

The Impact of Military Service on Post-Service Labor Market Performance of Female Veterans: Evidence from the United States

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Abstract: This paper intends to explore and show evidence of whether the impact of the recent period of the U.S. military service including overseas combat or war zone experience, service-related disability status, and presence of young children at home affect the post-service labor market performance of female veterans. Labor market success is measured by four outcomes: labor force participation, employment, unemployment, and usual weekly hours of work.

Using data from the Veteran Supplement to the CPS from 2007 to 2013, I estimate labor force participation, unemployment, and employment by probit models and hours of work by OLS. I find that females are less likely to participate in the labor force and less likely to be employed and work less than male veterans. Combat zone experience, the presence of a young child at home, and being married to a spouse in the armed forces affect female veterans adversely as compared to male veterans.

Keywords: Female veterans, employment, combat, disability, marriage

JEl Codes: J01, J12, J15, J16

Introduction

The military, which had been primarily a male occupation, has become a career consideration for women. The representation of women in the military has grown significantly. The proportion of women serving in the military was around 2 percent before the all-volunteer era and has reached 15.9 percent as of 2016 (Defense, 2016; M. A. Kleykamp, 2010). This change in the demographic profile of the military has labor market implications as women veterans'¹ transition into civilian life. According to the Bureau of Labor Statistics, 18 percent of all veterans who served during the recent wartime period² were female in 2016. There are and will be more female veterans in the civilian labor force than ever, but there is little research done regarding how they fare in the civilian labor market after they discharge from the military.

¹ Veterans are civilians who served previously on active duty in the U.S. Military.

 $^{^2}$ Acording to official records and reports, recent wartime period also refers to Gulf War-era II that applies to September 2001 forward.

The aspects of the military experience have been different over the last decade. The mobility of the U.S. military has increased enormously including large overseas deployments to Iraq and Afghanistan since the 9/11 terrorist attack. The veterans who served on active duty in the overseas war territories during this period has reached 48 percent in 2016 (Labor Statistics, 2017). The veterans of this recent war period return home with higher rates of combat zone experience, as happened in previous war periods like the Vietnam War and World War II. Among many differences in the aspects of the experience they gain, this is a time that the recruits experience combat in the all-volunteer era following a long and relative peacetime period. Moreover, there are more women who have participated in the combat zones than any period of war in the U.S. military history because not all positions in the military were open to them in previous war periods (Segal & Hansen, 1992).

Figure 1 presents the ratio of combat zone experienced veterans aged 18 to 40 by gender. Data comes from the Veteran Supplement to the Current Population Survey. According to the Figure 1, the rate of veterans with combat zone experience increases over the years, especially between 2009 and 2012. Reason for such a big increase is that the U.S. Government decided to withdraw from Iraq and more veterans with combat zone experience return to civilian life starting in 2008 (Obama, 2007). And the gap between the ratios of female and male veterans with combat zone experience decreases as females are allowed to serve in combat zone positions. Besides, veterans return to the civilian labor force with higher rates of service-connected disability since the Vietnam War ended. Figure 2 presents how the rate of service-connected disability by gender increases during the recent war period.

Exploring and understanding the effects of the recent military experience on female veterans is important as the female veteran population is expected to increase (Veteran Affairs, 2014). And nowadays, the Department of Defense has announced that all combat positions in the military have been opened to women starting in January 2016. It is an important policy-relevant question whether being exposed to a combat zone has any different effect on female veterans as compared to male veterans. Combat experience has implications for the health outcomes of veterans. Veterans with combat zone experience are more likely to have post-traumatic stress disorder (PTSD) than veterans without combat zone experience (Cesur, Sabia, & Tekin, 2013; Hoge et al., 2004), and women veterans are more likely to be diagnosed with PTSD than male veterans (Zinzow, Grubaugh, Monnier, Suffoletta-Maierle, & Frueh, 2007).

Historically, men served in all combat positions and researchers examined how the military service is related with subsequent civilian labor market performance of the returning veterans, particularly male veterans. Studies find generally positive outcomes for the veterans of World War II, however they find the opposite for the veterans of Vietnam War. On the other hand, considering higher rate of enlistment among female population and the recent war period and its observable effects on female veterans, such as service-related disability and combat zone experience, surprisingly little research exists in the related literature.

