What Happened To Desert Strom Veterans When They Returned Home?

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Abstract: The focus of this study is to estimate the impact of having served during the Gulf War I era and having received a service connected injury, on the probability of being employed for those veterans. The hypothesis is that Gulf War I era veterans experience a positive impact on their probability of being employed as a result of having served. Furthermore, veterans receive a negative impact on their probability of being employed if they received a service connected injury. The theoretical framework that will be used in this study is a reduced- form specification of employment. The empirical model that is used in order to test the theory is the linear probability model. This research has found that there is a positive impact on the probability of being employed as a result of serving during the Gulf War I era after controlling for service connected injury rating, demographic characteristics, and other unobserved characteristics and preferences. This research has also found that veterans who have a higher service connected injury rating experience a higher negative impact on their probability of being employed.

Introduction

On March 20, 2008, the US Department of Labor and the Bureau of Labor Statistics released a data analysis of the Current Population Survey titled "Employment Situation of Veterans: 2008." In the analysis, Gulf War I era is represented by veterans who served between August 1990 to August 2001. During this era, there were 2.9 million veterans who served. Of those who served, the demographic makeup consist of 85%men, 16% blacks, 9%Hispanics, and

70% were 35 years old or older. The unemployment rate for Gulf War I era veterans in 2008 was 4%. On the other hand, in the analysis, Gulf War II era is represented by veterans who served from August 2001 to the present. During this era, there are 1.7 million veterans who have served thus far. The demographic makeup is similar to the Gulf War I era, but there is a higher proportion of females who served. The unemployment rate for Gulf War II era veterans in 2008 was 7.3%.

The difference in unemployment rates between Gulf War I and Gulf War II veterans may be explained because unemployment rates for younger individuals may be higher than for older individuals. The focus of this study is to measure the impact that service during the Gulf War I era and service connected injury has on the probability of being employed for veterans. By measuring the impact that military service and service connect injury had on the probability of being employed for Gulf War I veterans in 1999, we may better understand the impact that military service and service connected injury has on the employment probability for Gulf War II veterans in 2009. The hypothesis is military service during the Gulf War I era had a positive impact on the probability of being employed while service connected injury had a negative impact on the probability of being employed for veterans in 1999. The theoretical framework that will be used in order to analyze this statement is a reduced-form specification of employment (see Alexandre, Patrick, Beauliere, and Martins 2009.) Furthermore, the empirical model that will be used in order to analyze the hypothesis is the linear probability model. There are several economic studies that focus on the labor market effects that military service has on the employment conditions of Veterans. Nevertheless, there is no existing literature that focuses on the impact of serving in Gulf War I and Gulf War II eras. The contribution of this

paper is to fill the gap in the existing literature by measuring the effects that service and service connected injury has on the employment probabilities of Desert Storm veterans.

Theoretical Framework

The theoretical model that will be used in this study in order to analyze the impact that service during Gulf War I and service connected injury had on the employment probability of veterans in 1999 is based on a reduced form-specification of employment (see Alexandre, Patrick, Beauliere, and Martins 2009). A reduced form specification model in economics is the combination of two different models that may have a relationship. Both of the models that are combined have endogenous and exogenous variables. Therefore, when the models are re-worked, all of the endogenous variables will be on the left-hand side of the model, and all of the exogenous variables will be on the right-hand side. The endogenous variable is what the research is attempting to explain within the context of the model, and the exogenous variables are explanatory variables within the model that attempt to explain the endogenous variable. For this research, the two models that are being combined are human capital and labor supply, and they are functions of years of military service, race, gender, education, and marital status. Included in the model is a total annual household income variable which will serve as a proxy for non-labor income and it is a function of labor supply. This model is a modified version of the reduced-form specification of employment used by Alexandre, Patrick, Beauliere, and Maritns. In their model, they use psychological distress as an explanatory variable of employment; whereas, this model has dropped the psychological distress variable and added a Gulf War era I veteran status and a service connected injury rating which are human capital variables. In the

theory of human capital, Gulf War I veteran status serves as a function of work experience, and service connect injury rating serves as a function of health.

$$E_i = E_i\ (+ S_i, - SCI_i, - I_i, \pm X_i)$$

E represents employment; S represents Gulf War era I veteran status; SCI represents service connected injury rating; I represents total annual household income, which is a proxy for non-labor income; X is a vector for demographic variables, (for instance, years of military service, race, gender, education, and marital status). In this reduced-form specification of employment, employment for the individual respondent is a function of service during the Gulf War I era, service connected injury rating, total annual household income, and demographic characteristics. The impact that military service during the Gulf War I era has on employment is expected to be positive. For service connected injury rating and total annual household income, the impact on employment is expected to be negative. Nevertheless, the impacts of exogenous demographic variables on employment will vary.

