994). Screening and signaling theories indicate that the abundance of credentialed job-seekers in the labor market has simply provided employers with a tool for sorting and categorizing applicants (Spence, 1973; Bills, 2003). Vast differences between rural and urban labor markets were identified in the literature, including their makeup, their dynamics, and their vitality. Below is an overview of the literature that covers some of the main points on credentials and rural labor markets.

Credentials. An important initial factor to consider about credentialing is that there are several different categories of credentials that vary widely in the length and intensity of training needed to achieve them, as well as the cost and level of knowledge required. A review of the literature confirmed differences between the various types of credentials, and it emphasized the importance of not viewing all credentials as one and the same (Schneider, 2015). Education-related credentials are awarded after a course of study and consist of degrees and certificates that are conferred by academic institutions (Carnevale & Desrochers, 2001; Association for Career and Technical Education, 2019). Work-related, or industry-recognized credentials, on the other hand, include occupational certifications and professional licenses that are awarded by industry

associations and government licensing boards to individuals who have demonstrated a mastery of skills or who have met specified requirements (Association for Career and Technical Education, 2019; U.S. Department of Labor, 2010a). Licenses provide individuals with the legal authority to perform an occupation, and they are required for certain jobs (Bureau of Labor Statistics, 2020b).

Higher education institutions and the public workforce system have increased their focus on postsecondary credential attainment over the past decade, as evidenced through the heightened presence of credential-based initiatives in their programs and policies. During his presidency, Barack Obama encouraged all Americans to gain postsecondary education or workforce training, and he set a goal stating that by 2020, America should lead the world in the proportion of residents who have obtained either a postsecondary degree or industry-recognized credential (Obama White House Archive; U.S. Department of Labor, 2010b). Research demonstrates that attaining a credential can have a number of positive impacts on one's labor market outcomes, including their ability to secure employment and earnings potential (Hout, 2012; Gittleman, Klee, & Kleiner, 2018). Studies focused on the WIA population have also shown a positive connection between credentials and participant employment and earnings (Hollenbeck, 2009; Harper-Anderson, 2018). Projections indicated that 65 percent of all jobs would require postsecondary education and training by 2020, with 44 percent requiring an associate's degree or higher (Carnevale, Smith, & Strohl, 2013). With an average rating representing an associate's degree or vocational training and some job experience, a Pew Research report found that over the past 35 years, the number of workers in occupations requiring average or above-average preparation more than doubled the increase for jobs with below-average requirements (Pew Research Center, 2016).

Debate over Credentialing. Despite the well-documented labor market rewards for earning a credential, some scholars have been critical of the mass production of credentials and the public funds that have supported these initiatives. Bankston (2011) noted that as the number of college graduates in the United States increased, the rate at which degree-holders entered fields in which their degree was not necessary also increased. He questioned the need for credentials and suggested that the increase in credential attainment over the past few decades has fueled the demand for more credentialed job-seekers by creating the expectation that people have a credential (Bankston, 2011). Employer use of credentials as screening tools creates situations where job-seekers must have a credential in order to be considered for a job, even if those without a credential may in fact have the knowledge and skills to perform the occupation (Jacobs, 2004; Bills, 2003). Jacobs (2004) criticized the increasing disconnect between credentials and education by suggesting that, over time, both teachers and students have become more focused on credential attainment than learning. More recently, Caplan (2018) contributed to the credentialing debate by questioning the value of the education system, pointing out that it is the credential that is rewarded in the labor market, not the education that led to it.

Rural Labor Markets. The literature also revealed relevant information about rural labor markets. In particular, rural areas of the country have experienced unique challenges in dealing with unemployment as the economy has shifted from being goods-based to services-based (Gibbs, Kusmin, & Cromartie, 2004). Traditional industries typically found in rural areas, like agriculture and manufacturing, have diminished as the result of globalization and rapid technological changes (Drabenstott, 2003; Goetz, Partridge, & Stephens, 2018). Farm employment in rural areas of the country declined from 15 to 6 percent between 1969 and 2015 (Goetz, Partridge, & Stephens, 2018). Meanwhile, rural labor markets have disadvantages that

impact their ability to attract new employers, including low educational attainment rates for residents and out-migration of young people who complete higher education (Drabenstott, 2003; Slack, 2014). Physical isolation, low population density, and fewer opportunities for residents to unify, can make rural areas unappealing for new businesses and, therefore, less diverse in job offerings (Slack, 2014).

One study, by Holder, Fields, and Lofquist (2016), found that as rurality increased, the percentage of adults with at least a bachelor's degree decreased, the percentage of working-age adults who were employed decreased, and poverty rates increased. With fewer job opportunities available, underemployment is a significant problem in rural localities as well (Slack, 2014). Scarcity of supportive services is an additional factor that contributes to the economic and educational challenges that impact rural labor markets. Rural workers often have transportation barriers, and services for training, childcare, disabilities, and healthcare may be more dispersed or unavailable (Partridge & Rickman, 2006). As rural labor markets have become more constrained and challenged, it has become even more important for national policy to be responsive to the unique needs of rural communities and for policy-makers to understand implications for rural residents (Stauber, 2001).

Federal workforce programs, such as WIA and now WIOA, focus on providing job search assistance and employment training, typically in a manner that reflects policy trends and economic concerns of the times (Beane, 2006). Rurality of a region has implications for the way in which programs are implemented and the availability of services for participants. Funding allocations are impacted by population, so rural workforce centers typically receive fewer funds, resulting in fewer staff (Betesh, 2018). From a geographical perspective, however, rural workforce regions are typically larger than urban ones, which can present challenges for

participants who need to travel long distances to access service providers or commute to job opportunities (Betesh, 2018). Also, rural areas often have fewer specialized resources to assist participants with significant barriers to employment such as opioid addiction or prior criminal convictions (Betesh, 2018).

Background for the Study

Rural labor markets have unique challenges, and research shows that they tend to operate differently than their urban counterparts. There have been few comparative studies to date on workforce development initiatives in rural and urban regions, with the exception of research conducted in the early days of WIA (Betesh, 2018). To address the gap, this study analyzed employment and earnings for WIA participants in rural and urban regions with a focus on examining their relationship with credential attainment. By gaining a better understanding of the connection between credential attainment and employment outcomes, as well as the influence of rurality on this connection, policy-makers can make informed decisions about credentialing and workforce development initiatives. As evidenced in the literature, a great deal of resources are being committed to credentialing, so it is important to understand the return on those investments for both rural and urban residents and the communities that they inhabit. To add context to the quantitative analysis, this study also gathered qualitative data from employers about the ways in which they screen and select employees, as well as the role that credentials play in these decisions. As a case study, this research specifically focused on the Commonwealth of Virginia.

Employment Challenges in Rural Virginia. Aligning with national trends, an examination of Virginia employment also suggests that rural residents have challenges in securing lasting job opportunities that pay family-sustaining wages. Statewide, Virginia boasts a low unemployment rate, which at 4.1 percent in 2016, was below the national average of 4.9

percent (Virginia Employment Commission, 2016). However, when comparing rates among Virginia's localities, a more startling picture emerges. Populous and prosperous Northern Virginia localities tend to have much lower rates, such as Arlington County's 2016 unemployment rate of 2.6 percent, while rural localities in southwest and southern Virginia report higher rates, such as Buchanan County's 2016 rate of 10.8 percent (Virginia Employment Commission, 2016). Nationally, rural unemployment was 5.3 percent in 2016, compared to 4.8 in urban areas; however, labor force participation had a greater impact on reducing rural unemployment because many rural job-seekers abandoned their searches and exited the labor market during the years after the Great Recession of 2007-2009 (United States Department of Agriculture, 2019).

Leaders in state government and political circles often refer to the disparities in employment trends between rural and urban Virginia. A *Washington Post* article examining key topics from Virginia's 2017 gubernatorial race noted that a great deal of debate focused on the economy, which initially seems surprising since the commonwealth's unemployment rate is one of the lowest in the nation (Schneider, 2017). However, the article went on to discuss economic differences between rural and urban regions of Virginia, pointing out that "the demise of legacy industries," including coal mining, textile manufacturing, furniture-making, and tobacco farming, has resulted in the need for some areas to completely rebuild their economies since the jobs once held by previous generations no longer exist (Schneider, 2017, para.7). In economically challenged regions, new employment opportunities have been scarce, and newly created jobs have typically offered lower wages than those that they replaced (Schneider, 2017).

Wallmeyer (2016), provides a geographical framework for comparing the employment and economic outlook of rural regions of Virginia, covering topics such as labor force

participation, poverty, education, drug addiction, and unemployment. Such conditions in the rural "extremes," consisting of the Eastern Shore, Southside, and Southwest regions of Virginia, are significantly more challenged than the rest of the commonwealth. Compared to the 64.9 percent of Virginians in the statewide labor force, the "extremes' have only a 54.2 percent labor force participation rate (Wallmeyer, 2016). In terms of poverty, the commonwealth as a whole has a rate of 11.8, while the "extremes" have a 19.7 percent poverty rate (Wallmeyer, 2016). Wallmeyer (2016) suggests that through targeted public policy initiatives supported by legislators and agency leads, improvements can be made to the conditions in extremely rural regions of Virginia.

The need for workforce and economic development initiatives, particularly those that address the unique challenges of rural Virginia, has been a theme in platforms of state leaders from a variety of backgrounds. For example, the Virginia Chamber of Commerce's business plan, titled *Blueprint Virginia 2025*, notes that top concerns include ensuring the availability of workers with desirable job skills and creating economic development opportunities in all areas of the commonwealth (Virginia Chamber of Commerce, 2017). An advocate for initiatives to revitalize rural Virginia, former Governor Gerald Baliles discussed rural and urban Virginia as two distinct regions, referred to as the "rural horseshoe" and the "golden crescent" (A tale of 'two Virginias,' 2018, para. 4). If the "rural horseshoe," which represents 75 percent of Virginia's geography, was separated from the rest of the state, then it would rank 50th in the nation in terms of educational attainment, and the rest of Virginia would rank 2nd (Virginia Community College System, 2015). Baliles called on legislators and state education leaders to take action to improve education, employment, and income for rural Virginians (Shapiro, 2018).

Workforce Investment Act. Since the 1930's, the United States has had some form of public assistance program in place to provide services to the unemployed. From the Works Projects Administration (WPA) that began during the Great Depression to the Workforce Innovation and Opportunity Act (WIOA) that is currently in place, these programs have evolved, building on successful initiatives of the past, in an effort to train and prepare the nation's workforce in the most efficient and effective way possible. Between 1998 and 2015, federal workforce programs were authorized through the Workforce Investment Act (WIA). Under the WIA, a customer-driven approach was developed in order to provide participants with access to an array of job training and employment services in a single location. To promote individual responsibility and decision-making, participants were able to choose from a selection of training options in high-demand occupational fields (U.S. Department of Labor, 1998). Meeting the demands of individual participants, as well as the employers that would eventually hire them, was a priority of the WIA program.

Through a tiered approach, WIA offered three categories of services – core, intensive, and training – to three groups of participants – dislocated workers, adults, and youth – based on participant eligibility criteria. The federal government measured states using common performance measures, which, for the adult and dislocated worker populations, were: entrance into unsubsidized employment, employment retention, and average earnings (U.S. Department of Labor, 1998). Additionally, states were required to adopt their own additional measures of performance. In Virginia, credential attainment for participants who entered employment was a statewide WIA measure, and credentials were tracked accordingly for participants. Following national trends of prioritizing credentialing initiatives, reauthorization under WIOA included credential attainment as a primary indicator of performance (U.S. Department of Labor, 2017b).

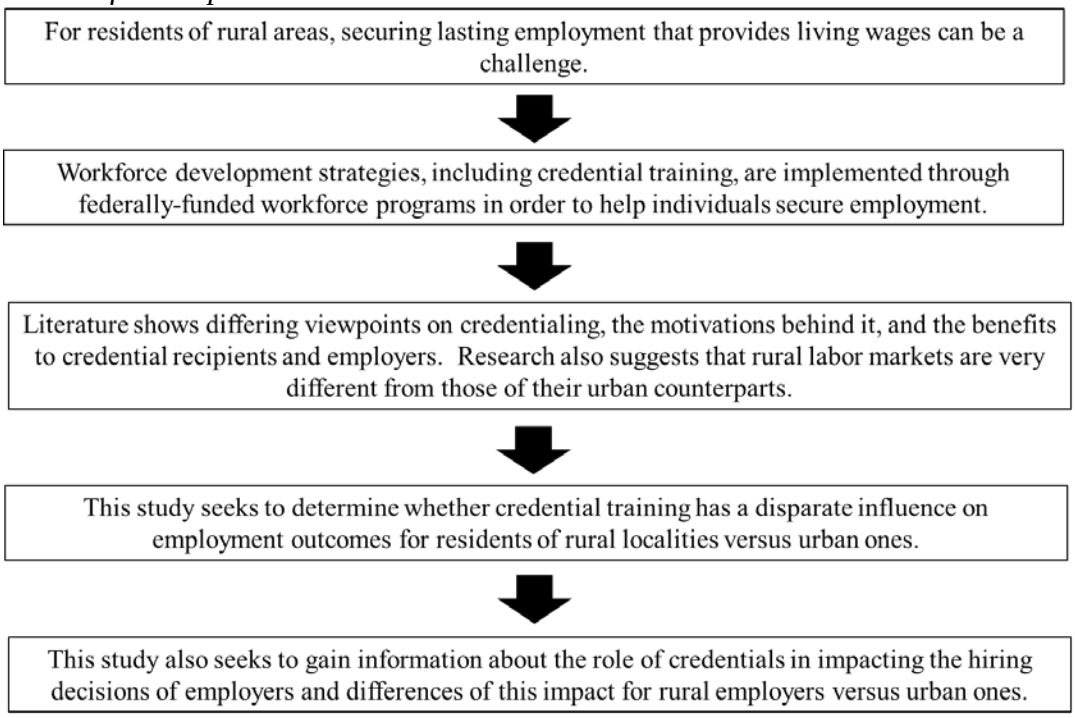
Conceptual Framework

The overarching problem that prompted this study was the need for a better understanding of the impact of workforce development initiatives in rural labor markets, since research shows that securing meaningful employment can be especially challenging for rural job-seekers. The public workforce system offers services to assist job-seekers in both rural and urban areas, including job search and resume assistance; however, the service category that demands the most public resources is training, particularly training for credentials. The literature demonstrates differing viewpoints among scholars and practitioners about the relevance of credentials in the labor market and the linkage between credential attainment and one's abilities on the job. Furthermore, the literature suggests that there are stark differences between the dynamics of rural and urban labor markets and the factors that influence supply and demand.

Using Virginia data, this research examined the relationship that credential attainment has with employment and earnings, with a focus on identifying whether there are differences in this relationship between rural and urban job-seekers. By incorporating supplemental qualitative data, this study also researched the role that credentials play in employer decision-making, as well as other factors that influence employer screening and hiring processes. Figure 1.1 provides a visualization of the conceptual framework driving this study.

Figure 1.1

Visualization of Conceptual Framework



Purpose of the Study

Despite Virginia's overall low unemployment rates, researchers like Wallmeyer (2016) pointed out that there are still many unemployed and economically disadvantaged people in rural Virginia who need opportunities for employment with a secure source of income. This study examined the influence of credential attainment on employment and earnings for residents of rural and urban Virginia. The knowledge gained through this research can serve multiple purposes. From a policy perspective, understanding the impact of credentialing can provide valuable information about the benefits gained from allocations of federal workforce funds. For the most part, public workforce programs are implemented using a cookie-cutter approach across all geographic regions. Identifying whether there are differences between the return on investment for rural job-seekers, compared to urban ones, can prompt policy reforms or targeted

initiatives to mitigate disparities. Furthermore, the insight gained from employer interviews can help to shed light on challenges that impact supply and demand of workers in rural labor markets. As policy-makers and practitioners continue to seek new and creative solutions to connect job-seekers with employment opportunities, understanding the credentials or other qualifications that employers prioritize will be vital to success. Through informed decision-making, stakeholders in workforce development can better ensure that scarce resources are used in the best possible way.

Research Questions

Research questions for this study were as follows:

1. Credential Influence on Employment (Quantitative Analysis)
    a. Are credentials earned by WIA participants influential in the likelihood of employment?
    b. Are credentials more influential on the likelihood of employment after controlling for rurality?
    c. Is the type of credential influential on the likelihood of employment?
    d. Is the influence of credential type on the likelihood of employment different for urban residents versus rural?
2. Credential Influence on Earnings (Quantitative Analysis)
    a. Are credentials earned by WIA participants influential in determining earnings for those who became employed?
    b. Are credentials more influential on earnings after controlling for rurality?
    c. Is the type of credential influential on earnings?
    d. Is the influence of credential type different for urban residents versus rural?

3. Employer Perceptions of Credentials (Qualitative Analysis)
    a. How do credentials impact the hiring decisions of urban employers differently than rural employers?
    b. Does the type of credential that a job-seeker has impact hiring decisions?

Overview of Methodology

This study used a mixed-methods approach to examine employment outcomes based on credential attainment, as well as the impact of credentials on employer decision-making, with a focus on identifying differences between rural and urban areas. Using administrative data for adult and dislocated worker participants who exited the WIA program between July 1, 2012 and June 30, 2015, the influence of credential attainment and rurality on employment and earnings was examined. These were measured quantitatively to respond to Questions #1 and #2. Because employment and earnings can vary based on characteristics of the labor market (Bennett & Vedder, 2015; Harper-Anderson, 2018), control variables for median earnings and unemployment rates in each participant's locality of residence were included in the regression models. Furthermore, demographic variables, consisting of age, race, gender, and educational attainment prior to WIA enrollment were included as well.

To address Question #3, questions were formulated for employer interviews in order to collect information that could not be gathered from the quantitative analysis. The purpose of the qualitative component was to gain a better understanding of the credentials that employers seek in job candidates and the factors that influence their screening and hiring decisions. Responses were compared between employers in rural and urban areas.

Through this QUAN→qual explanatory sequential design (Creswell, 2018), the research focused on quantitative data but incorporated supplemental qualitative data to add context to the findings. Quantitative data, consisting of WIA administrative records, was analyzed through logistic and ordinary least squares (OLS) regression models. Qualitative data was collected through interviews with employers that were selected through stratified sampling and purposeful selection methodologies (Maxwell, 2005). The content of interview transcripts was analyzed, and open coding was utilized to identify patterns (Salmona, Lieber, & Kaczynski, 2019). Using inductive reasoning, the assigned codes were used to develop common themes, which were applied back to relevant theories (Creswell, 2009).

Summary

Workforce development programs like WIA are vital to the United States by providing disadvantaged citizens and dislocated workers with the necessary training and services to secure gainful employment. By improving the employability of its citizens, states can alleviate numerous societal problems, such as welfare dependency, low educational attainment rates, and unemployment. Through public workforce programs, individuals can receive training to prepare them for credentials that are intended to lead to new employment opportunities. Past studies demonstrate that current workforce strategies do make a difference in improving employment outcomes. An important remaining question, however, is whether credential training strategies have a disparate impact based on a participant's residence in a rural or urban locality. With scarce public resources and many competing priorities for funds, it is important to ensure that workforce development funds allocated to both rural and urban areas are getting a return for the investment. Through the knowledge gained from this study, policy-makers can become better

informed about the impact of credentialing initiatives and any differences in this impact for rural and urban job-seekers. This can facilitate informed decision-making about policies that account for the unique challenges of rural job-seekers and assist them in gaining the employment opportunities that they need to support themselves and their families.

Definition of Terms

Adult (WIA): An individual aged 18 years or over who meets eligibility requirements of the WIA Adult program, such as one of the following: low-income, basic skills deficient, homeless.

Certificate: Education-related credential awarded by a higher education institution after a student completes specific coursework, usually lasting less than two years.

Certification: Work-related credential awarded by an industry association after an individual demonstrates required competencies.

Credential: According to the U.S. Department of Labor, "an attestation of qualification or competence issued to an individual by a third party with the relevant authority or assumed competence to issue such a credential." Includes both education-related and work-related credentials.

Degree: Credential awarded by an institute of higher education, including associate, bachelor, and master degrees.

Diploma: Credential awarded by a secondary or post-secondary educational institute.

Dislocated Worker (WIA): An individual who meets eligibility requirements of the WIA Dislocated Worker program, such as one of the following: terminated or laid off from employment.

Earnings: Based on a modified version of the WIA measure, average earnings for participants during the 2nd and 3rd quarters after exit, adjusted to 2015 levels.

Employment: Based on a modified version of the WIA measure, unsubsidized employment during the 2nd quarter after a participant's exit from the program.

Exit (WIA): The date on which an Adult or Dislocated Worker received their last service through the WIA program.

Human Capital Theory: Theory stating that investments in education build resources in the form of human capital.

Industry-Recognized Credential: Professional license or occupational certification.

License: State-issued license required for employment in a regulated field, such as healthcare or commercial transportation.

Occupational Certification: See certification.

Professional License: See license.

Screening Theory: Theory suggesting that employers use credentials as a screening tool in order to determine which job candidates to consider for employment opportunities.

Signaling Theory: Theory suggesting that employees use credentials as a tool to signal to employers about their qualifications for a job.

Training (WIA): A service provided through the WIA program that includes post-secondary education and credential preparation.

Training Provider (WIA): A school or other postsecondary educational entity that is approved to provide training services under the WIA program.

Workforce Innovation and Opportunity Act (WIOA): Federal workforce program in effect since July 1, 2015.

Workforce Investment Act (WIA): Federal workforce program in effect between 1998 and 2015.

Workforce Investment Act (WIA) Participant: An individual who is deemed eligible to receive services under one or more of the three core programs of WIA Title I – Adult, Youth, and Dislocated Worker.

Youth (WIA): An individual between the ages of 14 and 24 years old who meets the eligibility criteria of the WIA Youth program, such as one of the following: low-income, foster youth, homeless, high school dropout.

Chapter 2: Review of the Literature

Introduction

In the literature on the role that credentials have historically played in influencing employment and earnings, human capital theory provides a framework to explain why credential training has become such an important part of workforce development initiatives. Signaling and screening theories emerged as informative frameworks when considering the ways in which both job-seekers and employers use credentials. In considering these theories, this review examines the literature on credential outcomes, as well as rural labor markets and the ways in which their unique characteristics may impact the connection between credentialing and employment outcomes. Background information on the evolution of the federal workforce system and the steps that led workforce policy to become more focused on credentials is also provided.

The Role and Significance of Credentials

The most recent decade has brought about a heightened awareness of credentialing, as government agencies, foundations, and educational institutions have placed greater focus on credential-based initiatives in their programs and policies. In 2010, the Obama administration set a goal that by 2020, America will be the nation with the highest proportion of residents who have a postsecondary degree or industry-recognized credential (U.S. Department of Labor, 2010b). Four years later, Congress enacted new federal workforce legislation that replaced WIA with the newly created Workforce Innovation and Opportunity Act (WIOA). Under WIOA, credential attainment, which was once an optional measure adopted by some states, became a primary indicator of performance for all core workforce programs authorized by the federal government (U.S. Department of Labor, 2017b). More recently, the Lumina Foundation, which is an independent, private foundation committed to expanding postsecondary education opportunities,

set a goal that 60 percent of Americans will have a degree, certificate, or other high-quality postsecondary credential by 2025 (Lumina Foundation, 2019b). This goal was set in response to the fact that the U.S. currently lags behind in postsecondary credential rates, compared to its global competitors, which include South Korea, Japan, and Canada (Lumina Foundation, 2019b).

In terms of demand, since 2011, 11.5 million jobs have been added to the U.S. economy for workers who have more than a high school education, while only 80,000 jobs were created for workers with a high school diploma or less (Lumina Foundation, 2019a). Projections suggested continued growth with Bureau of Labor Statistics (BLS) data indicating that in 2020 65 percent of all jobs will require some form of postsecondary education or training, with 44 percent of these requiring an associate degree or higher (Carnevale, Smith, & Strohl, 2013).

In Virginia, both the Community College System and the Department of Education have established programs and pathways to encourage students to earn occupational certifications and state licenses, in addition to the degrees, certificates, and diplomas conferred by educational institutions (Virginia Community College System, 2019; Virginia Department of Education, 2019). Overall, Virginia has a goal to award 1.5 million degrees and workforce credentials by 2030 (State Council of Higher Education for Virginia, 2019).

Human Capital Theory. Human capital theory provides a framework that can be used to examine the motivations behind increased credentialing initiatives. Most scholars credit Gary Becker's 1962 work, "Investment in Human Beings" for the development of human capital theory, which views education as an investment that builds human capital (Blaug, 1976; Bauer and Dolan, 2011). Becker (1962) referred to human capital investments as "activities that influence future real income through the imbedding of resources in people" (p. 9). Formal schooling and on-the-job training are both examples of human capital investments that can

provide an economic return. In the United States, education is positively related to income increases, even after accounting for the cost of education and after adjusting for the possibility that highly educated people may simply have greater abilities or come from backgrounds that may make them more likely to succeed (Becker, 1994).

Critics of human capital theory, such as Caplan (2018), suggest that education itself does not increase productivity, but instead, more productive people are likely to continue their education. Historically, it has been difficult to provide empirical evidence for the relationship between education and increased success on the job due to challenges associated with measuring worker productivity, especially for highly skilled and professional positions (Blaug, 1976; Riley, 1976).

Human capital theorists, however, believe that earnings and productivity are positively impacted by education because education provides greater knowledge, skills, and problem-solving abilities (Becker, 1994; Arrow, 1973). Under human capital theory, there is an assumption that occupations have an ever-increasing demand for educated workers, even when the job content remains the same; therefore, people become more qualified for work and more valuable to employers when they increase their educational credentials (Baker, 2011). As such, human capital theory provides support for the notion that through increases in credential initiatives, society can build human capital, which, in turn, yields economic gains.

Background on Credentials. The federal definition of a credential is "an attestation of qualification or competence issued to an individual by a third party with the relevant authority or assumed competence to issue such a credential" (U.S. Department of Labor, 2010b, p.5). Credentials can be either education-related or work-related, both of which can provide employers with valuable information about the qualifications of job applicants (Association for Career and

Technical Education, 2019). Education-related credentials consist of educational certificates, degrees, and diplomas that are awarded by secondary or postsecondary institutions after completion of a specified program of study (Carnevale & Desrochers, 2001; Association for Career and Technical Education, 2019). Work-related credentials, also called industry-recognized credentials, include occupational certifications that are awarded by industry associations, as well as professional licenses from government licensing boards (Association for Career and Technical Education, 2019). Occupational certifications require recipients to pass an exam based on fixed standards before being conferred by an industry, trade, or professional association, while professional licenses require recipients to pass an exam and meet other requirements in order to receive legal authority to perform a specific occupation (Carnevale & Desrochers, 2001; Bureau of Labor Statistics, 2020b).

Credentials can vary widely in the amount of time that is needed to earn them and the requirements to maintain them over the years. For education-related credentials, certificates typically take less than two years to complete, while degrees often take two or more years (U.S. Department of Labor, 2010b). For industry-recognized credentials, the time needed to earn a certification or license can vary, and continued training or reassessment are often required to maintain them (Association for Career and Technical Education, 2019). An example of an education-related certificate is a Certificate in Business, and examples of degrees include Associate of Arts and Bachelor of Science degrees. Examples of work-related certifications include Certified Welder and Certified Logistics Specialist credentials, and examples of professional licenses are Registered Nurse and Commercial Driver's License (Association for Career and Technical Education, 2019).

Screening, Signaling, and Credentialist Theories. Screening and signaling theories provide frameworks for considering how employers and job-seekers, respectively, use credentials to serve their needs. Bills (2003) stated that "employers screen, and job-seekers signal" (p. 446), meaning that employers use information available to them to make decisions about job candidates and job-seekers use information to send messages to employers about their qualifications. Credentials often serve the purpose of communicating this information. Since employers do not yet have any concrete information about an individual's work capabilities when they initially apply for a job, credentials can provide a mechanism that employers can use to screen applicants and make decisions about who to hire (Bills, 2003). Similarly, credentials provide job-seekers with a tool that they can use to signal to employers that they are qualified for a job (Spence, 1973; Bills, 2003). Baker (2011) rejected human capital theory's assertion that investment in education and credentials provides valuable work preparation, by claiming that credentials are simply a way for employers to sort and allocate workers into categories. Arkes (1999) argued that credentials do not signal abilities, but instead they signal to employers that a job candidate has potential.