Another aspect of women serving in the military is that they are often the primary caregiver to children. They have an extra role in the household that is mostly peculiar to women. During their active service in the military, women typically postpone maternity plans because of their military obligations and overseas deployments. One possible explanation for the employment differences among veterans may be presence of young children in the household.

Author mainly examines whether recent wartime period and the military service experience have gender differential effects on the subsequent labor force performance of the veterans. Using data from the Veteran Supplement to the Current Population Survey, I estimate models to test whether veterans differ based on gender regarding labor force participation, employment, unemployment and usual weekly hours worked. I find that female veterans are less likely to participate in the labor force, be employed and work less than male veterans. Although there are limited studies examined the effect of combat zone experience on male veterans, to the best of author's knowledge, this study is the first empirical study examining the effect of combat zone experience on female veterans.

The remainder of the paper is organized as following: Section II provides a summary of the previous studies regarding the labor market outcomes of female veterans. Section III describes and explains the data and the method used in the paper. Section IV presents the results of the analysis and Section V discusses the findings.

Previous Studies

There is a considerable amount of research on the labor market impact of the military service on veterans however, most of this literature focuses exclusively on male veterans. The results of the empirical research on the economic returns to the military service are inconclusive. For example, studies find employment and educational premium for the veterans of World War II; however, outcomes are negative for the veterans of the Vietnam War (J. D. Angrist, 1990; J. Angrist & Krueger, 1994; Teachman, 2004; Teachman & Tedrow, 2004). Most of the reasons for studies being limited to male veterans are data availability because of the low enlistment rates among women during those years. However, the presence of women in the U.S. military has increased significantly with the beginning of the all-volunteer era.

Research examining how prior military experience affects civilian labor market outcomes of female veterans is limited. In an empirical study, Stranahan (1998) analyzes the effect of prior military experience on the civilian wages of the early all-volunteer era female veterans, using data from the National Longitudinal Survey of Youth (NLSY). Following the two-step method to correct for potential sample selection bias, the author finds that female veterans benefit from military experience with a wage premium as compared to female non-veterans.

The volunteer army experienced a relatively peaceful period until the 9/11 terrorist attack. Since then, the mobilization of the military has increased significantly. During that period, the military has made large overseas deployments and veterans of this period, including

female veterans, return to civilian life with large rates of combat experience. Thus, it is argued that the effects of the military training in peacetime and wartime have a different effect on the human capital accumulation of the veterans (Faberman & Foster, 2013).

Some empirical studies on veterans of the post 9/11 period include female veterans in their analysis. Kleykamp (2013) compares the odds of unemployment and earnings between veterans and non-veterans using data from the Current Population Survey of 2005-2011. Using logistic regression and generalized linear models, the author finds that female veterans have higher difficulty finding jobs than male veterans, as compared to non-veterans, but she finds no gender difference on wage premium attributed to prior military service. On the other hand, Routon (2014) analyzes the impact of military service on employment outcomes using data from the National Longitudinal Survey of Youth 1997. In this study, female veterans are found to be equally employable with female non-veterans using several empirical methodologies including sibling fixed effects and propensity score matching.

Recent veterans, namely post-9/11 veterans return home with higher rate of combat zone experience, comparable to previous war periods. Combat experience is generally associated with worse health outcomes. Using data from the Panel Study of Income Dynamics from 1968 to 2003, MacLean (2010) shows evidence on the association between combat experience and disability and unemployment of male veterans. Author finds that veterans with combat experience are more likely to have disability and more likely to be unemployed in 1994, estimating logistic regression models.

This paper examines the gender differences in the effects of recent military experience including overseas deployments and combat zone experience on the labor market performance of the female veterans. The measures of success in the labor market include: labor force participation, unemployment, and usual weekly hours of work. Using data from the Veteran Supplement to the CPS from 2007 to 2013, I estimate labor force participation and unemployment by probit models and hours of work by OLS. I find that females are less likely to participate in the labor force, combat experience has little or no effect and female veterans with combat experience or service-related disability have significantly less likely to participate in the labor force as compared to male veterans are found to be equally employable except for female veterans with combat experience have higher unemployment penalty than comparable male veterans. I find that on average females work less and combat experience is positively associated with higher work of hours but service-related disability decreases hours of work.