Literature Review

There is not any extensive literature that has been done on the impact of service and service connect injuries on labor market outcomes of American war veterans, and research that has been done in this area has failed to study these impacts on Desert Storm veterans. Savoca and Rosenheck (2000) analyzed the effects that psychiatric health had on Vietnam veterans' employment conditions. The National Survey of the Vietnam Generation (NSVG) was used for the empirical analysis. The earnings equation was estimated using the Mincer Model. The natural log of hourly wage is used as a dependent variable; while, age measures potential

lifetime work experience, and years of schooling measures education. Savoca and Rosenheck (2000) found that the effects of PTSD significantly lowered the probability of working for male Vietnam Era veterans. Furthermore, the veterans who did happen to find employment, PTSD significantly lowered their wage. Their paper contributed to the existing literature by analyzing psychiatric impacts on the labor market for veterans. PTSD is rarely looked at when economists have done research on the topic of military experience impacts on the civilian labor market because there is a very limited supply of PTSD data, and it is often hard to obtain veteran health data from the government.

When measuring the impact of service connected injuries on labor market outcomes for veterans, a human capital model is the method used to determine the outcomes. Since human capital varies across race and ethnicity, it is necessary to analyze the difference between veterans who have service connected injuries but come from different racial and ethnic backgrounds. Chatterji, Alegria, Lu, and Takeuchi (2005) were to be the first to analyze psychiatric disorders and labor market outcomes using the National Latino and Asian American Study. The authors use a human capital framework in order to analyze the effect of psychiatric disorders on the accumulation of human capital through education and training. They found that psychiatric disorders and mental distress have a negative impact on the probability of being employed. This paper is especially helpful because of the focus on how psychiatric disorders affect human capital accumulation by impacting motivation, judgment, cognition and social interactions. Chatterji, Alegria, Lu, and Takeuchi research is also relevant to this research because this essay will be using a similar theoretical and econometric model.

Moreover, when the theory of human capital is applied, there are several variables that are functions of human capital. This study analyzes variables related to racial and ethnical demographics as well as education and years spent in the military; therefore, it is necessary to review the relevant literature that analyze racial, cultural, and educational attainment differences; it is also important to review the impacts of these differences in the civilian labor market. Race, culture, and education are functions of employment, and employment is impacted by earnings; therefore, literature that analyzes these characteristics is relevant to this research. Teachman (2004) uses a model in his article that investigates the consequences for subsequent civilian earnings for Vietnam era veterans. Teachman's study is connected to this research because this paper will provide evidence that earnings have a negative impact on the probability of being employed. The data that Teachman used for his empirical study came from the National Longitudinal Study of Young Men. He used a fixed-effect regression model for predicting the natural log of earned income as a dependent variable. Teachman found that military experience during the Vietnam era had a negative effect on Subsequent Civilian Earnings for Vietnam veterans, but these effects were short lived and wore off after about ten years. He also found that these effects were confined to veterans who reported that they had been drafted. Nevertheless, Teachman neglected to look at the effects of psychiatric health on civilian labor market conditions for Vietnam veterans.

Because this study is interested in the employment probability of Desert Storm veterans who received service connected injuries, we focus on literatures that analyze the labor market outcomes for veterans who served during times of war. In order to understand the differences in labor market outcomes between veterans who go to war and those who do not, we need to

review literature that can estimate the differences between the two. Mangum and Balls (1989) analyze the impact of military service on civilian labor market outcomes for veterans during a war era compared to the impact of military service on civilian labor market outcomes for veterans who did not serve in a war. The focus of their paper is the post service earnings of young men and women who served in the post draft era; this is relevant to my study because earnings impact employment. Most of the previous research in this area focuses on war era generations; this study is unique because it focuses on peace time service. The data that was used was drawn from the NLS-Youth Cohort. What the authors found was that during post-draft, post-war era, the skill set transfer between the military and civilian labor markets were considerable, and that the military is viable as an institution for skill development comparable to civilian institutions.

Furthermore, when analyzing the impacts of military service and combat related injury on the civilian labor market conditions for veterans, it is important to understand that there are several ways of approaching the topic. One way is to compare those who served to those who did not serve. Another way is to compare veterans who served in a war to those who did not served in a war. Hirsch and Mehay (2003) analyze the labor market performance of veterans using the Reserve Components Survey. The Reserve Components Survey is unique because instead of comparing veterans to civilians, they compared veterans to reservist who have never served on active duty. This reduced problems that are inherit in the usual data sources like the Census and Current Population Survey because the reservist and veterans that were studied had similar characteristics like age, fitness, and social economic backgrounds and so on, and these similarities help to reduce bias that arise when comparing veterans with civilians. The

authors found that the wage differential between enlisted veterans and non-veterans was small. This outcome is relevant to my study because wage impacts employment. Nevertheless, the shortcoming of this study is that it does not take into account the impact of combat related injuries on wage differentials between enlisted veterans and non-veterans. Nevertheless, the shortcoming is addressed in this research, but Hirsch and Mehay was included in the review in order to show that there is not just one way of approaching this topic for analysis. In other words, there will be limitations to this research.

