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ABSTRACT

This paper compares the employment status and earnings of veterans and nonveterans following their receipt of public workforce development services in Washington State during the years 2002–2012. It also describes workforce program participation patterns for veterans and nonveterans to determine if veterans have equal or prioritized access to key programs, where prioritization is required by law. Based on tabulations and propensity score weighted regressions using administrative data, the results indicate slightly lower levels of participation by veterans than nonveterans in two major workforce programs (Wagner-Peyser and the Workforce Investment Act Adult program), and high participation in veteran-specific programs (Disabled Veterans Outreach Program and Local Veterans Employment Representative). Employment rates of veterans after program receipt are substantially lower than those for nonveterans. Meanwhile, average earnings are slightly higher, conditional on employment. These results highlight the ongoing challenge of closing the gap in employment between veterans and nonveterans to reach goals stated by policymakers.

JEL Classification Codes: J68, J18, H59, O15

Key Words: veterans, employment, workforce development, wages

Policymakers are highly attentive to the employment status of military veterans and their families. In 2012, First Lady Michelle Obama said, "I won't be satisfied, nor will my husband, until every single veteran and military spouse who wants a job has one" (Farrington and Kennedy 2012). Although veterans as a group that year had a lower unemployment rate than nonveterans (7.0 percent compared to 7.9 percent), veterans from the Gulf War II era (since September 2001) faced a 9.9 percent unemployment rate (Bureau of Labor Statistics 2013), suggesting that the Obamas' goals have not yet been fulfilled.

To maximize veterans' employment, federal and state governments often rely in part on the workforce development system. Programs such as the Workforce Investment Act (WIA), Wagner-Peyser, and Trade Adjustment Assistance seek to provide people with skills and knowledge to enable them to obtain and maintain employment (O'Leary, Straits, and Wandner 2004). Services to veterans are offered both within these overarching programs and through special grants and service priority programs.

Building on previous research that tracks the workforce system, I examine the specific experiences of veterans in the workforce development system in Washington State during the years 2002–2012. Using wage and employment data from the Unemployment Insurance system (for the years 2000–2012) and program participation and demographic data from the state workforce caseload management system (covering the years 2002–2012), I address these three research questions: 1) Which workforce services did veterans use most frequently? 2) Within key programs and across all programs, did veterans obtain and retain employment at the same rates as other participants? 3) Were postprogram earnings levels of veteran participants similar to those of nonveteran participants? The goal of this research is to assess the effectiveness of the workforce development system for military veterans, one of its key customer groups.

BACKGROUND

Federally funded workforce development and job training in the United States can trace its roots to the 1930s. In more recent years, since the Workforce Investment Act of 1998, states have provided workforce development services at federally and state-funded One-Stop Career Centers, now called American Job Centers. Specifically for military veterans, the Jobs for Veterans Act (JVA) of 2002 created a priority of service requirement for veterans receiving workforce development services.

The system serves veterans through the workforce programs available to the public at large and also through specific programs designated only for veterans. General programs include the Adult and Dislocated Worker provisions of the Workforce Investment Act, which provide in-depth job training and matching services to highly disadvantaged workers, and a less-intensive matching program interchangeably called Wagner-Peyser, Labor Exchange, and Employment Service. See Decker and Berk (2011) and Chrisinger (2013) for further descriptions of these programs.

Specifically for veterans, and officially provided by the U.S. Department of Labor's Veterans' Employment and Training Service (VETS), programs offered include the Disabled Veterans Outreach Program (DVOP) and Local Veterans Employment Representative (LVER). DVOP provides eligible veterans with case-managed intensive employment and training services and connections with potential employers, along with referrals to other programs such as medical services from the Department of Veterans Affairs. The Local Veterans Employment Representative program is similar but with greater focus on outreach to potential employers and raising awareness of incentive programs for hiring veterans (U.S. Department of Labor 2013). Although such incentive programs are separate, they are an important component of veterans'

employment. Just a few examples of these programs include tax incentives to encourage employers to hire veterans and veteran preference provisions for hiring at many organizations. It should also be noted that many of the reemployment counselors employed by workforce agencies are themselves veterans.