Further supporting screening and signaling theories is a 2016 CareerBuilder survey, conducted by Harris Poll of more than 2,300 hiring and human resource managers. Results indicated that approximately 41 percent now hire college graduates for jobs that were previously held primarily by high school graduates, an increase from 37 percent during the previous year (CareerBuilder, 2017). Stark and Poppler (2016) questioned the growing propensity of employers to demand post-secondary degrees for low-skilled jobs, which are generally considered to be those that require no more than a high school diploma or one year of work experience. An undergraduate degree is now considered to be a minimal requirement for many

jobs, similar to the way that a high school diploma was in the past (Stark & Poppler, 2016). An increase in the supply of credentials in the labor market has resulted in increased demand from employers (Collins, 2002). As a result, screening tactics to dismiss job applicants who lack a credential have become more widely used, as have signaling tactics that job-seekers use to demonstrate their qualifications to potential employers (Collins, 2002; Bills, 2003);

Research suggests that the type of credential that a job candidate possesses impacts its effectiveness as a screening or signaling tool. Since educational attainment has increased in recent decades and more people are earning bachelor degrees, a four-year college education may not be the effective screening and signaling tool that it once was (Vedder, Denhart & Robe, 2013). As a result, new screening and signaling devices are emerging. They may include earning advanced credentials such as a master or doctoral degree, which employers can use to screen job-seekers and job-seekers can use to signal to employers (Vedder, Denhart & Robe, 2013). New ways for screening and signaling also include focusing on credentials earned from high-ranking or prestigious institutions, such as Ivy League schools (Vedder, Denhart & Robe, 2013; Rivera, 2011). Research indicates that in some fields, elite jobs are formally restricted to those whose credential was obtained from a high-status university (Rivera, 2011).

Changes in screening criteria not only impact job-seekers at the highest education levels, but they affect job-seekers at lower levels as well. As blue-collar workers strive to attain the credentials that they are told will help them move forward in their careers, they too can be overshadowed by competitors who have more signals to send employers, often in the form of multiple credentials or more prestigious schools (Chen, 2015). Screening occurs not only when employers focus on credential attainment, or lack thereof, at the individual level, but it also happens when credentials provide new tools for comparing job applicants to each other.

Yet another form of screening takes place when employers use information about job-seekers to exclude them from job opportunities. Research demonstrates that a past criminal record can serve as a disqualifier, or a "negative credential," for job applicants even if they otherwise have the skills or credentials to qualify for a job (Pager, 2003, p. 942; Hickox & Roehling, 2013).

Credentialist theory takes an alternate approach to human capital theory by suggesting that rather than using credentials to determine which job-seekers would be the most productive in the job, employers depend on societal assumptions about the relationship between schooling and employment (Collins, 1979; Bills, 2003). In fact, credentialist theorists question the human capital argument that education provides people with the skills that they need for employment (Walters, 2004). Instead of linking education to productivity on the job, credentialist theory links education, and thus acquired credentials, with rewards for credentialed individuals (Bills, 2003). Collins (1979, p. 93) discussed credentials as a form of "cultural currency," in which individuals who obtain them are rewarded in the workplace, but others who may have attained similar levels of schooling, without completing a credential, are excluded from the reward. Examined as a "sheepskin effect," there is non-linear relationship between years of education and job market rewards (Hungerford & Solon, 1987, p.175; Belman & Haywood, 1991). Employment and earnings rewards are higher upon completion of a credential, as opposed to increasing with each year of school completed (Bills, 2003). Contrary to the value that human capital purists place on education itself, equivalent education without a credential to validate it does not yield the same results in the job market as a credential (Caplan, 2018).

Educational requirements for jobs have increased dramatically over the past century, an occurrence that many believe is a necessary result of increasingly complex and demanding

workplaces (Brown, 2001). Credentialist theory provides an opposing viewpoint by suggesting that employers requiring credentials do so not to certify technical skills but instead to ensure that hired employees hold similar cultural dispositions to others within their organization (Brown, 2001). By hiring credentialed employees, employers can cover their real motives to exclude those who are different by pretending that technical skills and merit are the qualifications being sought (Collins, 1979; Brown, 2001).

Impact of Credentials. The literature clearly demonstrates a correlation between education-related credentials and one's employment and earnings over their career, with increased levels of education resulting in increased premiums (Wolman, Lichtman, & Barnes, 1991; Arkes, 1999; Oreopoulos & Petronijevic, 2013). College graduates are able to secure and retain better jobs with higher long-term earnings, compared to high school graduates (Hout, 2012; Vuolo, Mortimer, & Staff, 2016). A 2017 study by the Economic Policy Institute found that the unemployment rate for recent high school graduates was approximately 16.9 percent, while the unemployment rate for college graduates was close to 5.6 percent (Kroeger & Gould, 2017). Community college graduates earned higher hourly wages and salaries, compared to their peers who did not receive any postsecondary education (Marcotte, Bailey, Borkoski, & Kienzl, 2005). Researchers at Georgetown University examined earnings for workers with varying education levels, finding that median lifetime earnings steadily rose with educational attainment (Carnevale, Rose, & Cheah, 2011).

Even in cases where they do not receive a degree, individuals who receive some postsecondary education earn almost a quarter of a million dollars more over their lifetime than those who only receive a high school diploma (Carnevale, Rose, & Cheah, 2011). A study by the Pew Research Center (2014) examined young working adults by looking not only at their

earnings and employment placement, but also their perceptions of their jobs, such as job satisfaction and access to opportunities for career advancement. On nearly every measure of economic prosperity and career attainment, college graduates scored higher than their counterparts who have less education (Pew Research Center, 2014).

Past research supports the notion that more education can lead to higher earnings; however, most of this research focuses on four-year colleges and universities, without taking into consideration the impact of credentials awarded by community colleges or the significance of industry-recognized credentials (Marcotte et al., 2005; Kerckhoff & Bell, 1998). "College-for-all" policies have become more prevalent in high schools, thus encouraging all students to pursue traditional college without informing them of promising career paths that do not require a degree (Rosenbaum, 2001, p.266). Training for industry-recognized credentials, specifically occupational certifications and licenses, is an alternative option for postsecondary education that is typically lower in cost with a shorter time commitment (Schneider, 2015).

Research into occupational certifications and licenses is fairly new and not as abundant as the data on college degrees, but where available, it too indicates a positive relationship between credentials and employment outcomes. Ewart and Kominski (2014) found that 29 percent of survey respondents who worked full-time had occupational certifications or licenses, while only 13 percent of respondents who were unemployed had an industry certification or license. This study also found that median monthly earnings for individuals without a college degree, but with an occupational certification or license, were significantly higher compared to those without a certification or license at the same education level (Ewart & Kominski, 2014). Although the number of occupations requiring a professional license has increased significantly over the years, there have not been many studies on this topic either, and there are limited secondary data

sources (Gittleman, Klee, & Kleiner, 2018; Ewart & Kominski, 2014). A recent study found that even after controlling for occupation, employees with a government-issued license were more likely to have a job, earn higher wages, and have the opportunity to receive employer-sponsored health insurance, as compared to employees without a license (Gittleman, Klee, & Kleiner, 2018).

In 2015, the Bureau of Labor Statistics began including questions about occupational certifications and licenses in the Current Population Survey (CPS) so that employment and earnings data could be examined for these credential categories, in addition to the traditional educational categories based on degree attainment (Allard, 2016). A study using CPS data to analyze the returns of occupational certifications and licenses for workers in the manufacturing industry found that those with an occupational certification or professional license earned an average of $211 more per week, compared to those without one of these credentials (Renski, 2018). Although the extent of the impact varied, workers with industry-recognized credentials earned more than their counterparts without them in almost all sociodemographic categories (Renski, 2018). Analysis conducted by the BLS showed similar trends for workers in all occupations, not just those in the manufacturing industry. Among individuals with similar education levels, higher earnings were reported for those with an occupational certification or license, compared to those without one (U.S. Bureau of Labor Statistics, 2016).

Non-degree, education-related credentials, such as certificates awarded by community colleges or technical schools, are often referred to as sub-baccalaureate certificates since they require more education than high school but less than a college degree (Grubb, 1997; Schneider, 2015). Typically, these credentials focus on a specific occupation and require two years of study or less. Research into the labor market outcomes of those who complete certificates shows

positive earnings results, an impact that appears to be stronger for recipients of certificates taking one or two years to complete, compared to certificates awarded after less than a year of study (Bosworth, 2010). Longitudinal analysis of the return on a sub-baccalaureate education found that completion of an occupational certificate increased earnings for women, but it appeared to have no significant earnings impact for men (Bailey, Kienzl, & Marcotte, 2004).

Several studies reviewed were specific to WIA participants. When administrative data about employment and earnings was examined to understand the return on public funds spent on WIA services, results demonstrated that the benefits exceeded the costs; however, this payoff generally occurred more than two years after exit (Hollenbeck, 2009b). When considering earnings gains after WIA training, several studies found that participants in the WIA Adult program had stronger labor market returns than those in the WIA Dislocated Worker program (Hollenbeck, 2009a; Heinrich, Mueser, Troske, Jeon, & Kahvecioglu, 2009; Andersson, Holzer, Lane, Rosenblum, & Smith, 2013). The earnings impact for such studies was based on a participant's increase over pre-program earnings, so it was noted that dislocated workers often have substantial employment histories with relatively high wages prior to their layoff (Hollenbeck, 2009a). The literature also demonstrated that performance outcomes for WIA participants can vary widely based on demographics, with participants who are female, Hispanic, and Black typically receiving lower earnings after exit than those who are not (Moore & Gorman, 2009) Research into the return-on-investment for WIA programs implemented in Virginia also found employment and earnings gains for participants who received a credential (Harper-Anderson, 2018). There were differences in the magnitude of gains based on credential type with bachelor degrees correlating with the greatest likelihood of employment and occupational licenses with increased earnings (Harper-Anderson, 2018).

The studies examined through this literature review also provided helpful information about additional aspects of student backgrounds that may impact employment and earnings. These are important considerations when reporting the correlations between credentials and employment and earnings. There was a positive relationship between community college credentials and employment outcomes, even after controlling for a variety of factors, including disability, performance in secondary school, family background characteristics, attendance at the same high school, and rural residence (Marcotte et al., 2005). Despite the inclusion of a rural/urban variable, within-group comparisons were made for rural graduates, as opposed to between-group comparisons with their urban counterparts (Marcotte et al., 2005).

Field of study also had a significant impact on employment outcomes, with higher returns observed in technical fields for men and in healthcare for women (Grubb, 1997). A similar study found that for long-term credentials in healthcare, such as an associate's degree in nursing, significant wage increases were evident, while associate degrees in fields such as humanities, social science, communication, and design were not as lucrative (Dadgar & Trimble, 2015). Yet another study found that earning an associate's degree is beneficial for increasing employment and earnings outcomes, but the impact is much greater for degree programs that focus on occupational skills (Bailey, Kienzl, & Marcotte, 2004). Among graduates of four-year colleges and universities, the risk of unemployment was high for those who studied in architecture, arts, and humanities and liberal arts (Carnevale, Cheah, & Strohl, 2012). Furthermore, a study of certificate holders, found that programs that focus on "fixing things," particularly those with "technician" or "technologies" in their name, generally resulted in higher wages (Schneider, 2015, p. 71).

Providing evidence to support screening and signaling theories, the literature also demonstrated an increase in employers that require credentials. Based on BLS projections from 2007, jobs requiring a high school diploma or less were expected to increase by 10 percent over the next decade, while those requiring a bachelor's degree or higher had an anticipated growth of 19 percent (Holzer & Lerman, 2007). With average preparation representing as associate's degree or vocational training and some experience, the number of employees in occupations requiring average or above-average education, training, and experience increased from 49 million to 83 million between 1980 and 2015, more than twice the increase for occupations that required below average preparation (Pew Research Center, 2016). These trends suggest not only job growth for occupations requiring a credential, but they may also demonstrate an increase due to changing job requirements for existing occupations, perhaps in part due to the use of credentials for screening and signaling and the increased supply of credentials in the job market.

Aligning with human capital theory, Grubb and Lazerson (2005, p. 297) explored the "education gospel," which suggests that more formal schooling is the solution for our nation's public and private dilemmas because it yields economic and societal benefits. Through credentialing initiatives, schools have shifted their focus from the more traditional civic and moral purposes of education to preparation for work, referred to as "vocationalism" (Grubb & Lazerson, 2005, p. 298). While credentialing was historically defined by the awarding of degrees from educational institutions, the rise of occupational credentialing has become part of a revolution in which efforts are made to relate credentials back to jobs and strengthen ties between the education and employment communities (Baker, 2011).

As higher education costs have increased and job markets have tightened, the United States has experienced a cultural shift toward tying investments made in education to job market

returns. When considering the cost of credentials, several studies produced results that contradicted the long-held belief that increased education equates to greater employment outcomes. Bennett and Vedder (2015)'s research found that lower income students were increasingly more likely to take out large student loans, making their financial situations worse after college as they competed for low-paying jobs that were previously staffed by workers without a degree. Oreopoulos and Petronijevic (2013) also warned that if students do not carefully select the best investment for their education dollars, including the college they attend, their major, and the occupation that they will pursue, they may not receive expected returns.

Credential Inflation. Despite findings that employment and earnings are positively correlated with credential attainment, a number of scholars have questioned the rise of credentialing initiatives and the value that credentials provide. Without a doubt, the volume of individuals completing credentials has increased tremendously over the years. At the start of World War II, less than 5 percent of Americans held credentials from colleges and universities, while in 2008, that figure stood at 30 percent (Bankston, 2011). Based on 2010 Census data, 60 percent of prime-age workers had postsecondary education or training, while BLS data at that time estimated that only 31 percent of jobs required postsecondary education or training (Carnevale, Smith, & Strohl, 2013). Such phenomena have led some critics of credentialing to warn against credential inflation. Among these critics are Bankston (2011), Jacobs (2004), and Collins (2002), each of whom has expressed concern that the abundance of credentialed people in society reduces the value of credentials.

As the number of college graduates entering the U.S. labor market has increased, so has the rate at which degree-holders enter occupations that do not require a degree to perform the job, including clerical work and manual labor (Bankston, 2011). The expansion of degree holders

in the labor market has increased the relative value of the credential by elevating their status in the eyes of employers (Boylan, 1993). This presents questions about the forces that have created the demand for more credentialed workers and whether there is a legitimate need for more workers with credentials or if the increase in supply of credentialed workers has falsely created that demand (Bankston, 2011). Collins (2002, p. 229) wrote that most degrees lack substantive value and instead are "bureaucratic markers channeling access to the point at which they are cashed in."

Despite the generally positive findings reported by credential studies conducted by the Economic Policy Institute and Georgetown's Center on Education and Workforce, their research also included some observations that may support critics of credentialing. In a recent report from the Economic Policy Institute, Gould (2017) noted that average wages for workers who had some college or a bachelor's degree declined between 2016 and 2017. Although it is unknown why this occurred, it could indicate a greater supply than demand of college-educated workers, suggesting that today's economy does not have the shortage of credentialed workers that so many believe to be the case. Gould (2017) suggested that if the demand were there, then employers would need to offer higher wages to attract and retain credentialed workers. Goldin and Katz (2008) also discussed such fluctuations, noting that supply and demand of educated workers impacts wage premiums. Additionally, a Georgetown study found that while there appear to be general wage increases that occur with increased educational attainment, earnings still show great variance based on the type of degree received, age, gender, race, ethnicity, and occupation (Carnevale, Rose, & Cheah, 2011). This suggests that credential attainment may simply be one of many factors that correlate with earnings, and it presents questions about the role that credential attainment plays in influencing earnings.

Caplan (2018) did not doubt that the labor market rewards credentials, but instead he questioned the value of the education that leads to them. It is flawed to solely attribute employment and earnings to the impact of education because the labor market pays for the combined effect of education and ability, a term referred to as "ability bias" (Caplan, 2018, p.70). Hacker and Pierson (2010) discussed the role of technology changes in increasing the division between credentialed and non-credentialed workers, noting that such changes have made formal education more valuable. While workers with college degrees have increased their earnings compared to those without, there are still vast discrepancies among the earnings of degreed workers, as the salaries of the very top percentage of the American workforce have grown substantially in recent decades (Hacker & Pierson, 2010). Goldin and Katz (2008) discussed the "race between education and technology" (p. 292), suggesting that educational attainment grew at a faster rate during the first half of the twentieth century, and technology grew faster during the second half, thereby contributing to broader economic inequalities among American workers in more recent decades.

Additional critics have also focused on overeducation, which occurs when the supply of higher educated workers grows more quickly than the demand. A Dutch study on this topic had employees self-rate the level of education most appropriate for their current job compared to their actual education levels, and it had them perform similar self-ratings on their skills (Allen & van der Velden, 2001). The results demonstrated a clear distinction between education level and job skills, suggesting that matching skills of workers with job characteristics may be more important than matching education levels with jobs (Allen & van der Velden, 2001). Vedder, Denhart, and Robe (2013) used Say's Law to suggest that with regard to credentials, supply can create demand. Over time, many employers have developed a demand for credentialed

employees, simply because a greater number of job-seekers have credentials, not necessarily because a credential is needed to perform the job. This can result in more people being underemployed, meaning that they work in jobs that do not require the knowledge and skills associated with the credentials that they possess (Vedder, Denhart, & Robe, 2013).

For-profit colleges have played a role in increasing credential output (Cottom, 2017). In what Cottom (2017, p.33) refers to as "up-market degrees," many for-profit colleges offer credential sequences that start by recruiting students for low-level degree programs and then try to retain them to continue into higher degrees. Since students at for-profit colleges often have barriers that make traditional higher education difficult to access, continuing at a for-profit institution is often the only option for those who wish to obtain additional credentials (Cottom, 2017). This can be costly, and research does not indicate favorable economic returns once students enter the job market (Cottom, 2017). One study found that graduates of for-profit schools were more likely to be unemployed six years after starting school, and those who did enter employment earned $1,800 to $2,000 lower wages than graduates who attended other types of institutions (Deming, Goldin, & Katz, 2011). Credential offerings at for-profit colleges do not always align with labor market demand, making it difficult for students to secure employment and more likely that they will need to seek additional credentials so that they can get a job (Cottom, 2017). For example, there are critical labor market needs for various healthcare occupations, particularly doctors, nurses, and physician's assistants; however, the second most popular healthcare certificate program at for-profit colleges is massage therapy (Cottom, 2017). Students often like massage therapy, which earns money for for-profit colleges, but the return on investment for these students may not be as impactful, particularly since for-profit colleges may train more students for this field than the labor market demands (Cottom, 2017).

Jacobs (2004) has been another critic of credentialing who expressed concerns about disconnect between credentialing and education, due to a growing demand for credentials. She noted that educational institutions rely on resources generated from the output of credentials; therefore, they are incentivized for increasing credential production. This can result in credential attainment overshadowing learning objectives (Jacobs, 2004). Additionally, employer use of credentials as a screening tool for job candidates creates situations where credentials are no longer an attestation of knowledge, skills, and abilities (Jacobs, 2004; Bills, 2003). Instead, credentials become a way for employers to make unfair assumptions about job-seekers' knowledge, skills, and abilities, simply based on whether or not they have a certain credential (Jacobs, 2004).

Another voice in the credentialing debate questions the widely held belief that all high school graduates should attend college. There is significant demand in the labor market for jobs that require middle skills, and these jobs offer substantial wages (Holzer & Lerman, 2007). Practices in educational counseling and policies that push all young people toward college are misguided and do not consider the reality that a college may not be for everyone (Rosenbaum & Person, 2003). Instead, practices and policies that prepare students for the transition from high school to work, inform them of labor market realities, and provide them with alternative training options may be more effective for supporting employment success (Rosenbaum & Person, 2003).

Rural and Urban Labor Markets: Differences in Supply and Demand

When considering supply and demand of credentials, as well as the way that associated theoretical frameworks explain the role of credentialing, it is important to consider differences between rural and urban labor market conditions. As the United States has experienced a decline in agrarian industries, as well as competition from foreign manufacturers, rural areas have been

heavily impacted (Bauer & Dolan, 2011). Furthermore, the types of industries that have risen to take the place of declining jobs have been less diverse, which has weakened economic conditions and made rural areas more susceptible to economic downturns (Bauer & Dolan, 2011). Job loss and economic changes have also resulted in an increase of outmigration from rural America, with many young people fleeing small towns for cities that offer more opportunities (Duncan, 2014). These and other challenges facing rural regions set rural labor markets apart from their urban counterparts.

Defining Rural and Urban. Prior to a deeper exploration into rural and urban labor market differences, it will be important to determine exactly how rural and urban localities will be defined for this study. Past literature was vital for informing the rural and urban classifications used. Identifying a single definition of rural can be a challenge, particularly given the many different rural categorizations, which may be based on "administrative, land-use, or economic concepts" (Cromartie & Bucholtz, 2008, p.2). There are two main federal systems for defining rural and urban, which are: 1) the U.S. Census Bureau's designation, which focuses on separating areas based on population and density, and 2) the system designed by the Office of Management and Budget (OMB), which emphasizes integration of rural and urban (Isserman, 2005).

The Census Bureau uses the population and density of census blocks to define very small areas as urban or rural; therefore, a county or zip code can have a portion designated as urban and another portion rural (Ratcliffe, Burd, Holder & Fields, 2016). Using this methodology, the 2010 Census Summary File 1 provides an urban and rural percentage distribution at the zip code level, allowing the creation of a continuous variable identified as percent rural (U.S. Census Bureau, 2012). Waldorf and Kim (2015, p.19) discussed the benefits of quantifying rurality as a

continuous variable, because it allows for examination of the more nuanced "degree of rurality." Continuous measurements may be more favorable for some types of research because the simpler dichotomous classifications "do not do justice to the complexity and diversity of both the rural and non-rural landscapes" (Waldorf & Kim, 2015, p.1).

The OMB uses Metropolitan Statistical Area (MSA) and Micropolitan Statistical Area designations to identify rural and urban localities. Entire counties and independent cities are classified as rural if they fall outside of an identified metropolitan or micropolitan area (Health Resources & Services Administration, 2017). The OMB's rural and urban designation is often used for public policy studies and economic research since it allows for a binary variable to be assigned to identify rural and urban localities at the county-level (Browne, 2001; Cromartie & Bucholtz, 2008; Goetz, Partridge, & Stephens, 2018).

Although there is some overlap, the Census and OMB definitions differ and are not interchangeable (Ratcliffe, et al., 2016). Isserman (2005) pointed out that the Grand Canyon is not densely populated by any means, but it is located in a metropolitan area. As a result, researchers are faced with the decision of determining which definition to use. Data availability is often a deciding factor in this, since some datasets are only available at the county-level, while others are provided for smaller localities (Isserman, 2005). The purpose of the research is another consideration. For example, land-use studies may benefit from using a continuous variable based on population density of a specific locality. Economic studies, on the other hand, may benefit from using a broader, dichotomous variable that recognizes the impact of core urban localities on neighboring markets (Cromartie & Bucholtz, 2008).

Challenges of Rural Labor Markets. Rural literature paints a picture of labor market interactions that function quite differently from those of urban areas. A significant reason for this

is the lack of accessible educational resources (Berry, Katras, Sano, Lee, & Bauer, 2008). A criticism of human capital theory is that it assumes homogeneous markets with equal opportunities for everyone, something that is not the case when rural and urban labor markets are examined (Bokemeir & Tickamyer, 1985; Slack, 2004). As human capital theory suggests, investments in continual education and training are essential for building human capital; however, these opportunities are not always available in rural areas, particularly for low-income residents and women who may have childcare barriers (Berry, et al., 2008).

In addition to barriers related to education, a changing society has impacted rural America, particularly with regard to rural-urban interdependency and symmetry between rural and urban influences (Lichter & Brown, 2011). As rural areas of the country have shifted from having goods-based to services-based economies, unemployment challenges have been presented (Gibbs, Kusmin, & Cromartie, 2004). Globalization and automation have caused the once dominant industries of agriculture and manufacturing to diminish in rural areas of the country (Drabenstott, 2003; Goetz, Partridge, & Stephens, 2018). According to Bureau of Economic Analysis data, the share of agriculture employment in non-metropolitan areas declined from 15 percent in 1969 to 6 percent in 2015 (Goetz, Partridge, & Stephens, 2018). Additionally, pools of qualified job-seekers have become more constrained as out-migration has increased, resulting in those with the necessary education, skills, and experience for certain jobs to move elsewhere (Slack, 2004; Bostic, 2017). Due to their physical isolation, low population density, and lack of opportunities for residents to unify, rural areas may also be unappealing for new businesses that could introduce diverse job opportunities (Slack, 2014).

An examination of census data has demonstrated that as rurality increased, the percentage of adults with a college degree decreased and the percentage of employed, working-age adults

decreased (Holder, Fields, & Lofquist, 2016). Berube (2016) examined employment rates specifically for men between the ages of 25 and 54, finding that as the level of rurality increased, the share of workers in this demographic decreased. Poverty rates also increased along with the rurality of one's residence, with approximately 16 percent of rural adults living in poverty, compared to 10 percent of urban adults (Holder, et al., 2016). Another factor that contributes to the challenges of rural labor markets is a scarcity of supportive services. In rural areas, workers may have transportation barriers due to the lack of public transportation and the long commutes that many residents have between their homes and work (Partridge & Rickman, 2006; Berry, 2008). Childcare services may be more difficult to access, and services for training, disabilities, and health care may be more dispersed, or they may not be available at all (Partridge & Rickman, 2006).

With fewer job opportunities available, underemployment, which is "the degree to which workers are not employed full-time" in jobs where they are earning wages above the poverty-level, is a significant problem in rural localities as well (Slack, 2014, p. 579). Local labor market characteristics of rural areas, including unemployment and job turnover rates, as well as average worker earnings, all have the potential to impact involuntary underemployment by making it difficult for underemployed workers to move on to new jobs (Bonnal, Lira, & Addy, 2009). Labor force participation is another challenge. Research by Jack, Hall, and Yerger (2010) used peer groups to benchmark rural Pennsylvania counties against similar counties across the country, based on industrial structure and level of rurality. Using the lowest ratio between working-age adults without jobs and the working-age population, potential workers were identified in each county. This study concluded that several of the rural counties could expand

their labor force considerably if there were job opportunities to accommodate more workers (Jack, Hall, & Yerger, 2010)**.**

For Virginia, national research into rural labor market challenges appears to hold true. Wallmeyer (2016) wrote of the severe challenges that Virginia's most rural areas, the Eastern Shore, Southside, and Southwest, have in terms of workforce development, economic development, unemployment, poverty, drug addiction, and access to healthcare. While the rest of Virginia has become more diverse and prosperous, these regions of the commonwealth have been largely isolated from economic success. Termed the "extremes" by Wallmeyer (2016), these localities have lost a considerable number of jobs due to declines in furniture, textile, and tobacco manufacturing, as well as deteriorations in the coal industry. Rural Virginia residents are concerned about the future of their hometowns, as many younger and more educated people who grow up there, moved elsewhere (Wallmeyer, 2016).

Public Policy Implications for Rural Areas. Browne (2001) and Wallmeyer (2016) both pointed out that rural residents are often dissatisfied with the government's response to their unique needs. With approximately 80 percent of the U.S. landmass considered nonmetropolitan but only 20 percent of U.S. residents living in these areas, rural residents are more widely dispersed with fewer advocacy options, which can make it difficult for them to influence public policy decision-making to ensure that policies address their needs (Browne, 2001).