Model Specifications and Development of Results

The Linear Probability Model is the empirical model that has been used in order to test the hypothesis that Gulf War I era veterans experience a positive impact on their probability of being employed compared to non-veterans, but they experience a negative impact on their probability of being employed compared to non-veterans if they have received a service connected injury. This empirical model has been derived from a reduced-form of employment which combines labor supply theory and human capital theory. The Linear Probability Model is estimated using ordinary least squares; nevertheless, the results must be interpreted differently. The reason why the results are interpreted differently is because the dependent variable is a dummy variable that only takes on a value of 1 if the respondent is employed, or it takes on a value of 0 if the respondent is not employed. One of the main interpretations of the Linear Probability Model, which is different from the typical Ordinary Least Squares, is the fact that the typical OLS gives us an estimate of the expected value that the dependent variable will take on average; nevertheless, the Linear Probability Model gives us an estimate of the probability that the dependent variable will take. Furthermore, the intercept for the typical OLS

tells us the change in the dependent variable given a one unite change in the independent variable. Nevertheless, for the Linear Probability Model, the intercept represents the change in probability that the dependent variable will be equal to one given a one unit change in the independent variable. Since the Linear Probability Model is estimated using ordinary least squares, we must comply with the traditional OLS assumptions. One of the classical OLS assumptions is that the error term observations must have a constant variance; this is called homoskedasticity. Each error term observation does not necessarily have to be the same size; they just must come from the same probability distribution. When the error term observation variances are different, heteroskedasticity is present in the model. One of the ways to find out if heteroskedasticity is present in the model is to plot the error term observations by size. If there was a serious enough case of heteroskedasticity, then we would be able to see the non-constant variances in the error term observations. Another problem with heteroskedasticity is that when it exists, the standard error statistic will be invalid, and this will bias the t-statistic. Since we are using a Linear Probability Model in order to test our theoretical model, we will need to correct the model for heteroskedasticity because it is an inherit problem with the linear probability model; meaning, whenever we use a linear probability model, heteroskedasticity will automatically be present. For this study, we corrected for heteroskedasticity by using a proc reg procedure in SAS called **acov.** This procedure corrects for heteroskedasticity by calculating Robust Standard Errors from an asymptotic covariance matrix. The adjusted standard errors are considered to be more robust, and they can deal with the failure to meet the classical OLS assumption of homoskedasticity. Therefore, the standard errors and t-values in our regression have been adjusted in order to correct for heteroskedasticity in the model.

$$E_i = E_i\ (+ S_i, - SCI_i, - I_i, \pm X_i)$$

This reduced-form specification of employment theoretical model can be converted to an empirical model in order to test the hypothesis by using a linear probability model.

$$PrE = - \beta + \beta(S) - \beta\ (SCI) - \beta\ (I) \pm \beta(X) + U$$

Where PrE represents the probability of being employed; S represents Gulf War I veteran status; SCI represents service connected injury rating; I represents total annual family income; X represents demographic characteristics; and U represents unobserved characteristics and preferences.

The data that is used in this study was obtained from the Current Population Survey. The Census Bureau has been conducting the Current Population Survey of around 50,000 households, for the Bureau of Labor Statistics, on a monthly basis for over 50 years. For this study, a sample of 8,917 civilians from the United States population was used in order to estimate the coefficients for each variable. The Census Bureau collected this data in 1999, and it includes veterans and non-veterans. Some of the veterans in the sample served during Gulf War I era, but there are also veterans who served in other military conflicts and during peace time. In the empirical model, the dependent variable is the probability of being employed. It is a dummy variable that takes on a value of 1 if the respondent is employed, and it takes on a value of 0 if the respondent is not employed. The Gulf War I veteran status variable (S) is an explanatory variable, and it is also a dummy variable that takes on a value of 1 if the respondent has served on active duty in the military between August 1990 and August 2001, and it takes on a value of 0 if the respondent did not serve during that era. The Gulf War I

veteran status variable and the service connected injury variable are the main variables of focus for the hypothesis. The impact of military service during Gulf War era I on the probability of being employed, while controlling for service connected injury, is expected to be positive; nevertheless, the impact of service connected injury rating on the probability of being employed is expected to be negative. The following explanatory variables are control variables that are added in order to control for observable characteristics that may also impact the probability of being employed. By controlling these variables, an estimate of the impact of service during Gulf War I and service connected injury on the probability of being employed can be specified with residuals that fall within a reasonable adjusted r-squared. The control variables include total annual household income, years of service, race, ethnicity, education, and marital status.