A moderately sized literature discusses the effects of military service on employment and earnings. For recent veterans, some evidence suggests no association between veteran status and civilian wages among whites, and equal employment rates for veterans and nonveterans overall (Routon 2014). Other studies find a wage premium for recent veterans with a high school education or less compared to similar nonveterans and lower rates of employment for recent veterans than nonveterans (Kleykamp 2013). For reservists, results suggest short-term earnings losses but long term gains (Loughran and Klerman 2012).

Meanwhile, evidence for previous periods of military service (since 1974) suggests that average earnings of veterans exceeded those of nonveterans within two years after departure from the military (Mangum and Ball 1989). However, findings differ when the focus shifts to longer-term earnings trajectories (Teachman and Tedrow 2007). Further back, Vietnam-era veterans appeared to earn less than nonveterans, on average (Rosen and Taubman 1982).

Bureau of Labor Statistics (2013) documents show higher unemployment rates among Gulf War II era veterans than nonveterans, with a rate of 12.1 compared to 8.7 in 2011 and 9.9 compared to 7.9 in 2012. In addition to greater unemployment, associated risks such as homelessness are also greater for veterans than nonveterans (Perl 2013).

Related research has compared the use of health care services by veterans and nonveterans (Wolinsky et al. 1985) or by gender (Hoff and Rosenheck 1998) and examined the influence of health insurance expansions on the labor supply of veterans and nonveterans (Boyle

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and Lahey 2010). Authors have described the effects of the GI Bill on educational attainment, earnings, and employment (Angrist and Chen 2011).

In theory, veterans' labor market outcomes might be better than nonveterans' outcomes because veterans have received military training that may be transferrable, incentive policies encourage employers to hire veterans, and legislation gives veterans priority to receive civilian workforce development services. However, little research has focused exclusively on veterans in the workforce development system and their associated labor market experiences, despite the prioritization of veterans within the system. The most closely related research to the current paper is an evaluation of the Priority of Service provision of the Jobs for Veterans Act, commissioned by the U.S. Department of Labor. It finds that service receipt within the WIA Adult and Dislocated Worker programs was similar for veterans and nonveterans, that employment rates were similar, and that earnings were higher among veterans both before and after program participation (Trutko and Barnow 2010). Data used in that study did not permit direct analysis of receipt of non-WIA services, such as LVER and DVOP, as is possible in the current research.

More broadly, the literature on the effectiveness of the workforce development system in enhancing participants' earnings is somewhat mixed but generally positive or neutral. Heinrich et al. (2013) find that WIA participants experience average earnings gains of several hundred dollars per quarter, based on up to four years of follow-up data after program entry. Hollenbeck and Huang (2006) similarly find earnings and employment increases associated with WIA participation in Washington State, while Chrisinger (2013) and Mueser and Stevens (2003) focus on the postprogram earnings growth rates, and both find no association between participation and long-term earnings trajectories.

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Given policymakers' interest in promoting employment among military veterans, additional research on the specific experiences of veterans in the workforce development system is warranted. Based on the limited related literature (Kleykamp 2013), the hypotheses of this paper are that 1) veterans who have recently participated the workforce development system will have lower rates of employment than nonveterans, since that is the trend among recent veterans in the population at large, but 2) veterans who are employed will have higher earnings than nonveterans, since that is also the trend among less-skilled veterans and nonveterans in the general population. Overall, the aim of the current research is to add to our knowledge of the experiences of veterans and shed light on strengths and opportunities within the realm of workforce development service provision for veterans.

DATA AND METHODS

Washington State provided the administrative data for this analysis. The data consist of quarterly wage and employment information from the Unemployment Insurance system for the years 2000–2012 and matching program participation and demographic data from the state workforce caseload management system covering the years 2002–2012. These data sets represent the complete universe of program participants in the state during this time period, making them extremely large and rich collections of information.

Identification of participants as veterans or nonveterans is based on a variable in the demographic data set. The variable identifies each participant as a veteran, a Vietnam-era veteran, a disabled veteran, a few other categories of veteran status, or a non-veteran. Other than the Vietnam indicator, it does not indicate a specific period of service. The information is self-reported to the program staff and as such may contain inaccuracies. The state believes that

people who are identified as veterans in the data are very likely to actually be veterans, but there are concerns that some people not identified as veterans could indeed be veterans who have chosen not to report that information. The exact magnitude of this potential problem is unknown, but one simple test that provides reassurance is to compare the representation of veterans in the workforce population with representation of veterans in the population as a whole based on other data, and to observe only very trivial differences.