In some cases, such as the 2016 presidential election, rural residents have been able to gain a voice through their votes. Analysis of this election demonstrated that even after controlling for social, demographic, and economic factors, the position of a voter's county in the "urban-rural continuum" was statistically significant in suggesting voting patterns, with rural residents more likely to vote for Donald Trump (Scala & Johnson, 2017, p.162). To some extent,

these voting patterns were likely the result of the dissatisfaction felt by rural residents with regard to public policy. The regions with the largest shifts in voting patterns between the election of Barack Obama and the election of Trump are those that are "generally worse off today that they were a generation or two ago" in terms of economic, social, and health distresses (Monnat & Brown, 2017, p.229).

Wuthnow (2018) explored the factors leading up to the 2016 election, finding that 62 percent of rural voters supported Trump, compared to 50 percent of suburban voters and 35 percent of urban voters. Interviews with rural voters found that frustration about economic conditions, unemployment, and the changing demographics of America contributed to their voting decisions (Wuthrow, 2018). Furthermore, distrust of the federal government and the belief that elected officials in Washington do not represent rural interests were also common sentiments. Rural residents view Washington as "a massive bureaucracy imposing one-size-fits-all rules on everyone without bothering to hear what ordinary people say or to understand local needs and differences" (Wuthnow, 2018, p.106). Hochschild (2016, p. 222) also wrote about the distrust that many rural Americans have when it comes to government, noting that they have felt "economically, culturally, demographically, and politically" different, like a "stranger in [their] own land." Given the challenges of rural labor markets and the skepticism of their residents when it comes to government intervention, it is especially important for national policy to be responsive to the unique needs of rural regions and for policy-makers to understand policy implications for rural residents (Stauber, 2001). Since Trump's populist campaign that was overwhelmingly supported by rural voters, policy-makers and academics have attempted to learn more about the economic frustrations of rural Americans, and a number of proposed policies

have resulted, including tax incentives for employers that hire workers in distressed communities (Porter, 2018)

Understanding the literature behind rural perceptions of public policy is informative for this study, given federal and state government support for credentialing as a solution for reducing unemployment and increasing earnings across all type of communities. Interviews with rural and urban employers conducted as the qualitative component of this research uncovered differences, as well as some similarities, in the role of credentialing in employer hiring decisions.

The Public Workforce System and the Rise of Credentials

Since the early part of the twentieth century, the federal government has funded public workforce programs that reflect the policy trends and economic concerns of the times. The first federally funded training programs began in the 1930s as the Works Projects Administration (WPA), which was one of President Franklin Roosevelt's "New Deal" programs created to alleviate the widespread unemployment that occurred during the Great Depression (Beane, 2006; O'Leary, Straits, & Wandner, 2004). WPA targeted low-skilled and unskilled unemployed by providing them with opportunities for training and employment in public works, such as building bridges and roads (Beane, 2006). WPA eventually led into the Manpower Development and Training Act (MDTA) of the early 1960s, which was marketed as an anti-poverty program with a focus on providing workforce training to low-income individuals and welfare recipients (O'Leary, Straits, & Wandner, 2004). This program was tailored to address one of the country's economic challenges at the time, which was job loss due to automation and technology changes (Beane, 2006).

The early 1970s brought about the Comprehensive Employment and Training Act (CETA), which shifted the way in which training and employment services were provided.

Under CETA, decentralization was a common theme, and decision-making power that was once held by the federal government went to state and local governments (O'Leary, Straits, & Wandner, 2004). Although this shift would suggest a movement toward giving rural areas more authority over their workforce initiatives, this did not occur. Instead, workforce funds were provided directly to localities that were considered to be urban, but funds designated for rural areas went to states (Guttman, 1983). CETA's attempt to decentralize workforce training presented issues related to coordination of services since state governments had a commanding role in program implementation for rural areas but no role in doing so for urban ones (Guttman, 1983).

During the Reagan administration, federal policy focused on increasing earnings and employment, while lowering dependency on welfare programs (O'Leary, Straits, & Wandner, 2004). This was reflected through the Job Training Partnership Act (JTPA) of 1982, which took a new approach to intergovernmental relations by focusing on providing funds to state and local governments based on function, rather than geography (Guttman, 1983). Under JTPA, states took on the role of coordinating, supervising, monitoring, and evaluating programs, while local service delivery areas formed partnerships of government and business representatives in order to oversee administration and design of job training (Guttman, 1983). JTPA also took on an employer-focus by limiting job training opportunities provided to job-seekers to only those that aligned with skills in demand by local employers (O'Leary, Straits, & Wandner, 2004).

In 1998, the Workforce Investment Act (WIA) replaced JTPA. Building on lessons learned from past workforce programs, WIA emphasized the needs of both employers and job-seekers and viewed both as customers of the public workforce system (U.S. Department of Labor, 1998). Under WIA, each state was required to establish both a state-level and several

local-level Workforce Investment Boards (WIBs) with required representation from business leaders, as well as other community partners including labor, education, and elected officials (U.S. Department of Labor, 1998). WIA utilized a tiered services approach in which the first tier, core services, was universally available and consisted of general job search assistance and basic career services. If additional help was needed for a participant to secure employment, then the next tier was intensive services, which consisted of services such as individual career plan assistance and career assessments. If a participant continued to have difficulty finding a job, then he or she would be eligible to receive occupational or basic skills training linked to local job demands (U.S. Department of Labor, 1998).

WIA was enacted during a time in which economic conditions had vastly improved and many parts of the United States had full employment. As a result, the policy shifted from a government responsibility to an individual responsibility for making many decisions (O'Leary, Straits, & Wandner, 2004). A "one-stop" approach that was piloted under JTPA was used to create one-stop workforce centers that could more easily help employers find skilled workers while simultaneously providing job-seekers with the various resources that they may need to gain employment (U.S. Department of Labor, 1998; O'Leary, Straits, & Wandner, 2004). Propelled by initiatives such as the Department of Labor's goal to increase degree and credential attainment, a policy was created to define the different types of credentials eligible for WIA funding and to outline strategies for improving alignment between credential training and the labor market (U.S. Department of Labor, 2010b). Under WIA, the importance of credentials was highlighted for the first time and states were required to report credential data; however, credential attainment remained an optional performance measure for states to calculate and report to stakeholders (Negoita, 2015).

In 2015, WIA was replaced by the Workforce Innovation and Opportunity Act (WIOA). Like its predecessor, WIOA was also designed to provide job search and training services to dislocated workers, as well as adults and youth with barriers to employment. In keeping with the historical trend of evolving workforce programs, WIOA included a few important changes. A primary reform is the WIOA requirement for states and local areas to better align publically-funded programs operated by partner agencies in order to coordinate delivery of resources and services (U.S. Department of Labor, 2017b). Such coordination is intended to maximize availability of supportive services to participants who need them, including transportation, childcare, and housing assistance (U.S. Department of Labor, 2017a). Another key WIOA initiative is fostering regional collaboration by taking into account local economic development priorities when developing workforce strategies (U.S. Department of Labor, 2017b). WIOA also emphasized the need for participants to receive access to training that will prepare them for in-demand jobs, and perhaps most importantly, credential attainment became a required measure of performance (U.S. Department of Labor, 2017b). The WIOA program is still fairly new and evaluation of early performance is just beginning. However, the changes included in this new legislation suggest that greater emphasis is being placed on the needs of local areas, including the rural localities being examined in this study, and the importance of credentials is being acknowledged.

In implementing federal workforce programs, rural regions have unique challenges that affect the way in which employment services are delivered. Funding allocations to local areas are impacted by population; therefore, rural one-stop centers usually receive less funding than urban ones, providing them with fewer resources for staff and training (Betesh, 2018). Since rural regions are geographically larger, participants may also have transportation barriers impacting

their access to services and jobs (Betesh, 2018). Furthermore, problems such as opioid addiction and limited availability of prisoner reentry programs tend to be more prevalent in rural areas, which often means that WIA participants served in rural regions have significant barriers to employment (Betesh, 2018). Flexibility was provided under WIA, often in the form of waivers, to allow local areas to respond to the demands of employers in their area, the specific needs of participants, and local economic conditions (Decker & Berk, 2011).

The literature on historical workforce training programs demonstrates the way that workforce policy has evolved over the years to be responsive to current trends and economic challenges of the time. While JTPA was designed in response to the rapidly changing and more complex nature of industry in the United States, WIA was enacted during a prosperous time, with a focus on improving specific services and administration (Bancroft, 2002). Although implementation strategies and key initiatives have changed over time, the core responsibility of these programs – workforce training – has remained steadfast and the need for such training has been continuous. As evidenced in new workforce legislation, there has been a gradual shift toward policies that give authority to local areas, which is likely to benefit rural regions. There has also been a rise in initiatives that specifically target credential attainment and greater focus on the importance of credentialing.

Factors Influencing Employer Hiring Decisions. The history of federal workforce policy also demonstrates an evolution toward policy and programmatic initiatives that target the job-seeker *and the employer* as customers. Ultimately, job-seeker success in obtaining employment and achieving higher earnings depends on hiring and compensation decisions made by employers. Based on the literature reviewed, theories and past research can attempt to explain the connections between credentials and employment outcomes, but, understanding employer

perceptions of credentialing is an integral part of this conversation as well. Literature on employer decision-making can inform the qualitative component of this study by providing information to help craft interview questions for employers.

As demonstrated in previous literature reviewed on screening theory and the impact of credentials, research suggests that employers pay attention to the educational institution that awarded a job applicant's credential. Data also demonstrates that employment outcomes may differ based on the type of educational institution that a credential holder attended. Research into employer callback rates for interviews also support this and suggest that employers strongly prefer candidates with educational credentials from public colleges and universities, rather than for-profit institutions (Deming, Yuchtman, Abulafi, Goldin, & Katz, 2016). The exception to this is job openings in healthcare careers, such as nursing, that also require a professional license. For these jobs, which have an added requirement for applicants to pass a competency-based, third-party examination, there were no differences in the number of callbacks received for resumes that listed public training providers versus for-profit providers (Deming, et al., 2016).

Employer preferences for the types of skills sought in job applicants are also important. Ohren and Reese (1999) explored these through surveys and interviews administered to randomly selected businesses in a region that was impacted by automobile plant closures. Most of the employers indicated that they prefer to use on-the-job training to ensure that employees can meet the specific needs if their company, but they want to hire employees who already possess basic skills, including competence in math and literacy, teamwork skills, and a positive work ethic (Ohren & Reese, 1999). Another study found that credentials influence employer assumptions about applicants' pre-college abilities, as well as unobserved abilities, such as motivation and perseverance (Arkes, 1999). Providing another angle through which to view

credentialist theory, Garnett, Guppy, and Veenstra (2008, p.147) discussed talent sought by employers as not just credentials, abilities, and skills, but also as cultural competencies, together which they termed "cultural talent."

Many employers have indicated an increase in their expectations for applicants to have credentials, with a heightened interest on college degrees and specialized certificates and licenses, especially for occupations in the skilled trades and healthcare fields (Ohren & Reese, 1999). Holzer (1996) not only found an employer preference for credentials in his employer surveys, but also a tendency among some employers to use referrals from current employees in recruiting new staff. Employer surveys also confirmed the use of screening tests and interviews to inform decision-making about job candidates (Holzer, 1996).

Unfortunately, research into employer hiring tendencies has also uncovered biases in which race and gender play a role in determining who gets hired and how much they are paid (Holzer, 1996; Wilson, 1996). Patten (2016) noted that earnings gaps can often be somewhat explained by measurable differences in job candidates' qualifications, including credentials and experience. However, remaining gaps are often attributed to discrimination (Patten, 2016). Some employers mistrust portions of the information presented to them by job-seekers and rely more heavily on information that they collect personally through job interviews, a practice that may be influenced by racial and cultural biases (Rosenbaum & Person, 2003).

Weaver (2017) questioned whether a gap exists between employer demands and job-seeker skills, as so many believe to be the case. Refuting the possibility of a clear skills gap, employer surveys demonstrate a great deal of variation in the level of skills demanded, including soft skills and technical skills (Weaver & Osterman, 2017; Ohren & Reese, 1999). Instead of a skills shortage, Weaver and Osterman's (2017) research points to cyclical economic factors as

the cause of fluctuations in labor market outcomes that seem to suggest a skills gap. The most effective solution for ensuring that supply and demand are balanced in job markets is for the credentialing entities that produce worker supply and the employers that produce worker demand to synchronize their efforts (Weaver & Osterman, 2017).

Summary

The literature reviewed provided a deeper understanding of the theories that inform credential initiatives, including human capital, screening, signaling, and credentialist theories. Each of these analyzes from a different perspective the various aspects of credentialing, as well as the motivations of stakeholders involved. Past research supports the quantitative component of this study by demonstrating a clear connection between credentials and employment outcomes, but also operational differences between rural and urban labor markets. When analyzing the influence of credentials on employment outcomes, it is important to consider that the relationship between the two may be impacted by labor market and economic conditions of rural areas. The unemployed could not have had their needs addressed by training, job counseling, or other WIA services, if jobs were not available for them (Ohren & Reese, 1999). Furthermore, literature on employer demands demonstrates a desire for credentialed employees, but the reasons for this are less clear. The supplemental qualitative data collected through this study provides a better understanding of the underlying needs of employers, whether those needs are fulfilled by credentials, and differences that exist between the needs of rural and urban employers.

Chapter 3: Methodology

Research Design

This study employed a mixed methods approach following a QUAN→qual explanatory sequential design (Creswell, 2018). This mixed methods design was the most comprehensive way to study the two different, but associated, units of analysis that play a role in the employment dynamic – employees and employers. Through the QUAN→ qual explanatory sequential design, the primary focus was on an initial phase of quantitative analysis, which examined employment and earnings for individuals based on their credential attainment status. A subsequent phase of qualitative analysis followed in order to learn more about how employers screen job applicants and how credentials influence their hiring decisions. This sequence of research activities is referred to as a follow-up explanations variant, which is most common for explanatory sequential designs (Creswell & Clark, 2018).

For the quantitative component of this study, the rurality of the locality in which the WIA participants lived was examined in order to gain a better understanding of rural and urban differences. A non-experimental method of research was used to quantitatively examine the same data elements for participants who live in locations with varying levels of rurality. Quasi-experimental and experimental methods were not possible, since it would be neither feasible nor ethical to create a control group by manipulating either of the factors driving the two predictor variables – place of residence and credential attainment (Creswell, 2009).

In the subsequent qualitative research, the rural or urban designation of the employer's locality was used to identify differences in responses. These designations were based on each employer's inclusion in or exclusion from a MSA.

Quantitative Analysis

Population and Sampling. The population studied for the quantitative component of this research consisted of participants who received training services and who exited either the WIA Adult or Dislocated Worker program between July 1, 2012 and June 30, 2015. This timeframe is appropriate because it includes participants who exited during the final three years of the WIA program. On July 1, 2015, the WIA program was replaced by WIOA. Under WIOA, significant changes were made to the methodology for data collection, processes for data submission, and file layouts for federal workforce reporting. As such, it is too early to comprehensively analyze employment and earnings data for participants who received workforce training services through the more recent WIOA program.

Sampling methodology was not needed for the quantitative component of this study since all participants meeting specific study criteria were included. There were, however, several exclusions that were applied to the original dataset in order to identify the final population. These are displayed in Table 3.1. For the first exclusion, instances where identical participant records were included in files for multiple program years were removed. In these occurrences, the duplicate records had the same entries across all variables, so the retained record was simply the first occurrence for a given participant. Next, all participants who lived outside of Virginia were removed. WIA does not require participants to receive services in their state of residence, which allows participants who live in other states to be served by Virginia workforce centers. The third exclusion component was related to non-traditional exit reasons. The dataset included codes to identify individuals who ceased their WIA participation due to an approved reason that may have prevented them from being able to gain employment. These include institutionalization, illness, death, care for a family member, or relocation to a mandated residential facility. Participants who

exited for these reasons were not included in federal performance reporting. As such, they were also removed from the dataset used this study. Another exclusion was for participants with zip codes that did not match to decennial census data measuring rurality. Since percent rural was a key variable and it could not be assigned to these records, they too were excluded from the research. Finally, two participants were removed due to erroneous entries for the employment and earnings variables. The table below outlines the records that were removed from the original file, which consisted of 14,752 records.

Table 3.1

Exclusion Criteria for WIA Dataset

Removal Reason	Total Records Removed
Duplicate records	4,045
Reside outside of Virginia	206
Excluded exit reasons, consisting of: • Institutionalization (48) • Medical (156) • Death (24) • Family care (45) • Relocation to a mandated residential facility (19)	292
Invalid zip code (no match to Census data on rurality)	96
Other (erroneous records)	2

After record removal, the final dataset consisted of 10,111 records for 10,073 unique participants. There were 38 participants who enrolled and exited twice during the study timeframe. Since each enrollment was associated with a different training program and resulted in different employment and earnings outcomes, both records for these individuals were retained. A total of 4,687 records were for participants enrolled in WIA through the Dislocated Worker

program and 5,518 enrolled through the Adult program, including 94 participants who were co-enrolled as both an Adult and Dislocated Worker.

The unit of analysis for this research was the WIA participant. Table 3.2 provides descriptive data for the demographic characteristics of participants included in this study.

Table 3.2

WIA Participant Demographics

Variable	Category	Total	Percent
Gender	Male	4,209	41.6%
	Female	5,902	58.4%
Ethnicity	Hispanic/Latino	387	3.8%
	Not Hispanic/Latino	9,380	92.8%
	No Ethnicity Indicated	344	3.4%
Race	American Indian/Alaskan Native	159	1.6%
	Asian	254	2.5%
	Black/African American	4,609	45.6%
	Native Hawaiian/Pacific Islander	38	.4%
	White	4,708	46.6%
	No Race Indicated	454	4.5%
Age	18-20	140	1.4%
	21-30	2,239	22.1%
	31-40	2,478	24.5%
	41-50	2,553	25.2%
	51-60	2,228	22.0%
	61-70	450	4.5%
	71 and Over	23	0.2%
Highest Education Level Prior to WIA Participation	Less than High School Diploma	413	4.1%
	High School/GED	4,652	46.0%
	Some College	2,226	22.0%
	Associate's Degree	915	9.1%
	Bachelor's Degree or Higher	1,618	16.0%
	Other Certification	287	2.8%

Data Collection. The quantitative analysis used secondary data from the Workforce Investment Act Standardized Record Data (WIASRD). The WIASRD was a file that was created using data on WIA participants collected through a case management system, as well as matched data on employment and earnings. As the administrator of Virginia's WIA Adult and Dislocated Worker programs, the Virginia Community College System (VCCS) oversaw and maintained the case management system. This involved the provision of training and technical assistance to case managers who were responsible for verifying and entering data on the WIA participants who they served. Through a data system shared between the VCCS and the VEC, participant records were then matched to employment and earnings data collected by the VEC's Unemployment Insurance program. In instances where VEC data was not available for a participant, local case managers could rely on supplemental documentation to verify employment, and those outcomes were also included in the WIASRD.

VCCS staff prepared a file for this research using select variables from the WIASRD submissions for federal program years 2013, 2014, and 2015. The file provided for this research contained 14,752 records, which consisted of Adult and Dislocated Worker participants who received a training service and exited the WIA program between 2012 and 2015. All personally identifiable information was removed from the file, including dates of birth and dates of service, which were converted to year. An anonymous, unique number was used to identify each participant record. As described above, 10,111 records remained for analysis after exclusion criteria was applied by the researcher.

The following table, 3.3, lists the variables that were examined quantitatively. For each, operationalization, measurement, and sources are provided.

Table 3.3

Operationalization of Quantitative Variables

Variable	Operationalization	Measurement	Source
Participant Employment	Binary indicator with 1 representing participants who were employed during the 2nd quarter after exiting the WIA program.	Nominal	WIASRD
Participant Earnings	For those who obtained employment and had reported earnings, the average of each participant's earnings during the 2nd and 3rd quarter after exit, adjusted to 2015 standards.	Ratio	WIASRD
Credential Received	Binary indicator with 1 representing participants who received a credential as the result of WIA training.	Nominal	WIASRD
Type of Credential Received	Type of credential received by the participant as the result of WIA training, defined as: • No Credential • High school diploma/GED • Associate's degree • Bachelor's degree or higher • Occupational skills licensure • Occupational skills certificate • Other	Nominal	WIASRD
Percent Rural (Locality)	The percent of a participant's zip code of residence that is classified as rural.	Ratio	WIASRD, U.S. Census Bureau (2010)
Rural Indicator	Binary indicator with 1 representing that the locality of a participant's residence is between 50 and 100 percent rural and 0 indicating that the locality of residence is less than 50 percent rural.	Nominal	WIASRD, U.S. Census Bureau (2010)
Median Earnings (Locality)	Median individual earnings in each participant's zip code of residence.	Ratio	WIASRD, U.S. Census Bureau (2015)
Unemployment Rate (Locality)	Percent of the civilian labor force who are unemployed in each participant's zip code of residence.	Ratio	WIASRD, U.S. Census Bureau (2015)
Disadvantaged Minority	Binary indicator with 1 representing a participant whose race was identified as Black/African American and/or	Nominal	WIASRD

	whose ethnicity was identified as Hispanic/Latino.		
Age at Exit	Age of participant during the year in which they exited the WIA program.	Ratio	WIASRD
Female	Binary indicator with 1 representing a participant who identified as female.	Nominal	WIASRD
Education Prior to WIA Participation	Highest school grade completed by the participant prior to entering WIA training, ranging from 1 to 17.	Interval	WIASRD

In the WIASRD dataset, a binary indicator is provided to identify whether each participant was employed during each of the four quarters after exit. This study used 2nd quarter after exit as the timeframe for measuring employment. This variable was identified as Participant Employment. Frequency analysis demonstrated that a total of 8,253 participants (81.6%) were employed during the 2nd quarter after exit, while 1,858 (18.4%) were not employed during this timeframe.

To measure earnings in this study, the average of each participant's wages during the 2nd quarter after exit and the 3rd quarter after exit was calculated. For some participants, employment could be verified, but earnings were not available in the dataset. A total of 1,216 participants were employed during either the 2nd or 3rd quarters after exit, or both, but their wages were unavailable for all or part of this time. Since wages for these participants were incomplete or unavailable, they were excluded from earnings analysis. An additional 1,477 participants were not employed at all during this timeframe and earned $0. Although methodologies can differ from study to study, the literature on WIA outcomes found that some researchers (Hollenbeck, Schroeder, King, & Huang, 2005; Moore & Gorman, 2009) included only participants who became employed, and who thus had wages, in their analysis. As a result, participant records without any wages were excluded from the earnings analysis in this study as well. After

removing 2,693 participant records from the data analyzed in the OLS regression models, a total of 7,418 remained. Descriptive statistics and frequencies were examined for this subgroup of study participants used for the earnings analysis, and no notable differences were observed. Data summaries for both the full participant group examined in the employment analysis and the subgroup examined in the earnings analysis are provided in Appendix A

Since participants exited the WIA program at different points of time between 2012 and 2015, the earnings variable represented wages earned during different timeframes. Using the annual Consumer Price Index (CPI) for all urban consumers during the year in which they exited the WIA program, each participant's average earnings calculation was adjusted to 2015 standards. The resulting variable used for this study was identified as Participant Earnings. Table 3.4 provides the CPI adjustments applied for each year (Bureau of Labor Statistics, 2020a).

Table 3.4

Consumer Price Index Adjustments

Year	CPI	Adjustment (2015 CPI)
2012	229.594	3.233098%
2013	232.957	1.742811%
2014	236.736	0.118698%
2015	237.017	0.000000%

After exclusions were applied and CPI adjustments were made, average earnings during the 2nd and 3rd quarters after exit ranged from $1 to $55,886. The median quarterly earnings for the 7,418 participants was $5,449, and the mean was $6,595.

A binary indicator was created to identify whether a credential was obtained as a result of training provided by WIA. This was identified as Credential Received. Frequencies for this

variable displayed that 7,273 (71.9%) of participants earned a credential, while 2,838 (28.1%) did not.

Another variable used in this study provided a descriptor for the type of credential that each participant earned. Although it is possible that some participants received multiple credentials, the WIASRD only provided the capability for the first credential to be reported. For this study, Type of Credential Received was used to create dichotomous dummy variables for each credential category. Table 3.5 provides frequencies for the 7,273 participants who received a credential.

Table 3.5

Frequencies for Type of Credential Received

Variable	Category	Total	Percent
Type of Credential Received	High School Diploma/GED	24	0.3%
	Associate's Degree	727	10.0%
	Bachelor's Degree	57	0.8%
	Post Graduate Degree	3	0.0%
	Occupational Skills Licensure	830	11.4%
	Occupational Skills Certificate	5,325	73.2%
	Other Recognized Diploma, Degree, or Certificate	307	4.2%

Since a focal point of this study is examining the role that rurality plays in predicting employment and earnings, data on rural and urban designations was obtained from the U.S. Census Bureau. As noted by Waldorf and Kim (2015), measuring rurality as a continuous variable allows for distinctions to be made based on the extent of rurality. Using the 2010 Census Summary File 1 urban and rural data, the percentage of the population in each zip code that was rural was determined (U.S. Census Bureau, 2012). This Percent Rural variable was then matched to each participant's zip code of residence provided in the WIASRD. This methodology allowed

level of rurality to be examined as a ratio variable at a much smaller geographic level than county or city designations. The range for this variable was 0 to 100 percent. The mean was 34 percent and the median was 13 percent. Table 3.6 displays rural percentage frequencies for the participant records analyzed.

Table 3.6

Frequencies for Percent Rural

Variable	Category	Total	Percent
Percent Rural	0% Rural	3,357	33.2%
	0.1 to 24.9% Rural	2,472	24.4%
	25 to 49.9% Rural	1,178	11.7%
	50 to 99.9% Rural	1,234	12.2%
	100% Rural	1,870	18.5%

As Waldorf and Kim (2015) also pointed out, there are some instances where it is more useful to measure rural and urban as a dichotomous variable. Between-group comparisons are such a situation. The most meaningful way to examine the role of rurality in the relationship between the type of credential attained and employment and earnings is through a comparison between localities in rural areas and localities in urban areas. As such, a binary indicator was also assigned to each record. This variable was created using rurality categories defined by the U.S. Census Bureau, with completely rural localities identified as those that are 100 percent rural, mostly rural localities as those between 50 and 99.9 percent rural, and mostly urban localities as those that are less than 50 percent rural (Ratcliffe, et al., 2016). Based on these definitions, participants who lived in localities that were between 50 and 100 percent rural were categorized as rural for this study and coded as 1, and those who lived in localities that were less than 50 percent rural were categorized as urban and assigned a 0. This created a Rural Indicator variable

for use in between-group comparisons. Using this designation, there were 3,104 rural participants and 7,007 urban participants in the dataset.

A participant's ability to secure employment and their earnings can also vary based on the economic characteristics and labor market conditions of the locality in which they live. Past studies reviewed in the literature (Bennett & Vedder, 2015; Harper-Anderson, 2018) included control variables to account for this variability in their regression models. Two economic indicator variables were added to the dataset used for this research as well.

The first variable used to control for economic and labor market conditions was Unemployment Rate. This data was obtained from the U.S. Census Bureau's 2015 American Community Survey data and calculated based on the percentage of the civilian labor force age 16 and over who are employed (U.S. Census Bureau, 2020a). The rates were obtained by Virginia zip code and then matched to participant records based on zip code of residence. Unemployment rates by zip code ranged from 0 to 64.9 percent, with an average rate of 8.0 percent and a median unemployment rate of 7.2 percent.

The second control variable for economic conditions was Median Earnings, defined as the median annual earnings for individuals age 16 and over. Median earnings were used because average earnings may be skewed by outliers. These figures were also obtained through 2015 American Community Survey data and reported by zip code (U.S. Census Bureau, 2020a). The range for zip codes in which WIA participants reside was $9,400 to $101,713. A total of 120 participants live in zip codes in which the median individual earnings was suppressed. Each of the suppressed zip codes was in a county or independent city that was outside of an MSA. In order to assign a control variable for earnings to these records, the average for all non-MSA zip

codes was calculated, which was $33,098. Overall, the mean for this variable was $31,831, and the median was $29,585.