The Current Population Survey is a multiple choice survey; therefore, most of the variables can only be made into dummy variables. All of the control variables are dummy variables except for total annual household income. In order to increase the explanatory power of the empirical model, total annual household income has been converted into a continuous variable from fourteen fixed variables. For example, the respondent was asked what their total annual household income was last year, and they had fourteen possible answers. The respondent could have chosen 1 which would have been less than $5,000, or the respondent could have chosen 2 which fall between 5,000 to 7,499 dollars. These choices go up to 14 which represent $75,000 or more. In that case, the median between 75,000 and 95,000 was calculated. Since the rest of the explanatory variables and the dependent variable are dummy variables, the reference groups need to be identified in order to know what the dummy

variables are being compared to. For the dependent variable "employed," the reference group consists of those individuals who are unemployed. For the service connected injury category, the reference group consists of those individuals, both veterans and civilians, who did not receive a service connected injury ratings. The years of service category has a reference group of civilian respondents who did not serve in the military. For the race category, the reference group is blacks, American Indians, Elutes, and Eskimos; the Hispanic category has a reference group of those individuals who are non-Hispanic; the education category has a reference group of respondents who have not attended any years of college; the marital status category has a reference group of respondents who were never married; and the reference group for the gender category is male.

Variable Description, value, and Expected sign

Served in Gulf War I	**1 if respondent served and 0 if the respondent did not serve**	**Positive impact**
Injury rating 0 to 10	**1 if the injury rating is between 0 and 10; 0 if not**	**Negative impact**
Injury rating 11 to 49	**1 if the injury rating is between 11 to 49; 0 if not**	**Negative impact**
Injury rating 50 to 89	**1 if the injury rating is between 50 and 89; 0 if not**	**Negative impact**
Injury rating 90 to 100	**1 if the injury rating is between 90 and 100; 0 if not**	**Negative impact**
Log total annual household income	**Log of median ranges of fixed income variables; consistent**	**Negative impact**
Years in service 4 or less	**1 if spent 4 or less years in military; 0 if not**	**Positive impact**
Years in service 5 to 9	**1 if spent 5 to 9 years in military; 0 if not**	**Positive impact**
Years in service 10 to 14	**1 if spent 10 to 14 years in military; 0 if not**	**Positive impact**
Years in service 15 to 19	**1 if spent 15 to 19 years in military; 0 if not**	**Positive impact**

Years in service 20 and over	**1 if spent 20 or more years in military; 0 if not**	**Positive impact**
Race white	**1 if white; 0 if not**	**Positive impact**
Asian or Pacific Islander	**1 if API; 0 if not**	**Negative impact**
Female	**1 if female; 0 if not**	**Negative impact**
Hispanic	**1 if Hispanic; 0 if not**	**Negative impact**
Less than 1 year in college	**1 if less than 1 year; 0 if not**	**Positive impact**
Freshman	**1 if freshman; 0 if not**	**Positive impact**
Sophomore	**1 if Sophomore; 0 if not**	**Positive impact**
Junior	**1 if junior; 0 if not**	**Positive impact**
Four or more years in college	**1 if 4 or more; 0 if not**	**Positive impact**
Widowed	**1 if widowed; 0 if not**	**Negative impact**
Divorced	**1 if divorced; 0 if not**	**Positive impact**
Married	**1 if married; 0 if not**	**Positive impact**
Separated	**1 if separated; 0 if not**	**Positive impact**

Parameter Estimates
Dependent Variable: Employment Probability
***(**) (***) represent significance at 90% 95% 99% critical level based on a two tailed test.**
T-values and standard errors are robust and adjusted for heteroscedasticity

Explanatory Variable	**Parameter Estimates**	**T-Value**
Served in Gulf War I	.277*** (.01882)	14.72
Injury rating 0 to 10	-.022 (.02667)	-.83

Injury rating 11 to 49	-.06* (.03460)	-1.70
Injury rating 50 to 89	-.226*** (.06198)	-3.64
Injury rating 90 to 100	-.46*** (.03409)	-13.47
Log total annual household income	.236*** (.00746)	31.60
Years in service 4 or less	.031*** (01080)	2.90
Years in service 5 to 9	.071*** (01561)	4.52
Years in service 10 to 14	.063** (.02837)	2.21
Years in service 15 to 19	.109** (.04879)	2.23
Years in service 20 and over	-.082*** (.02092)	-3.94
Race white	-.065*** (.01635)	-3.97
Asian and Pacific Islander	-.036 (.04529)	-.80
Female	.02 (.02135)	.90
Hispanic	.109*** (.02658)	4.10
Less than 1 year in college	.101*** (.02504)	4.05
Freshman	.058*** (.01877)	3.11
Sophomore	.096*** (.01369)	7.04
Junior	.042* (.02299)	1.84
Four or more years in college	.123*** (.04031)	3.04
Widowed	-.257*** (.01993)	-12.90
Divorced	.146*** (.01503)	9.73
Married	.03 (.04397)	.69