Data and Summary Statistics

The Current Population Survey (CPS) is the primary source of labor force statistics in the U.S. and it collects detailed individual-level data from a nationally representative sample of approximately 60,000 households each month. Monthly surveys consist of two sets of questions:

the basic monthly demographic and labor questions and month specific supplemental questions. In addition to basic labor and demographic questions, in one month³ of each year interviewers are asked supplementary questions regarding disability, combat or war zone experience, military branch, year of discharge and length of service (Bureau of Census, 2014).

Veteran supplement data samples are particularly useful for my analysis. In addition to basic demographic and work related information, it collects information regarding veterans' prior military experience such as, whether they have combat or war zone experience, service-related disability or length of service. In this regard, I pooled the most recent available samples from 2003 to 2014, excluding the years 2004, 2006 and 2008, which are not available. The year 2003 is chosen for the availability of combat zone experience variable, and it reflects the year recent veterans return home.

Veterans come from the all-volunteer era and they served in the active duty component of the military anywhere in the world since 2001. These veterans are subject to overseas deployments in Iraq and Afghanistan. Analytic samples are restricted to those aged 18 to 40 because this age group has high labor force attachment. The lower bound of age limit is set to 18 because there are almost no observations of returning veterans who are 17 years old or younger. For a credible comparison between female and male veterans, upper bound is set to 40, for this age group represents mostly the post-9/11 veterans.

Individuals who are self-employed and those who are currently in the active duty component of armed forces are excluded from my analytical samples for they may be less likely to be affected by the military experience. I impose the age restriction and exclusion of selfemployed for the analytic sample for labor force participation and employment. In addition, the sample for unemployment is limited to civilian non-institutional labor force and usual weekly hours of work is limited to those who are employed.

Table 1 provides the summary statistics of the characteristics of female and male veterans by combat zone experience. Mean values shows that female veterans are less likely to be in the labor force, have lower employment but higher unemployment and work less weekly hours of work. On average, females with combat zone experience are younger, more likely to have a service-related disability, have less potential civilian experience⁴, more likely to be married to a spouse in armed forces, less likely to be married in general but more likely to be divorced or separated than male veterans with combat zone experience. Also female veterans are more likely to have young child at home, who is less than six years old and on average they have more children at home than male veterans. Although they appear to have lower rates of high school degree, they have higher rate of some college and bachelor or higher degree than all groups.

³ Veteran supplement data are collected in one month every year. For the last 10 years, it surveyed on every August, except in year 2010 and it was on June.

⁴ Potential civilian experience represents the years spent in civilian life since discharge from the military.

Table 2 compares and tests mean outcomes among sub-samples by age groups, spouse in armed forces, young child at home, combat zone experience, service-related disability status, and race/ethnicity. Among all sub-samples, females appear to have a lower labor force participation rate, lower employment rate and lower usual weekly hours of work than males. On the other hand, they have higher unemployment rate among those who are aged 25 to 30. Also among those with combat zone experience, those who have young child at home and those with service-related disability, female veterans have higher unemployment rate than male veterans. Although these raw mean differences between female and male veterans gives understanding but does not control for the compositional differences provided in Table 1. In this regard, in the following section in a multivariate regression setting, this study examines the gender differences in the effects of recent military experience on the labor market performance of female veterans. In order to test whether there are differences in the labor outcomes between female and male veterans, I interact female with combat zone experience, spouse in armed forces, presence of young children and race/ethnicity.

Estimation and Results

Empirical Model

The main goal of this paper is to explore the determinants of the differences in the labor market performance of female and male veterans. I begin my analysis by examining whether female and male differences in the outcomes provided in Table 2 holds true when other demographic characteristics are controlled in a multivariate regression setting.

