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The Labor Market Impact of the VOW Act on The U.S. Veterans: Evidence from the Current Population Survey

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The Labor Market Impact of the VOW Act on The U.S. Veterans: Evidence from the Current Population Survey

Abstract:

Using data from the Current Population Survey, this paper provides evidence on the impact of the “Veterans Opportunity to Work to Hire Heroes Act of 2011 (VOW Act)” on the labor market performance of veterans. The effect of the legislation was evaluated on five outcomes; labor force participation, unemployment, employment, weekly hours of work, and weekly earnings. Differences-in-Differences estimates suggest that veterans without disability increase their labor force participation by around 4 percentage points and this increase leads to higher chances of employment by about 3 percentage points. Female veterans with disability have the highest increase in employment by about 17 percentage points.

The findings of this study suggest that the VOW Act had a positive impact on veterans' labor market outcomes. The increase in labor force participation and employment is likely due to the VOW Act's provisions that provide veterans with access to job training, education, and financial assistance. The findings of this study are important for policymakers who are interested in improving the labor market outcomes of veterans.

JEL Codes: H25, J58, J60

1. Introduction

The U.S. military has made two major overseas deployments in the Global War on Terrorism since the 9/11 terrorist attack. After relatively peacetime period for the all-volunteer army, which started in 1973, recent long lasting overseas deployments and the wartime period have been a great challenge for the returning veterans. Moreover, 29 percent of veterans who served during the recent period of deployments since 2001 were reported to have a service-related disability in August of 2014, compared with 16 percent of all veterans (Labor Statistics, 2016). Several studies, the national labor statistics reports and the media suggested that as the veterans of this recent war period return to civilian life, the unemployment rate of veterans increased and was found to be higher than their comparable non-veteran peers (Faberman & Foster, 2013; Heaton & Krull, 2012; Humensky, Jordan, Stroupe, & Hynes, 2012; Kleykamp, 2013; Loughran, 2014).

As an effort to eliminate this unemployment gap between veterans and nonveterans, the U.S. Government passed the “Veterans Opportunity to Work to Hire Heroes Act of 2011 (VOW Act)”, signed by President Obama on November 21st 2011. The VOW Act was designed to lower unemployment among veterans by providing incentives to employers to hire unemployed veterans. The VOW Act consists of two tax credits. The Returning Heroes Tax Credit is committed to providing a maximum tax credit of \$2,400 for employers who hire short-term unemployed veterans and a tax credit of up to \$5,600 for firms who hire long-term unemployed veterans. Moreover, for the businesses that hire veterans with service-related disabilities, the Wounded Warriors Tax Credit is intended to provide them with a maximum credit of \$9,600 per veteran.

The idea of subsidized jobs is not new for the federal government. Although prevalent only for limited period of times, over the last five decades, subsidy programs have increasingly been used in order to improve employment prospects of certain groups considered to be economically disadvantaged. The specific target groups have generally included low-income youth, workers who are recipients of federal assistance programs, ex-felons and veterans who are members of families receiving public assistance. However, for the first time, the VOW Act was, particularly, designed to improve the labor market performance of veterans by offering wage subsidies to potential employers.

Figure 1 presents the rate of unemployment, calculated as a share of civilian labor force ages 18 to 30, by veteran status. Starting after the recent recession in 2007, rate of unemployment for veterans and non-veterans increase with same pace, but starting in 2010 unemployment rate of veterans deviate from the unemployment rate of non-veterans. Figure 2 presents the employment rates, calculated as a share of civilian population ages 18 to 30, by veteran status. As a measure of success in the labor market, rate of employment is also important, since long-lasting unemployment may discourage workers from searching for job.

This paper relies on time to identify the effect of the legislation using Integrated Public Use Micro-data samples from the Current Population Survey from 2010 to 2013. The VOW Act was passed in late November 2011, and it is assumed the legislation has no effect in December.