Separated	.16629 *** (.03351)	4.96
	R-Square .1839	Adj R-Square .1817

Gulf War I veterans experience a positive impact of 27.7% on their probability of being employed compared to a reference group that consist of veterans who did not serve during the Gulf War I era, and those individuals who have not served in the military at all. The adjusted t-value for this estimate is 14.72, and the adjusted standard error is .01882. This means that this estimate is statistically significant at the 99% critical level based on a two-tailed test. Therefore, we reject the null hypothesis that the estimate is not different from zero. Information on employment percentages that were obtained from the US Department of Labor and the Bureau of Labor Statistics data analysis of the Current Population Survey titled ,"Employment Situation of Veterans: 2008," indicates that the average employment level for the reference group was 54%. For the purpose of this study, this percentage was calculated by averaging together the average employment percentages from five categories; World War II veterans, Korean War veterans, Vietnam veterans, veterans who served during other service periods, and non-veterans. Furthermore, the employment level for Gulf War I veterans in 2008 was 84.4%. The observed impact of serving in Gulf War I, based on data from 1999, is consistent with the difference in employment percentages between the reference group and Gulf War I veterans which is about a 30% difference. The US Department of Labor and the Bureau of Labor Statistics did not begin to analyze the employment percentages of Gulf War I veterans until 2005; therefore, percentages from 2008 were used in order to compare the effect that is estimated in the regression with employment percentages from the most recent period.

Moreover, Military veterans from World War I, Korean War, Vietnam War, Gulf War I era, and veterans who served during other service periods who received a service connected injury rating of 0 to 10%, on average, will receive a negative impact of -2.2% on their probability of being employed compared to military veterans from all of these service periods who did not receive a service connected injury rating and non-veterans. The adjusted t-value for this estimate is -.83, and the adjusted standard error is .02667. Therefore this estimate is not statistically significant. Since we do not know that this estimate is really different form zero, we accept the null hypothesis that it is not. Those veterans who served during the same periods mentioned above, and who received a service connect injury rating of 11 to 49% also received a negative impact of -6% on their probability of being employed compared to those veterans who served and did not receive a service connected injury rating and non-veterans. The adjusted t-value for this estimate is -1.7, and the adjusted standard error is .03460. Therefore, this estimate is statistically significant at the 90% critical level based on a two-tailed test. In this case, we will reject the null that the estimate is not different from zero. All veterans who served, and who received a service connected injury rating of 50 to 89%, is estimated to have a negative impact of -22.6% on their probability of being employed compared to all veterans who served and did not receive a service connected injury rating and non-veterans . The adjusted t-value for this estimate is -3.64, and the adjusted standard error is .06198. This means that this estimate is statistically significant at the 99% critical level based on a two-tailed test, so we will reject the null that this estimate is not different from zero. Military veterans who received a service connected injury rating of 90 to 100% also received a negative impact of -46% on their probability of being employed compared to military veterans who have not received a service

connected injury rating and non-veterans. The adjusted t-value of this estimate is -13.47, and the adjusted standard error is .03409. This estimate is statistically significant at the 99% critical level based on a two-tailed test. We also will reject the null hypothesis that the estimate is not different from zero. Once service connected injury ratings reach 90%, the beneficial human capital consequences of serving in the military is cancelled out by this level of injury.

Furthermore, if an individuals total annual household income increases by 100% (for instance, if a person's total annual household income increased from $40,000 a year to $80,000 a year), then there will be a positive impact on the probability of being employed by 23.6%. The adjusted t-value of this estimate is 31.6, and the adjusted standard error is .00746. Therefore, this impact is statistically significant at the 99% critical level based on a two-tailed test. This variable was used in this study in order to serve as a proxy for non-labor income. Nevertheless, based on the theory of labor supply, as non-labor income increases, the amount of hours that an individual will supply to the labor market will decrease, or in some cases, the individual would tend to withdraw from the labor market all together. In economics, this effect is called the income effect. Therefore, the positive impact that total annual household income has on the probability of being employed, which is the observed impact for this estimate, is biased and counter intuitive based on the theory of labor supply. The explanation for the observed biased is a reverse causal relationship between total annual household income and employment probability. Since an increase in total annual household income may indicate that another member of the household has become employed, then, it is logical to think that employment may be having a positive impact on total annual household income, and not the other way around. Thus, indicating a reverse causal relationship between total annual household income

and the probability of being employed which is what is causing the biased, positive impact for this estimate. Therefore, total annual household income does not serve as a significant proxy for non-labor income.