Past studies revealed that demographics, including age, gender, race, and ethnicity, can have an impact on employment and earnings (Moore & Gorman, 2009; Dadgar & Trimble, 2015; Bennet & Vedder, 2015; Harper-Anderson, 2018). As a result, select demographic variables were used in this analysis. Age at Exit was determined by subtracting the year of birth from the year that the participant exited the WIA program, therefore, providing the age of each participant at the time that they were searching for employment. Gender was used to create a Female variable with a binary indicator for all participants who identified as female.

Data indicates that Hispanic and Black workers have considerably lower earnings than White and Asian workers, a disparity that holds true across nearly all occupation categories (Bureau of Labor Statistics, 2018). Literature on WIA performance outcomes also showed lower earnings among Hispanic and Black participants (Moore & Gorman, 2009). Research shows that such persistent wage gaps can be partially explained by differences in education, work experience, industry, occupation, or other measurable factors; however, remaining differences that cannot be explained by data are often attributed to discrimination (Patten, 2016). Using the race and ethnicity categories in the WIASRD, participants who had identified as either Black/African American, Hispanic/Latino, or both were assigned a binary indicator of Disadvantaged Minority. A total of 4,844 participants identified as either Black/African American or Hispanic/Latino, and 76 identified as both. This resulted in a total of 4,920 participants (48.6%) who were categorized as disadvantaged minorities and 5,191 (51.3%) who were not identified as disadvantaged minorities.

Highest school grade completed prior to WIA participation is another data element that is collected in the WIASRD, and not surprisingly, this too has been shown to impact employment and earnings (Moore & Gorman, 2009). This is indicated as 1 through 17, representing secondary school grade levels through four years of college and beyond. There were a few additional categories in the data, however, representing attainment of a high school diploma, GED, certificate of completion, other post-secondary degree or certification, and associate's degree. Each of these categories was recoded based on years of education required, for the purpose of this study. Participants who had a high school diploma or GED as their highest education level were identified as having completed 12 years of school. Those with a post-secondary certification were identified as having 13 years of school. Those with an associate's degree were identified as having 14 years of school. This allowed prior education to be examined as a single, interval variable, labeled Highest Education Prior to WIA Participation.

Data Analysis. As demonstrated in the literature, other participant factors outside of geographic location may also influence the relationship between credential attainment and employment outcomes. These were examined as control variables and included: education prior to WIA participation; and demographic factors, including factors such as age, race, and sex. Additionally, local economic factors, consisting of unemployment rates and median individual earnings, were examined as moderator variables in order to control for differing economic and labor market conditions in the various localities. When analyzing results, it was important to consider that education-related credentials, including GEDs, associate's degrees, and bachelor's degrees, provide a different kind of workforce preparation than industry-recognized credentials, which consist of occupational certifications and professional licensures (Association for Career and Technical Education, 2019). Education-related credentials also require more investment of

resources in terms of training dollars as well as the time that it takes for a participant to complete the credential.

The first quantitative research question was:

1. Credential Influence on Employment
    a. Are credentials earned by WIA participants influential in the likelihood of employment?
    b. Are credentials more influential on the likelihood of employment after controlling for rurality?
    c. Is the type of credential influential on the likelihood of employment?
    d. Is the influence of credential type on the likelihood of employment different for urban residents versus rural?

Based on the literature reviewed, it was hypothesized that WIA participants who earned a credential will have a higher likelihood of being employed. Furthermore, the literature on labor market differences between rural and urban areas suggested that job-seekers in rural areas, even those with credentials, may have to contend with unique challenges. As such, it was hypothesized that rurality will have a significant influence on the likelihood of employment. It was also hypothesized that the type of credential earned will influence this relationship, with occupational certifications and licenses resulting in higher employment, particularly in urban areas.

This question was analyzed using binary logistic regression analysis in SPSS version 26, which was appropriate because the dependent variable, employment, is binary. Dichotomous variables for categorical credential attainment fields were used with participants who did not receive a credential serving as the reference variable.

The second quantitative research question was:

2. Credential Influence on Earnings
    a. Are credentials earned by WIA participants influential in determining earnings for those who became employed?
    b. Are credentials more influential on earnings after controlling for rurality?
    c. Is the type of credential influential on earnings?
    d. Is the influence of credential type different for urban residents versus rural?

Based on the literature reviewed, it was hypothesized that obtaining a credential would have a positive influence on earnings. Additionally, it was expected that rurality would have a significant influence on earnings. It was also hypothesized that the type of credential earned would impact this relationship, with occupational certifications and licenses having more influence on earnings, especially in urban areas.

This question was analyzed using ordinary least squares (OLS) regression analysis in SPSS version 26, since the dependent variable, earnings, is a continuous variable. Dichotomous variables for categorical credential attainment fields were used with no credential received serving as the reference variable.

The equations that correspond to each quantitative research question are provided in Table 3.7 below.

Table 3.7

Summary of Research Questions and Corresponding Equations

1. Employment a. Are credentials earned by WIA participants influential in the	$\text{Ln}\left(\frac{P}{1-P}\right)$ $Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7$	Y = Employment (Employed=1) X_1 = Credential Received (Yes=1) X_2 = Gender (Female=1) X_3 = Age X_4 = Disadvantaged Minority (Black and/or Hispanic=1)

	likelihood of employment?		X_5 = Median Earnings X_6 = Unemployment Rate X_7 = Education Prior to WIA Participation
b.	Are credentials more influential on the likelihood of employment after controlling for rurality?	$\text{Ln}\left(\frac{P}{1-P}\right)$ $Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8$	Y = Employment (Employed=1) X_1 = Credential Received (Yes=1) X_2 = Percent Rural X_3 = Gender (Female=1) X_4 = Age X_5 = Disadvantaged Minority (Black and/or Hispanic=1) X_6 = Median Earnings X_7 = Unemployment Rate X_8 = Education Prior to WIA Participation
c.	Is the type of credential influential on the likelihood of employment?	$\text{Ln}\left(\frac{P}{1-P}\right)$ $Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11}$	Y = Employment (Employed=1) X_1 = High School (HS=1) X_2 = Associate's Degree (Assoc.=1) X_3 = Bachelor's Degree or Higher (BA=1) X_4 = Occupational Certificate (Certificate=1) X_5 = Occupational License (License=1) X_6 = Gender (Female=1) X_7 = Age X_8 = Disadvantaged Minority (Black and/or Hispanic=1) X_9 = Median Earnings X_{10} = Unemployment Rate X_{11} = Education Prior to WIA Participation Reference Category = No Credential Received
d.	Is the influence of credential type on the likelihood of employment different for urban residents versus rural?	$\text{Ln}\left(\frac{P}{1-P}\right)$ $Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11}$	Y = Employment (Employed=1) X_1 = High School (HS=1) X_2 = Associate's Degree (Assoc.=1) X_3 = Bachelor's Degree or Higher (BA=1) X_4 = Occupational Certificate (Certificate=1) X_5 = Occupational License (License=1) X_6 = Gender (Female=1) X_7 = Age X_8 = Disadvantaged Minority (Black and/or Hispanic=1) X_9 = Median Earnings X_{10} = Unemployment Rate X_{11} = Education Prior to WIA Participation Reference Category = No Credential Received (Between-groups comparison based on Rural Indicator)

2. Earnings a. Are credentials earned by WIA participants influential in determining earnings for those who became employed?	$\hat{Y} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7$	$\hat{Y}$ = Earnings X_1 = Credential Received (Yes=1) X_2 = Gender (Female=1) X_3 = Age X_4 = Disadvantaged Minority (Black and/or Hispanic=1) X_5 = Median Earnings X_6 = Unemployment Rate X_7 = Education Prior to WIA Participation
b. Are credentials more influential on earnings after controlling for rurality?	$\hat{Y} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8$	$\hat{Y}$ = Earnings X_1 = Credential Received (Yes=1) X_2 = Percent Rural X_3 = Gender (Female=1) X_4 = Age X_5 = Disadvantaged Minority (Black and/or Hispanic=1) X_6 = Median Earnings X_7 = Unemployment Rate X_8 = Education Prior to WIA Participation
c. Is the type of credential influential on earnings?	$\hat{Y} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11}$	$\hat{Y}$ = Earnings X_1 = High School (HS=1) X_2 = Associate's Degree (Assoc.=1) X_3 = Bachelor's Degree or Higher (BA=1) X_4 = Occupational Certificate (Certificate=1) X_5 = Occupational License (License=1) X_6 = Gender (Female=1) X_7 = Age X_8 = Disadvantaged Minority (Black and/or Hispanic=1) X_9 = Median Earnings X_{10} = Unemployment Rate X_{11} = Education Prior to WIA Participation Reference Category = No Credential Received
d. Is the influence of credential type different for urban residents versus rural?	$\hat{Y} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11}$	$\hat{Y}$ = Earnings X_1 = High School (HS=1) X_2 = Associate's Degree (Assoc.=1) X_3 = Bachelor's Degree or Higher (BA=1) X_4 = Occupational Certificate (Certificate=1) X_5 = Occupational License (License=1) X_6 = Gender (Female=1) X_7 = Age X_8 = Disadvantaged Minority (Black and/or Hispanic=1)

	X_9 = Median Earnings X_{10} = Unemployment Rate X_{11} = Education Prior to WIA Participation Reference Category = No Credential Received (Between-groups comparison based on Rural Indicator)

Instrumentation. Reliability was not a significant problem because case management and administrative data collected for federal performance reporting was used. Data entered in the case management system was categorized into established fields and formats, which were defined by a data dictionary that was maintained by USDOL. All staff entering data into the system received training and signed an acknowledgement form, along with their supervisor, to verify that data was accurately and truthfully recorded. The VCCS also provided training and established policies in order to ensure consistent processes for recording data in the case management system. Case managers sometimes relied on WIA participants to self-report their credential attainment and employment; however, supplemental documentation, such as a transcript or pay stub, had to be obtained by the case manager before the information could be entered into the system.

Validity was established through VCCS data validation and monitoring processes in which audit staff visited local workforce offices and reviewed files to ensure that backup documentation supported what was entered into the system. For example, if a particular credential was recorded, then a transcript or copy of that credential with the recipient's name on it must be on file. If supporting documentation was not found during a data validation or monitoring visit, then the local workforce board could be subject to financial penalties. On a quarterly basis, the VCCS was also required to submit the WIASRD file to DOL in order to

generate performance reports. As part of this submission process, records were validated in order to be processed successfully. For instance, if a participant's recorded credential date occurred prior to their training start date, then the record would be flagged as invalid during the WIASRD submission and returned to the VCCS for the error to be resolved.

Confidentiality of Data. Data was extracted from WIASRD by a VCCS staff person other than the researcher and all personally-identifiable information was removed from the dataset. The unique identifier used in the analysis did not include any personal identifiers. VCCS staff converted all dates of birth and dates of exit to the year of birth and year of exit to ensure that participants could not be identified. Furthermore, only aggregate data was included in reports. WIASRD data is owned by the VCCS and the VEC because the case management system is under the VCCS's purview and the wage match data is collected by the VEC through state unemployment insurance records. Both the VCCS and the VEC provided approval for this research.

Limitations. Local case managers are provided periodic training sessions and technical assistance to ensure that data are entered into the case management system consistently and accurately. However, there is still the possibility of data error, which could include incorrect coding of credential type. Since the credential categories can sometimes be confusing, there is the possibility that a professional license may be categorized as an occupational certificate, or vice versa. In addition to limitations of the case management data, there may also be instances where participants had employment and earnings that were not able to be captured in the data. For example, self-employed individuals are not reported in wage match data. Finally, each participant's zip code at the time of WIA participation was used for all geographical analysis. There may be occurrences where individuals moved to or worked in an area that is categorized

differently from their place of residence. Unfortunately, a geographical identifier for the participant's employer was not available in the dataset.

Another limitation to consider is that the dichotomous rural and urban variable categories were determined by classifying all localities with between 50 and 100 percent rurality as rural and those with less than 50 percent rurality as urban. Using a different threshold to make these determinations could change the results. However, it is important to note that redefining these categories would not impact the majority of participants, since most were on the extreme ends of the rural and urban spectrum. For example, a total of 343 participants, or 3.4 percent, lived in localities that were between 50 and 60 percent rural, so they would be reclassified from rural to urban if the rural threshold changed to 60 to 100 percent rurality. This is a very small percentage of the total.

Other limitations to consider have to do with the availability of data fields. Quantitative data is not available to identify job qualifications, such as past work experience or specific technical fields, and these could have an impact on employment and earnings, even for participants with the exact same credential. Furthermore, consistent data on the type of employment that the participant entered was not collected under WIA. As a result, there may be situations where participants obtain jobs in fields that are unrelated to the credential that they earned while in the program. In such a case, it may not actually be the newly earned credential that is influencing employment and earnings.

Availability of data for the earnings analysis is another important limitation to consider when reviewing findings from the current study and those in the literature. This research measured earnings as the average of those received during the 2nd and 3rd quarters after exit, using the data available in the WIASRD. Several past return-on-investment studies, on the other

hand, had access to longitudinal administrative wage records for WIA participants, allowing the analysis of earnings for 10 or more quarters after WIA exit (Hollenbeck, 2009b; Heinrich, et al., 2009). The literature suggested that wage gains for participants who received WIA training continued to increase over time (Hollenbeck, 2009b; Heinrich, et al., 2009), so earnings increases observed in this study may actually be stronger than reported.

Another potential limitation is representation. WIA participants in Virginia were used as a case study for the quantitative analysis, and this selection was appropriate given the focus of the WIA program on providing job-seekers with training that leads to credential attainment. Available data on this population was robust and included a number of variables to evaluate in the regression models. However, it is important to keep in mind that the trends observed may not be representative of all job-seekers in Virginia. Furthermore, Virginia findings may not be the same as those observed in another state. Also, many outside factors, including allocated WIA funds, localized program priorities, economic trends, and availability of training programs can vary by area, and these can also impact participant performance (Hollenbeck, 2009a).

Qualitative Analysis

Population and Sampling. The list of credentials included in Virginia's New Economy Workforce Credential Grant Program and related Standard Occupation Codes (SOC) were used to identify occupation categories to initially target a broad group of employers for the qualitative research (Virginia Career Works, 2020). This group consisted of employers with at least one staff member working in the Computer and Mathematical (SOC 15-0000) occupation group or the Office and Administrative Support (SOC 43-0000) occupation group. These broad occupation categories were targeted because they align with industry credentials that may be valuable for employers but that are not legally required (Cunningham, 2019). Interviews with

employers about the value that they place on credentials are likely to be more telling if the credential is optional, but not required, to perform the job. For example, in order to work as a truck driver, a Commercial Driver's License (CDL) is required by law. Therefore, it is unlikely that there would be much variation in interviews with rural and urban employers about the value of a truck driving credential. As such, an attempt was made to target the interviews toward employers that have at least some positions for which a credential is not required.

Listings of employers meeting the above criteria were obtained from the Virginia Employment Commission (VEC). These listings included data elements used to populate the VEC's Employer Search by Occupation" interactive, online tool (Virginia Employment Commission, 2018). They were provided in a series of 16 separate CSV documents. To further reduce the population before drawing a sample, SAS was used to generate a list of employers with at least 15 employees. This employee minimum was used to ensure that employers selected for the interviews had sufficient experience with hiring processes. The final dataset from which to pull the sample consisted of 47,028 employer records.

These records were then divided by the researcher into separate rural and urban lists. Metropolitan Statistical Area (MSA) was a field assigned to each employer in the file, and these were used to identify employers for the urban list. MSAs are defined as a group of counties or equivalent entities with a high degree of social and economic integration and at least one urbanized area with at least 50,000 people (U.S. Census Bureau, 2020b). Employers that were not located within an MSA were identified as "None" in the VEC data and were used to populate the rural list. The results contained 5,564 rural employers and 41,464 urban employers. As demonstrated in the literature, using MSA designations to distinguish between rural and urban

localities is appropriate for social science and economic research (Cromartie & Bucholtz, 2008; Goetz, Partridge, & Stephens, 2018).

A stratified sampling methodology was used to identify rural employers to contact for phone interviews. The basis for stratifying the sample came from a dataset published by the Bureau of Labor Statistics (BLS), which provides the percentage of individuals who hold professional certifications or licensures, based on the industry category in which they are employed (Bureau of Labor Statistics, 2020b). The BLS industry categories were slightly different from the North American Industry Classification System (NAICS) codes that were assigned to employers in the VEC file. As a result, a crosswalk was created to assign a BLS industry category to each NAICS code, allowing both to appear on each employer record. This crosswalk is provided in Table 3.8, below.

Table 3.8

Crosswalk between NAICS Categories (VEC Data) and BLS Industries

NAICS Category (VEC)	BLS Industry Category
Accommodation and Food Services (72)	Leisure and hospitality
Administrative and Support and Waste Management and Remediation Services (56)	Professional and business services
Agriculture, Forestry, Fishing and Hunting (11)	Agriculture and related industries
Arts, Entertainment, and Recreation (71)	Leisure and hospitality
Construction (23)	Construction
Educational Services (61)	Education and health services
Finance and Insurance (52)	Financial activities
Health Care and Social Assistance (62)	Education and health services
Information (51)	Information
Management of Companies and Enterprises (55)	Professional and business services
Manufacturing (31-33)	Manufacturing
Mining, Quarrying, and Oil and Gas Extraction (21)	Mining, quarrying, and oil and gas extraction
Miscellaneous	Other services
Other Services, except Public Administration (81)	Other services
Professional, Scientific, and Technical Services (54)	Professional and business services

Public Administration (92)	Public administration
Real Estate and Rental and Leasing (53)	Financial activities
Retail Trade (44-45)	Retail trade
Transportation and Warehousing (48-49)	Transportation and utilities
Utilities (22)	Transportation and utilities
Wholesale Trade (42)	Wholesale trade

Licenses are issued by government entities and provide individuals with the legal authority to perform an occupation, while certifications are issued by non-governmental entities to certify that an individual has specific job skills (Bureau of Labor Statistics, 2020b). Employers are legally required to hire individuals with a license for certain occupations, such as a truck driver, nurse, or teacher. Certifications, on the other hand, are not required by law, giving employers the flexibility to drive their demand (Cunningham, 2019). Since the focus of the qualitative analysis was to better understand employer preferences for credentials, BLS data on individuals with a certification but without a license was used to inform the sampling methodology (Bureau of Labor Statistics, 2020b). Based on these percentage distributions, sample sizes were identified for each industry category. SAS was then used to select a stratified sample of 100 employers from the rural listing. The sample sizes by industry category are provided in table 3.9.

Table 3.9

Stratified Sample for Rural Employers Based on Industry

BLS - Industry Category	BLS - Percent of Individuals with a Certification but without a License	Percent of Total	Sample Size
Financial activities	3.5%	11.5%	12
Professional and business services	3.0%	9.9%	10
Mining, quarrying, and oil and gas extraction	2.9%	9.5%	10
Other services	2.7%	8.9%	8
Education and health services	2.5%	8.2%	8
Manufacturing	2.2%	7.2%	8

Wholesale trade	2.1%	6.9%	8
Information	2.1%	6.9%	6
Public administration	1.9%	6.3%	6
Construction	1.9%	6.3%	6
Transportation and utilities	1.8%	5.9%	6
Leisure and hospitality	1.4%	4.6%	4
Retail trade	1.3%	4.3%	4
Agriculture and related industries	1.1%	3.6%	4

Source: Bureau of Labor Statistics, 2020b

Several research methodologists (Maxwell, 2005; Creswell, 2009) have noted that random sampling is not necessary for qualitative research. Instead, purposeful selection is often used to select participants that will best help the researcher gain knowledge and insight of the question being asked (Patton, 2015). For this study, a combination of stratified sampling and purposeful selection was used. The list of rural employers was selected using the stratified sampling method described above. When the rural employers were contacted, many were not interested in participating in the research, were not permitted by company leadership to do so, or they could not be reached. After attempts to contact 67 employers on the rural list, interviews were conducted with 9 rural employers. One additional interview with a rural employer in the wholesale industry was scheduled but cancelled as the COVID-19 pandemic began to impact the United States.

Given the challenges encountered in recruiting employers through the stratified sampling methodology, purposeful selection was used to select the list of urban employers. Based on the industry categories of the rural employers that were interviewed, similar employers from the urban list were selected, and attempts were made to contact them. As part of the purposeful selection process, internet searches were conducted to identify a specific human resources contact or hiring manager to call. Attempts were made to contact 60 urban employers, and 10

interviews were conducted. An additional interview was also scheduled with an urban employer in the accommodation and food services industry, but it was cancelled due to the COVID-19 situation.

A total of 19 employer participants were interviewed for the qualitative component of this study, consisting of 9 rural and 10 urban employers. Geographically, these employers were located around the commonwealth. Most of the rural employers were located in the southwest, south central, and eastern parts of the state. The urban employers were predominately located in northern Virginia, central Virginia, and the Hampton Roads area.

To the extent possible, efforts were made to purposefully sample urban employers that matched the industry categories represented by the employers that participated in the rural interviews. For example, a YMCA, television station, local government agency, home healthcare provider, and poultry processing plant were all represented in both the rural and urban groups. Table 3.10 outlines characteristics for the employers that were interviewed, including size range, broad industry category, and detailed industry information.

Table 3.10

Characteristics of Employers Interviewed

Identifier	Size	Industry Category	Detailed Industry
Rural 7	15-49	Health Care and Social Assistance	Home Health Care Services
Rural 9	15-49	Health Care and Social Assistance	Child and Youth Services
Rural 16	15-49	Information	Software Publishers
Rural 20	100+	Accommodation and Food Services	Traveler Accommodation
Rural 21	100+	Manufacturing	Animal Slaughtering and Processing
Rural 23	50-99	Manufacturing	Nonmetallic Mineral Product Manufacturing

Rural 39	15-49	Public Administration	Executive, Legislative, and Other Government Support
Rural 66	100+	Information	Television Broadcasting
Rural 95	50-99	Utilities	Electric Power Distribution
Urban 6	15-49	Health Care and Social Assistance	Home Health Care Services
Urban 17	15-49	Information	Newspaper, Periodical, Book, and Directory Publishers
Urban 18	100+	Information	Television Broadcasting
Urban 21	100+	Health Care and Social Assistance	Child and Youth Services
Urban 22	15-49	Manufacturing	Primary Metal Manufacturing
Urban 24	15-49	Manufacturing	Animal Slaughtering and Processing
Urban 41	50-99	Public Administration	Executive, Legislative, and Other Government Support
Urban 48	15-49	Wholesale Trade	Lumber and Other Construction Materials Wholesalers
Urban 49	15-49	Wholesale Trade	Hardware, Plumbing, and Heating Equipment Wholesalers
Urban 60	50-99	Finance and Insurance	Real Estate Credit

Data Collection. Employers selected in the sample were contacted via phone to recruit for interviews. The script for telephone recruitment is provided in Appendix B. Phone numbers were available in the employer listings provided by the VEC, but prior to calling, the researcher searched employer websites to determine whether specific contact information for a hiring manager or human resources professional could be obtained. Recruitment efforts were focused on hiring managers and human resources professionals because they were most likely to have knowledge of the hiring processes and the criteria that are used to screen and select job applicants, including criteria related to credential attainment. In a couple of instances,

particularly for smaller employers, the researcher was referred to the company owner or president, who was interviewed instead.

A few employer representatives were immediately available upon being reached by telephone, in which case the interview took place at that time. Several others accepted the researcher's offer to set up a subsequent call for an interview. Three employers contacted asked that the researcher send an email with details about the study so that they could decide whether to participate. Many employers in the sample either could not be reached or declined participation. In some cases, the contact information provided in the VEC file was incorrect or outdated. Employers were contacted for recruitment up to three times, and voicemail messages were left for many but not returned. For those that declined participation, reasons provided included outsourced responsibility for hiring decisions, such as through corporate headquarters, as well as company prohibitions from participating in research.

In order to respect the time of interviewees and to encourage participation, interviews were kept to a maximum timeframe of 20 minutes with most lasting approximately 15 minutes. Prior to starting the interviews, an oral consent form was read, and interview participants were informed about the research. A copy of the oral consent script is provided in Appendix C. Participants were assured that their names and the names of their employers would remain confidential, and they were told that their participation was completely voluntary and could be withdrawn at any time. Contact information for the VCU IRB and for the researcher was provided. Interviewees were also informed that their conversations would be recorded for the sole purpose of transcribing notes. After obtaining consent from each participant, the Otter Voice Meeting Notes application was used to record each interview and transcribe the conversations.

Phone interviews, as opposed to in-person interviews, were selected as the data collection tool for this research since they provided a quick and convenient way to reach out to many different employers across the commonwealth. Also, the topic being discussed was not sensitive in nature; therefore, there was not a great need for the researcher to look for unspoken cues or consider facial expressions and mannerisms when conducting the interviews. The interview questions were straight-forward and action-based. In keeping with the QUAN→qual explanatory sequential design for this study, specific interview questions were finalized after the quantitative data analysis was complete (Creswell & Clark, 2018). The interviews were designed to collect supplemental data to provide context to the quantitative analysis and further uncover themes that relate to the theories explored in the literature. Since the employers interviewed hire staff for an array of different positions, the interviews were semi-structured. This gave the researcher the flexibility to ask follow-up questions that were relevant and to skip questions that were not applicable. A list of interview questions is provided below, and it is also available in Appendix D.

- What is your company's process for selecting candidates to interview for a given job?
- What are the main factors that you use to screen resumes submitted by job applicants?
- What qualities do you look for in job candidates?
- How do you weigh past work experience compared to credential attainment for job applicants?
- Is there a certain amount of work experience or specific skills that would compensate for an applicant's lack of a credential?

- Which credentials does your company value most when considering job candidates? (i.e., degrees, industry certifications, professional licenses, badges/micro-credentials) Why are these credentials important to you?
- Do you consider whether a credential was earned in the classroom or online when reviewing job applicant qualifications?
- Do you encourage current employees to pursue any specific training? If so, does the training lead to a credential?
- What is your biggest challenge in hiring qualified job candidates?
- What are some of your solutions to these challenges?
- Does your company have interaction with the public workforce system? (For example, does your company work with your local workforce one-stop center to advertise job openings or does a representative from your company serve on your local workforce development board?)

The traditional social science research interview was the type of qualitative inquiry used. Through this approach, the researcher used standardized interviewing tactics, such as using follow-up probes to gain more information, documenting answers to questions without interpreting responses, and maintaining a neutral, professional relationship with the interviewee (Patton, 2015).

Data Analysis. As is customary with an explanatory sequential design, qualitative data was collected and analyzed after the quantitative data analysis was complete. The qualitative data analysis sought to gain a better understanding of the role that credentials play in hiring decisions, as well as any other qualifications or factors that are considered by employers when screening

job applicants and selecting job candidates. Qualitative data collected from rural and urban employers was compared to uncover any differences between the two.

The qualitative research question was:

3. Employer Perceptions of Credentials
    a. How do credentials impact the hiring decisions of urban employers differently than rural employers?
    b. Does the type of credential that a job-seeker has impact hiring decisions?

Recording transcriptions of the interviews were identified based on whether they were obtained from rural or urban employers, and size ranges and industry categories were assigned to each. All transcripts were imported into Dedoose version 7.0.23 and thoroughly reviewed while listening to the recordings. Memos were written to document the researcher's thoughts and observations. The researcher then used content analysis and open coding to identify patterns among the responses (Grbich, 2013; Salmona, Lieber, & Kaczynski, 2019). Transcripts and recordings were reviewed several times to ensure consistent and comprehensive coding. Through inductive reasoning, the assigned codes were used to develop common themes, which were reported as generalized qualitative findings (Creswell, 2009). These were then related back to the theories explored in the literature, and they were used to provide context and additional explanation to supplement the quantitative findings (Creswell & Clark, 2018).

Figure 3.1 is a word cloud with frequencies of the various codes that were assigned through the content analysis. A complete codebook with a description of each code is provided in Appendix E.