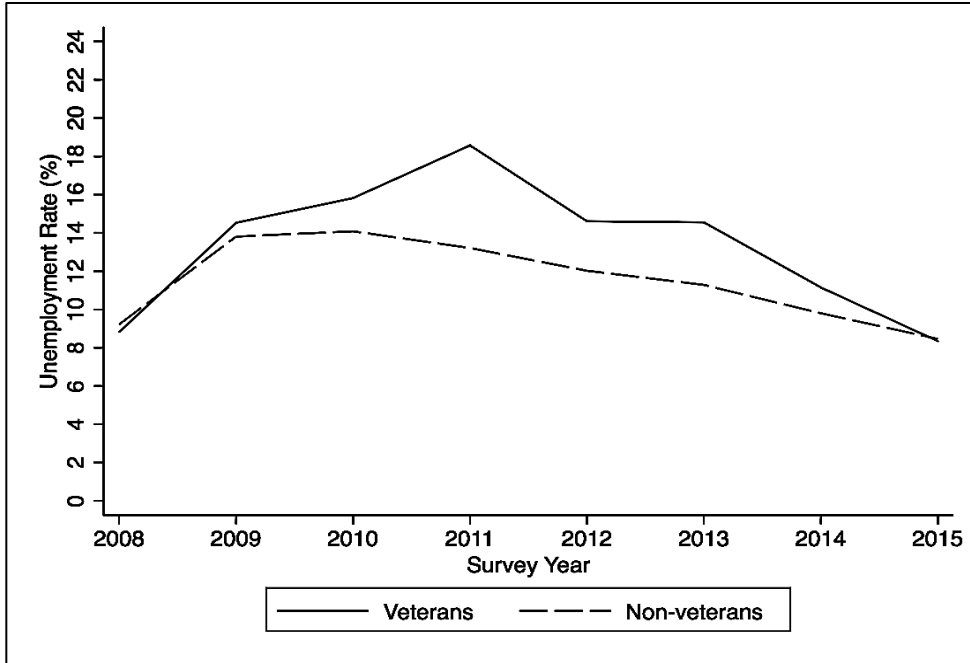


Figure 1 - Rate of Unemployment by Veteran Status

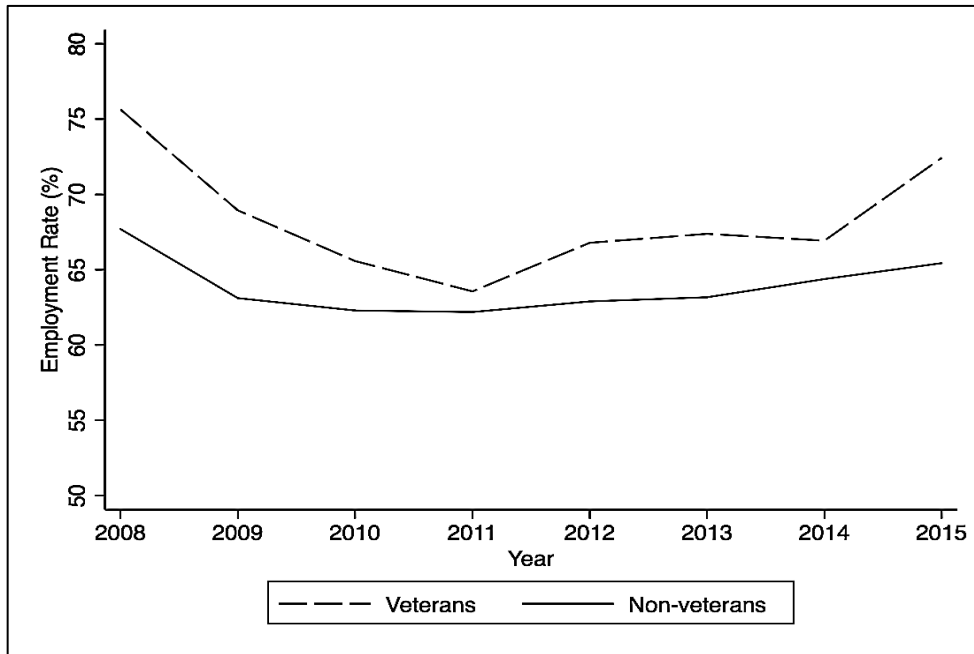


Figure 2 - Rate of Employment by Veteran Status

Note: Calculations use weighted samples from Integrated Public Use Micro-data from Current Population Survey. Unemployment rate defined as the ratio of unemployed in the labor force, and employment rate is calculated as share of employed to population.

This study examines the causal effect of this legislation on the labor force participation decisions and employment of veterans using quasi-experimental design. The effect of the legislation on employment level is evaluated by looking at labor force participation, unemployment, employment, weekly hours worked and weekly earning. In contrast to previous findings in related literature, this paper shows evidence that the VOW Act, as a wage subsidy program, leads to an increase in the employment of veterans on the extensive margin and average weekly hours worked on the intensive margin as compared to non-veterans. On the other hand, I find that the employment gain from the legislation does not lead to an increase in earnings.

The remainder of the paper is designed as follows: I begin with summarizing the previous findings on the subsidy programs in Section II. And in Section III, I describe the data. Section IV explains the empirical strategy and presents the empirical findings. And finally, Section V presents conclusions.

2.2 Literature Review

As a legislative tool, public assistance programs have been used to improve the economic conditions of certain target groups. Some of these support programs offered financial incentives directly to individuals in order to encourage them to participate more in the labor force. One of the popular supply-side subsidies is the Earned Income Tax Credit (EITC). The EITC was started in 1986 and targeted working individuals and couples, particularly, those with children. Studies have shown that the EITC promotes labor force participation and employment among eligible single women with children (Eissa & Liebman, 1996; Meyer & Rosenbaum, 2001).

Alternatively, another type of federal intervention has offered wage subsidies in the form of a tax credit to employers for hiring members of targeted groups, considered to have difficulty

finding jobs. On the demand side of the labor market, employer subsidy programs have been designed to lower the cost of hiring the target groups so that employers favor members of targeted groups at the expense of ineligible workers. The Targeted Jobs Tax Credit (TJTC), which was popular in the 1980s, was found to increase employment of young workers by over 10 percent (Bishop & Montgomery, 1993). In contrast, the experimental study by Burtless (1985) indicates that exposing workers as subsidized by the government reduces the chance of employment through stigmatizing effect. He explains that workers participating the subsidy programs would be considered as “damaged goods” by the employers and thus, workers would be disadvantaged as compared to ineligible applicants.

In 1996, as a sequel to the TJTC, the Work Opportunity Tax Credit (WOTC) was created with a few improvements; for example, only new hires would be eligible for the subsidy and they need to work for a certain period of time to be eligible for the credit. It is a federal hiring tax subsidy program like the TJTC and designed to expand employment among specific targeted groups. Although started in 1996 and extended several times, there is little research about how effective the program increases the employment of targeted groups. Hamersma (2003, 2005, 2008) shows evidence that the WOTC had low participation rate and thus, led to little impact on the employment among targeted workers. Using the expansion of the WOTC on disabled veterans in 2007, Heaton (2012) shows that the WOTC expanded employment among disabled veterans.

Regarding the limited literature on the effectiveness of hiring tax subsidy programs on the employment of targeted workers, this paper is the first examination of the VOW Act on the labor outcomes of the veterans, which was particularly designed to improve the employment prospects of veterans.

3. Data and Summary Statistics

Data for this study comes from basic monthly Current Population Survey (CPS) Integrated Public Use Microdata Samples (IPUMS) from 2010 to 2013 (Flood, King, Ruggles, & Warren, 2015). The CPS is the main source of national labor force statistics in the U.S., surveying about 60,000 households each month. It provides the usual monthly labor force information on the U.S. population.

The employment analytic sample is restricted to those aged 18 to 30 since this group is more likely to be in the labor force. This data set is useful because it provides information on the veteran and disability status of individuals. Veterans are identified in the data as those who previously served in the active duty component of the U.S. Armed Forces and are presently in civilian life. Although not identified explicitly in the data, this age group represents mostly the veterans who served during overseas deployments since 2001.

The impact of the VOW Act is measured by five outcomes: labor force participation, unemployment, employment, weekly hours of work and weekly earnings. Each outcome is analyzed in separate analytic samples. For all samples, I exclude any individual who is self-employed for they are less likely to be affected by the legislation. The analytic sample I analyzed the impact of the VOW Act on usual weekly hours worked is further restricted those who are employed and who have strictly positive working hours. And the sample used to analyze the weekly earnings is also restricted to those who are employed and who have strictly positive weekly earnings.