To address the research questions, this study uses tabulations, multivariate regression, and propensity score matching. However, unmatched tabulations may be misleading because of the influence of other characteristics. Among the characteristics that may influence employment and earnings outcomes other than veteran status are age, gender, race, education, time period, and geographic location, to name a few.

Since veteran status is not randomly assigned in the real-world data set that forms the basis for this research, this research uses multivariate regression and propensity score matching to separate the association of veteran status with labor market outcomes from the association of other factors with labor market outcomes. Propensity score matching is useful for adding confidence to the comparison of participant groups that may be different from each other in ways other than, in this case, veteran status alone (Guo and Fraser 2010).

To implement the propensity score approach, I calculate a propensity score that represents the probability of being a veteran as a function of observed characteristics in the data set. I then drop nonveterans from the sample who have a low probability of being a veteran, or use the propensity score itself as a weight (known as the Horvitz–Thompson estimator) to minimize their statistical influence. In other words, these individuals form a poor match for the veterans in the sample based on observable characteristics. The resulting effective sample then

contains matched veterans and nonveterans who have similar propensity scores. I conduct

balancing tests to verify that observable characteristics, on average, within the sample are

statistically equal after the matching procedure. If not, I repeat the matching process until the

characteristics are statistically equivalent. Again, this approach improves our ability to infer that

an outcome is attributable to veteran status rather than other characteristics.

I also use multivariate regression (and logistic regression in the case of binary outcomes),

both independently and in combination with propensity score matching. Multivariate regression

shows average levels of the outcome variable in association with the key variable of interest,

while holding other variables constant, helping to isolate the role of veteran status alone.

Estimating unmatched regressions is the next step after tabulations to determine whether the

results remain the same or not. However, regression alone does not create a matched sample and

thus is still not the most advanced method available for addressing self-selection concerns. An

improved method, implemented in this project, is the use of regression in combination with the

propensity score approach, either with a matched sample with nonmatching individuals removed

or using weights to change the effective composition of the sample. In the case of weighting, the

typical form of the weight when estimating the average treatment effect is $1/(1 - P)$ for a control

participant and $1/P$ for a treatment participant, where P is the propensity score (Gelman and Hill

2007). Both approaches are used here, and the results are compared in a sensitivity analysis.

Another key matter to consider, other than choice of methods, is the time horizon for

analysis. In this research, I compare outcomes among veterans and nonveterans at different time

intervals after their last receipt of any workforce development service. I use six months after

program exit as the primary comparison window, for consistency with performance measures

from the U.S. Department of Labor, but also use one year to gain additional information about

the longer-term economic well-being of former workforce program participants. I control for time period in the regressions to account for economic effects of the Great Recession and other macroeconomic factors.

To repeat, the research uses propensity score matching to create from the data a group of veterans and nonveterans who are statistically equivalent to each other. This strategy, when used in combination with multivariate regression, offers one of the best available methods for comparing employment and earnings outcomes across potentially quite different population groups.

RESULTS

This section first presents descriptive statistics for 2002–2012 across the workforce development system in Washington State, comparing veterans and nonveterans. Any person who received any of the following services is included: WIA Adult, Wagner-Peyser, Claimant Placement Program, WIA Dislocated Worker, Trade Adjustment Assistance, Disabled Veterans Outreach Program, and Local Veterans Employment Representative. As background information for interpreting **Table 1**, note that among the civilian population in Washington State aged 18 and over, the Census Bureau estimates the presence of 587,266 veterans out of a total of 5,266,221 people, or a rate of approximately 11 percent.[1] The representation of veterans in these workforce system statistics is also approximately 11 percent, taking the reporting of veterans in the data at face value.

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[1] American FactFinder: S2101 Veteran Status: 2012 American Community Survey 1-Year Estimates, https://factfinder.census.gov/bkmk/table/1.0/en/ACS/12_1YR/S2101/0400000US53 (accessed May 5, 2017).