Three outcomes, labor force participation, employment to population and unemployment are binary variables. For this reason, I estimate nonlinear probability models, particularly probit models. The model is as follows,

$$P(Y_i = 1) = \Phi(\alpha + X_i\beta + M_i + \varepsilon_i) \tag{1}$$

where Y_i is an indicator equal to one if the individual *i* participates in the labor force, or employed or unemployed; X_i is a set of indicator variables of gender, race, marital status, education, whether the person married to a spouse in armed forces, presence of any young child, total number of own children, urban residence and continuous variables of age and potential years of experience, computed as time since discharge from the military, and their quadratic forms to capture the effects of diminishing returns; M_i is a set of military characteristics such as indicator variables of combat zone experience status, service-related disability status, length of service category. In addition to these variables, each model contains year dummies in order to increase accuracy of the variables and to control for overall unobserved fixed effects.

For each outcome variable, I estimate four models. Model 1 is the baseline model. In order to test whether the labor outcomes differ among veterans I include interactions in following models. Model 2 includes interactions of female and spouse in armed forces and presence of

young child in the household. Model 3 examines the whether the effect of combat zone experience differs by gender interacting female and combat zone experience and service-related disability. Finally, model 4 examines whether race/ethnicity composition matter on the labor outcomes.

As for the usual weekly hours of work, I estimate the same form of the model (1), instead, dependent variable is not binary, but continuous. In this respect, I estimate the abovementioned model with ordinary least squares (OLS). Since the probit is a nonlinear model, the probit coefficients do not reflect the marginal effects, as is the case in OLS estimation. Average marginal effects are calculated using margins command in STATA version 13 and presented in Table 3, Table 4 and Table 5. For dummy variables, indicated as factor variables, margins command calculates the average change in the predicted probability for each case of discrete variable.

Estimation Results

Labor Force Participation

Table 3 presents the average marginal effects calculated after probit estimation of labor force participation. In all four models, females consistently less likely to participate in the labor force by 9 percentage points to 14 percentage points except for the model 2. Although combat experience appears to have little or no effect, veterans with service-related disability have lower probability of labor force participation across models. Model 1 is the baseline model; other models include interaction terms. All models except model 2 suggest that female veterans are less likely to be in the labor force. In model 2, I add interactions of female and a spouse in armed forces and presence of a young child at home. Results suggest that female veterans married to a spouse in armed forces by 21-percentage point than similar male veterans. It is likely that female veterans married to a spouse in armed force for caring their young children. When interactions are included, the female coefficient is not significant anymore. This result suggests that female veterans are only less likely to participate in the labor force when they have young children at home. Presence of young children at home matters for female veterans, as in the overall labor market.

Model 3 suggests that female veterans with combat zone experience or service-related disability are less likely to participate in the labor force by more than 8 percentage points as compared to male veterans with combat experience or service-related disability. Combat zone experience and service-related disability disability appear to have significant negative effect on female veterans but not on male veterans. In Model 4, interactions of female veterans and race/ethnicity show that female veterans of color are 10 percentage points less likely to participate in the labor force.

Employment to Population

Table 4 presents the average marginal effects for probability of being employed. Baseline model 1 suggests that on average female veterans are less like to be employed when controlled for demographic differences. And across all models except model 2, female veterans are less likely to be employed than male veterans by about 10 percentage points. Model 2 shows that female veterans with young child at home are less likely to be employed than male counterparts by over 20 percentage points. However, being married to a spouse in armed forces is found to have no differential effect. Model 3 suggests that serving in a combat zone or having a service-related disability decreases the odds of employment of female veterans by about 9 percentage points as compared to similar male veterans. According to the results, combat zone experience and service-related disability harms employment of female veterans as compared to male veterans with Hispanic origin are less likely to be employed as compared to male veterans with Hispanic origin.

Unemployment

Table 5 reports the average marginal effects for the unemployment outcome. Except model 4 all models show that female veterans are equally employable as male veterans. In model 4, female veterans are found to be more likely to be unemployed once they participate in the labor force. Interactions of several characteristics suggest that female veterans are not different than male veterans about unemployment. Only female veterans with combat zone experience are more likely to be unemployed than male veterans with combat zone experience. As in previous estimates, combat zone experience has gender differential effects on the labor market outcomes.