The effect of the legislation on the labor outcomes of the veterans is examined by comparing the average outcomes before and after the legislation. This empirical approach,

namely difference-in-differences approach uses control and treatment groups. For a credible comparison, this study uses non-veterans as the control group and veterans as the treatment group in all sub-samples. Empirical method relies on the assumption that control and treatment groups have common trend in the absence of the treatment, which is in pre-policy years.

Descriptive statistics organized by gender, veteran status, and disability status is reported in Table 1. It presents the mean values of the characteristics of the control and treatment groups. There are marked differences across sub-populations. Male veterans without disability have higher labor force participation rate than male non-veterans however, there is little difference between female veterans and non-veterans. Labor force participation is similar among those with disability. Except for females without a disability, all sub-samples of veterans have higher employment rate, but female veterans without a disability have lower employment rate than female non-veterans without a disability. Once participating in the labor force, veterans have a higher rate of unemployment in all subsamples except among males with disability. On the other hand, veterans have higher usual hours of work weekly. Weekly earnings are adjusted for inflation using CPI factors and they are in 2014 dollars. Weekly earnings variable is available only for quarter of the data, which is for those, Merged Outgoing Rotation Group, who are in their fourth month in the survey sample. Similar to employment rates, veterans earn more than non-veterans in all sub-samples except for female veterans without a disability. On average, veterans are older and have higher rate of some college degree but a lower rate of high school degree. As for bachelor or higher degree, except male veterans with disability all sub-samples of non-veterans have higher rate. In all groups, veterans are more likely to be married and divorced or widowed than non-veterans. Veterans are also more likely to be white or black, but less likely to be Hispanic.

Table 1 Summary Statistics by Disability Status and Gender

Variables	Without disability				With disability			
	Females		Males		Females		Males	
	Non-veteran	Veteran	Non-veteran	Veteran	Non-veteran	Veteran	Non-veteran	Veteran
Labor force participation	0.68	0.67	0.78	0.83	0.40	0.43	0.41	0.56
Employment	0.61	0.57	0.67	0.71	0.30	0.32	0.30	0.41
Unemployment	0.11	0.15	0.13	0.15	0.24	0.25	0.26	0.26
Weekly Hours Worked	34.36	37.61	38.01	41.07	30.98	34.01	33.26	40.25
Weekly Earnings (\$)	537.25	643.53	658.75	772.52	413.54	1060.28	486.59	656.61
Age	23.97	26.66	23.84	26.43	24.31	26.66	23.74	26.59
< High School	0.12	0.01	0.15	0.02	0.23	0.04	0.28	0.05
High School/GED	0.26	0.24	0.31	0.37	0.37	0.18	0.44	0.38
Some College	0.39	0.56	0.35	0.49	0.31	0.75	0.22	0.47
BA+	0.24	0.19	0.19	0.12	0.09	0.03	0.06	0.09
Enrolled in school	0.27	0.13	0.25	0.12	0.18	0.21	0.18	0.13
Married	0.26	0.50	0.19	0.37	0.16	0.42	0.10	0.41
Divorced/Widowed	0.05	0.19	0.03	0.13	0.09	0.32	0.04	0.20
Never Married	0.69	0.31	0.79	0.50	0.75	0.26	0.86	0.40
White, non-hispanic	0.58	0.60	0.57	0.67	0.61	0.53	0.61	0.72
Black, non-hispanic	0.14	0.18	0.13	0.13	0.16	0.28	0.16	0.08
Other, non-hispanic	0.08	0.07	0.08	0.06	0.07	0.12	0.06	0.07
Hispanic	0.19	0.15	0.22	0.15	0.15	0.07	0.17	0.14
Urban residence	0.72	0.61	0.73	0.68	0.64	0.59	0.65	0.58
N	499,307	3,230	455,184	13,015	18,196	289	19,858	1,139

Note: Calculations are weighted with IPUMS-CPS sampling weights. Weekly hours worked and weekly earnings are calculated conditional on employment with positive weekly working hours and positive weekly earnings. Weekly earnings are in 2014 dollars, adjusted for inflation with CPI factor.

4. Method and Results

4.1. Difference Model

The main goal of this paper is to estimate the causal effect of the VOW Act 2011 on the employment outcomes of the veterans. I will start my analysis comparing average labor force participation and employment levels of the veterans before and after 2011. The VOW Act was put into effect in late November in 2011. For this purpose, I estimate the following linear probability model among only veterans:

$$Y_{it} = \alpha + \beta_1 d_t + \beta_2 Z_{it} + \varepsilon_{it}, \quad (1)$$

where i denotes individuals and t denotes time; Y_{it} is the outcome of interest for individual i in period t , $t=0, 1$; d_t is a dummy variable equals 1 for post-2011 years; and Z_{it} is a set of demographic control variables, including age, three educational levels, race or ethnicity dummies, marital status, urban status, presence of a child ages less than six years old, whether enrolled in school and state and year dummies. β_1 is the average effect of the new legislation on the labor outcomes for veteran.

The key assumption in this model is that, if there were no legislation, β_1 would be zero. As reported in Table 1, there are demographical differences between male and female veterans. For the accuracy of the treatment effect, in each regression I control for these demographic differences. Average differences in outcomes could be computed as $\Delta \bar{U} = \bar{U}_1 - \bar{U}_0$, but in that case I could not adjust standard errors for probable heteroskedasticity and could not adjust for demographic differences.