Figure 3.1

Word Cloud with Frequencies of Qualitative Codes

Instrumentation. Validity is an area of concern for qualitative data collection since researchers must ensure that data collection tools are valid for the intended purpose (Grbich, 2013). To ensure validity, the researcher had to verify the integrity of the interview questions to make sure that they were clear to those being interviewed and that they collected information as intended. To address this concern, pilot interviews were conducted with acquaintances of the researcher, and feedback was used to clarify the questions. Reflexivity can often be a concern in qualitative research since researchers often select topics that they have prior knowledge of or experience with, which could create biases (Grbich, 2013). In this study, the researcher is an employee of the VCCS, which is a training provider used by many employers. When conducting outreach to employers, the researcher did not use this affiliation in any way to encourage participation. The researcher identified as a doctoral student and explained that this was an independent study to fulfill a dissertation requirement. In order to achieve valid results from the interviews, it was important for the researcher to remain objective and avoid showing emotion or reflection when asking interview questions. Coding was done solely by the primary researcher, as opposed to a team of research assistants, which minimized risks of issues with inconsistent

coding methodology. A codebook was created to provide a description for each code used in the analysis.

Confidentiality of Data. Employers voluntarily participated in interviews, and they were informed that their identities would remain anonymous. The names of participants and their employers were not disclosed in any research materials. Data collected through the interviews was summarized and reported in a manner that did not reveal identifying characteristics about the employers. Although employer size ranges, industry categories, and rural/urban designations were reported, specific geographic identifiers were not revealed in the data.

Limitations. A significant challenge encountered when conducting this study was recruiting employers to participate. During the planning process, phone calls were identified as a promising method for recruitment since they provide convenience for both the researcher and the participants. Upon implementation, however, this recruitment method proved to be difficult. The phone numbers provided in the VEC listing were usually customer contact lines, so it was difficult to use them to connect with the appropriate employer contact who is responsible for hiring decisions. Upon calling, the researcher was typically connected to a voicemail recording or central operator, and attempts to secure an interview through those methods were often unsuccessful. By incorporating a purposeful sampling strategy that also considered the availability of contact information on employer websites, the researcher was able to recruit the targeted number of employers.

Every effort was made to include employers from similar industries in both rural and urban areas. This attempt was made since industry can be a factor that impacts an employer's hiring practices. There may be additional factors as well that could not be considered in the sampling. These may include familiarity with credentials, as well as unique employer

characteristics, such as training requirements, organizational culture, or current employees. Furthermore, it is important to consider the possible impact of nonresponse bias on these results. There may be similar characteristics among the employers that choose not to participate in this study or those that could not be reached through phone calls, which could be telling if included in the results.

Another possible limitation is that the individual who was interviewed may have had different viewpoints than other colleagues who also influence hiring decisions. The interview participants were either hiring managers or human resources professionals; however, there may be factors impacting hiring decisions that are outside of their purview. For example, a company owner may hire an acquaintance without regard to the job qualifications that are typically sought.

Representation should be considered as a possible limitation. Employer interviews were conducted with a very small sample of overall employers in Virginia. Every effort was made to ensure that the sampling procedures were strategic and provided the best opportunity for gaining pertinent information for this qualitative analysis, but there is certainly the possibility that a separate group of employers selected in the same manner may provide different responses.

Finally, it is important to acknowledge that this study consisted of two different sets of analyses that targeted different populations and used different methodologies. The quantitative data analysis focused on job-seekers who met the specific qualifications to participate in the WIA program. While WIA participants may have pursued employment opportunities offered by the employers included in the qualitative analysis, there was no direct connection between the WIA program and the employers that were selected. The employer interviews were simply intended to provide insight from a demand perspective to add context to the quantitative analysis that focused on the supply of job-seekers.

Summary of Analyses

This study used mixed methods in order to examine research questions using both a quantitative and qualitative approach. Although the trends uncovered through the quantitative analysis may not relate directly to those observed in employer/job-seeker dynamics examined in the qualitative analysis, the data collected through these two separate components are complimentary of each other. Below is a table that summarizes the research questions, hypotheses, and methods.

Table 3.11

Summary of Research Questions, Hypotheses, and Methods

Research Question	Hypothesis	Methods
1. Credential Influence on Employment		
a. Are credentials earned by WIA participants influential in the likelihood of employment?	Credentials will be influential on the likelihood of employment.	Quantitative - Logistic Regression
b. Are credentials more influential on the likelihood of employment after controlling for rurality?	Rurality will have a significant influence on the likelihood of employment.	Quantitative - Logistic Regression
c. Is the type of credential influential on employment outcomes?	Occupational certifications and licenses will be most influential on the likelihood of employment.	Quantitative - Logistic Regression
d. Is the influence of credential type on the likelihood of employment different for urban residents versus rural?	Certifications and licenses will have the most influence on the likelihood of employment for urban residents.	Quantitative - Logistic Regression
2. Credential Influence on Earnings		
a. Are credentials earned by WIA participants influential in determining earnings for those who became employed?	Credentials will be influential on earnings.	Quantitative - Ordinary Least Squares Regression

b. Are credentials more influential on earnings after controlling for rurality?	Rurality will have a significant influence on earnings.	Quantitative - Ordinary Least Squares Regression
c. Is the type of credential influential on earnings?	Occupational certifications and licenses will be most influential on earnings.	Quantitative - Ordinary Least Squares Regression
d. Is the influence of credential type different for urban residents versus rural?	Certifications and licenses will have the most influence on earnings for urban residents.	Quantitative - Ordinary Least Squares Regression
3. Employer Perceptions of Credentials		
a. How do credentials impact the hiring decisions of urban employers differently than rural employers?	N/A	Qualitative - Thematic Analysis
b. Does the type of credential that a job-seeker has impact hiring decisions?	N/A	Qualitative - Thematic Analysis

A QUAN→qual explanatory sequential design is the most appropriate design for this study since it offered the researcher an opportunity to test the relationship that credentials have with employment and earnings using quantitative data, while also examining the role of rurality. Furthermore, the collection and analysis of qualitative data provided context to quantitative findings and answered lingering questions about the role of credentials in screening and signaling. The rural and urban designations used were informed by the literature and allowed for new findings to be contributed to the limited body of research on the relationship between rurality, credentialing, and employment.

Chapter 4: Findings

Quantitative Findings

As described in previous chapters, this study used quantitative data to analyze the impact of credential attainment on employment and earnings, with a focus on identifying whether there are differences in this relationship for residents of rural areas, versus urban ones. Quantitative research questions were as follows:

1. Credential Influence on Employment
    a. Are credentials earned by WIA participants influential in the likelihood of employment?
    b. Are credentials more influential on the likelihood of employment after controlling for rurality?
    c. Is the type of credential influential on the likelihood of employment?
    d. Is the influence of credential type on the likelihood of employment different for urban residents versus rural?
2. Credential Influence on Earnings
    a. Are credentials earned by WIA participants influential in determining earnings for those who became employed?
    b. Are credentials more influential on earnings after controlling for rurality?
    c. Is the type of credential influential on earnings?
    d. Is the influence of credential type different for urban residents versus rural?

Correlations

Prior to starting the quantitative analysis, correlation coefficients were examined for all of the variables included in the regression models, in order to determine how closely related they

are. This step is important to ensure that each variable serves a unique purpose in the model, resulting in little to no multicollinearity.

Statistically significant correlations were observed among many of the variables examined. Of particular interest is the significant positive correlation between the independent and dependent variables. Table 4.1 shows the correlations between each variable. Credential received and employment had a significant, positive correlation ($r=.107$, $n=10,111$, $p<.01$), as did credential received and earnings ($r=.057$, $n=10,111$, $p<.01$). The geographic variable, percent rural, did not have a statistically significant relationship with credential received, suggesting that a participant's level of rurality did not influence whether or not they received a credential through WIA training. When examined with employment and earnings, however, percent rural had significant correlations to both. Percent rural had a positive correlation with employment ($r=.046$, $n=10,111$, $p<.01$) and a negative relationship with earnings ($r=-.045$, $n=10,111$, $p<.01$), indicating that increased levels of rurality correlate with increased likelihood of employment but decreased earnings.

When considering the predictor variables, the two control variables for economic and labor market factors, median earnings and unemployment rates in the locality of residence, had a negative relationship ($r=-.482$, $n=10,111$, $p<.01$). Not surprisingly, this suggests that earnings rise as unemployment declines.

Consistent with the literature showing lower rates of employment and earnings for minorities, disadvantaged minority had a negative relationship with both employment ($r=-.028$, $n=10,111$, $p<.01$) and earnings ($r=-.095$, $n=10,111$, $p<.01$). Age also had a negative relationship with employment ($r=-.052$ $n=10,111$, $p<.01$) but a positive relationship with earnings ($r=.106$,

n=10,111, p<.01), suggesting that younger participants had greater levels of employment and older participants had greater earnings. Female participants had lower earnings than males, as shown by the variable's negative relationship with earnings (r=-.177, n=10,111, p<.01). Finally, education prior to WIA participation had a positive relationship with employment (r=.023, n=10,111, p<.05) and earnings (r=.244, n=10,111, p<.01) confirming that those with higher education levels before starting their training had increased employment and earnings.

Table 4.1

Pearson's Correlation of Values for All Participants

	Participant Employment	Participant Earnings	Credential Received	Percent Rural (Locality)	Median Earnings (Locality)	Unemployment Rate (Locality)	Disadvantaged Minority	Age at Exit	Female	Education Prior to WIA Participation
Participant Employment	1	.419**	.107**	.046**	.022*	-.055**	-.028**	-.052**	-.015	.023*
Participant Earnings	.419**	1	.057**	-.045**	.182**	-.124**	-.095**	.106**	-.177**	.244**
Credential Received	.107**	.057**	1	.006	.044**	-.029**	-.022*	0	-.016	.034**
Percent Rural (Locality)	.046**	-.045**	.006	1	-.303**	-.022*	-.311**	-.079**	-.003	-.270**
Median Earnings (Locality)	.022*	.182**	.044**	-.303**	1	-.482**	.014	.162**	-.049**	.344**
Unemployment Rate (Locality)	-.055**	-.124**	-.029**	-.022*	-.482**	1	.158**	-.104**	.032**	-.156**
Disadvantaged Minority	-.028**	-.095**	-.022*	-.311**	.014	.158**	1	-.114**	.102**	-.026**
Age at Exit	-.052**	.106**	0	-.079**	.162**	-.104**	-.114**	1	-.111**	.236**
Female	-.015	-.177**	-.016	-.003	-.049**	.032**	.102**	-.111**	1	-.025*
Education Prior to WIA Participation	.023*	.244**	.034**	-.270**	.344**	-.156**	-.026**	.236**	-.025*	1

*N = 10,111; * p<.05 level (2-tailed); ** p<.01 level (2-tailed)*

Do Credentials Influence Employment?

Binary logistic regression models were used to examine whether credentials earned through WIA training were influential in determining the likelihood of employment. To address

each sub-question relating to the influence of credentials on employment, four regression models were created with new variables incorporated in each one. Demographic data and economic indicators were included as control variables. Since the universe of participants was used for this analysis, as opposed to a sample, statistical significance is not a driving factor in evaluating each variable's influence. Statistical significance is, however, still reported in the findings.

All necessary assumptions were considered prior to running the binary logistic regression models. Sample size was not a concern since the data includes all WIA participants meeting the research criteria. Descriptive statistics were examined for each predictor variable, as reported in Chapter 3, and no outliers were identified for the variables used in the logistic regression models. The correlations reported in Table 4.1, above, did not identify any issues with multicollinearity. Furthermore, collinearity diagnostics were examined, and the tolerance levels ranged from .628 to .997. This confirmed that the logistic regression models do not contain highly intercorrelating variables.

Credential Influence on Employment. The first question examined whether receiving a credential through WIA training influenced the likelihood of a participant being employed during their 2nd quarter after exit from the program. This was analyzed in Logistic Regression Model 1, which was statistically significant, x^2 (7, N=10,111) = 187.774, p<.001, suggesting that the model was able to distinguish between participants who were employed and those who were not. The model explained between 1.8 percent (Cox and Snell R square) and 3.0 percent (Nagelkerke R squared) of the variance in employment.

Table 4.2, below, shows the strongest predictor of employment was the credential variable, with an odds ratio of 1.76. This indicates that participants who received a credential

through WIA training were almost twice as likely to be employed, compared to those who did not receive a WIA credential. Disadvantaged minority (B=-.12) and female (B=-.09) had a negative relationship with employment, suggesting that participants who were minority and female were less likely to gain employment than those who were not. Age at exit (B=-.02) also had a negative relationship, indicating that as age increases, the odds of employment decreases. Education prior to WIA participation (B=.04) had a positive relationship with employment, showing that higher prior education levels increased the likelihood of employment. Local area unemployment rates (B=-.04) also had a negative relationship with participant employment, demonstrating that those who lived in areas with lower unemployment rates had an increased likelihood of gaining employment. Local area median earnings was not statistically significant and did not have an influence on the model.

Table 4.2

Logistic Regression Predicting the Likelihood of Employment Based on Credential Received (Logistic Regression Model 1)

	B	S.E.	Wald	p	Odds Ratio
Credential Received(1)	.56	.05	107.93	.000	1.76
Female(1)	-.09	.05	2.83	.092	.91
Disadvantaged Minority(1)	-.12	.05	4.99	.025	.89
Age at Exit	-.02	.00	43.01	.000	.99
Education Prior to WIA Participation	.04	.02	7.10	.008	1.04
Median Earnings (Locality)	.00	.00	.33	.563	1.00
Unemployment Rate (Locality)	-.04	.01	21.67	.000	.96
Constant	1.62	.24	46.74	.000	5.06

Credential Influence on Employment, Considering Rurality. The second question also examined whether having a credential influenced the likelihood of employment, but this

time rurality was also included as a predictor variable. This variable consisted of the percent of each participant's zip code of residence that was considered rural. Logistic Regression Model 2 examined this relationship. The model remained statistically significant, x^2 (8, N=10,111) = 206.801, p<.001, and explained between 2.0 percent and 3.3 percent of the variance in employment, slightly more than the previous one. Results are shown in Table 4.3, below. With an odds ratio of 1.39 for percent rural, this model suggested that after holding all other factors constant, participants who lived in rural localities (closer to 100 percent rural) had a greater likelihood of employment compared to those who lived in urban locales (closer to 0 percent rural). The strongest predictor of employment remained credential received through WIA with an odds ratio of 1.75.

Table 4.3

Logistic Regression Predicting the Likelihood of Employment Based on Credential Received and Rurality (Logistic Regression Model 2)

	B	S.E.	Wald	p	Odds Ratio
Credential Received(1)	.56	.05	106.34	.000	1.75
Percent Rural (Locality)	.33	.08	18.70	.000	1.39
Female(1)	-.09	.05	2.95	.086	.91
Disadvantaged Minority(1)	-.04	.06	.54	.461	.96
Age at Exit	-.01	.00	40.89	.000	.99
Education Prior to WIA Participation	.06	.02	11.90	.001	1.06
Median Earnings (Locality)	.00	.00	.30	.587	1.00
Unemployment Rate (Locality)	-.03	.01	16.23	.000	.97
Constant	1.14	.26	19.11	.000	3.14

Influence of the Type of Credential on Employment. The third question examined whether the type of credential obtained by WIA participants influenced the likelihood of

employment. A dichotomous variable was included for each credential category, with the omitted reference category consisting of WIA participants who did not obtain a credential while in the program. This model, Logistic Regression Model 3, was statistically significant, x^2 (13, N=10,111) = 201.411, p<.001, and explained between 2.0 and 3.2 percent of the variance in employment. As shown in Table 4.4., every type of credential had a positive relationship with employment, suggesting that all credentials earned by WIA participants increased their likelihood of gaining employment. The credential that was the strongest predictor of employment was associate's degree with an odds ratio of 2.25, meaning that participants who received an associate's degree as the result of their WIA training were more than twice as likely to become employed, compared to WIA participants who did not earn a credential. This was followed by occupational license with an odds ratio of 2.18, bachelor's degree with an odds ratio of 2.15, other credential with an odds ratio of 1.72, and occupational certificate with an odds ratio of 1.65. Graduate degree had a very high odds ratio; however, there were only 3 participants in the dataset who received a graduate degree through WIA, so this is not a significant finding.

Table 4.4

Logistic Regression Predicting the Likelihood of Employment Based on Type of Credential Received (Logistic Regression Model 3)

	B	S.E.	Wald	p	Odds Ratio
High School Diploma Received	.35	.51	.48	.487	1.42
Associate's Received	.81	.12	46.00	.000	2.25
Bachelor's Received	.76	.41	3.52	.061	2.15
Graduate Degree Received	19.89	23190.08	.00	.999	432376490.52
Occupational License Received	.78	.11	47.70	.000	2.18
Occupational Certificate Received	.50	.06	76.53	.000	1.65
Other Credential Received	.55	.16	11.21	.001	1.72

Female(1)	-.08	.05	2.23	.135	0.92
Disadvantaged Minority(1)	-.10	.05	3.64	.057	0.90
Age at Exit	-.02	.00	43.86	.000	0.99
Education Prior to WIA Participation	.05	.02	8.18	.004	1.05
Median Earnings (Locality)	.00	.00	.07	.791	1.00
Unemployment Rate (Locality)	-.04	.01	20.46	.000	0.97
Constant	1.53	.24	40.95	.000	4.62

Influence of the Type of Credential on Employment for Rural and Urban Participants. The final sub-question examining the influence of credentials on employment sought to determine whether the influence of credential type on employment differed between rural and urban participants. For this question, a disaggregated model was created to analyze the likelihood of employment for participants living in rural and urban localities separately. Based on the rural indicator variable described in Chapter 3, there were 3,104 participants who were considered rural and 7,007 who were urban. Logistic Regression Model 4 was statistically significant for rural participants (x^2 (13, N=3,104) = 56.296, p<.001) and urban participants (x^2 (13, N=7,007) = 162.448, p<.001). The model explained between 1.8 percent and 3.1 percent of the variance in employment for rural participants and between 2.3 and 3.7 percent for urban.

As shown in Table 4.5, below, associate's degree produced the highest likelihood of employment for rural participants, with a 2.15 odds ratio, followed by other credential with an odds ratio of 2.07, occupational certificate with an odds ratio of 1.77, and occupational license with an odds ratio of 1.73. For urban participants, bachelor's degree resulted in the highest odds of employment, with a 2.77 increase over those who did not earn a WIA credential; however, this finding was not statistically significant. Urban participants who obtained an occupational

license from WIA training were 2.40 times as likely to obtain employment, those who earned an associate's degree were 2.25 times as likely, those who gained an occupational certificate were 1.61 times as likely, and those who achieved another credential were 1.59 times as likely to become employed, compared to participants who did not receive a credential while participating in WIA. Directional relationships between the other predictor variables and employment remained similar to previous models, with the exception of disadvantaged minority. In urban localities, disadvantaged minorities were less likely to be employed with an odds ratio of 0.88, but in rural areas, disadvantaged minorities were 1.29 times more likely to be employed, compared to those who were not minority. The results of the disaggregated model demonstrated that all types of WIA credentials increase the odds of employment for rural and urban participants, but associate's degrees and other credentials appear to have the greatest influence on employment in rural areas, while occupational license and associate's degree produced the highest employment odds in urban areas.

Table 4.5

Disaggregated Logistic Regression Predicting the Likelihood of Employment Based on Type of Credential Received for Rural and Urban Participants (Logistic Regression Model 4)

	Rural		Urban	
	B	Odds Ratio	B	Odds Ratio
High School Diploma Received	.00	1.00	.44	1.55
Associate's Received	.77**	2.15	.81**	2.25
Bachelor's Received	.47	1.60	1.02	2.77
Graduate Degree Received	19.97	472565899.59	19.88	429445797.43
Occupational License Received	.55**	1.73	.88**	2.40
Occupational Certificate Received	.57**	1.77	.48**	1.61
Other Credential Received	.73*	2.07	.47**	1.59
Female(1)	-.22*	0.80	-.03	0.97
Disadvantaged Minority(1)	.26*	1.29	-.13	0.88

Age at Exit	-.01**	0.99	-.02**	0.98
Education Prior to WIA Participation	.03	1.03	.06**	1.07
Median Earnings (Locality)	.00	1.00	.00	1.00
Unemployment Rate (Locality)	-.02	0.99	-.05**	0.95
Constant	1.30	3.66	1.51	4.55

** p<.05 level; ** p<.01 level*

Do Credentials Influence Earnings?

Ordinary least squares (OLS) regression models were used to examine the influence of credentials received by WIA participants on earnings, based on average quarterly wages during the 2nd and 3rd quarters after their exit from the program. Like the logistic regression analysis, four models were created to examine each sub-question related to earnings. The models included a variable to measure rurality, and demographic and economic indicator variables were used as control variables. The purpose of these models is to explain the influence that the group of predictor variables has on earnings and the relationship that each individual predictor variable has with earnings.

After excluding participants who did not receive earnings during the given timeframe, 7,418 participant records remained available for the OLS analysis. Since this was a subset of the total participant records that were examined in the binary logistic regression models, Pearson's correlations were reexamined. As shown in Table 4.6, below, there were no changes to the direction of the relationship between variables, compared to the correlations reported for all participants in Table 4.1. All positive relationships remained so, as did negative ones. There was only one change to statistical significance. When examined only for participants with earnings, the correlation between female and education prior to WIA participation was no longer statistically significant. Aligning with the literature reviewed, percent rural had a negative

relationship with earnings (r=-.083, n=7,418, p<.01), female had a negative relationship with earnings (r=-.227, n=7,418, p<.01), and disadvantaged minority had a negative relationship with earnings (r=-.119, n=7,418, p<.01). Credential received through WIA had a positive relationship with earnings (r=.050, n=7,418, p<.01), as did education prior to WIA participation (r=.344, n=7,418, p<.01).

Table 4.6

Pearson's Correlation of Values for Participants with Earnings

	Participant Earnings	Credential Received	Percent Rural (Locality)	Median Earnings (Locality)	Unemployment Rate (Locality)	Disadvantaged Minority	Age	Female	Education Prior to WIA Participation
Participant Earnings	1	.050**	-.083**	.264**	-.151**	-.119**	.197**	-.227**	.344**
Credential Received	.050**	1	.006	.038**	-.028*	-.023*	-.011	-.013	.026*
Percent Rural (Locality)	-.083**	.006	1	-.305**	-.025*	-.305**	-.054**	-.022	-.269**
Median Earnings (Locality)	.264**	.038**	-.305**	1	-.472**	.018	.147**	-.037**	.333**
Unemployment Rate (Locality)	-.151**	-.028*	-.025*	-.472**	1	.159**	-.109**	.034**	-.147**
Disadvantaged Minority	-.119**	-.023*	-.305**	.018	.159**	1	-.134**	.122**	-.026*
Age at Exit	.197**	-.011	-.054**	.147**	-.109**	-.134**	1	-.104**	.212**
Female	-.227**	-.013	-.022	-.037**	.034**	.122**	-.104**	1	-.017
Education Prior to WIA Participation	.344**	.026*	-.269**	.333**	-.147**	-.026*	.212**	-.017	1

*N = 7,418; * p<.05 level (2-tailed); ** p<.01 level (2-tailed)*

Assumptions. Prior to running the OLS models, it was important to confirm the assumptions of multiple regression. With a dataset representing the full target population and containing 7,418 cases, as well as 13 predictor variables in the largest model, it could be assumed that the sample size was sufficient. The Pearson's correlations shown in Table 4.6 did not suggest any issues with multicollinearity. The highest correlation between predictor variables

was -.472, which was between unemployment rates and median earnings. This correlation is not high enough to cause concern. Collinearity statistics for predictor variables were also examined in each OLS model, and they supported the assumption that there are no issues with multicollinearity. Ranges for the collinearity tolerance levels are reported with each model. Because the universe of participants with earnings was analyzed in the OLS models, as opposed to just a sample of participants, it was not necessary to assess the assumptions of normality, linearity, and homoscedasticity. Furthermore, outliers were retained in the dataset since they represented valid participant earnings.

Credential Influence on Earnings. The first question examined the influence of a credential earned through WIA training on quarterly earnings for participants who became employed. The R Square for OLS Regression Model 1 was .206, indicating that the model explained 20.6 percent of the variance in earnings. The ANOVA table confirmed statistical significance of the model ($p<.001$). Collinearity statistics showed tolerance levels ranging from .693 for median earnings to .997 for credential received, supporting the assumption that there is no risk of multicollinearity in the model.

As shown in Table 4.7, the credential received variable was statistically significant (beta=.03, $p<.001$) with a positive influence on earnings. After accounting for all factors in the model, earning a credential through WIA training had a positive $406 influence on quarterly earnings. The standardized coefficients indicate that education prior to WIA participation was the variable with the strongest unique contribution to the model (beta=.27, $p<.001$). Earnings were predicted to increase by $858 based on each year of education prior to WIA participation. The female variable also had a strong, unique contribution (beta= -.20, $p<.001$), but it was negative. The model showed that being female had a negative influence of $2,169 in quarterly

earnings. Disadvantaged minority was also statistically significant with a negative influence of $835 on earnings (beta=-.08, p<.001). Age was statistically significant as well (beta=.09, p<.001), with the model showing a positive earnings influence of $39 for each additional year of age. Median earnings was statistically significant with a slightly positive influence (beta=.15, p<.001). Unemployment rate was not statistically significant.

Table 4.7

Ordinary Least Squares Regression Model Predicting Earnings Based on Credential Influence (OLS Regression Model 1)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-7336.36	521.70		-14.06	.000
	Credential Received	406.04	125.98	.03	3.22	.001
	Female	-2168.63	115.03	-.20	-18.86	.000
	Disadvantaged Minority	-835.27	116.09	-.08	-7.20	.000
	Age at Exit	39.22	4.91	.09	7.97	.000
	Education Prior to WIA Participation	858.37	35.69	.27	24.05	.000
	Median Earnings (Locality)	.08	.01	.15	12.04	.000
	Unemployment Rate (Locality)	-16.22	17.63	-.01	-.92	.358

Credential Influence on Earnings, Considering Rurality. The second question examined the influence of the variables on earnings, but this time rurality was also included as a predictor variable. Again, the R Square demonstrated that the model explains about 20.6 percent of the variance in earnings, and the model was statistically significant (p<.001). There were no changes to the range of collinearity tolerance levels for included variables.

As shown in Table 4.8, in OLS Regression Model 2, the rurality variable was not statistically significant and had very little influence on the model's prediction of earnings (beta=.02, p=.202); however, the slight influence that rurality did have was positive. WIA credential attainment continued to show a positive influence on earnings (beta=.03, p<.001), with a predicted increase of $404. All other predictor variables produced similar results as the model above.

Table 4.8

Ordinary Least Squares Regression Model Predicting Earnings Based on Credential Influence (OLS Regression Model 2)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-7663.74	581.37		-13.18	.000
	Credential Received	403.90	125.99	.03	3.21	.001
	Percent Rural (Locality)	207.10	162.31	.02	1.28	.202
	Female	-2168.82	115.03	-.20	-18.85	.000
	Disadvantaged Minority	-788.96	121.62	-.07	-6.49	.000
	Age at Exit	39.37	4.92	.09	8.00	.000
	Education Prior to WIA Participation	867.68	36.42	.27	23.82	.000
	Median Earnings (Locality)	.08	.01	.15	11.92	.000
	Unemployment Rate (Locality)	-12.77	17.83	-.01	-.72	.474

Influence of the Type of Credential on Earnings. The next question examined the influence of credential type on earnings. This model, OLS Regression Model 3, was statistically significant (p<.001) and explained about 21 percent of the variance in earnings. No changes were observed in the collinearity tolerance levels. As shown in Table 4.9, associate's degree was the

strongest statistically significant credential variable that influenced earnings (beta=.07, p<.001). The model predicted a positive influence of $1,471 on earnings of participants who received an associate's degree through WIA, compared to those who did not earn a credential. Occupational certificate was also influential in the model (beta=.03, p<.05), with a predicted earnings increase of $279. All credentials positively influenced earnings.