Table 1 Demographic Composition at Six Months after Exit (Unmatched)

	Nonveterans	Veterans
Age	39.9	46.6
Female (%)	48	11
Less than HS (%)	14	2
GED (%)	14	10
HS diploma (%)	31	35
Some college (%)	20	28
Associate's degree (%)	7	10
Bachelor's degree (%)	11	11
Graduate degree (%)	3	3
Asian American (%)	6	3
Black (%)	6	9
Native American (%)	2	2
Pacific Islander (%)	1	1
Unknown race (%)	15	8
White (%)	71	78
Latino/Hispanic (%)	12	5
Number	1,323,913	153,434

Addressing the first research question, which workforce services veterans used most frequently, Table 2 shows the number of unique people who used each service during the period 2002–2012. The total is by person rather than service to avoid double counting if a person uses a program more than once. The table shows that more than half of veterans used DVOP. Some veterans use multiple services, and thus the total number of people represented in these services adds to more than the actual number of unique veterans in the data set.

Table 2 Program Use by Veterans and Nonveterans

	Nonveterans		Veterans	
	Number	%	Number	%
WIA Adult	89,911	6.8	8,486	5.5
Wagner Peyser	877,863	66.3	88,299	57.5
Claimant Placement Program	872,963	65.9	81,662	53.2
WIA Dislocated Worker	107,912	8.2	13,692	8.9
Trade Adjustment Assistance	25,459	1.9	4,150	2.7
Disabled Veterans Outreach Program	18,213	1.4	89,568	58.4
Local Veterans Employment Rep.	10,803	0.8	61,969	40.4
Total unique people	1,323,913		153,434	

From a program perspective with the universe of all workforce development participants and not just veterans, these numbers suggest that 9 percent of people who used WIA Adult and Labor Exchange were veterans, and 83 percent of people using DVOP and 86 percent of people using LVER were veterans (since these programs are specifically for veterans, these numbers might reflect underreporting of veteran status).

Table 3 counts instead in terms of programs used by veterans, meaning that one person could use a program more than once and would be counted accordingly. Therefore, these numbers reflect program and daily operations of service provision to veterans. There were nearly 3 million service encounters by the more than 150,000 veterans served during this time period. Again, the people counted here as using these services are veterans exclusively; nonveterans are not included in these counts even if they also use these programs. These counts are totals for the entire time period of the analysis. The table suggests that service to veterans, as measured by service encounters, was predominately provided through veteran-specific programs such as DVOP and LVER rather than generalized programs such as WIA.

Table 3 Number of Service Encounters by Veterans by Program, 2002–2012

Program	No.	%
Disabled Veterans Outreach Program	812,134	27.2
Labor Exchange - Wagner Peyser	632,709	21.2
Claimant Placement Program	556,052	18.6
Local Veterans Employment Representative	449,812	15
Workfirst Job Search	98,639	3.3
WIA Dislocated Worker	80,279	2.7
Trade Assistance Act	50,345	1.7
Job Match Initiative	38,954	1.3
WIA Adult	38,418	1.3
Total	2,991,137	100

The second research question is whether, within key programs and throughout the workforce development system, veterans obtained and retained employment at the same rates as

other participants. I count people in the data set as employed during a quarter if their total wages during that quarter equal or exceed $100. If a person does not appear in the wage records for a particular quarter, I count his or her wages as $0 for that quarter. This practice could potentially omit or misrepresent some people who work for employers who do not report wages or who work out of state, but I expect those problems to be overwhelmed by the sheer volume of included wage information.

Starting with an overall measure across all programs included in this analysis (see list at the beginning of the results section), Table 4 provides a simple comparison of employment rates six months after exit for veterans and nonveterans. Table 5 gives the same information for employment rates one year after program exit. Table 6 breaks the one-year comparison up by time period to examine possible effects of the recession on employment outcomes. The tabulations suggest that in all cases, veterans were much less likely than nonveterans to be employed within 6 months or a year after program exit. The economic downturn appears to have affected both groups negatively and may offer a partial explanation for the employment rates that were lower one year after exit than at six months after exit. Another possibility is that individuals lost or left jobs relatively quickly after an initial period of postprogram employment.

Table 4 Employment Six Months after Exit (unmatched comparison)

Employed	Nonveterans		Veterans	
	No.	%	No.	%
No	716,047	54	95,380	62*
Yes	607,866	46	58,054	38*
Total	1,323,913	100	153,434	100

NOTE: * indicates different from nonveterans in a comparison of proportions.

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Table 5 Employment One Year after Exit (unmatched comparison)

Employed		Nonveterans		Veterans	
		No.	%	No.	%
	No	771,009	58	101,893	66*
	Yes	552,997	42	51,541	34*
Total		1,324,006	100	153,434	100

NOTE: * indicates different from nonveterans in a comparison of proportions.