Table 2 Initial Results in Difference Model

Variables	Dependent Variable: Labor Force Participation				Dependent Variable: Employment			
	Without Disability		With Disability		Without Disability		With Disability	
	Women	Male	Women	Male	Women	Male	Women	Male
Post2011	0.058*	0.065***	0.249*	0.034	0.079**	0.088***	0.313**	0.115*
	(0.027)	(0.010)	(0.123)	(0.052)	(0.028)	(0.013)	(0.095)	(0.049)
Age	-0.063	-0.028	-0.007	-0.072	-0.096	-0.054*	0.075	-0.159
	(0.056)	(0.023)	(0.260)	(0.096)	(0.058)	(0.027)	(0.230)	(0.089)
AgeSQ	0.001	0.001	-0.001	0.001	0.002	0.001*	-0.002	0.003
	(0.001)	(0.000)	(0.005)	(0.002)	(0.001)	(0.001)	(0.004)	(0.002)
< High school	-0.264*	-0.096**	-0.205	-0.029	-0.283**	-0.045	-0.643***	-0.023
	(0.109)	(0.029)	(0.177)	(0.076)	(0.101)	(0.033)	(0.147)	(0.070)
Some college	0.081***	-0.031***	0.226	0.031	0.100***	-0.006	-0.107	0.006
	(0.024)	(0.008)	(0.130)	(0.039)	(0.025)	(0.010)	(0.087)	(0.037)
BA+	0.222***	0.020	0.380	0.016	0.241***	0.074***	-0.062	0.097
	(0.029)	(0.011)	(0.217)	(0.069)	(0.031)	(0.014)	(0.179)	(0.069)
Enrolled in school	-0.232***	-0.263***	-0.016	-0.107	-0.235***	-0.236***	-0.071	-0.121*
	(0.033)	(0.015)	(0.121)	(0.061)	(0.032)	(0.016)	(0.102)	(0.057)
Married	-0.218***	0.062***	0.077	0.064	-0.214***	0.102***	0.162*	0.159***
	(0.021)	(0.008)	(0.100)	(0.042)	(0.023)	(0.010)	(0.078)	(0.041)
Divorced/Separated	-0.032	0.044***	-0.009	0.020	-0.043	0.068***	0.167	-0.061
	(0.025)	(0.012)	(0.160)	(0.050)	(0.028)	(0.014)	(0.136)	(0.049)
Black, Non-hispanic	0.007	-0.041**	-0.236	-0.162*	-0.074**	-0.091***	-0.099	-0.140*
	(0.027)	(0.013)	(0.130)	(0.073)	(0.028)	(0.016)	(0.099)	(0.071)
Other, Non-hispanic	-0.040	-0.013	-0.360**	-0.023	-0.061	-0.005	-0.393***	0.018
	(0.038)	(0.017)	(0.110)	(0.077)	(0.041)	(0.020)	(0.079)	(0.069)
Hispanic	0.035	0.008	-0.199	-0.011	-0.036	-0.017	-0.393*	-0.033
	(0.029)	(0.012)	(0.210)	(0.063)	(0.029)	(0.015)	(0.163)	(0.059)
Urban residence	-0.020	0.003	0.084	0.140***	0.011	0.013	-0.055	0.182***
	(0.023)	(0.008)	(0.112)	(0.038)	(0.023)	(0.010)	(0.098)	(0.036)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE		Yes		Yes		Yes		Yes
Constant	1.640*	1.180***	0.452	1.351	1.849*	1.175***	-0.881	2.196
	(0.730)	(0.291)	(3.291)	(1.225)	(0.753)	(0.347)	(2.895)	(1.128)
Observation	3,230	13,015	289	1,139	3,230	13,015	289	1,139
R-SQ	0.160	0.090	0.503	0.176	0.156	0.090	0.577	0.218

Note: Robust standard errors are reported in parentheses. Calculations use given IPUMS-CPS sampling weights. Stars indicate significance level, * p<0.05, ** p<0.01, *** p<0.001.

Table 2 reports ordinary least squares (OLS) estimates of equation (1), which is a linear probability model. Dependent variables are binary variable, 1 if the individual i is in the labor force or employed. The coefficient of interest is a time dummy variable, $Post2011$, which is equal to one for the years after the legislation. It gives the average impact of the VOW Act on labor force participation of the veterans and employment of veterans.

The results in the Table 2 suggest that female veterans without disability increased labor participation by about 5 percentage points and female veterans with disabled increased their labor force participation by about 24 percentage points after the VOW Act became effective. As for the employment, results suggest that all veterans increase their chances of employment significantly as compared to pre-2011 period. The highest increase is among veterans with disability, female veterans by about 31 percentage points and male veterans by about 11 percentage points. And veterans without disability are more likely to be employed by about 8 percentage points as compared to pre-2011 period.

4.2 Difference-in-Differences Approach

In a simple difference model, for a credible comparison, I assume that veterans are comparable over the years (2010 to 2013), meaning that veterans have the same influences overtime, such as other changes in the labor market, or trends in outcome.

In order to leave out these to internal validity, I can use an untreated control group that does not receive the treatment but experiences all other influences that affect the veterans in the labor market. Since the VOW Act does not directly affect employment levels of non-veterans, I can use non-veterans as a control group for veterans.

In order to achieve this goal, I use difference in differences model, as following:

$$Y_{it} = \beta_1 + \beta_2 Vet_i + \beta_3 d_t + \beta_4 (Vet_i \times d_t) + \beta_5 Z_{it} + \varepsilon_{it}, \quad (2)$$

where Y_{it} is the outcome variables, labor force participation, employment, weekly usual hours worked and log of weekly earnings; Vet_i is dummy variable for the veteran status; d_t is time dummy variable for post legislation period. In this model, difference in differences estimator, β_4 gives the causal effect of the new legislation on the outcomes of the veterans. I estimate this model using ordinary least squares (OLS). Again the key assumption is that β_4 is zero if there were no legislation, implicitly saying that two groups, veterans and non-veterans have the same trends overtime. Without controlling for demographic variables, estimate of β_4 can be obtained by $\Delta \bar{U} = (\bar{U}_1 - \bar{U}_0)^1 - (\bar{U}_1 - \bar{U}_0)^0$. This says the same as subtracting differences in the control group from the differences in the treatment group. Since both groups are assumed to have common trends and influences, this gives the net effect of the legislation. Discussion on common trend assumption is developed in section 4.4.

4.3 Estimation Results

4.3.1 Labor Force Participation

Table 2.3 reports the OLS estimates of the equation (2) for the labor force participation outcome. Here in this model, variable of interest is the interaction term of veteran status and post2011 time dummy variable. For each subsample, I estimate two models, with and without controlling for demographic control variables. Each regression includes year fixed effects for there are multiple years. Results suggest that the VOW Act has significant positive effect on the labor force participation of veterans without disability. Female veterans without a disability increase their labor force participation by about 5 percentage points as compared to control group, female non-veterans without disability, when controlled for demographic differences.