Table 4.9

Ordinary Least Squares Regression Model Predicting Earnings Based on Type of Credential Received (OLS Regression Model 3)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-7594.04	527.49		-14.40	.000
	High School Diploma Received	1909.29	1115.55	.02	1.71	.087
	Associate's Received	1470.87	230.98	.07	6.37	.000
	Bachelor's Received	452.13	753.57	.01	.60	.549
	Graduate Degree Received	3399.06	2788.60	.01	1.22	.223
	Occupational License Received	222.83	220.05	.01	1.01	.311
	Occupational Certificate Received	279.48	132.42	.03	2.11	.035
	Other Credential Received	170.33	347.92	.01	.49	.624
	Female	-2180.58	115.50	-.20	-18.88	.000
	Disadvantaged Minority	-772.66	116.54	-.07	-6.63	.000
	Age at Exit	37.80	4.92	.08	7.69	.000
	Education Prior to WIA Participation	870.76	36.03	.272	24.17	.000
	Median Earnings (Locality)	.09	.01	.156	12.51	.000
	Unemployment Rate (Locality)	-13.95	17.62	-.009	-.79	.429

Influence of the Type of Credential on Earnings for Rural and Urban Participants.

Finally, OLS regression was used to analyze the influence of credential type on earnings, comparing results for participants living in rural and urban areas. To examine this, OLS Regression Model 4 was a disaggregated model using the rural indicator variable, with 2,338 rural participants and 5,083 urban. The model was statistically significant for rural participants ($p<.001$), and the variables explained approximately 15.5 percent of the earnings variance. It was also statistically significant for urban participants ($p<.001$), and the variables explained about 22.1 percent of the earnings variance. For rural participants, collinearity statistics showed tolerance levels ranging from .664 for occupational certificate to .995 for graduate degree received. For urban participants, collinearity statistics depicted tolerance levels ranging from .530 for median earnings to .995 for graduate degree. Despite these changes, there were still no concerns about multicollinearity.

Table 4.10 provides the results, which show that associate's degree was the most influential credential for both rural (beta=.10, $p<.01$), and urban participants (beta=.07, $p<.01$). For rural WIA participants who earned an associate's degree, the model predicted a positive earnings influence of $1,099, compared to rural participations who did not receive a credential. Likewise, for urban participants who earned an associate's degree, the model predicted an increase of $2,045. Other credential received through WIA was also statistically significant for rural participants (beta=.04, $p<.01$), and it showed an increase in predicted quarterly earnings of $946; however, this credential category had a negative correlation with predicted earnings for urban participants. All remaining credential types showed earnings increases in both rural and urban areas, but they were not statistically significant. The amount of earnings increase attributed to each credential type varied between rural and urban participants. High school diploma

produced higher earnings in rural areas with an increase of $2,425, compared to an increase of $1,091 for urban participants. Bachelor's degrees, on the other hand, produced greater earnings for urban participants, with an increase of $1,002, compared to $225 for rural. Occupational license demonstrated an earnings increase of $396 in rural areas and $98 in urban ones, and occupational certificate showed an earnings increase of $306 for rural participants and $247 for urban. Graduate degree produced very high earnings for both rural and urban participants, but this was not a significant finding, as only a very small number of WIA participants earned a graduate degree while in the program.

For rural and urban participants, being female had a strong negative influence on predicted earnings (rural beta=-.27, p<.01; urban beta=-.18, p<.01). In rural areas, the earnings penalty for female participants was $2,197, and in urban areas, it was $2,128. Disadvantaged minority was also influential on earnings for rural and urban participants (rural beta=-.07, p<.01; urban beta=-.06, p<.01). Being a disadvantaged minority predicted a $640 earnings decline for rural participants and a $766 decline for urban participants. Another highly influential factor in predicting earnings was education prior to WIA participation (rural beta=.14, p<.01; urban beta=.30, p<.01). For each year of education prior to participation, the model predicted that earnings gains of $449 for rural participants and gains of $974 for urban.

Table 4.10

Disaggregated Ordinary Least Squares Regression Model Predicting Earnings Based on Type of Credential Received for Rural and Urban Participants (OLS Regression Model 4)

	Rural		Urban	
	B	Beta	B	Beta
(Constant)	-2881.93		-8222.16	
High School Diploma Received	2425.28	.04	1090.79	.01
Associate's Received	1098.95	.10**	2044.75	.07**

Bachelor's Received	224.90	.01	1002.26	.01
Graduate Degree Received	4775.85	.03	3204.76	.01
Occupational License Received	395.91	.03	97.90	.00
Occupational Certificate Received	306.28	.04	246.58	.02
Other Credential Received	945.66	.04**	-256.92	-.01
Female	-2196.69	-.27**	-2127.51	-.18**
Disadvantaged Minority	-639.70	-.07**	-766.31	-.06**
Age at Exit	38.06	.11**	35.53	.07**
Education Prior to WIA Participation	448.77	.14**	974.15	.30**
Median Earnings (Locality)	.10	.13**	.07	.14**
Unemployment Rate (Locality)	12.78	.01	-52.77	-.03

** p<.05 level; ** p<.01 level*

Summary of Quantitative Findings. The quantitative findings displayed a strong, statistically significant, positive relationship between credential attainment by WIA participants and their likelihood of employment after exiting the WIA program. Participants who received credentials through WIA training were 1.76 times more likely to be employed than those who received training but did not obtain a credential. After considering rurality, the strong positive relationship between credential attainment and employment remained, and results indicated that the odds of employment were higher for credential recipients in rural areas. As credential type was included in the analysis, associate's degree produced the greatest likelihood of employment with a 2.25 odds ratio over participants who did not receive a WIA credential. This was followed by occupational license with a 2.18 odds ratio. Finally, a disaggregated model was analyzed, which showed associate's degree as the credential type with the greatest likelihood of predicting employment in rural areas, followed by other credential. For urban participants, bachelor's degree produced the greatest likelihood of employment, followed by occupational license.

For the earnings analysis, OLS results found that earning a credential through WIA training had a positive impact on participants' earnings with a predicted increase of $406. However, the variable with the strongest unique influence on earnings was education prior to WIA participation, which produced an increase of $858 for each additional year of schooling. Being female and being a disadvantaged minority had a strong, statistically significant, negative influence on predicted earnings. As rurality was factored into the model, it was found to have very little influence on earnings, and it was not statistically significant. Overall, the type of credential with the greatest, statistically significant influence on predicted earnings was the associate's degree, followed by the occupational certificate. All credential types produced higher predicted earnings when compared to those for participants who did not earn a credential. When a disaggregated model was examined to analyze rural and urban results separately, associate's degree remained the strongest, statistically significant credential type to influence predicted earnings for both rural and urban participants. Earning an associate's degree through WIA training produced double the earnings increase in urban areas, compared to rural, however. The other credential category had a statistically significant, positive influence on predicted earnings for rural participants but a negative influence for urban. All additional credential types analyzed in the disaggregated model produced earnings increases for both rural and urban participants, compared to WIA participants in the same rural/urban categories who did not earn credentials. High school diploma produced large increases for both rural and urban participants, with the predicted increase for rural participants at more than twice that of urban. Bachelor's degrees produced greater increases for urban participants, while occupational licenses and occupational certificates appeared to be more influential on earnings in rural areas.

What Are Employer Perceptions of Credentials?

Transcripts from employer interviews were analyzed in order to identify common themes in employer perceptions of credentials, as well as differences between rural and urban employer hiring preferences and considerations. As discussed in Chapter 3, an attempt was made to target employers that hire for occupations in which credentials are optional but not required. The interview conversations revealed, however, that most of the employers hire for an array of positions with varying credential requirements. The following research questions were addressed using qualitative data.

3. Employer Perceptions of Credentials
    a. How do credentials impact the hiring decisions of urban employers differently than rural employers?
    b. Does the type of credential that a job-seeker has impact hiring decisions?

Credential Preferences of Employers. Over 84 percent of the employers interviewed (16 out of 19 employers) responded that their credential requirements and preferences vary depending on the job. For certain occupations that require a credential, such as nursing aides, chemists, and engineers, a specific industry certification or academic degree is required; therefore, candidates must have one in order to be hired. Even for jobs that do not have credential requirements, employers still showed a preference for credentials, but they considered credential attainment in conjunction with a number of other factors. As shown in the summary of code assignments in Table 4.11, overall, the urban employers interviewed expressed greater preferences for credentials. Six of the 10 urban employers indicated that a credential is preferred or required, and another 3 urban employers stated that credentials benefit job-seekers in the hiring process. For the rural employers, 4 out of 9 indicated that a credential is preferred or required, and an additional employer discussed credentials as a plus for job candidates.

Table 4.11

Code Assignments for Credential Preferences of Interviewed Employers

Locality Type	Credential is Preferred/Required	Credential is a Plus	Credential is Not Necessary	Total
Rural	44% (4)	11% (1)	44% (4)	100% (9)
Urban	60% (6)	30% (3)	10% (1)	100% (10)

While the above findings are certainly relevant to the inquiry examined in this study, the interviews with employers revealed a much more complex consideration of job-seeker qualifications. Employers from both rural and urban areas discussed the consideration that they give to a job-seeker's credential attainment status, while also pointing out other qualifications that they desire. When asked about the role of credentials in considering job candidates, one employer stated:

> "I look to see if they have them. They are nice to have, but it's not something that is really going to determine whether I bring someone in or not. In the end, it's about what they are trying to accomplish and how they are going to better the organization, as opposed to certification." (Rural 7).

Another employer pointed to the difference between occupations that require a specific credential and those that do not. Both rural and urban employers indicated that they would not hire someone who was not qualified to perform the job. For some positions, this means that the individual hired must have a specific credential. In situations in which a credential is not a job requirement, however, employers often use their own discretion to evaluate candidates based on various qualifications. As one employer indicated:

> "If it's a position that requires a specific certification or license, then obviously work experience isn't going to replace that. But otherwise, work experience would be fine. Again, it is very job-specific." (Rural 95)

A few employers acknowledged that credentials are sometimes used as an initial screening tool for decisions about which candidates to consider for a particular position. However, they also pointed out that after initial screening has taken place, there may be additional qualifications that are more effective at predicting a candidate's success on the job. One employer noted:

> "In my opinion, you know, a degree gets you in the door. It shows that you have the ability to learn and the ability to complete something. But, your experience in the industry shows how effective you are at being able to lead and effect change." (Urban 22)

A hiring manager reflected on the role of his own credential in getting him through the screening process, as he attempted to secure his current position. Once hired, however, job performance became a higher priority. This individual said the following about his credential:

> "I think it got my foot in the door for the manager training program, which does require a degree, but once I got in, it didn't matter that I had it anymore. It was all performance-based." (Urban 49)

Employers also mentioned that earning a credential can speak to an applicant's dedication and perseverance, and these qualities can translate to employment success. In some cases, the actual skills gained through training and knowledge gained through education may be of less importance than the fact that the job-seeker demonstrated persistence in completing their program of study and successfully attained a credential. Below is an employer quote on this topic.

> "I like to see a college degree if I can get one, and I'll tell you why that is. What a degree indicates is not necessarily an expertise in the field that they got the degree in, but it

shows that an individual can come in and stick with something. It shows that they can see something through." (Rural 95)

Although the interviews suggested that slightly more urban employers preferred or required credentials as a job qualification, the conversations with employers uncovered much more depth about this issue. Furthermore, the discussions demonstrated more similarities between the rural and urban employers in terms of how they use credentials for decision-making. Responses from both rural and urban employers suggested that credentials are important. For certain occupations, they are necessary to prove that a candidate has the required skills to perform the job. For other jobs, however, credentials may be of benefit to inform employers about knowledge and skills gained, or they may serve employers in a completely different way by suggesting an applicant may have certain unmeasurable job qualities.

Rural and Urban Demand for Credentials. Both rural and urban employers explained that their hiring decisions are based on a combination of many factors, including credentials. Clear distinctions between rural and urban perceptions of credentials were not evident. However, a component of the interviews that was very telling in distinguishing between rural and urban employers was the difference in their responses to the question about challenges that they have in hiring qualified job candidates. Employers from both groups talked about current economic conditions and the impact of declining unemployment rates in producing smaller and less qualified applicant pools. Both also mentioned that they were competing with other employers for the best candidates. Only rural employers, however, talked about the many challenges that they have in attracting and retaining credentialed and qualified employees to work for them because of their location. As one hiring manager (Rural 23) stated, "In our location, finding a candidate who is attracted to a rural setting – that is the biggest challenge."

Rural employers discussed the lack of amenities and activities in their area and the impact that it has on the willingness of job candidates to live and work there. They reported that with limited opportunities for experiences like shopping and extracurricular activities, many of the more qualified applicants, based on their personal desires or those of their family members, choose to live and work in more populous areas. The following comment was from an employer in the hospitality sector. She noted that many tourists visit the area, but it is a challenge to hire workers since few people wish to live there.

> "Because we are in a rural area, we have a hard time getting workers to come here."…"It is a beautiful area, but a lot of people are looking for towns and cities and different things to do, and if you are used to a bigger city, sometimes people are not happy here." (Rural 20)

One rural employer also discussed the role that the local school system has on their ability to hire qualified candidates, noting that job-seekers with children often opt to live in an area that has stronger schools. Below is a statement from this hiring manager.

> "There are a lot of people who would be interested in a general labor position, but when it comes to skilled positions, there are not necessarily a lot of candidates. Over the years, we have brought candidates in for interviews, and they do not want to relocate here. It is very rural. There is a lack of amenities, and it is very challenging to get people to relocate here, particularly if they have children." (Rural 95)

Overall, six of the nine rural employers interviewed discussed challenges associated with hiring locally, given a limited supply of credentialed job candidates. Strategies that they use to mitigate these difficulties include hiring employees who live elsewhere and allowing them to work remotely, adjusting their credential requirements or preferences, where possible, and

considering an applicant's ties to the local area when making hiring decisions. One rural hiring manager, who discussed a particular position that is especially difficult to fill, indicated that they were working to try to change the requirement that the successful candidate have a bachelor's degree in a specific field, in an effort to ease the hiring burden. Another rural employer mentioned that they try to recruit and attract graduates from local colleges with the hope that they may have local connections that will encourage them to stay. As noted below, retention of qualified candidates is a significant challenge for this employer.

> "The biggest challenge is finding someone qualified enough who is going to stay and wants to live here. A lot of people in our business end up migrating to the larger metro areas." (Rural 66)

An additional relevant finding that distinguished rural and urban employers related to hiring decisions based on the company's mission. Interestingly, two employers, both in rural locations, discussed their mission to provide opportunity to job-seekers who may often be overlooked by other employers. Both indicated that credentials are not a necessary job qualification for them. Instead, they give consideration to hiring candidates who lack qualifications that are typically desired by other employers. One employer described their company as a faith-based organization, and she explained that this affiliation encourages hiring managers to provide a second chance to individuals who may have had inconsistent employment histories or past criminal convictions. Another talked about instances where inexperienced candidates without credentials were able to learn and grow into successful employees after being given a job opportunity, despite the fact that they did not meet more traditional job qualifications. Although these differences did not relate specifically to the value that these

employers place on credentials themselves, they did unveil unique reasons why credentials are not a requirement for them.

Employer Demand Based on Credential Type. The rural and urban employers that were interviewed discussed different types of credentials that they value. These included academic degrees, as well as work-related credentials, including certifications and licenses. Again, the preference for specific types of credentials depended greatly on the type of position and related requirements for specific job duties. Occupations including commercial truck drivers and electricians were mentioned as having very defined credential requirements, since they require a license or certification to ensure that the employee has the necessary skills to perform the job safely. Other occupations, some of which are filled predominantly by college graduates, appeared to be more flexible though. A few employers remarked that many of their current staff have degrees; however, they were willing to consider candidates without a degree if the individual had other qualifications that align with the position. Below is a comment on such a situation.

> "This is a professional environment. Usually, we are looking at somebody who has a college degree, but I don't feel like they have to have a college degree. If they've got 5, 10, 15, or 20 years of relevant work experience, they have learned how to handle the question of "where did you go to school". I just don't think it's that big of a deal." (Urban 17)

Only two of the interviewed employers, both of them urban, mentioned a preference for graduate degrees for specific positions. Despite these preferences, however, they stressed that a credential is still just one of several qualifications considered in their evaluation of candidates. One employer offered the following:

> "I'll tell you, a lot of times those with a bachelor's degree and other experience might go ahead of someone with a master's degree, just based on their overall resume and what they have to offer." (Urban 18)

Areas of study for preferred credentials included those that relate to computer proficiencies, occupational safety, languages spoken frequently in the workplace, and other specific skills relevant for the industry. Furthermore, employers were asked about any preferences that they have for credentials that were awarded as the result of classroom training versus online training. Most indicated that they would not prioritize one over the other when considering candidates' credentials. Several did acknowledge, however, that they personally see more benefit to classroom training. As one employer (Urban 21) stated when asked this question, "You want to say no, but it is kind of a yes. I mean, just being there. But, it is 2020 and online is what it is." Another employer pointed out that many non-traditional students who complete online training are also juggling work and family commitments, which is a testament to their dedication and perseverance.

Looking toward the future, one employer suggested that credentials will increase in prominence as work environments become more virtual and employers need to validate the skills of workers who may be hired remotely. She said:

> "The next generation of workers is going to rely much more heavily on credentials."…"If the labor market stays as tight as it is now, we're going to have to rely on credentials in order to know whether people are really able to demonstrate the skills needed to do the job." (Rural 16)

Additional Qualifications Considered by Employers. Overwhelmingly, both rural and urban employers mentioned numerous factors that they consider when screening applicants and

evaluating qualifications. Credential attainment was one of these, but a host of other considerations were uncovered as well, many of which are considered along with credentials. As stated by one hiring manager (Urban 22), “A degree doesn’t show all of your skill sets. It is just one piece of the puzzle.”

In addition to credentials, qualifications that employers discussed included communication skills, fit with the organization’s culture, experience, personality traits, the ability to work well with others, and soft skills, such as punctuality, work ethic, and dependability. Experience was the qualification that was offered most frequently by both rural and urban employers. Below are two quotes from employers of a similar size, the first in the utilities industry and the latter in finance. Both statements recognize the value of experience, particularly when combined with other factors.

- “We love to see job stability. We love to see experience. We love to see education. And, we like to see things in the resume or application that lead us to believe that the person is going to add value to the organization.” (Rural 95)
- “Generally speaking, unless there is a need for a formal education for a specific job, we do not really dwell on education history. It is more about experience, level of expertise through that experience, and whether or not they are a hard worker, a quick learner, and a good culture fit.” (Urban 60)

Personality was frequently discussed as well, with more urban employers mentioning it as a desired qualification. When asked about credential preferences, one employer (Urban 49) stated “Certifications are great, but they have to be in addition to having the right personality too.” The employers interviewed appeared to value personality as a trait that allows new hires to

connect to customers, as well as fellow employees. If a candidate lacks training or experience, that gap can be addressed by providing them with an opportunity to learn. Several employers indicated that they offer on-the-job training, as well as financial support for education and training opportunities offered by local providers and industry associations. As the employer below noted, personality, however, cannot be changed.

> "The number one thing is personality. When I say personality, I'm saying is this a person who I would enjoy being around every day and is this a person who would be a good fit for my company. With regard to what a person's experience is or their training is, there are a lot of things you can do to help with that, but if the personality isn't right, you can't fix it." (Urban 17)

Hiring a candidate who is a good fit with the organization's culture was another priority concern for both the rural and urban employers interviewed. The following two employers discussed the importance of selecting a candidate who not only has the skills and qualifications to perform the job, but who also displays teamwork skills and a commitment to the organization's values.

- "We're really looking at the individual and their personality and does it seem like they have the aptitude to learn the work. I'm really looking at whether they are going to be a good fit with the rest of the team." (Rural 23)
- "Culture fit is really number one for us, and I would say credentials are right up there, but they are number two. We're not going to hire someone who is not qualified for the job, but culture fit is just super important for us." (Urban 21)

The employer interviews confirmed the use of credentials as a tool for screening job candidates. Some of the other qualifications discussed, however, may be a bit more challenging

to assess. When asked to elaborate on how they gain information from candidates on other qualities such as experience, personality, and culture fit, responses included background checks, referrals and reference checks, tests and assessments, and interviews. In many cases, credential attainment information provided in a candidate's resume, along with information gathered through these additional screening tools, are used in tandem by employers as they decide which job-seeker to consider for a position.

Summary of Qualitative Findings. The qualitative analysis found that credentials play an important role in employer hiring decisions, but the findings revealed a number of nuances in how and why credentials are considered by employers. Conversations with both rural and urban employers suggested that credential requirements and preferences are heavily dependent on the type of job being filled. Furthermore, several of the interviews also suggested that employer requirements and preferences for credentials are impacted by the supply of credentialed job-seekers. More of the urban employers interviewed expressed a requirement or preference for job candidates to have a specific credential, but several urban employers also commented that much of their current workforce and many of their job applicants are credential holders. Credential requirements were not as strong among the rural employers, and there was less indication that the current workforce is made up of credential recipients.

The greatest distinction between the responses from rural and urban employers were evident when they were asked about challenges impacting their hiring processes. The rural employers consistently expressed unique challenges related to hiring credentialed and otherwise qualified candidates, due to the circumstances of rural living. They talked at length about difficulties that they have in hiring and retaining qualified employees because many do not want to live in a rural area. Credential type also appeared to have an impact on employer hiring

decisions, but once again, this consideration was occupation-specific, rather than region-specific. There did not appear to be clear differences in the types of credentials preferred by rural versus urban employers.

A finding of note, which was evident for both rural and urban employers, was that credentials were typically considered in screening and hiring decisions, along with a number of other factors. These typically include other qualifications, such as experience, personality, culture fit, and soft skills. Rural and urban employers both expressed a desire for qualifications such as these, and an inclination toward screening applicants for them, in addition to credentials. Of all the employers interviewed, there were not any that indicated that they screen applicants based solely on credentials.

Chapter 5: Discussion and Conclusions

Discussion of Findings

This study used both quantitative and qualitative data analysis to examine the role of credentials in influencing employment and earnings outcomes for rural and urban WIA participants. Under WIA, training was offered to adults and dislocated workers who had a difficult time securing and maintaining employment (Bancroft, 2002). Adult WIA participants often had a barrier, such as being low income, basic skills deficient, or homeless. Dislocated workers were either unemployed or expected to become unemployed as the result of a layoff. The literature demonstrated relatively consistent data supporting the linkage between obtaining a credential and securing employment, in addition to positive correlations between credentials and earnings (Wolman, Lichtman, & Barnes, 1991; Arkes, 1999; Oreopoulos & Petronijevic, 2013). However, the research also suggested a number of other factors that intermingle with these relationships, including demographic characteristics, credential type, and occupation requirements, as well as the supply of credentialed workers in the labor market (Holzer, 1996; Goldin & Katz, 2008; Carnevale, Rose, & Cheah, 2011; Patten, 2016). Furthermore, the literature revealed that residents of rural areas have unique employment challenges and a tendency to feel that broad public policy initiatives do not always support their interests (Slack, 2014; Wallmeyer, 2016).

Past research consistently demonstrated the value of credentials. This study provided further support for previous studies by confirming the influence of credentials on employment and earnings. The findings extend prior knowledge by showing that the influence of credentials is different for rural versus urban credential holders. Overall, a stronger influence on the likelihood of employment was observed for credentialed job-seekers in rural areas. Furthermore,

this research quantified the differences in each type of credential's influence between rural and urban areas. A positive influence was observed for almost all credential types across all areas, but most specific types of credentials had the greatest influence on employment and earnings in urban areas. While it was evident from the literature that employers value credentials, this research also highlighted the challenges faced by rural employers in attracting credentialed workers to areas that are deficient of amenities.

Credential Influence on Employment. The quantitative data analyzed demonstrated a strong positive relationship between credentials attained through WIA training and the likelihood of employment. This finding supports past research on performance outcomes for federally-funded workforce programs, including return-on-investment studies suggesting that WIA training positively influenced employment outcomes for adult participants (Hollenbeck, 2009b; Andersson et al., 2013).

As a new research contribution, this study also sought to understand whether there was a difference in the connection between credential attainment and employment odds, based on whether a participant lived in a rural or urban area. The data demonstrated this to be true; however, the relationship was not as expected. Based on the literature describing rural labor market conditions and the associated challenges that impact job-seekers (Gibbs, Kusmin, & Cromartie, 2011; Wallmeyer, 2016), it was hypothesized that urban participants would have greater employment gains after obtaining a credential. Instead, the relationship between overall credential attainment and employment was stronger for rural participants who received a credential during WIA training. This suggests that earning a credential through WIA may actually be more influential for securing employment in rural labor markets. This was a surprising finding, given the many barriers to education and employment that plague rural labor

markets, including lack of public transportation, scarce childcare providers, and inconsistent supportive services (Partridge & Rickman, 2006; Berry, 2008). However, as rural areas have changed in recent decades, Florida (2017) pointed out that urban areas have as well, with large concentrations of highly-educated and creative people flocking to cities. As literature on credential inflation suggested, this increase in the number of credentialed people living in urban areas may have served to reduce the value of the credentials (Collins, 2002; Jacobs, 2004; Bankston, 2011). Likewise, the scarcity of credentialed job-seekers in rural areas may increase the value of credentials there.

When considering the types of credentials that participants earn after WIA training, all credentials had positive correlations with employment but to varying degrees. In the literature, Ewart and Kominski's (2014) research indicated that associate's degrees predict significant increases in employment odds, while Harper-Anderson (2018) found this to be the case for occupational licenses earned by WIA participants. This study supported both of those findings, as associate's degrees and licenses earned through WIA produced the greatest odds of employment, respectively.

When the influence of odds on employment for rural and urban WIA participants was examined separately, the odds of being employed increased for credential earners in all credential categories. In rural areas, participants who earned an associate's degree were found to have the greatest likelihood of employment, followed by the other credential category. In urban areas, occupational license produced the greatest, statistically significant, odds on employment, followed by associate's degree. While all credential categories produced positive results, the degree to which each credential was influential on the odds of employment varied between urban and rural participants. Compared to rural, urban credential earners had greater odds of

employment in the associate's degree, occupational license, bachelor's degree, and high school diploma categories, but lower odds in the occupational certificate and other credential categories. These findings suggest that some types of credentials are more influential in urban areas, and others are more influential in rural areas.

Given the Pearson's correlations and the research uncovered in the literature, it was expected that the economic indicator variables tied to participant localities would be influential on the odds of employment. Median individual earnings were expected to have a positive relationship with the likelihood of employment, while unemployment rates were expected to have a negative relationship. This was not the case, however, with both of these control variables having little to no influence on the odds of employment.

Credential Influence on Earnings. The data showed that credential attainment had positive correlations with predicted earnings for exited program participants. This finding reinforced prior studies about the broad linkages between credentials and higher wages (Carnevale, Rose, & Cheah, 2011; Oreopoulos & Petronijevic, 2013). It also provided support for research showing connections between credential attainment for WIA participants and increased earnings (Hollenbeck, 2009b; Heinrich, et al., 2009; Harper-Anderson, 2018). In addition to credentials earned by WIA participants, the variable that had the most influence on earnings was education level prior to WIA participation. This is not surprising and may actually provide further support for the connection between credential attainment and earnings. As shown in the descriptive statistics provided in Table 3.2, participants can enter the WIA program with varying levels of education, and many already have academic degrees and/or industry-recognized credentials. Since education prior to WIA participation speaks to credentials that participants

earned before enrolling, this control variable's correlation with earnings also supports the linkage between overall credential attainment and earnings.

Once again, this study incorporated an examination of rurality as a new contribution to the research on credentials and earnings. Including the rurality variable in the overall regression model was not significant in predicting participant earnings and did very little change to the results. Rural and urban differences in the relationship between credentials and earnings were observed, however, in the disaggregated results discussed below.

Overall, all credential types had a positive influence on predicted earnings, supporting previous WIA research findings suggesting the same (Harper-Anderson, 2018). Earnings predictions varied heavily by credential type with increases ranging from $170 for other credential to $3,399 for a graduate degree. The credential types with the strongest influence on earnings were associate's degrees and occupational certifications. These had statistically significant, positive coefficients, suggesting predicted earnings increases in the amounts of $1,471 and $280, respectively.