Moreover, military veterans who served in World War II, Korea, Vietnam, Gulf War I, and those veterans who served during other service periods experience a positive impact of 3.1% on their probability of being employed if they served 4 years or less in the military compared to non-veterans. The adjusted t-value for this estimate is 2.9, and the adjusted standard error is .01080. This means that the estimate is statistically significant at a 99% critical level based on a two-tailed test. In this case, we will reject the null hypothesis that the estimate is not different from zero. Also, veterans with the same characteristics described in the previous interpretation experience a positive impact of 7.1% on their probability of being employed if they served 5 to 9 years in the military compared non-veterans. This estimate has an adjusted t-value of 4.52, and an adjusted standard error is .01561. Therefore, this estimate is statistically significant at a 99% critical level, and we will reject the null hypothesis that the estimate is not different from zero. Those veterans mentioned previously who served 10 to 14 years in the military experience a positive impact on their probability of being employed by 6.3% compared to non-veterans. The adjusted t-value for this estimate is 2.21, and the adjusted standard error is .02837. This means that the estimate is statistically significant at the 95% critical level based on a two-tailed test. Therefore, we will reject the null hypothesis that the estimate is not different from zero. Military veterans who served 15 to 19 years in the military receive a positive impact of 10.9% on their probability of being employed compared to non-veterans. The adjusted t-value of this estimate is 2.23, and the adjusted standard error is

.04879. This means that this estimate is statistically significant at a 95% critical level based on a two-tail test. In this case, we will reject the null hypothesis that the estimate is not different form zero. Those veterans who served 20 years or more in the military will receive a negative impact of -8.2% on their probability of being employed compared to non-veterans. The adjusted t-value for this estimate is -3.94, and the adjusted standard error is .02092. Therefore, it is statistically significant at a 99% critical level based on a two-tail test. In this case, we will reject the null hypothesis that the estimate is not different from zero. Up to this point, there may be a relatively linear and positive relationship between length of service and employment. Nevertheless, for those who served 20 years or more in the military, there is a sudden change in the relationship between years of service and employment; the relationship becomes non-linear and negative. This can be explained because those veterans who served 20 years of service or more in the military and are retired answered no to the question about their employment status. The negative impact may change to a positive impact, and the relationship between years of service and employment may become linear if we were to control for retirement in the model. This could be done by adding a new dummy variable to the model. It would take on a value of 1 if an individual served 20 years or more in the military and are not retired, and it would take on a value of 0 if the individual served 20 years or more in the military and are retired. Then, we would replace the dummy variable that does not distinguish between military veterans who served 20 years or more and are retired with those who served that many years and are not retired with the new dummy variable that does distinguish between retirements or not among military veterans who have served 20 years or more in the military.

Furthermore, those individuals who are white experience a negative impact on their probability of being employed by -6.5% compared to blacks, American Indians, Aleuts, and Eskimos. The adjusted t-value for this estimate is -3.97, and the adjusted standard error is .01635. Therefore, this estimate is statistically significant at the 99% critical level based on a two-tail test. In this case, we will reject the null hypothesis that the estimate is not different from zero. Nevertheless, this estimate is counter to what theory would suggest. On average, we would expect whites to have an advantage in the labor market. One explanation for this counter intuition would be the fact that this estimate does not distinguish between males and females. One would expect females to spend less time in the labor market during their lifetimes because most of them decide to start a family at some point in their lives. Therefore, it only seems that whites experience a negative impact on their probability of being employed, but the estimate is biased because there is no distinction between males and females. This problem could be solved by creating separate dummy variables for white males and white females. Nevertheless, those individuals who are Asian and Pacific Islander experience a negative impact of -3.6% on their probability of being employed compared to blacks, American Indians, Aleuts, and Eskimos. The adjusted t-value for this estimate is -.80, and the adjusted standard error is .04529. Therefore, it is not statistically significant at all. In this case, we will accept the null hypothesis that the estimate is not different from zero. This estimate has encountered the same problem as the previous estimates; it does not distinguish between males and females. Therefore, this estimate is biased which would explain the statistical insignificance. In order to correct the bias, we could create separate dummy variables for male Asians and Pacific Islanders and female Asians and Pacific Islanders.

Moreover, females experience a positive impact on their probability of being employed by 1.9% compared to males. The adjusted t-value for this estimate is .90, and the adjusted standard error is .02135. Therefore, this estimate is not statistically significant. In this case, we will accept the null hypothesis that the estimate is not different from zero. Nevertheless, we would expect there to be a negative impact on the probability of being employed as a result of being female since females spend less time in the labor market during their lifetimes because of child rearing decisions. The reason for the biased in this estimate is similar to the reason there was bias in the race estimates; there needs to be distinction between genders and race. In order to correct the bias in this estimate, new dummy variables would be created that distinguish between white males, white females, black males, and black females.