Table 3 Estimation Results of Labor Force Participation

Variables	Without disability				With disability			
	Female		Male		Female		Male	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Veteran x Post2011	0.016 (0.019)	0.049** (0.018)	0.022** (0.008)	0.037*** (0.007)	-0.009 (0.067)	0.079 (0.066)	-0.044 (0.035)	-0.031 (0.035)
Veteran	-0.020 (0.013)	-0.077*** (0.012)	0.048*** (0.005)	-0.062*** (0.005)	0.030 (0.049)	-0.071 (0.048)	0.175*** (0.026)	0.033 (0.027)
Post2011	-0.010*** (0.002)	-0.001 (0.002)	-0.001 (0.002)	0.002 (0.002)	-0.065*** (0.012)	-0.023* (0.011)	-0.004 (0.011)	0.019* (0.010)
Age		0.069*** (0.003)		0.125*** (0.003)		-0.023 (0.016)		0.005 (0.015)
AgeSQ		-0.001*** (0.000)		-0.002*** (0.000)		0.000 (0.000)		-0.000 (0.000)
<High School		-0.150*** (0.003)		-0.075*** (0.002)		-0.149*** (0.010)		-0.109*** (0.009)
Some College		0.080*** (0.002)		0.030*** (0.002)		0.196*** (0.010)		0.145*** (0.010)
BA+		0.154*** (0.002)		0.034*** (0.002)		0.319*** (0.015)		0.291*** (0.016)
Enrolled in school		-0.246*** (0.002)		-0.350*** (0.002)		-0.095*** (0.012)		-0.111*** (0.011)
Married		-0.155*** (0.002)		0.051*** (0.001)		-0.012 (0.011)		0.123*** (0.013)
Divorced/Widowed		-0.018*** (0.003)		0.012*** (0.003)		-0.053*** (0.014)		0.030 (0.018)
Black, non-hispanic		-0.027*** (0.002)		-0.070*** (0.002)		0.000 (0.012)		-0.120*** (0.011)
Other, non-hispanic		-0.115*** (0.003)		-0.078*** (0.003)		0.009 (0.016)		-0.040*** (0.016)
Hispanic		-0.036*** (0.002)		0.028*** (0.002)		0.001 (0.013)		-0.006 (0.012)
Urban residence		-0.002 (0.002)		-0.006*** (0.001)		0.026** (0.009)		0.006 (0.009)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE		Yes		Yes		Yes		Yes
Constant	0.692*** (0.001)	-0.156*** (0.036)	0.775*** (0.001)	-0.741*** (0.032)	0.438*** (0.008)	0.785*** (0.194)	0.416*** (0.008)	0.363** (0.179)
N	502537	502537	468199	468199	18485	18485	20997	20997
R-SQ	0.001	0.132	0.001	0.237	0.002	0.114	0.005	0.110

Note: Robust standard errors are reported in parentheses. Calculations use given IPUMS-CPS sampling weights. Stars indicate significance level, * p<0.05, ** p<0.01, *** p<0.001.

Table 4 Estimation Results of Employment to Population

Variables	Without disability				With disability			
	Female		Male		Female		Male	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Veteran x Post2011	-0.003 (0.020)	0.021 (0.019)	0.023* (0.009)	0.032*** (0.009)	0.089 (0.063)	0.168** (0.061)	0.033 (0.034)	0.043 (0.033)
Veteran	-0.035** (0.013)	-0.097*** (0.013)	0.023*** (0.007)	-0.100*** (0.006)	-0.032 (0.044)	-0.121** (0.044)	0.090*** (0.026)	-0.061** (0.026)
Post2011	0.004 (0.002)	0.017*** (0.002)	0.012*** (0.002)	0.022*** (0.002)	0.005 (0.011)	-0.006 (0.010)	0.024* (0.010)	0.027*** (0.010)
Age		0.078*** (0.003)		0.137*** (0.003)		-0.002 (0.014)		0.037*** (0.014)
AgeSQ		-0.001*** (0.000)		-0.002*** (0.000)		-0.000 (0.000)		-0.001** (0.000)
<High School		-0.164*** (0.003)		-0.086*** (0.002)		-0.158*** (0.008)		-0.106*** (0.008)
Some College		0.102*** (0.002)		0.064*** (0.002)		0.160*** (0.010)		0.119*** (0.010)
BA+		0.194*** (0.002)		0.098*** (0.002)		0.317*** (0.015)		0.276*** (0.017)
Enrolled in school		-0.184*** (0.002)		-0.261*** (0.002)		-0.050*** (0.011)		-0.033*** (0.010)
Married		-0.125*** (0.002)		0.090*** (0.002)		-0.025* (0.011)		0.135*** (0.012)
Divorced/Widowed		-0.029*** (0.004)		0.018*** (0.004)		-0.049*** (0.013)		0.006 (0.017)
Black, non-hispanic		-0.092*** (0.002)		-0.139*** (0.003)		-0.046*** (0.011)		-0.124*** (0.010)
Other, non-hispanic		-0.125*** (0.003)		-0.084*** (0.003)		-0.031* (0.015)		-0.041*** (0.014)
Hispanic		-0.044*** (0.002)		0.028*** (0.002)		-0.016 (0.012)		-0.024** (0.011)
Urban residence		0.004* (0.002)		0.002 (0.002)		0.025** (0.008)		0.011 (0.008)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE		Yes		Yes		Yes		Yes
Constant	0.602*** (0.002)	-0.418*** (0.037)	0.667*** (0.002)	-1.100*** (0.036)	0.297*** (0.008)	0.382* (0.176)	0.287*** (0.007)	-0.234 (0.163)
N	502,537	502,537	468,199	468,199	18,485	18,485	20,997	20,997
R-SQ	0.001	0.128	0.000	0.193	0.002	0.123	0.003	0.118

Note: Robust standard errors are reported in parentheses. Calculations use given IPUMS-CPS sampling weights. Stars indicate significance level, * p<0.05, ** p<0.01, *** p<0.001.