Table 6 Employment Over Year after Exit (separated by time period)

During 2002–2007					
		Nonveterans		Veterans	
Employed		No.	%	No.	%
	No	181,294	47	33,719	59*
	Yes	205,923	53	23,191	41*
Total		387,217	100	56,910	100
During 2008–2012					
		Nonveterans		Veterans	
Employed		No.	%	No.	%
	No	589,715	63	68,174	71*
	Yes	347,074	37	28,350	29*
Total		936,789	100	96,524	100

The third research question is whether earnings levels of veterans were similar to those of nonveteran participants, after program exit. First approaching the question for all participants and programs, Table 7 shows the average quarterly wages at six months after exit for veterans and nonveterans, and Table 9 shows the same information one year after program exit. Table 8 separates quarterly wage information by gender at six months after program exit. All wage calculations are conditional on employment, and all monetary amounts are expressed in 2012 U.S. dollars (using the monthly U.S. City Average, Not Seasonally Adjusted Consumer Price Index for All Urban Consumers, All Items). The basic results suggest that employed veterans experience higher earnings than nonveterans at both six months and one year after program exit, among both women and men.

Table 7 Quarterly Wages Six Months after Exit (unmatched comparison)

	Nonveterans	Veterans
Mean quarterly wage ($, 2012)	7,227	8,848
Standard error	9.1	35.7

Table 8 Quarterly Wages Six Months after Exit (separated by gender)

	Male nonveteran	Male veteran	Female nonveteran	Female veteran
Mean quarterly wage ($, 2012)	8,192	9,058	6,183	6,994
Standard error	14.3	38.8	10.6	70.0

Table 9 Quarterly Wages One Year after Exit (unmatched comparison)

	Nonveterans	Veterans
Mean quarterly wage ($, 2012)	7,924	9,622
Standard error	12.6	33.1

The next perspective is from multivariate regressions on an unmatched sample.
Regression analysis helps to control the influence of factors other than veteran status on
employment and earnings. Table 10 shows estimates for earnings and employment status at 6
and 12 months after exit. The inference is the same as previously stated: veterans are much less
likely to be employed than nonveterans but have higher quarterly earnings when employed.

To improve on the unmatched and unweighted approach, I use propensity scores in two
ways to account for selection into veteran status. Propensity scores are the probability of being a
veteran, estimated using a logit model on the demographic characteristics and time period. Table
11 uses functions of propensity scores as weights in the regressions. The overall results remain
largely the same as the unweighted version.

Table 10 Unweighted Regressions without Matching

	6 months after exit		12 months after exit	
	Earnings	Employed	Earnings	Employed
Veteran	120.2***	0.724***	123.9**	0.704***
Age	49.34***	0.986***	45.19***	0.985***
Female	−2,326.8***	1.010**	−2,453.7***	1.015***
Less than HS	−2,699.7***	0.671***	−3,260.4***	0.670***
HS	−1,376.7***	0.951***	−1,674.8***	0.950***
GED	−2,210.2***	0.701***	−2,514.4***	0.682***
Some college	−275.8***	0.964***	−295.3***	0.976***
Bachelor's degree	2,639.7***	1.049***	3,042.1***	1.084***
Graduate degree	5,347.6***	0.952***	5,894.0***	0.992
Asian American	438.6***	1.180***	447.4***	1.294***
Black	−1,021.5***	0.857***	−987.9***	0.839***
Native American	−726.6***	0.804***	−929.8***	0.838***
Pacific Islander	−864.8***	0.918***	−831.6***	0.908***
White	32.46	1.084***	−21.09	1.110***
Hispanic	−354.6***	1.214***	−581.2***	1.132***
Recession years	−362.3***	0.589***	−294.9***	0.527***
Constant	7,346.6***		8,384.7***	
Observations	675,447	1,477,345	611,530	1,477,438

NOTE: * p<0.05, ** p<0.01, *** p<0.001.

Odds ratios shown for employed.

Omitted categories: Associate's degree and unknown race.

Recession years are 2008-2012.