Nevertheless, Hispanics experience a positive impact on their probability of being employed by 10.8% compared to non-Hispanics. The adjusted t-value for this estimate is 4.10, and the adjusted standard error is .02658. Therefore, this estimate is statistically significant at the 99% critical value. Moreover, we would reject the null hypothesis that the estimate is not different from zero. Nevertheless, according to theory, Hispanics may experience a negative impact in the labor market as a result of their ethnicity. This estimate is biased because ethnicity needs to have distinction between genders. In order to correct the biased in this estimate, we would create new dummy variables that distinguish between Hispanic males and Hispanic females.

On the other hand, those individuals who have attended less than on year in college will experience a positive impact of 10.13% on their probability of being employed compared to those individuals who have never attended college at all. The adjusted t-value for this estimate

is 4.05, and the adjusted standard error is .02504. Therefore, this estimate is statistically significant at a 99% critical level. In this case, we will reject the null hypothesis that this estimate is not different from zero. Nevertheless, this estimate makes it appear that going to college for one year is very beneficial, but this estimate is biased because it does not only capture the effect of going to college for less than one year; it also captures the effect of those individuals who have not gone to college at all, and those individuals who have not even finished high school. Therefore, for this estimate, it would be erroneous to state that less than one year in college has a positive impact on the probability of being employed by 10.13% compared to those individuals who have not attended college at all. Those individuals who are freshmen in college experience a positive impact of 5.83% on their probability of being employed compared to those individuals who have not attended college. The adjusted t-value for this estimate is 3.19, and the adjusted standard error is .05834. This means that this estimate is statistically significant at the 99% critical level, so we will reject the null hypothesis that this estimate is not different from zero. The reason why freshman may have a lower employment probability compared to those individuals who have not attended college is because of the fact that students who attend college do not work full time on average. Those individuals who are sophomore in college experience a positive impact of 9.64% on their probability of being employed compared to those individuals who have not attended college. The adjusted t-value for this estimate is 7.04, and the adjusted standard error is .01369. Therefore, this impact is statistically significant at the 99% critical level. In this case we will reject the null hypothesis that the estimate is not different from zero. Those individuals who are junior in college experience a positive impact of 4.23% on their probability of being

employed compared to those individuals who have not attended college. The adjusted t-value for this estimate is 1.84, and the adjusted standard error is .02299. This estimate is statistically significant at the 90% critical level, so we will reject the null hypothesis that this estimate is not different from zero. Individuals who have spent four or more years in college experience a positive impact of 12.26% on their probability of being employed compared to those individuals who have not attended college. The adjusted t-value for this estimate is 3.04, and the adjusted standard error is .04031. This estimate is statistically significant at the 99% critical level. In this case, we will reject the null that the estimate is not different to zero.

Furthermore, those individuals who have been widowed experience a negative impact of -25.71% on their probability of being employed compared to those individuals who have never been married. The adjusted t-value for this estimate is 12.90, and the adjusted standard error is .01993. This estimate is statistically significant at the 99% critical level. Therefore, we will reject the null hypothesis that the estimate is not equal to zero. Nevertheless, the interpretation of this estimate would be that the effect is biased because there would be different impacts of being widowed between males and females. In order to correct the error in this estimate, there would be two separate dummy variables created that distinguish between male widows and female widows. Those individuals who are divorced will experience a negative impact on their probability of being employed by -14.63% compared to those individuals who have never been married. The adjusted t-value for this estimate is 9.73, and the adjusted standard error is .01503. In this case, we will reject the null hypothesis that the estimate is not different from zero. Nevertheless, the same biased from the previous estimates also applies to this estimate. In order to correct the biased, we would create two new dummy

variables that distinguish between male divorcees and female divorcees. Those individuals who are married experience a positive impact on their probability of being employed by 3% compared to those individuals who have never been married. The adjusted t-value for this estimate is .69, and the adjusted standard error .04397. Therefore, this estimate is not statistically significant. In this case, we will accept the null hypothesis that this estimate is not different from zero. Nevertheless, this estimate would benefit with a set of new variables that distinguish between males who are married and females who are married. Those individuals who are separated experience a positive impact on their probability of being employed by 16.63% compared to those individuals who have never been married. The adjusted t-value for this estimate is 4.96, and the adjusted standard error is .03351. In this case, we will reject the null hypothesis that the estimate is not different form zero. Nevertheless, this estimate could also benefit with distinction between males who have been separated and female who have been separated.