Table 5 Estimation results of Unemployment

Variables	Without disability				With disability			
	Female		Male		Female		Male	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Veteran x Post2011	0.025 (0.018)	0.031 (0.018)	-0.003 (0.008)	-0.001 (0.008)	-0.223* (0.092)	-0.216* (0.092)	-0.111** (0.042)	-0.119** (0.042)
Veteran	0.027* (0.012)	0.041*** (0.012)	0.021*** (0.006)	0.056*** (0.006)	0.122 (0.072)	0.160* (0.073)	0.065 (0.034)	0.157*** (0.034)
Post2011	-0.010*** (0.002)	-0.008*** (0.002)	-0.016*** (0.002)	-0.015*** (0.002)	0.015 (0.016)	0.008 (0.016)	-0.035* (0.015)	-0.046** (0.015)
Age		-0.043*** (0.003)		-0.076*** (0.003)		-0.042 (0.024)		-0.105*** (0.022)
AgeSQ		0.001*** (0.000)		0.001*** (0.000)		0.001 (0.000)		0.002*** (0.000)
<High School		0.089*** (0.003)		0.049*** (0.003)		0.239*** (0.022)		0.115*** (0.017)
Some College		-0.047*** (0.002)		-0.052*** (0.002)		-0.030* (0.013)		-0.015 (0.012)
BA+		-0.072*** (0.002)		-0.077*** (0.002)		-0.117*** (0.016)		-0.057*** (0.016)
Enrolled in school		-0.046*** (0.002)		-0.046*** (0.002)		-0.047** (0.017)		-0.113*** (0.017)
Married		-0.014*** (0.001)		-0.049*** (0.001)		0.023 (0.016)		-0.073*** (0.014)
Divorced/Widowed		0.018*** (0.003)		-0.009* (0.004)		0.008 (0.022)		0.035 (0.024)
Black, non-hispanic		0.100*** (0.002)		0.116*** (0.003)		0.119*** (0.019)		0.133*** (0.021)
Other, non-hispanic		0.029*** (0.002)		0.020*** (0.002)		0.081*** (0.023)		0.033 (0.023)
Hispanic		0.018*** (0.002)		-0.011*** (0.002)		0.033 (0.019)		0.035* (0.018)
Urban residence		-0.010*** (0.002)		-0.010*** (0.002)		-0.013 (0.013)		-0.018 (0.012)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE		Yes		Yes		Yes		Yes
Constant	0.121*** (0.001)	0.748*** (0.035)	0.139*** (0.001)	1.210*** (0.036)	0.232*** (0.011)	0.783** (0.295)	0.279*** (0.011)	1.788*** (0.269)
N	350,838	350,838	367,536	367,536	7,774	7,774	9,363	9,363
R-SQ	0.001	0.054	0.002	0.059	0.001	0.087	0.002	0.081

Note: Robust standard errors are reported in parentheses. Calculations use IPUMS-CPS sampling weights. Stars indicate significance level, * p<0.05, ** p<0.01, *** p<0.001.

And male veterans without disability have an increase of about 3 percentage points. On the other hand, I find no effect on the labor force participation of veterans with a disability. Female veterans without disability results are sensitive to demographic controls because when I do not control for demographic differences, I find no significant effect on labor force participation.

4.3.2 Employment to Population

To further examine the impact of the VOW act on the employment of veterans, I estimate the equation (2) for the employment outcome. The dependent variable is binary that equals 1 if the individual is employed, and I estimate a linear probability model. According to the results reported in Table 2.4, male veterans without a disability and female veterans with a disability increase their chances of employment as compared to their respective control groups. The effect of the VOW act is highest among the female veterans with disability, by around 17 percentage points, and male veterans without disability increase chances of employment by up to 3.2 percentage points. Although the results are robust to demographic differences for male veterans without disability because there is little change in the effect after I add demographic control variables in the model. However, I find no effect for the female veterans with disability if I exclude demographic controls. Apart from these results, I find no evidence that there is any effect on employment of female veterans without disability and male veterans with disability.

4.3.3 Unemployment

The effect of the VOW Act on unemployment is examined using equation (2). Outcome variable is unemployed if an individual is unemployed. I estimate these linear probability model by OLS. Table 2.5 reports the estimates of unemployment outcome. Results suggest that the VOW Act has no effect on the veterans without a disability. As for the veterans with a disability, they have lowered their unemployment significantly. The highest change is among female

veterans by about 20 percentage points and it is about 11 percentage points for male veterans without a disability. The results for both veterans with and without a disability is robust to demographic differences.

4.3.4 Weekly Hours of Work

Another aspect of the VOW Act is whether this employment gain translates into intensive labor and higher earnings for the veterans. I now examine the impact of the VOW act on the weekly hours of work of the veterans in the same estimation setting. For this analysis, sample is restricted to those who are employed and have positive working hours. The results reported in Table 2.5 suggest that the VOW act increased the hours of work of the veterans with disability, only when controlled for demographic differences. Among those with a disability, female veterans have increased their weekly working hours by on average 7 hours and male veterans have increased their weekly working hours by about 3 hours after controlling for demographic differences. On the other hand, I find no effect on the weekly working hours of veterans without a disability.

4.3.5 Weekly Earnings

And finally, the last outcome estimated is the log of weekly earnings. Earnings are adjusted for inflation and are in 2014 dollars. For estimating the log of weekly earnings, sample is restricted to those who are employed and with positive earnings. Estimation results of the equation (2) by OLS are reported in Table 2.6. Results suggest that there is no significant effect of the VOW Act on the weekly earnings of the veterans. Although, to some extent, the VOW Act has lead to positive changes in all employment outcomes but results suggest that this employment gain does not translate into monetary gain.