Combat zone experience appears to give harm to labor outcomes of female veterans as compared to male veterans.

Usual Weekly Hours Worked

The outcome of usual weekly hours of work is using the same form of the equation (1). Table 6 reports OLS estimates of usual weekly hours of work on four different model specifications. I find that among employed with positive hours of work, female veterans work less by about 3 hours across all models. Model 2 suggests that female veterans with young child at home work less than male veterans with young child at home by about 3 hours. As in employment and labor force participation outcomes, having a young child at home only affects female veterans negatively. On the other hand, model 3 suggests that having combat zone experience or service-related disability does not affect the workload of veterans differently on the basis of gender. The race/ethnicity interactions show that female veterans of color work more than male veterans of color by about 2 hours.

Discussion and Concluding Remarks

This paper contributes to literature by examining, for the first time, the gender differences in the effects of recent military experience, including overseas deployments and combat zone experience, on the labor market performance of female veterans. The measures of success in the labor market include: labor force participation, employment, unemployment, and usual weekly hours of work. I find that female veterans are less likely to participate in the labor force and less likely to be employed than comparable male veterans and also, that once they are in the labor force, they are equally employable as male veterans, which is consistent with the findings of past studies (M. Kleykamp, 2013; Routon, 2014). Further I show evidence that female veterans work less than male veterans once they are employed. The findings of this study suggest that female veterans have difficulty entering the labor force and finding jobs once they return to civilian life as compared to male veterans. As the representation of women in the U.S. military increase, there will be more female veterans in the future. Policymakers should note that female veterans are more likely to have lower labor market success than male veterans.

The findings from this study make several contributions to the current literature. First, this study shows that combat zone experience harms labor market performance of female veterans as compared to male veterans. Reasons for differences in the effects of combat zone experience on the labor outcomes of veterans on the basis of gender may be related to effects of combat on health outcomes. Past studies show evidence that combat experience is associated with worse health problems, particularly mental health problems including PTSD (Cesur et al., 2013; Hoge et al., 2004). And studies show that females respond to stress in a different way than males, particularly, female veterans are more likely to have trauma than male veterans (Nayback, 2008; Zinzow et al., 2007). Overall, the adverse differential effect of combat zone experience has important policy implications. The U.S. Government recently announced that all occupations in the military, including direct combat units, are open to women. Thus, there will be more female veterans in the civilian life with combat zone experience. Policymakers should note the potential differential effects of the combat experience on the subsequent labor outcomes of female veterans.

Secondly, this study shows that female veterans are more likely to have a young child at home, and these female veterans with a young child at home are less likely to participate in the labor force and less likely to be employed as compared to male veterans. Due to the nature of military service and overseas deployments, female veterans may not consider to have child while in the military. Thus these types of commitments emerge in subsequent civilian life. Recently, Department of Defense has taken steps in order to make the military a more family friendly environment for active duty personnel extending the maternity and paternity leave for military families and expanding hours of child care centers (Ryan, 2016). However, the findings of this study suggest that a similar policy development is needed for labor market success of female veterans.

The overall findings of the current study may serve as a base for future policy recommendations such that needs of female veterans are different than male veterans in order to succeed in the labor market after discharge from the military. Regarding the increasing contribution to the military and all combat positions, policy makers should consider potential differences in the effects of military service on the subsequent labor outcomes of female veterans.

Disclosure Statement: I have no conflicts of interest to disclose.

Data availability: The data that support the findings of this study are only available in The UPUMS-CPS website at <u>https://cps.ipums.org/cps/.</u>

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Table 1: Summary Statistics

Table 2: Mean Outcomes by Age, Gender, Combat Zone Experience, Service-related Disability, Race

Table 3: Average Marginal Effects From Probit Estimates of Labor Force Participation

Table 4: Average Marginal Effects From Probit Estimates of Employment to Population

Table 5: Average Marginal Effects From Probit Estimates of Unemployment

Table 6: OLS Estimates of Usual Weekly Hours Worked

Figure 1. Rate of Combat Zone Experience by Gender

Figure 2. Rate of Service-related Disability by Gender