Associate's degree produced the highest statistically significant earnings increase for both rural and urban participants, but the amount of increase was almost twice as much in urban areas, compared to rural areas. Furthermore, the other credential category predicted earnings gains for rural participants and an earnings penalty for urban. The literature on earnings by credential type (Ewart & Kominski, 2014; Renski, 2018, Harper-Anderson, 2018) pointed to occupational certificates and licenses as having strong correlations with increased earnings. The rural and urban findings also displayed earnings gains for participants who earned certificates and licenses; however, this observed relationship was neither strong, nor statistically significant. As was observed in the analysis on the likelihood of employment, the magnitude of earnings gains varied

by credential type and between the rural and urban participant groups. These findings suggest that the value of specific types of credentials can vary between rural and urban labor markets.

Demographic characteristics, specifically being female and/or a disadvantaged minority, had a strong influence on earnings, reinforcing past research suggesting wage gaps based on gender and race (Moore & Gorman, 2009; Patten, 2016). Being female was actually far more influential on earnings than credential attainment, with an earnings penalty of $2,067 for females. Being Black and/or Hispanic also had a negative influence on earnings, as the disadvantaged minority variable resulted in a $691 decline in earnings.

In the disaggregated rural analysis, being female was the most influential factor, surpassing that of credential received and education prior to WIA participation. This finding provides support to literature that discussed some of the challenges of accessing supportive services in rural areas and its impact on employment. Childcare services are scarce in rural areas, and childcare is a burden that often falls more heavily on women (Partridge & Rickman, 2006; Berry, et al., 2008). This may impact the availability to work and, therefore, earnings potential of female participants.

Employer Preferences for Credentials. The employers who were interviewed for the qualitative component of this study relayed that their credential preferences depend heavily on the type of job being filled. As discussed in the literature on credentials (Carnevale & Desrochers, 2001; Bureau of Labor Statistics, 2020b), the employers confirmed that when hiring for a job that requires a professional license and/or an academic degree, job candidates must have the specified credential. For other kinds of jobs, however, there is typically a little more flexibility and employers exercise discretion when determining who to hire. Overall, the qualitative data seemed to support the quantitative findings that showed a positive relationship

between credentials and employment outcomes. Employers suggested that credential training is a valuable investment, and they indicated that they consider credentials in their hiring decisions. Aligning with screening theory, employers responded that they take notice of credential attainment when reviewing job-seeker resumes, and they ask job candidates about their credentials during interviews. Several employers stated that the value of a credential goes beyond simply serving as an attestation of skills learned in school, by also demonstrating a commitment to learning and a candidate's ability to do so. These statements provide support for Arkes' (1999) finding that credentials influence employer assumptions about unobserved abilities of job-seekers, including motivation and perseverance.

With regard to credential type, employers value academic credentials, most commonly bachelor's degrees. They also discussed preferences for occupational certificates demonstrating computer proficiencies, an understanding of workplace safety protocols, and other specific job skills. Despite the literature suggesting that employers prefer credentials awarded by public training providers (Deming et al., 2016), the employers interviewed did not express a preference for a particular type of provider. Several stated that as long as the institution is accredited, they consider the credential to be valid. Furthermore, there did not seem to be a clear preference between online and in-class training providers. Some interviewees noted the benefit of in-person classes but acknowledged that technology has allowed online learning to become more prevalent.

The employers interviewed for this study appeared to be more flexible about hiring a qualified candidate who lacks a bachelor's degree, despite Holzer and Lerman's (2007) findings showing an increase in jobs requiring a bachelor's degree or higher. However, it is important to consider that this finding was observed in transcripts for urban employers, and they acknowledged that a majority of applicants have a bachelor's degree. As a result, employer

flexibility to hire those without a degree may be an exception rather than a typical occurrence, and it may be something that happens more often in non-rural areas.

Perhaps one of the more notable findings from the qualitative research was that while credentials were *a* factor considered by many employers, they definitely were not *the* factor. The employers discussed many additional considerations that play a role in their hiring decisions, including experience, personality traits, technical skills, soft skills, communication, and culture fit. This finding provides support for previous research stating that basic skills, teamwork, and a positive work ethic are all qualifications that are valued by employers (Ohren & Reese, 1999). Also, aligning with the literature on "negative credentials" (Pager, 2003, p. 942; Hickox & Roehling, 2013), a couple of employers mentioned background checks as a tool used to screen applicants so they can identify whether candidates have past criminal convictions. For job-seekers with a criminal past, credentials may be less relevant to their success in the job market because some employers will not consider them for employment, regardless of their credentials.

Supply of Credentialed Employees in Rural Areas. Another telling takeaway from the employer conversations was the stark difference in the challenges faced by rural and urban employers, as they seek to hire credentialed and otherwise qualified employees. Employers from both groups talked about the tight labor market and the fact that they are competing with other companies for a small pool of candidates. Only the rural employers, however, discussed difficulties that they have in recruiting and retaining qualified job candidates. This occurrence was often attributed to the characteristics of the local area. Several rural employers pointed to a lack of amenities in their region and the impact that it has on qualified candidates' desire to live there. They mentioned that people who enjoy living near shopping centers and having varied opportunities for activities typically seek jobs in cities, severely limiting their pool of qualified

candidates. This finding aligned with the literature on rural labor market challenges, which discussed growing out-migration of qualified job-seekers and suggested that some people find the physical isolation and lack of opportunity in rural areas unappealing (Slack, 2004; Slack, 2014; Wallmeyer, 2016; Bostic, 2017). An additional body of literature that adds context to this finding is Florida's (2002) writing on the "creative class." This work discussed the influence of museums, restaurants, and availability of experiential activities in attracting talented and creative workers to cities (Florida, 2002).

How and Why Employers Use Credentials for Decision-Making. The interview findings provide support for the literature on screening (Spence, 1973; Bills, 2003), as some employers acknowledged the use of credentials to categorize and make decisions about job-seeker qualifications. Sometimes credentials provided explicit information to employers about an individual's job skills, such as cases where job candidates passed an exam or skill assessment and earned a certification or license. Other times, employers used credentials to gain more implicit information about prospective employees, such as their dedication and ability to learn. This study uncovered examples of using credentials for both purposes.

While employers discussed using credentials as an initial screening tool, it was apparent that many additional factors were considered in final hiring decisions. Two such factors that were mentioned frequently by both rural and urban employers were personality and culture fit. This finding brings up the debate uncovered in the literature in which human capital theorists and credentialist theorists expressed different opinions about why employers value credentials (Bills, 2003; Walters, 2004). It was evident through the discussions that value is placed on job candidates' cultural competencies, aligning with literature on credentialist theory (Collins, 1979; Garnett, Guppy, & Veenstra, 2008); however, the employers did not indicate that credentials are

the mechanism for making these assessments. Instead, it appeared that the employers used a variety of tools, including credentials, interviews, and assessments, to gauge how well a job candidate's values and disposition align with those of current employees.

Public Policy Implications and Recommendations

This study found that WIA participants who received training and earned credentials experienced higher levels of employment and increased earnings, compared to those who received training but who did not earn a credential. These findings provide reinforcement for past literature demonstrating a linkage between credential attainment and employment and earnings (Hollenbeck, 2009b; Heinrich, et al., 2009; Harper-Anderson, 2018). From a policy standpoint, this is meaningful because it demonstrates consistency in positive returns for public funds spent on WIA training. Furthermore, it supports the continued allocation of public resources for credential training through WIA's predecessor, the WIOA program. WIOA was built on the WIA framework, but it includes an increased focus on credentialing. This study suggests that this credential focus was an effective policy decision, and it supports its continuance.

A new angle that this research took was the examination of credential influence on employment outcomes for rural versus urban areas. The quantitative data findings demonstrated that credentialed WIA participants living in rural areas had an overall greater likelihood of employment, compared to those in urban areas. The various credential types appeared to increase success across all areas, but the magnitude of influence differed for each type of credential in rural versus urban areas. The qualitative data also showed differences in rural and urban demand for credentialed workers, which appears to be at least partially based on the supply of credentialed workers. As Stauber (2001) pointed out in the literature, these findings suggest that

it is important for national policy to be responsive to the needs of communities, including rural communities with unique labor market and economic challenges. By providing flexibility in federal regulations, opportunities for local decision-making, and considering input from state and local workforce staff, legislators can ensure that they enact policies that consider local needs, as opposed to sweeping policies that take a cookie-cutter approach, often based on what works in urban areas.

The quantitative analysis consistently pointed to employment and earnings gains for WIA participants who obtained a credential, and the degree to which these gains were observed varied based on whether the participant lived in a rural or urban area. In the literature, Betesh (2018) noted that rural areas often have funding constraints since federal workforce dollars are allocated based on population. Given the evidence that credentials are important for securing employment and increasing earnings in both rural and urban areas, it will be important for policy-makers to make sure that both receive sufficient funding for credential training. The benefits of credentials for rural job-seekers should not be overlooked, and policy-makers should ensure that allocation formulas provide rural workforce boards with the necessary funds to pay for quality credential training.

As the type of credential that a WIA participant earned also produced differing employment and earnings outcomes, it is important for policy-makers and administrators at the federal, state, and local level to ensure that all regions are able to offer credential training that is meaningful. Associate's degrees earned through WIA training were consistently linked to increased odds of employment and earnings in both rural and urban areas. Fortunately, these are awarded by community colleges, which provide students across geographic regions with access to post-secondary education. Occupational licenses and occupational certifications also showed

valuable returns, particularly for rural participants. As such, it is important that access to the specialized training needed to prepare for these industry-recognized credentials, as well associated testing, be made available in rural and urban localities.

Public policy implications can also be derived from the differences observed in employment and earnings achieved based on participant demographics. This too had been observed in the literature, which highlighted concerns that local workforce staff were prone to cream-skimming (Moore & Gorman, 2009). This occurs when performance-based WIA, and now WIOA, sanctions and rewards incentivize local operators and administrators to systemically guide participants who are perceived to produce lower outcomes toward non-training services (Bancroft, 2002). Training is then reserved for high-performing customers, which increases the likelihood of meeting local performance goals and solidifies opportunity for future funds (Bancroft, 2002). After many years of concern about such practices under WIA, WIOA was implemented with the requirement that year-end performance accountability consider the demographic characteristics of participants and local labor market information (U.S. Department of Labor and Industry, 2020). The findings identified through this research suggest that this requirement was an important step to ensuring that participants from all backgrounds receive equal access to credential training, without regard to their impact on performance indicators that relate to earnings. As such, use of a statistical adjustment model at both the state and local level to adjust past WIOA performance should continue.

From a program implementation perspective, case managers may benefit from considering some of the other factors discussed by employers as being impactful on their hiring decisions. For example, a qualification that was consistently mentioned was experience. By connecting workforce participants with services that provide experiential learning,

apprenticeships, or on-the-job training opportunities, perhaps participants who have insufficient or inconsistent job experiences can build their qualifications. Personality traits and culture fit were mentioned frequently by the employers as well. These findings suggest that additional services, such as career assessments, career coaching, and other interventions that consider job-seeker interests and preferences, may be beneficial to their ability to obtain and retain a job. Rather than encouraging WIA participants to apply for jobs widely, there may be more success in focusing job search efforts on the positions that best fit a candidate's interests. Having an interest in the job and the desire to perform the work may also boost a job-seeker's self-confidence, commitment, and ability to communicate their strengths to potential employers.

A final implication involves the COVID-19 pandemic. The employer interviews conducted as part of this study were completed in February and early March of 2020, prior to the vast business closings that occurred across Virginia as the result of COVID-19. From February 2020 to April 2020, Virginia's unemployment rate rose from 2.8 to 10.8 percent (Virginia Employment Commission, 2020). As shown in the findings, economic factors and the supply of credentialed workers in the labor market can have a significant impact on employer demand. As unemployment has increased and local labor markets have filled with more job-seekers in recent months, the credentials that they possess may alter employer preferences. It will be important for policy-makers to understand that labor market demands may change with the economy. Resources should be allocated toward research into these changes, and the examination of employer demand should be ongoing. Furthermore, workforce directors and locally elected officials should continuously engage local employers to learn about their needs and their preferences for job qualifications, including credentials. These efforts can provide a better understanding of gaps between the supply of qualified workers and the demands of the

employers who may hire them. This can help to ensure that WIOA training offerings and resulting credentials have value in the labor market.

Future Research

This research presents several opportunities for future studies. One such study could involve conducting the quantitative analysis using data for the more recently implemented WIOA program. As discussed in the literature, WIOA was designed to build on the successes of WIA while also incorporating new strategies, including an increased focus on credential training (U.S. Department of Labor, 2017b). As substantial WIOA participant data becomes available for research, it will be helpful to examine whether the same trends occur. Furthermore, such research could also investigate the role of supportive services provided to participants. WIOA policy has a greater focus on coordination of services offered by various partner agencies, including supportive services such as transportation assistance, childcare, and housing assistance (WIOA Desk Reference, 2017a). By incorporating the receipt of supportive services into analysis of employment and earnings for credential recipients in rural and urban areas, a better understanding of the value of these services can also be gained. Such analysis may also uncover gaps in the availability of supportive services, which could have an underlying effect on the ability of participants to earn a credential and/or secure substantive employment. Research into supportive services availability and usage for those in credential training can provide more insight into the actual role that credentials play in influencing employment and earnings.

A future study could also take a different methodological approach to assigning participants to rural and urban categories. The literature uncovered various rural/urban definitions and suggested that researchers opt for the one that best meets their data needs (Isserman, 2005; Cromartie & Bucholtz, 2008; Ratcliffe, et al., 2016). The quantitative analysis

measured rurality based on the participant's zip code, which allowed it to be measured at a very granular level. A different measurement that may provide a broader examination of rurality, as well as the overall economic conditions of the labor market in which participants are likely to conduct their job search, may be the use of MSAs to make this determination. By replicating this research using a different geographic indicator, an alternative measure of rurality can be considered.

The role of different credential combinations may be a beneficial focus for a future study as well. As discussed in the findings, WIA participants may have many different combinations of credentials, some of which were awarded as the result of WIA training, and others that they already had when they began participating in the program. It may be helpful for future research on WIOA outcomes to explore whether there are differences in employment and earnings trends, based on different combinations of credentials. These combinations may include bachelor's degree and license, bachelor's degree and certification, associate's degree and license, and beyond. Additionally, to the extent that WIOA data is available, the alignment between the type of credentials that each participant has and the type of job that they obtain could be examined. This analysis could provide valuable information about the utility of various credentials, based on whether those who received them actually secured a job in a related field.

Finally, as the labor market has changed as the result of COVID-19, so have workplaces. Many employers have allowed their employees to telework in order to stop the spread of infection, and there are suggestions that these trends will likely continue (Feintzeig & Eisen, 2020). As workers have found new ways to engage with colleagues through technology and accomplish their work in remote settings, many may never have a need to return to an office environment. If this occurs, this study's findings related to the challenges of rural employers in

hiring and retaining credentialed workers may change. Employees will no longer need to live where they work; therefore, rural employers may have much greater access to a credentialed workforce that can live elsewhere and work remotely. As time progresses and the impact of COVID-19 on remote work structures becomes more evident, it is recommended that future research take place to examine how these changes affect the supply of credentialed and qualified workers available to work in rural areas.

Conclusion

The findings uncovered through this study provided several important contributions to workforce development and education policy. First, they added new research to support existing literature on the positive relationship between credential attainment and employment and earnings outcomes. Like previous studies specifically focused on publicly-funded credential training, this research also showed greater successes for training recipients who earned a credential. Second, this study included a new angle to examine the role of rurality in these dynamics, suggesting that credential attainment for WIA participants provides employment and earnings gains in both rural and urban areas, although to varying degrees. Third, strong employment and earnings gains were observed across all credential types, but the magnitude of these gains varied significantly for different types of credentials. Fourth, this research added confirmation to previous findings that demographics play a significant role in predicting labor market outcomes. This study's fifth contribution is provided as evidence that employers value credentials as one of many factors that impact their hiring decisions, but the ways that they consider credentials as screening tools and the reasons why vary. Finally, this research revealed significant challenges that rural employers have in recruiting and retaining credentialed job candidates, suggesting that supply of credentialed job-seekers impacts employer demand.

Overall, this study produced findings that aligned with previous literature, while also uncovering both similarities and differences in the influence of credentials in rural and urban labor markets. Through these findings, policy recommendations and suggested opportunities for future research were made.

References

Allard, M.D. (November, 2016). "Adding questions on certifications and licenses to the Current Population Survey." *Monthly Labor Review*.

Allen, J. and van der Velden, R. (2001). "Educational mismatches versus skill mismatches: effects on wages, job satisfaction, and on-the-job search." *Oxford Economic Papers*, 53(3). 434-452.

Andersson, F; Holzer, H.J.; Lane, J. I.; Rosenblum, D.; and Smith, J. (2013, September). "Does federally-funded job training work? Nonexperimental estimates of WIA training impacts using longitudinal data on workers and firms. *National Bureau of Economic Research Working Paper Series*.

Arkes, J. (1999). "What do educational credentials signal and why do employers value credentials?" *Economics of Education Review*, 18, 133-141.

Arrow, K.J. (1973). "Higher education as a filter." *Journal of Public Economics*, 2, 193-216.

Association for Career and Technical Education (2019). *What is a Credential? Fact Sheet*. Retrieved on February 10, 2019, from https://www.acteonline.org/wp-content/uploads/2018/02/What_is_a_Credential_71417.pdf.

Baker, D.P. (2011). "Forward and backward, horizontal and vertical: Transformation of occupational credentialing in the schooled society." *Research in Social Stratification and Mobility*, 29. 5-29.

Bancroft, K. (2002). "Maximizing the return on workforce investment: A review of the Workforce Investment Act of 1998 and suggestions on how to resolve issues arising in its implementation." *The Georgetown Journal of Law and Public Policy*, 1. 191-214.

Bankston, C. (2011). “The mass production of credentials: Subsidies and the rise of the higher education industry.” *The Independent Review*, 15(3), 325–349.

Bauer, J.W. and Dolan, E.M. (2011). *Rural Families and Work: Context and Problems*. International Series on Consumer Sciences. Springer: New York.

Beane, G. (2006). *Summary of Federal Workforce Development Legislation*. Retrieved on December 10, 2017, from http://www.geoffbeane.com/asa/wp-content/uploads/2009/04/history-of-federal-workforce-development.pdf.

Becker, G.S. (1962). “Investment in human capital: A theoretical analysis.” *Journal of Political Economy*, 70(5), 9-49.

Becker, G.S. (1994). Human capital revisited. In National Bureau of Economic Research (3rd Edition), *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education* (pp 15-28). The University of Chicago Press.

Belman, D. and Heywood, J.S. (1991). “Sheepskin effects in the returns to education: An examination of women and minorities.” *The Review of Economics and Statistics*, 73(4), 720-724.

Bennett, D.L. and Vedder, R.K. (2015). “Public policy, higher education, and income inequality in the United States: Have we reached diminishing returns?” *Social Philosophy and Policy*, 31(2), 252-280.

Berry, A.A., Katras, M.J., Sano, Y., Lee, J., and Bauer, J.W. (2008). “Job volatility of rural, low-income mothers: A mixed methods approach.” *Journal of Family and Economic Issues*. 29(5), 5-22.

Berube, A. (2016). *American’s Male Employment Crisis Is Both Urban and Rural*, Washington, Brookings Institution.

Betesh, H. (2018, April). “An institutional analysis of American Job Centers: AJC service delivery in rural areas.” Social Policy Research Associates. Retrieved on March 19, 2019, from https://www.dol.gov/asp/evaluation/completed-studies/RuralServices-AJCs.pdf.

Bills, D.B. (2003). “Credentials, signals, and screens: Explaining the relationship between schooling and job assignment.” *Review of Educational Research*, 73(4), 441-469.

Blaug, M. (1976). “The empirical status of human capital theory: A slightly jaundiced survey.” *Journal of Economic Literature*. 14(3), 827-855.

Bokemeier, J.L. and Tickamyer, A.R. (1985). “Labor force experiences of nonmetropolitan women.” *Rural Sociological Society*. (50)1, 51-75.

Bonnal, M., Lira, C., and Addy, S.N. (2009). “Underemployment and local employment dynamics: New evidence.” *The Review of Regional Studies*. 39(3), 317-335.

Bostic, R. (2017, November 14). “A view of the U.S. economy and rural and urban labor market dynamics.” Federal Reserve Bank of Atlanta. Retrieved on December 8, 2017, from https://www.frbatlanta.org/news/speeches/2017/1114-bostic-view-of-us-economy-rural-urban-labor-market-dynamics.

Bosworth, B. (December, 2010). “Certificates count: An analysis of sub-baccalaureate certificates.” Complete College America. Retrieved on February 16, 2019, from https://files.eric.ed.gov/fulltext/ED536837.pdf.

Boylan, R.D. (1993). “The effect of the number of diplomas on their value.” *Sociology of Education*, 66(3). 206-221.

Brown, D.K. (2001). “The social sources of educational credentialism: Status cultures, labor markets, and organizations.” *Sociology of Education*, 74, 19-34.

Browne, W.P. (2001). *The Failure of National Rural Policy: Institutions and Interests*. Georgetown University Press: Washington, D.C.

Caplan, B. (2018). *The Case Against Education: Why the Education System Is a Waste of Time and Money*. Princeton University Press.

CareerBuilder. (2017). Press Release. Retrieved on July 24, 2019, from http://press.careerbuilder.com/2017-03-16-41-Percent-of-Employers-Are-Hiring-College-Educated-Workers-for-Positions-That-Had-Been-Primarily-Held-by-Those-with-High-School-Degrees-Finds-CareerBuilder-Survey.

Carnevale, A.P. and Desrochers, D.M. (2001). *Help Wanted…Credentials Required: Community Colleges in the Knowledge Economy*. American Association of Community Colleges.

Carnevale, A.P., Cheah, B., and Strohl, J. (2012). "Hard times: Not all college degrees are created equal." Georgetown Center on Education and the Workforce. Retrieved on October 17, 2018, from https://cew.georgetown.edu/cew-reports/hard-times-2012/.

Carnevale, A.P., Rose, S.J., and Cheah, B. (2011). *The College Payoff: Education, Occupations, and Lifetime Earnings*. Georgetown University Center on Education and the Workforce.

Carnevale, A.P., Smith, N., and Strohl, J. (2013). *Recovery: Job Growth and Education Requirements through 2020*. Center on Education and Workforce Reports, Center on Education and the Workforce. Retrieved on July 24, 2019, from https://files.eric.ed.gov/fulltext/ED584413.pdf.

Chen, V.T. (2015). *Cut Loose: Jobless and Helpless in an Unfair Economy*. University of California Press.

Collins, R. (1979). *The Credential Society*. Academic Press: New York.

Collins, R. (2002). Chapter 1 – Credential inflation and the future of universities. In *The Future of the City of Intellect: The Changing American University*. Stanford University.

Cottom, T. M. (2017). *Lower Ed: The Troubling Rise of For-Profit Colleges in the New Economy*. The New Press: New York.

Cromartie, J. and Bucholtz, S. (2008). "Defining the "rural" in rural America." *Amber Waves*, 6(3), 28-34.

Creswell, J.W. (2009). *Research Design* (3rd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Creswell, J.W. and Plano Clark, V.L. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Cunningham, E. (2019, June). "Professional certifications and occupational licenses: Evidence for the current population survey." Bureau of Labor Statistics Monthly Labor Review. Retrieved on February 1, 2020, from https://www.bls.gov/opub/mlr/2019/article/pdf/professional-certifications-and-occupational-licenses.pdf.

Decker, P.T. and Berk, J.A. (2011). "Ten years of the Workforce Investment Act (WIA): Interpreting the research on WIA and related programs." *Journal of Policy Analysis and Management*, 30(4). 906-926.

Deming, D.J., Goldin, C., and Katz, L.F. (December 2011). "The for-profit postsecondary school sector: Nimble critters or agile predators?" (working paper). National Bureau of Economic Research. Retrieved on March 24, 2019, from https://www.nber.org/papers/w17710.pdf.

Deming, D.J., Yuchtman, N, Abulafi, A., Goldin, C., and Katz, L.F. (2016). "The value of postsecondary credentials in the labor market: An experimental study." *American Economic Review*, 106(3), 778-806.

Duncan, C. (2014). *Worlds Apart: Poverty and Politics in Rural America*. (2nd ed.). Yale University Press: New Haven.

Drabenstott, M. (2003). "A new era for rural policy." *Economic Review – Federal Reserve Bank of Kansas City*, 88(4), 81-98.

Ewart, S. and Kominski, R. (January 2014). *Measuring Alternative Educational Credentials: 2012*. U.S. Census Bureau. Retrieved on February 12, 2019, from https://www.census.gov/prod/2014pubs/p70-138.pdf.

Feintzeig, R. and Eisen, B. (2020, June 17). "When workers can live anywhere, many ask: why do I live here?" *The Wall Street Journal*. Retrieved on June 17, 2020, from https://www.wsj.com/articles/when-workers-can-live-anywhere-many-ask-why-do-i-live-here-11592386201.

Florida, R. (2002). *The Rise of the Creative Class*. New York: Basic Books.

Florida, R. (2017). *The New Urban Crisis*. New York: Basic Books.

Garnett, B, Guppy, N, and Veenstra, G. (2008). "Careers open to talent: Educational credentials, cultural talent, and skilled employment." *Sociological Forum*, 23(1), 144-164.

Gibbs, R., Kusmin, L. and Cromartie, J. (2004). "Low-skill jobs: A shrinking share of the rural economy." *Amber Waves*, 2(5), 38-44.

Gittleman, M., Klee, M.A., and Kleiner, M.M. (2018). "Analyzing the labor market outcomes of occupational licensing." *Industrial Relations*, 57(1), 57-98.

Goetz, S. J., Partridge, M.D., and Stephens, H.M. (2018). "The economic status of rural American in the President Trump era and beyond." *Applied Economic Perspectives and Policy*, 40(1), 97-118.

Goldin, C. and Katz, L.F. (2008). *The Race between Education and Technology*. Cambridge, MA: The Belknap Press of Harvard University Press.

Gould, E. (2017, August 2). "Wages for workers with a high school degree or less rose the fastest over the last year." Economic Policy Institute. Retrieved on August 15, 2018, from https://www.epi.org/blog/wages-for-workers-with-a-high-school-degree-or-less-rose-the-fastest-over-the-last-year/.

Grbich, N. (2013). *Qualitative Data Analysis: An Introduction* (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Grubb, W.N. (1997). "The returns to education in the sub-baccalaureate labor market, 1984-1990." *Economics of Education Review*, 16(3). 231-245.

Grubb, W.N., and Lazerson, M. (2005). "The education gospel and the role of vocationalism, in American education." *American Journal of Education*, 111(3). 297-319.

Guttman, R. (1983). "Job Training Partnership Act: New help for the unemployed." *Monthly Labor Review*, March, 3-10.

Hacker, J.S. and Pierson, P. (2010). *Winner-Take-All Politics*. New York: Simon & Schuster.

Harper-Anderson, E. (2018). "What is the return on investment for public workforce programs? An analysis of WIA and TAA in Virginia." *State and Local Government Review*, 50(4). 244-258.

Health Resources and Services Administration. (2017, January). Defining Rural Population. Retrieved on April 21, 2018, from https://www.hrsa.gov/rural-health/about-us/definition/index.html.

Hochschild, A. R. (2016). *Strangers in Their Own Land: Anger and Mourning on the American Right*. New York, NY: The New York Press.

Holder, K.A., Fields, A., and Lofquist, D. (2016, December 8). "Rurality Matters." United States Census Bureau, Census Blogs. Retrieved on April 19, 2018, from https://www.census.gov/newsroom/blogs/random-samplings/2016/12/rurality_matters.html.