Table 6 Estimation Results of Weekly Hours Worked

Variables	Without disability				With disability			
	Female		Male		Female		Male	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Veteran x Post2011	-0.506 (0.527)	0.201 (0.521)	-0.236 (0.291)	0.286 (0.277)	5.435 (2.923)	7.514** (2.751)	0.275 (1.322)	2.718** (1.336)
Veteran	3.725*** (0.380)	0.946* (0.373)	3.193*** (0.203)	0.339 (0.196)	0.095 (2.467)	-2.526 (2.260)	6.917*** (1.046)	1.396 (1.069)
Post2011	0.089 (0.067)	0.420*** (0.058)	0.382*** (0.068)	0.707*** (0.059)	0.239 (0.519)	0.155 (0.491)	-0.579 (0.555)	-0.973* (0.507)
Age		4.938*** (0.091)		4.562*** (0.094)		3.140*** (0.811)		0.460 (0.755)
AgeSQ		-0.089*** (0.002)		-0.081*** (0.002)		-0.058*** (0.016)		-0.001 (0.015)
<High School		-2.366*** (0.095)		-1.427*** (0.075)		-1.569* (0.746)		0.036 (0.609)
Some College		-0.173** (0.056)		-0.419*** (0.055)		1.637*** (0.438)		3.844*** (0.435)
BA+		3.133*** (0.060)		1.574*** (0.061)		7.182*** (0.543)		7.370*** (0.677)
Enrolled in school		-8.068*** (0.070)		-10.108*** (0.079)		-5.888*** (0.575)		-8.081*** (0.636)
Married		-0.377*** (0.051)		2.052*** (0.052)		1.539** (0.504)		4.421*** (0.480)
Divorced/Widowed		0.640*** (0.093)		1.230*** (0.125)		3.530*** (0.648)		1.554** (0.752)
Black, non-hispanic		0.221** (0.071)		-1.791*** (0.082)		2.645*** (0.605)		0.645 (0.715)
Other, non-hispanic		-0.179* (0.088)		-1.322*** (0.087)		2.866*** (0.676)		-1.077 (0.734)
Hispanic		0.628*** (0.063)		-0.325*** (0.062)		1.930*** (0.551)		0.593 (0.595)
Urban residence		0.368*** (0.052)		-0.850*** (0.055)		0.482 (0.437)		-1.601*** (0.428)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE		Yes		Yes		Yes		Yes
Constant	34.36*** (0.047)	-30.960*** (1.129)	37.63*** (0.048)	-22.17*** (1.166)	31.3*** (0.369)	-14.24 (9.841)	33.39*** (0.394)	24.11*** (9.351)
N	312,675	312,675	319,768	319,768	5,925	5,925	7,008	7,008
R-SQ	0.001	0.244	0.002	0.237	0.003	0.166	0.016	0.183

Note: Robust standard errors are reported in parentheses. Calculations use given IPUMS-CPS sampling weights. Stars indicate significance level, * p<0.05, ** p<0.01, *** p<0.001.

Table 7 Estimation Results of Log of Weekly Earnings

Variables	Without disability				With disability			
	Female		Male		Female		Male	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Veteran x Post2011	-0.057 (0.070)	-0.003 (0.062)	-0.043 (0.034)	0.008 (0.028)	-0.348 (0.397)	-0.147 (0.368)	-0.195 (0.123)	0.029 (0.135)
Veteran	0.303*** (0.047)	0.077 (0.042)	0.256*** (0.024)	0.032 (0.020)	0.726** (0.281)	0.464 (0.289)	0.637*** (0.080)	0.097 (0.104)
Post2011	-0.035*** (0.009)	-0.021** (0.007)	-0.034*** (0.009)	-0.025*** (0.007)	0.024 (0.067)	-0.007 (0.061)	0.004 (0.078)	-0.062 (0.071)
Age		0.218*** (0.011)		0.192*** (0.011)		-0.015 (0.091)		0.042 (0.107)
AgeSQ		-0.003*** (0.000)		-0.003*** (0.000)		0.001 (0.002)		-0.000 (0.002)
<High School		-0.217*** (0.011)		-0.202*** (0.008)		-0.215** (0.073)		-0.130 (0.080)
Some College		0.028*** (0.007)		0.008 (0.006)		0.102* (0.050)		0.272*** (0.057)
BA+		0.341*** (0.008)		0.306*** (0.008)		0.541*** (0.078)		0.633*** (0.094)
Enrolled in school		-0.396*** (0.008)		-0.478*** (0.009)		-0.372*** (0.080)		-0.354*** (0.068)
Married		0.031*** (0.006)		0.126*** (0.006)		0.107 (0.058)		0.316*** (0.059)
Divorced/Widowed		0.013 (0.012)		0.048*** (0.013)		0.260*** (0.075)		0.192* (0.112)
Black, non-hispanic		-0.033*** (0.008)		-0.152*** (0.009)		0.110 (0.074)		-0.212 (0.130)
Other, non-hispanic		-0.019 (0.011)		-0.031** (0.011)		0.147 (0.077)		-0.057 (0.097)
Hispanic		-0.020* (0.008)		-0.081*** (0.007)		0.118 (0.065)		0.010 (0.069)
Urban residence		0.081*** (0.006)		0.030*** (0.006)		0.153** (0.055)		-0.029 (0.052)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE		Yes		Yes		Yes		Yes
Constant	6.018*** (0.006)	2.890*** (0.159)	6.214*** (0.006)	3.413*** (0.143)	5.678*** (0.046)	5.841*** (1.099)	5.759*** (0.058)	5.891*** (1.364)
N	78,546	78,546	79,981	79,981	1,527	1,527	1,767	1,767
R-SQ	0.001	0.394	0.003	0.392	0.007	0.267	0.020	0.291

Note: Robust standard errors are reported in parentheses. Earnings are adjusted for inflation and are in 2014 dollars. Even number regressions also include industry, occupation fixed effects and control for private sector. Calculations use given IPUMS-CPS sampling weights. Stars indicate significance level, * p<0.05, ** p<0.01, *** p<0.001.

4.4 Placebo Estimates

For a credible result in difference-in-differences method, as I mention earlier that the control and treatment groups, veterans and non-veterans, are expected to have parallel trend in the labor outcomes in the absence of the treatment. This is saying that in the pre-policy years, under all the influences affecting the labor market conditions, outcomes of the control and treatment group change similarly and all these effects and changes in the labor market affect both groups in the same way. However, it is possible that labor outcomes of the groups, veterans and non-veterans, may be different from year to year and the main results of this study may be measuring one of these changes, which are indeed not the real effect of the legislation.