Table 11 Propensity Score Weighted Regressions, Six Months after Exit

	Earnings	Employed
Veteran	349.9***	0.640***
Age	43.21***	0.993***
Female	−2,284.9***	0.895***
Less than HS	−2,551.7***	0.770***
HS	−1,226.8***	0.931***
GED	−1,864.7***	0.778***
Some college	−265.9***	0.930***
Bachelor's degree	2,232.9***	1.031
Graduate degree	4,522.7***	1.029
Asian American	−31.99	0.996
Black	−1,228.3***	0.802***
Native American	−986.6***	0.850***
Pacific Islander	−1,116.0***	0.923
White	−284.0**	1.104***
Hispanic	−512.9***	1.056*
Recession years	−485.1***	0.630***
Constant	7,905.1***	
Observations	675,447	1,477,345

NOTE: * p<0.05, ** p<0.01, *** p<0.001.

Odds ratios shown for employed.

Omitted categories: Associate's degree and unknown race.

Recession years are 2008-2012.

Propensity score matching involves resampling to ensure that the control group is an appropriate comparison for the treatment group. To create a matched sample, some of the nonveterans are not selected to be in the sample because they have different characteristics than the veterans in the sample, as indicated by their propensity score. Several methods of matching are available. The method used here is nearest neighbor matching. Table 12 shows that the demographic composition of the control group after matching has changed substantially compared to the unmatched full data set. The control group is now much more comparable to the treatment group, helping to isolate the association of veteran status with the outcomes of interest.

That change is further illustrated in Figure 1 and Figure 2, which graph the propensity scores separately for veterans and nonveterans. The probability of being a veteran based on observed characteristics is quite less for nonveterans, until only closely matching nonveterans are selected.

Table 12 Demographic Composition of Matched Sample

	Nonveterans	Veterans
Age	43.6	46.5
Female (%)	18	11
Less than HS (%)	3	2
GED (%)	10	10
HS diploma (%)	38	35
Some college (%)	27	28
Associate's degree (%)	8	10
Bachelor's degree (%)	10	11
Graduate degree (%)	4	3
Asian American (%)	3	3
Black (%)	7	9
Native American (%)	2	2
Pacific Islander (%)	1	1
Unknown race (%)	10	8
White (%)	78	78
Latino/Hispanic (%)	7	5
Number	348,567	152,059

Figure 1 Propensity Scores for Full Data Set

kernel = epanechnikov, bandwidth = 0.0092
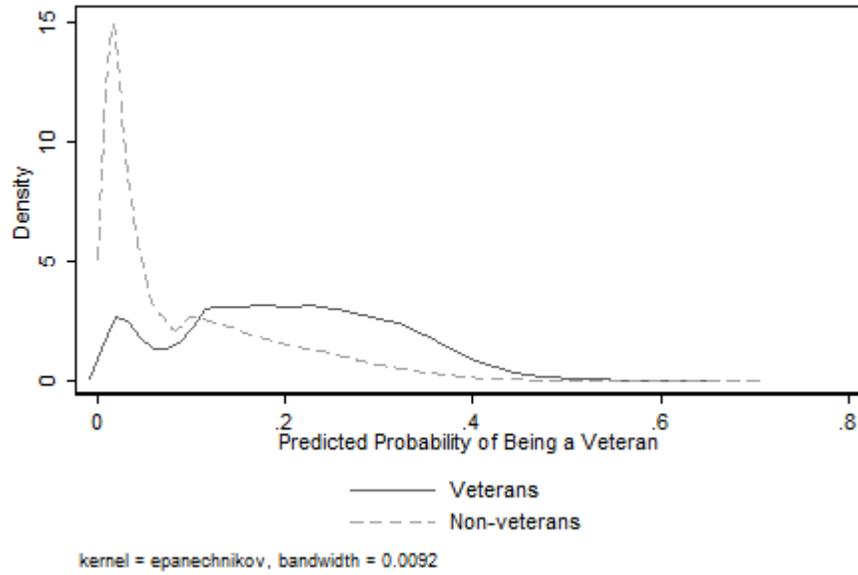
Figure 2 Propensity Scores for Matched Sample