Hollenbeck, K., Schroeder, D, King, C.T., and Huang. (2005). "Net impact estimates for services provided through the workforce investment act." Report prepared for the Division of Research and Demonstration, Office of Policy and Research, Employment and Training Administration, U.S. Department of Labor.

Hollenbeck, K. (2009a). "Does the workforce investment act work?" Presented at the 31st Annual Research Conference of the Association for Public Policy Analysis and Management (APPAM), Washington, DC, November 6.

Hollenbeck, K. (2009b). "Workforce Investment Act: New impact estimates and rates of return." Presented at European Commission-sponsored meeting, "What the European Social Fund Can Learn from the WIA Experience." Washington, D.C.

Holzer, H.J. (1996). *What Employers Want: Job Prospects for Less-Educated Workers*. New York: Russell Sage Foundation.

Holzer, H.J. and Lerman, R.I. (2007, November). *America's Forgotten Middle-Skill Jobs*. The Workforce Alliance.

Hout, M. (2012). “Social and economic returns to college education in the United States.” *Annual Review of Sociology*, 38, 379-400.

Isserman, A.M. (2005). “In the national interest: defining rural and urban correctly in research and public policy.” *International Regional Science Review*, 28(4), 465-499.

Jack, J.D., Hall, C.E., and Yerger, D.B. (2010). “Estimating core unemployable and workforce non-participants: A study of rural Pennsylvania’s labor force.” *Journal of Business and Economics Research*, 8(2), 11-18.

Jacobs, J. (2004). “Credentialing vs. educating.” *Virginia Quarterly Review*, 80(2). Retrieved on November 11, 2017, from http://www.vqronline.org/essay/credentialing-vs-educating.

Kerckhoff, A.C. and Bell, L. (1998). “Hidden capital: Vocational credentials and attainment in the United States.” *American Sociological Association*, 71(2). 152-174.

Kroeger, T., and Gould, E. (2017, May 4). The Class of 2017. Economic Policy Institute. Retrieved on August 15, 2018, from https://www.epi.org/publication/the-class-of-2017/.

Lichter, D.T., and Brown, D.L. (2011). “Rural American in an urban society: Changing spatial and social boundaries.” *Annual Review of Sociology*, 37, 565-592.

Lumina Foundation. (2019a). *Lumina Fact Sheet*. Retrieved on July 24, 2019, from https://www.luminafoundation.org/files/resources/fact-sheet-1.pdf

Lumina Foundation. (2019b). *Lumina’s Goal*. Retrieved on February 12, 2019, from https://www.luminafoundation.org/lumina-goal.

Marcotte, D.E., Bailey, T., Borkoski, C., and Kienzl. (2005). “The returns of community college education: evidences from the National Educational Longitudinal Survey.” *Educational Evaluation and Policy Analysis*, 27(2). 157-175.

Maxwell, J.A. (2005). *Qualitative Research Design: An Interactive Approach* (2nd ed.). Applied Social Research Methods Series, Volume 42. Thousand Oaks, CA: SAGE Publications, Inc.

Monnat, S.M., and Brown, D.L. (2017). "More than a rural revolt: Landscapes of despair and the 2016 presidential election." *Journal of Rural Studies*, 55. 227-236.

Moore, R.W. and Gorman, P.C. (2009). "The impact of training and demographics in WIA program performance: A statistical analysis." *Human Resource Development Quarterly*, 20(4). 381-396.

Negoita, M. (2015, November). "The Workforce Investment Act accountability system: The role of performance measures in service delivery." Issue Brief. Retrieved on March 30, 2019, from https://wdr.doleta.gov/research/FullText_Documents/ETAOP-2016-05_The%20Workforce%20Investment%20Act%20Accountability%20System%20-%20The%20Role%20of%20Performance%20Measures%20in%20Service%20Delivery.pdf.

Obama White House Archive. "Higher Education." Retrieved on April 17, 2018, from https://obamawhitehouse.archives.gov/issues/education/higher-education.

Ohren, J.F., and Reese, L.A. (1999). "What do businesses want? Some thoughts on job training for local development officials." *Public Administration Quarterly*, 22(4), 505-519.

O'Leary, S. A., Straits, C. J., and Wandner, R. A. (2004). Chapter 1 – U.S. job training: Types, participants, and history. In *Job Training Policy in the United States*. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1-20.

Oreopoulos, P. and Petronijevic, U. (2013). "Making college worth it: A review of the returns of higher education." *The Future of Children*, 23(1), 41-65.

Pallant, J. (2016). *SPSS Survival Manual* (6th ed.). New York, NY: McGraw-Hill Education.

Pager, D. (2003). "The mark of a criminal record." *American Journal of Sociology*, 108(5), 937-975.

Patten, E. (2016, July 1). "Racial, gender wage gaps persist in U.S. despite some progress." Pew Research Center. Retrieved on March 30, 2020, from https://www.pewresearch.org/fact-tank/2016/07/01/racial-gender-wage-gaps-persist-in-u-s-despite-some-progress/.

Patton, M.Q. (2015). *Qualitative Research & Evaluation Methods* (4th ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Partridge, M.D., and Rickman, D.S. (2006). *The Geography of American Poverty*. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Pew Research Center. (2014, February 11) "The rising cost of *not* going to college." Retrieved on August 15, 2018, from http://assets.pewresearch.org/wp-content/uploads/sites/3/2014/02/SDT-higher-ed-FINAL-02-11-2014.pdf.

Pew Research Center. (2016, October 6) "The state of American jobs: How the shifting economic landscape is reshaping work and society and affecting the way people think about the skills and training they need to get ahead." Retrieved on April 20, 2018, from http://www.pewsocialtrends.org/2016/10/06/the-state-of-american-jobs/.

Porter, E. (2018, December 14). "The hard truths of trying to 'save' the rural economy" *The New York Times*. Retrieved on February 20, 2020, from https://www.nytimes.com/interactive/2018/12/14/opinion/rural-america-trump-decline.html.

Ratcliff, M., Burd, C., Holder, K., and Fields, A. (2016, December). "Defining rural at the U.S. Census Bureau." American Community Survey and Geography Brief. Retrieved on April 20, 2018, from https://www2.census.gov/geo/pdfs/reference/ua/Defining_Rural.pdf.

Renski, H. (2018). "Estimating the returns to professional certifications and licenses in the U.S. manufacturing sector." *Economic Development Quarterly*, 32(4). 341-356.

Riley, J.G. (1976). "Information, screening, and human capital." *American Economic Review*, 66(2). 254-260.

Rivera, L.A. (2011), "Ivies, extracurriculars, and exclusion: Elite employers' use of educational credentials." *Research in Social Stratification and Mobility*, 29. 71-90.

Rosenbaum, J.E., and Person, A.E. (2003). "Beyond college for all: Policies and practices to improve transitions into college and jobs." *Professional and School Counseling*, 6(4), 252-260.

Salmona, M., Lieber, E., and Kaczynski, D. (2019). *Qualitative and Mixed Methods Data Analysis Using Dedoose*. Thousand Oaks, CA: SAGE Publications, Inc.

Scala, D.J. and Johnson, K.M. (2017, July). "Political polarization along the rural-urban continuum? The geography of the presidential vote, 2000-2016." *American Academy of Political and Social Science*, ANNALS, 162-184.

Schneider, G. (2017, October 24). "Virginia's unemployment rate is only 3.7%. So why is the economy a big issue in the governor's race?" *The Washington Post*. Retrieved on October 31, 2017, from https://www.washingtonpost.com/local/virginia-politics/virginias-unemployment-rate-is-only-37percent-so-why-is-the-economy-a-big-issue-in-the-governors-race/2017/10/24/ec5b73b8-b416-11e7-a908-a3470754bbb9_story.html?utm_term=.5f4226192f87.

Schneider, M. (2015). “The value of sub-baccalaureate credentials.” *Issues in Science and Technology*, 31(4), 67-73.

Shapiro, J.E. (2018, October 7). Opinion/Commentary: A voice from the past outlines a plan for Virginia’s future. *The Daily Progress*. Retrieved on March 23, 2019, from https://www.dailyprogress.com/opinion/opinion-commentary-a-voice-from-the-past-outlines-a-plan/article_b9e35df8-c8cc-11e8-9228-73d89bf86a0a.html.

Slack, T. (2014). Chapter 29 – Work in rural America in the era of globalization. *In Rural America in a Globalizing World*. Morgantown, WV: West Virginia University Press, 573-590.

Spence, M. (1973). “Job market signaling.” *The Quarterly Journal of Economics*, 87(3), 355-374.

Stark, E. and Poppler, P. (2016). “What are they thinking? Employers requiring college degrees for low-skilled jobs.” *S.A.M. Advanced Management Journal*, 81(3), 17-26.

State Council of Higher Education for Virginia. (2019). “Goals of the Virginia Plan for Higher Education.” Retrieved on July 24, 2019, from https://schev.edu/index/statewide-strategic-plan/goals.

Stauber, K.N. (2001). “Why invest in rural America--and how? A critical public policy question for the 21st century.” Center for the Study or Rural America, Federal Reserve Bank of Kansas City, MO.

Tale of ‘two Virginias’: Baliles believes education can rebuild local area. (2018, October 18). *Martinsville Bulletin*. Retrieved on March 23, 2019, from https://www.martinsvillebulletin.com/news/a-tale-of-two-virginias-baliles-believes-education-can-rebuild/article_889d77bf-b55e-566f-b770-b2db73922117.html.

U.S. Bureau of Labor Statistics. (2016, April 15). “Why this counts: New timely data on professional certifications and licenses.” Retrieved on February 16, 2019, from https://blogs.bls.gov/blog/2016/04/15/why-this-counts-new-timely-data-on-professional-certifications-and-licenses/.

U.S. Bureau of Labor Statistics. (August 2018). “Labor force characteristics by race and ethnicity, 2017.” Retrieved on February 20, 2020, from https://www.bls.gov/opub/reports/race-and-ethnicity/2017/home.htm.

U.S. Bureau of Labor Statistics. (2020a). “Consumer Price Index for all urban consumers.” Retrieved on February 19, 2020, from https://www.bls.gov/cpi/data.htm.

U.S. Bureau of Labor Statistics. (2020b). “Data on certifications and licenses.” Retrieved on February 8, 2020, from https://www.bls.gov/cps/certifications-and-licenses.htm.

U.S. Census Bureau. (2012 September). “2010 Census Summary File 1.” Retrieved on February 2, 2020, from https://www2.census.gov/programs-surveys/decennial/2010/technical-documentation/complete-tech-docs/summary-file/sf1.pdf.

U.S. Census Bureau. (2020a). American Community Survey. Retrieved on April 1, 2020, from https://www.census.gov/acs/www/data/data-tables-and-tools/.

U.S. Census Bureau. (2020b). “Glossary”. Retrieved on February 10, 2020, from https://www.census.gov/programs-surveys/metro-micro/about/glossary.html.

U.S. Department of Agriculture. (2019). *Rural Employment and Unemployment*. Economic Research Service. Retrieved on February 1, 2020, from https://www.ers.usda.gov/topics/rural-economy-population/employment-education/rural-employment-and-unemployment/#ue.

U.S. Department of Labor (1998). *Workforce Investment Act of 1998*. Retrieved on December 10, 2017, from http://www.doleta.gov/usworkforce/wia/plaintext.pdf.

U.S. Department of Labor. (2010a). *Credential Resource Guide.* Retrieved on February 16, 2018, from https://wdr.doleta.gov/directives/attach/tegl15-10a2.pdf.

U.S. Department of Labor. (2010b). Increasing credential, degree, and certificate attainment by participants of the public workforce system. [Training and Employment Guidance Letter 15-10.] Retrieved on February 20, 2018, from https://wdr.doleta.gov/directives/attach/TEGL15-10.pdf.

U.S. Department of Labor. (2017a). *WIOA Desk Reference*. Retrieved on June 12, 2020, from https://ion.workforcegps.org/resources/2017/07/14/09/22/Supportive_Services_Desk_Reference.

U.S. Department of Labor. (2017b). *WIOA Overview*. Retrieved on December 10, 2017, from https://www.doleta.gov/wioa/Overview.cfm.

U.S. Department of Labor. (2020). Negotiations and sanctions guidance for the workforce innovation and opportunity act (WIOA) core programs. [Training and Employment Guidance Letter 11-19.] Retrieved on June 28, 2020, from https://wdr.doleta.gov/directives/corr_doc.cfm?docn=3430.

Vedder, R., Denhart, C., and Robe, J. (2013, January). *Why Are recent College Graduates Underemployed?* Center for College Affordability and Productivity.

Virginia Career Works. (2020). *New Economy Workforce Credential Grant Program*. Retrieved on January 12, 2020, from https://virginiacareerworks.com/wp-content/uploads/HighDemandFieldsPrograms031618.pdf.

Virginia Chamber of Commerce. (2017). *Blueprint Virginia 2025*. Retrieved on December 8, 2017, from https://www.vachamber.com/advocacy/blueprint-virginia/.

Virginia Community College System. (2015). *Rural Virginia Horseshoe Initiative*. Retrieved on February 1, 2020, from https://www.vccs.edu/giving/rural-horseshoe-initiative/.

Virginia Department of Education. (2019). *The Path to Industry Certification*. Retrieved on February 12, 2019, from http://www.doe.virginia.gov/instruction/career_technical/path_industry_certification/index.shtml#data.

Virginia Employment Commission. (2016). *Current Local Area Unemployment Statistics*. Retrieved on January 10, 2020, from https://virginiaworks.com/local-area-unemployment-statistics-laus?page89556=1&size89556=48&page89557=1&size89557=48.

Virginia Employment Commission. (2020). *Current Local Area Unemployment Statistics*. Retrieved on June 1, 2020, from https://virginiaworks.com/local-area-unemployment-statistics-laus/lausparmyear/2020/lausparmperiodtype/03/lausparmareatype/01/lausparmarea/000000?LAUSParmPeriod=01,02,03,04&LAUSParmAdjusted=%5BSelectAdjusted%5D&page89556=1&size89556=48&page89557=1&size89557=48#Unadjusted-2685.

Vuolo, M., Mortimer, J.T., and Staff, J. (2016). "The value of educational degrees in turbulent economic times: Evidence from the youth development study." *Social Science Research*, 57, 233-252.

Waldorf, B. and Kim, A. (2015, April 16-17). "Defining and measuring rurality in the US: From typologies to continuous indices." Commissioned paper prepared for the National

Academies of Sciences *Workshop on Rationalizing Rural Classifications*, Washington, DC. Retrieved on February 20, 2020, from http://sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_168031.pdf.

Wallmeyer, A. (2016). *The Extremes of Virginia*. Dementi Milestone Publishing, Inc.

Walters, D. (2004). "The relationship between postsecondary education and skill: Comparing credentialism with human capital theory." *The Canadian Journal of Higher Education*. 34(2), 97-124.

Weaver, A. (2017, August 25). *The Myth of the Skills Gap*. MIT Technology Review. Retrieved on February 20, 2019, from https://www.technologyreview.com/s/608707/the-myth-of-the-skills-gap/.

Weaver, A. and Osterman, P. (2017, March). "Skill demands and mismatch in U.S. manufacturing." *ILR Review*, 70(2), 275-307.

Wilson, W.J. (1996). *When Work Disappears: The World of the New Urban Poor*. Alfred A. Knopf, Inc.: New York.

Wolman, H., Lichtman, C., and Barnes. S. (1991). "The impact of credentials, skill levels, worker training, and motivation on employment outcomes: Sorting out the implications for economic development policy." *Economic Development Quarterly*, 5(2), 140-151.

Wuthnow, R. (2018). *The Left Behind: Decline and Rage in Rural America*. Princeton University Press.

Appendix A

Descriptive Statistics and Frequencies for Participants Included in Employment and Earnings Analysis

Employment Analysis (N=10,111)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Percent Rural (Locality)	10111	.000000	1.000000	.33720110	.394179429
Age	10111	18	81	41.28	12.078
Median Earnings (Locality)	10111	$9,400	$101,713	$31,846.33	$10,305.538
Unemployment Rate (Locality)	10111	.0	64.9	7.978	3.6995
Valid N (listwise)	10111				

Credential Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2838	28.1	28.1	28.1
	1	7273	71.9	71.9	100.0
	Total	10111	100.0	100.0	

Rural Indicator

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7007	69.3	69.3	69.3
	1	3104	30.7	30.7	100.0
	Total	10111	100.0	100.0	

Female

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	4209	41.6	41.6	41.6
	1	5902	58.4	58.4	100.0
	Total	10111	100.0	100.0	

Disadvantaged Minority

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	5191	51.3	51.3	51.3
	1	4920	48.7	48.7	100.0
	Total	10111	100.0	100.0	

Education Level Prior to Participation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	4	.0	.0	.0
	3	1	.0	.0	.0
	4	1	.0	.0	.1
	6	5	.0	.0	.1
	7	8	.1	.1	.2
	8	38	.4	.4	.6
	9	58	.6	.6	1.1
	10	141	1.4	1.4	2.5
	11	157	1.6	1.6	4.1
	12	4651	46.0	46.0	50.1
	13	1597	15.8	15.8	65.9
	14	1561	15.4	15.4	81.3
	15	271	2.7	2.7	84.0
	16	1077	10.7	10.7	94.6
	17	541	5.4	5.4	100.0
	Total	10111	100.0	100.0	

High School Diploma Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	10087	99.8	99.8	99.8
	1	24	.2	.2	100.0
	Total	10111	100.0	100.0	

Associate's Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	9384	92.8	92.8	92.8
	1	727	7.2	7.2	100.0
	Total	10111	100.0	100.0	

Bachelor's Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	10054	99.4	99.4	99.4
	1	57	.6	.6	100.0
	Total	10111	100.0	100.0	

Graduate Degree Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	10108	100.0	100.0	100.0
	1	3	.0	.0	100.0
	Total	10111	100.0	100.0	

Occupational License Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	9281	91.8	91.8	91.8
	1	830	8.2	8.2	100.0
	Total	10111	100.0	100.0	

Occupational Certificate Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	4786	47.3	47.3	47.3
	1	5325	52.7	52.7	100.0
	Total	10111	100.0	100.0	

Other Credential Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	9804	97.0	97.0	97.0
	1	307	3.0	3.0	100.0
	Total	10111	100.0	100.0	

Earnings Analysis (N=7,418)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Percent Rural (Locality)	7418	.000000	1.000000	.34479764	.395390551
Age	7418	18	81	40.78	11.868
Median Earnings (Locality)	7418	$9,400	$95,690	$31,636.50	$9,991.563
Unemployment Rate (Locality)	7418	.0	64.9	7.952	3.6783
Valid N (listwise)	7418				

Credential Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2030	27.4	27.4	27.4
	1	5388	72.6	72.6	100.0
	Total	7418	100.0	100.0	

Rural Indicator

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	5080	68.5	68.5	68.5
	1	2338	31.5	31.5	100.0
	Total	7418	100.0	100.0	

Female

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3110	41.9	41.9	41.9
	1	4308	58.1	58.1	100.0

	Total	7418	100.0	100.0	

Disadvantaged Minority

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3825	51.6	51.6	51.6
	1	3593	48.4	48.4	100.0
	Total	7418	100.0	100.0	

Education Level Prior to Participation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	.0	.0	.0
	3	1	.0	.0	.0
	4	1	.0	.0	.1
	6	4	.1	.1	.1
	7	5	.1	.1	.2
	8	22	.3	.3	.5
	9	41	.6	.6	1.0
	10	99	1.3	1.3	2.4
	11	114	1.5	1.5	3.9
	12	3482	46.9	46.9	50.8
	13	1162	15.7	15.7	66.5
	14	1185	16.0	16.0	82.5
	15	182	2.5	2.5	84.9
	16	764	10.3	10.3	95.2
	17	354	4.8	4.8	100.0
	Total	7418	100.0	100.0	

High School Diploma Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7399	99.7	99.7	99.7
	1	19	.3	.3	100.0
	Total	7418	100.0	100.0	

Associate's Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	6848	92.3	92.3	92.3
	1	570	7.7	7.7	100.0
	Total	7418	100.0	100.0	

Bachelor's Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7376	99.4	99.4	99.4
	1	42	.6	.6	100.0
	Total	7418	100.0	100.0	

Graduate Degree Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7415	100.0	100.0	100.0
	1	3	.0	.0	100.0
	Total	7418	100.0	100.0	

Occupational License Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	6778	91.4	91.4	91.4
	1	640	8.6	8.6	100.0
	Total	7418	100.0	100.0	

Occupational Certificate Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3517	47.4	47.4	47.4
	1	3901	52.6	52.6	100.0
	Total	7418	100.0	100.0	

Other Credential Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7205	97.1	97.1	97.1
	1	213	2.9	2.9	100.0
	Total	7418	100.0	100.0	

Appendix B

Telephone Recruitment Script

Hello. My name is Carrie Douglas, and I am a student in Virginia Commonwealth University's Public Policy and Administration PhD program. As part of my dissertation, I am conducting brief interviews with employers to better understand the qualities that they seek in job candidates. Specifically, I am planning to examine whether there are differences in the role that credentials play in hiring decisions for employers in rural versus urban labor markets. The knowledge gained through this research can inform public policy discussions about credentialing initiatives and workforce development efforts to address unemployment.

Participation in this study is completely voluntary, and the names of individuals who are interviewed, as well as their employers, will not be identified in any research materials. The interviews will take place by phone and will consist of a series of questions about hiring practices and qualifications sought in job candidates. The interview is designed to last no more than 20 minutes.

[*Business Name*] was randomly selected from a publicly available list of employers. In your role at [*Business Name*], are you responsible for hiring decisions?

- [*If yes*] Would you be willing to participate in my study?
- [*If no*] Would you be willing to direct me to someone at [*Business Name*] who is responsible for hiring decisions? [*Restart script*]

[*If yes*] I plan to conduct interviews between [*insert date range*], and I would like to arrange a time to speak with you, at your convenience. Please let me know of a convenient time for me to contact you for the interview. I certainly appreciate your consideration of this request.

Thank you very much. If you have any questions or concerns in the meantime, please do not hesitate to contact me at (804) 338-8639 or douglascs@vcu.edu.

[*Oral consent to participate shared during the next call, prior to the interview.*]

Appendix C

Oral Consent Script

The qualitative component of this mixed methods study will consist of interviews with employers to gain more information about the role of credentials in hiring decisions. Interviews will be conducted by phone, and oral consent for participation will be requested at the start of each interview. The following information will be shared during this conversation.

- I am a student researcher pursuing my PhD in Public Policy and Administration at Virginia Commonwealth University.
- I am conducting interviews with employers as the qualitative component of a mixed methods study that seeks to better understand the connection between credential attainment and employment outcomes. Specifically, I am hoping to examine whether there are differences in the impact of credentials in rural and urban labor markets.
- The knowledge gained through this research can inform public policy discussions about credentialing initiatives and workforce development efforts to address unemployment.
- As a participant in this interview, you will be asked a series of questions about your hiring processes and the qualifications that you seek in job candidates. This interview was designed to last no more than 20 minutes.
- There are no known risks to participating in this study. Your participation is completely voluntary, and you may decide to stop participating at any time during the interview.
- In order to accurately document our discussion for my qualitative analysis, I plan to record our phone conversation. These recordings will not be shared publicly, and they will be used solely for the purpose of transcribing notes to identify key themes and findings. Once transcriptions are complete, all audio recordings will be destroyed.
- Your name and your employer's name will remain confidential and will not be identified anywhere in disseminated research materials.
- To protect your privacy, I will conduct the interview from a location where our conversation cannot be overheard by others. Please feel free to move to a private location for our discussion, if you have concerns about others hearing your responses.
- If you have any questions, concerns, or complaints about this study now or in the future, please contact the Institutional Review Board (IRB) at 804-827-2157.
- Please feel free to contact me at any time if you have questions about this study: Carrie Douglas; (804) 338-8639; douglascs@vcu.edu.
- Do you have any questions about this study?
- Do you agree to participate in this research?
- Are you at least 18 years of age?

Appendix D

Interview Questions

The interviews that will be conducted for the supplemental, qualitative component of this study will be semi-structured, and they will include questions such as the following:

- What is your company's process for selecting candidates to interview for a given job?
- What are the main factors that you use to screen resumes submitted by job applicants?
- What qualities do you look for in job candidates?
- How do you weigh past work experience compared to credential attainment for job applicants?
- Is there a certain amount of work experience or specific skills that would compensate for an applicant's lack of a credential?
- Which credentials does your company value most when considering job candidates? (i.e., degrees, industry certifications, professional licenses, badges/micro-credentials) Why are these credentials important to you?
- Do you consider whether a credential was earned in the classroom or online when reviewing job applicant qualifications?
- Do you encourage current employees to pursue any specific training? If so, does the training lead to a credential?
- What is your biggest challenge in hiring qualified job candidates?
- What are some of your solutions to these challenges?
- Does your company have interaction with the public workforce system? (For example, does your company work with your local workforce one-stop center to advertise job openings or does a representative from your company serve on your local workforce development board?)

Appendix E

Qualitative Codebook

Number	Code	Description
1.	Credential preferred	Credential is a preferred or required qualification for job candidates.
2.	Credential not necessary	Credential is not a necessary qualification for job candidates.
3.	Credential a plus	Having a credential is a plus but not a requirement for job candidates.
4.	Depends on the job	Credential preference depends on the job.
5.	Industry credentials	Industry credentials are preferred or required.
a.	Certifications	Industry certifications are preferred or required.
b.	Licenses	Professional licenses are preferred or required.
6.	Academic credentials	Academic credentials are preferred or required.
a.	High school diploma	A high school diploma is preferred or required.
b.	Bachelor's degree	A bachelor's degree is preferred or required.
7.	Employees pursue credentials	Current employees pursue credentials.
8.	Employer provides training	The employer provides in-house training to employees after hiring.
9.	Online or classroom – prefers classroom	The employer prefers job candidates who received classroom training
10.	Online or classroom – no preference	The employer has no preference between job candidates who received classroom and online training.
11.	Challenge – competing for employees	Competing with other employers for the same job candidates is a challenge.
12.	Challenge – finding candidates with specific credential	Finding candidates with a specific required credential.
13.	Challenge – finding experienced candidates	Finding job candidates with the right work experience is a challenge.
14.	Challenge – hiring locally	Hiring candidates in the local region is a challenge.
15.	Challenge – limited candidate pool	A limited pool of qualified candidates is a challenge.

16.	Challenge – meeting job qualifications	Hiring candidates who meet job qualifications is a challenge.
17.	Challenge – transportation	Lack of transportation for employees to travel to and from work is a challenge.
18.	Challenge – turnover	Employee turnover is a challenge.
19.	Challenge – work ethic	Hiring candidates with a good work ethic is a challenge.
20.	Qualification – experience	Work experience is a qualification sought in job candidates.
a.	Understands the work	Understanding the work is a qualification sought in job candidates.
b.	Understands the terminology	Understanding the terminology is a qualification sought in job candidates.
21.	Qualification – communication	Effective communication is a qualification sought in job candidates.
22.	Qualification – organizational culture	Hiring an employee who fits with the organization's culture is a qualification sought in job candidates.
23.	Qualification – personality	A desirable personality is a qualification sought in job candidates.
24.	Qualification – soft skills	Soft skills are a qualification sought in job candidates.
25.	Qualification – working with people	Working well with people is a qualification sought in job candidates.
26.	Screening – background	Background checks are used to screen job applicants.
27.	Screening – credentials	Reviewing resumes for credentials is used to screen job applicants.
28.	Screening – employment history	Reviewing resumes for employment history is used to screen job applicants.
29.	Screening - interviews	Interviews used as a screening tool
30.	Screening - recruiter	Recruiters are used for initial screening of candidates.
31.	Screening – referrals	Referrals and references are used to screen job applicants.
32.	Screening – skills	Certain skill proficiencies are used to screen job applicants.
33.	Screening – tests	Tests or assessments are used to screen job applicants.
34.	Opportunity	The employer expressed that providing job applicants with the opportunity to work (giving people a chance) is important.
35.	Value credentials over experience	The employer values credentials over experience.

36.	Value credentials and experience the same	The employer values credentials and experience the same.
37.	Value experience over credentials	The employer values experience over credentials.