The parallel trend assumption can be tested through estimating the equation (2) on data for earlier years of the legislation, following the practice of Slusky (2015). Since disability status is available in the monthly CPS only after 2008, I start estimating placebo regressions comparing average outcomes of the year couples 2008 and 2009, 2009 and 2010, and lastly 2010 and 2011 in same sub-samples and treatment and control groups. These difference-in-difference regressions assume that there was legislation put into effect in the end of the first year of year-couple. We are interested in whether the difference-in-differences coefficient is significant or not, rather than the sign of it. If the coefficient of veteran-year interaction is significant, then it suggests that the outcome of one group changed differently in that period and may concern our main results.

There are 5 outcomes, 3 veteran-year interactions for each outcome and it makes 15 tests for each sub-samples. I would expect less than 10% of the tests for each group to be significant; otherwise it would make us question the main results. For the females without a disability, there is only one significant result at 5 % significance level out of 15 tests; for males without a

disability there is two at 5% and 1 at 0.1%; for females with a disability there is 3 at 1%, 1 at 1% and 2 at 0.1%; for males with a disability there is 1 at 0.1% and 1 at 5%. Although half of the significant results come from the regressions of weekly earnings outcome, most veteran-year interactions are not significant. These test results suggest that it is likely that female veterans with a disability may have different trends than female non-veterans with a disability in the labor market and this makes me question my main results. However, results for the male and female veterans without a disability and male veterans with a disability show that the main results for that groups are the most robust.

Table 8 Placebo Estimates for Pre-policy Years

Variables	Without Disability		With Disability	
	Female (1)	Male (2)	Female (3)	Male (4)
Estimates of Labor Force Participation for Pre-policy Years				
Veteran x Post2008	0.019 (0.023)	-0.016 (0.010)	0.116 (0.363)	0.022 (0.124)
Veteran x Post2009	-0.044 (0.024)	-0.012 (0.011)	-0.134 (0.103)	-0.023 (0.051)
Veteran x Post2010	0.020 (0.026)	0.006 (0.011)	-0.001 (0.097)	-0.033 (0.053)
Estimates of Unemployment for Pre-policy Years				
Veteran x Post2008	-0.005 (0.019)	0.002 (0.010)	-0.753*** (0.095)	0.166** (0.059)
Veteran x Post2009	-0.001 (0.021)	0.013 (0.011)	0.037 (0.133)	0.059 (0.063)
Veteran x Post2010	0.035 (0.024)	0.043*** (0.012)	0.011 (0.143)	-0.022 (0.067)
Estimates of Employment for Pre-policy Years				
Veteran x Post2008	0.020 (0.025)	-0.019 (0.012)	0.442*** (0.081)	-0.111 (0.124)
Veteran x Post2009	-0.037 (0.026)	-0.021 (0.013)	-0.109 (0.099)	-0.049 (0.052)
Veteran x Post2010	-0.007 (0.027)	-0.030* (0.013)	-0.001 (0.087)	-0.012 (0.052)
Estimates of Weekly Worked Hours for Pre-policy Years				
Veteran x Post2008	1.457* (0.643)	0.064 (0.352)	4.736 (2.713)	6.510 (4.253)
Veteran x Post2009	-0.752 (0.710)	0.493 (0.382)	-0.397 (4.219)	-3.683 (1.958)
Veteran x Post2010	0.522 (0.771)	-0.626 (0.405)	-9.691* (4.468)	1.760 (2.079)
Estimates of Log of Weekly Earnings for Pre-policy Years				
Veteran x Post2008	-0.067 (0.082)	-0.049 (0.041)	0.329** (0.127)	1.118*** (0.218)
Veteran x Post2009	0.065 (0.092)	0.108* (0.045)	0.705** (0.229)	0.117 (0.163)
Veteran x Post2010	0.087 (0.094)	-0.073 (0.048)	-1.359** (0.490)	0.258 (0.151)

Note: Robust standard errors are reported in parentheses. Calculations use given IPUMS-CPS sampling weights. The Table reports pre-policy years x veteran interactions in regressions that include year fixed effects. Each coefficient is estimated in separate regressions for the dependent variables. Stars indicate significance level, * p<0.05, ** p<0.01, *** p<0.001.

2.5 Concluding Remarks

This is the first study to examine the effect of the Veterans Opportunity to Work to Hire Act on the labor market outcomes of the veterans regarding labor force participation, unemployment, employment, weekly working hours and earnings. Empirical results in this paper suggest that veterans without disability increase labor force participation by around 4 percentage points. Increase in labor force participation among male veterans without disability lead to higher chances of employment by about 3 percentage points, and female veterans with a disability have the highest increase in employment by about 17 percentage points. Also, unemployment of veterans with a disability decreases at least 10 percentage points. I further show evidence that these employment gains lead to higher number of weekly hours worked of veterans with disability by from 3 to 8 hours on average. And finally, I find that the employment impact of the VOW Act does not translate into higher weekly earnings for the veterans.

Governments have increasingly used wage subsidy programs in order to improve employment prospects of certain groups considered to be economically disadvantaged. The specific target groups have generally included low-income youth, workers who are recipients of federal assistance programs, ex-felons and veterans who are members of families receiving public assistance. However, for the first time, the VOW Act was, particularly, designed to improve the labor market performance of veterans by offering wage subsidies to potential employers.

The findings in this study also have important policy implications. Previous studies show that past wage subsidy programs, such as the WOTC, TJTC, have not been successful to increase employment among targeted groups due to several reasons including stigmatizing effect, low

participation by employers (Burtless, 1985; Hamersma, 2003, 2005, 2008). Unlike previous findings in related literature, this study shows evidence that the VOW Act, as a wage subsidy program, leads to an increase in the employment and decrease in the unemployment of veterans on the extensive margin and increase in average weekly hours worked on the intensive margin as compared to non-veterans. In other words, these findings suggest that as a wage subsidy program the VOW Act is successful and reaches the main goal of increasing employment among veterans. Therefore, unlike the previous ones, the VOW Act is successful and should continue to support the employment of veterans.

Another important implication of my findings is that, since the VOW Act is successful, a more careful investigation on understanding why the VOW Act works on veterans and in general the WOTC programs not working is important. Differences in implementations of these two programs may shed light on the failure of the WOTC programs and these programs might be started again. I believe a thorough examination of the issue would be a fruitful area for future research.

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