kernel = epanechnikov, bandwidth = 0.0096
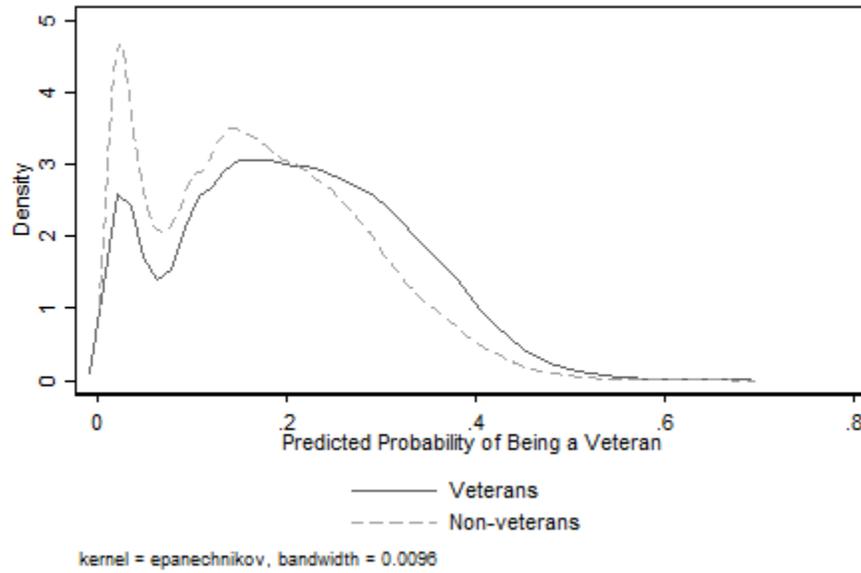
Table 13 Regressions on Matched Sample, Six Months after Exit

	Earnings	Employed
Veteran	61.24	0.741***
Age	25.89***	0.983***
Female	−2,580.2***	0.976**
Less than HS	−2,987.2***	0.746***
HS	−1,290.7***	0.972**
GED	−2,243.1***	0.737***
Some college	−142.4*	0.967**
Bachelor's degree	2,648.3***	1.005
Graduate degree	5,446.1***	0.938***
Asian American	−122.8	1.137***
Black	−1,534.6***	0.853***
Native American	−1,145.9***	0.882***
Pacific Islander	−1,206.2***	0.913*
White	2.958	1.130***
Hispanic	−733.0***	1.097***
Recession years	−404.8***	0.604***
Constant	8,574.1***	
Observations	220,034	500,626

NOTE: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.
Odds ratios shown for employed.
Omitted categories: Associate's degree and unknown race.
Recession years are 2008–2012.

When using a matched sample in Table 13, a very strong negative connection clearly still remains between being a veteran and being employed. Veterans appear to be less likely to be employed than nonveterans, even when carefully addressing selection and sample composition. In contrast, the relationship between earnings and veteran status becomes quite a bit less stark when using a matched sample where veterans and nonveterans are similar to each other on other demographic characteristics. A challenge in using propensity score matching is that standard errors become more difficult to compute with certainty. In these results, the magnitude of the standard errors becomes relevant to whether we would say there is or is not a correlation between earnings and veteran status. The positive direction of the relationship is still preserved, but the size of the effect is much less compared to unmatched results. When using the command

psmatch2 in the Stata software program, the average treatment effect on the treated (ATT) suggests that the significant positive effect of veteran status on earnings is still present, but only with a difference of $184 per quarter in earnings. If there is a slightly higher earnings level when employed for veterans than nonveterans, it is not very large after addressing other factors that could be related to earnings differences. That is not surprising given that veteran status is correlated with demographic characteristics that tend to fare better in the labor market.

CONCLUSION

A persistent result throughout this research is that veterans who have participated in workforce development programs are less likely to be employed after the program compared to nonveterans. The reason for that is not clear from this study but would be a good topic for future and more qualitative research. This study used propensity score methods and regressions to control for differences in age, race, ethnicity, gender, and education when testing the effect of being a veteran on being employed. Many other factors were not controlled, such as health status, marital status, parental status, or industry of desired employment.

The presence of a wage premium for veterans relative to nonveterans is supported but only weakly by the propensity score matching in this research. The premium may be far more modest when accounting for selection than it appears in raw tabulations. Further, the recession that fell during this study period was a challenge for both veterans and nonveterans.

Policymakers could use these results to support a redoubled effort to address any barriers to employment that may appear for veterans receiving workforce development services, and to work closely with employers to encourage further prioritization of veterans in hiring. Program

administrators may also choose to examine the program content and whether it could serve veterans more effectively.

REFERENCES

Angrist, Joshua D., and Stacey H. Chen. 2011. "Schooling and the Vietnam-era GI Bill: Evidence from the Draft Lottery." *American Economic Journal: Applied Economics* 3(2): 96–118.