Conclusion

There are thousands of teenagers and young adults across America who are thinking about joining the armed forces in order to gain training and skills that will transfer to the civilian labor market and increase their employment opportunities for the future. Some of those teenagers and young adults are wondering if joining the military really will improve their employment outcomes for the future. Furthermore, in this day in age when military labor is in short supply and unemployment levels are at some of the highest ever, it is valuable to know that Gulf War I veterans experienced a 27.7% increase on their probability of being employed in the civilian labor market in 1999 compared to individuals, with similar demographic

characteristics, who did not serve in the Gulf War I era. Nevertheless, it is also valuable to understand the risks involved when making a decision to supply labor to the military. The benefits may outweigh the cost of supplying labor to the military unless an individual receives a service connect injury of 90% to %100 which is the point when the beneficial human capital consequences of serving in the military is cancelled out by injury. If a person decides to serve in the military, and they unfortunately receive a service connect injury rating between 90% and 100%, their decision to serve may not have been the best choice. Basically, the decision to serve in the military is a risky decision; therefore, it may not be the best choice for the risk adverse.

Nevertheless, there are limitations to this research. First of all, when estimating a qualitative choice model, the Linear Probability Model may not be the best model to apply. Qualitative choice models are empirical models that have a dependent variable that is qualitative in nature instead of numeric. In this research, the dependent variable "employment," is a qualitative variable. Therefore, when a qualitative dependent variable that takes on a value of 1 if the respondent is employed and a value of 0 if the respondent is not employed is being used in a Linear Probability Model, the estimate probability can take on a value that is below 0 or above 1 which is obviously impossible. In order to correct this problem, future research would consider using a Probit model because it is based on a cumulative normal probability distribution which will not give probabilities greater than one or less than zero. The Probit model was not used in this research because the level of sophistication would demand more time; therefore, the Probit model is recommended for future research.

Second of all, in this research, we used total annual household income as a proxy for non-labor income, but when we interpreted the results, we found that it did not serve as a very

good proxy because it was counter intuitive according to the theory of labor supply. The Income Effect suggest that people tend to supply less hours to the labor market, and in some cases, they even drop out of the labor market as non-labor income increases. Nevertheless, in our results, our proxy for non-labor income appeared to have a positive effect on the probability of being employed. The proxy is biased because total annual household income is impacted by employment; not the other way around. The reason why is because an increase in total annual household income may result from another member in the household becoming employed; thus, increasing total annual household income. Therefore, the biased estimate for the proxy of non-labor income is a result of reverse causation. We left this proxy in the model because even though it is flawed, it was the closest measurement for non-labor income that we were able to obtain from the Current Population Survey.

Third of all, in a traditional human capital model, age serves as a very important variable because employment levels will vary greatly across different age brackets. Nevertheless, this study did not account for age in the reduced-form of employment model because data on age of the respondent was not available to the public from the Current Population Survey for 1999 which was the year that we did our analysis on. Therefore, this is a limitation to this study. Furthermore, in our study, we did not create separate categories for those respondents who attained education beyond a bachelor degree level. We clumped all of the respondents who attained 4 or more years of college into one group which may not have been the best way to measure the effect of education on employment. We need to know the impact on the probability of being employed for those individuals who have attained education beyond a bachelor degree level. There should be separate categories based on master's degree

level and PHD level. Moreover, individuals who attained education on a freshman, sophomore, junior, and senior level may still be pursuing their education; thus, making it appear that the effect of not attending college at all will be greater than the effect of attending college; this is biased and also a limitation to this research. In our model, the estimates for race, gender, and marital statuses were biased because we did not distinguish between males who had a given race and marital characteristic and females who had a given race and marital characteristic. Females, regardless of race, ethnicity, and marital status, tend to spend less time in the labor force during their lifetimes than males because of child rearing decisions. In conclusion, future research would want to improve upon all of these limitations and would want to add Post Traumatic Stress Disorder as a variable to the model in order to have a more accurate measurement of health and human capital.

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Appendix

Descriptive Statistics

	Standard Deviation	Mean
Served in Gulf War I	.171	.03
Injury rating 0 to 10	.178	.032
Injury rating 11 to 49	.134	.018
Injury rating 50 to 89	.079	.006
Injury rating 90 to 100	.101	.010
lntotalhouseholdincome	.670	10.52
Years in service 4 or less	.469	.326
Years in service 5 to 9	.308	.106
Years in service 10 to 14	.153	.024
Years in service 15 to 19	.088	.008
Years in service 20 and over	.244	.064
Race white	.3	.899
Asian and Pacific Islander	.1	.010
Female	.223	.052
Hispanic	.167	.029
Less than 1 year in college	.189	.037
Freshman	.261	.074
Sophomore	.340	.133

Junior	**.204**	**.043**
Four or more years in college	**.112**	**.013**
Widowed	**.223**	**.052**
Divorced	**.315**	**.112**
Married	**.102**	**.010**
Separated	**.131**	**.017**