Boyle, Melissa A., and Joanna N. Lahey. 2010. "Health Insurance and the Labor Supply Decisions of Older Workers: Evidence from a U.S. Department of Veterans Affairs Expansion." *Journal of Public Economics* 94(7–8): 467–478.

Bureau of Labor Statistics. 2013. "Employment Situation of Veterans 2012." News release, USDL-13-0477. https://www.bls.gov/news.release/archives/vet_03202013.pdf (accessed May 5, 2017).

Chrisinger, Collen K. 2013. "Earnings Progression and the Workforce Investment Act: Evidence from Washington State." *Industrial Relations: A Journal of Economy and Society* 52(4): 853–877.

Decker, Paul T., and Jillian A. Berk. 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.

Farrington, Brendan, and Kelli Kennedy. 2012. "First Lady Announces New Hiring Push for Vets." http://bigstory.ap.org/article/first-lady-announces-new-hiring-push-vets (accessed May 5, 2017).

Guo, Shenyang, and Mark W. Fraser. 2010. *Propensity Score Analysis: Statistical Methods and Applications*. Sage Publications.

Heinrich, Carolyn J., Peter R. Mueser, Kenneth R. Troske, Kyung-Seong Jeon, and Daver C. Kahvecioglu. 2013. "Do Public Employment and Training Programs Work?" *IZA Journal of Labor Economics* 2(1): 6.

Hoff, Rani A., and Robert A. Rosenheck. 1998. "Female Veterans' Use of Department of Veterans Affairs Health Care Services." *Medical Care* 36(7): 1114–1119.

Hollenbeck, Kevin, and Wei-Jung Huang. 2006. *Net Impact and Benefit Cost Estimates of the Workforce Development System in Washington State*. Upjohn Institute Technical Report No. TR06-020. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Kleykamp, Meredith. 2013. "Unemployment, Earnings and Enrollment among Post 9/11 Veterans." *Social Science Research* 42(3): 836–851.

Loughran, David S., and Jacob A. Klerman. 2012. "The Effect of Activation on the Post-Activation Civilian Earnings of Reservists." *Labour Economics* 19(1): 18–26.

Mangum, Stephen L., and David E. Ball. 1989. "The Transferability of Military-Provided Occupational Training in the Post-Draft Era." *Industrial and Labor Relations Review* 42(2): 230–245.

Mueser, Peter R., and David W. Stevens. 2003. "Low-Income and Welfare Client Priorities: Patterns of Earnings and Welfare Receipt for Workforce Investment Act Participants." Working paper. Washington, DC: U.S. Department of Labor, Employment Training Administration.

O'Leary, Christopher J., Robert A. Straits, and Stephen A. Wandner, eds. 2004. *Job Training Policy in the United States*. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Perl, Libby. 2013. *Veterans and Homelessness*. Washington, DC: Congressional Research Service. http://www.fas.org/sgp/crs/misc/RL34024.pdf (accessed May 5, 2017).

Rosen, Sherwin, and Paul Taubman. 1982. "Changes in Life-Cycle Earnings: What Do Social Security Data Show?" *Journal of Human Resources* 17(3): 321–338.

Routon, P. Wesley. 2014. "The Effect of 21st Century Military Service on Civilian Labor and EducationalOoutcomes." *Journal of Labor Research* 35(1): 15–38.

Teachman, Jay, and Lucky Tedrow. 2007. "Joining Up: Did Military Service in the Early All Volunteer Era Affect Subsequent Civilian Income?" *Social Science Research* 36(4): 1447–1474.

Trutko, John, and Burt Barnow. 2010. *An Evaluation of the Priority of Service Provision of the Jobs for Veterans Act by the Workforce Investment System in Providing Services to Veterans and Other Covered Persons*. Final report. Prepared for the U.S. Department of Labor Employment and Training Administration, Washington, DC.

U.S. Department of Labor. 2013. *VETS Employment Services Fact Sheet 1: Program Highlights*. Retrieved from http://www.dol.gov/vets/programs/empserv/employment_services_fs.htm

Wolinsky, Frederic D., Rodney M. Coe, Ray R. Mosely II, and Sharon M. Homan. 1985. "Veterans' and Nonveterans' Use of Health Services: A Comparative Analysis." *Medical Care* 23(12): 1358–1371.