ESTIMATING THE INCREASE IN WAGES FROM MILITARY SERVICE

Carl A. Kogut, University of Louisiana at Monroe
Larry E. Short, Northwestern State University
Jerry L. Wall, Northwestern State University

ABSTRACT

Using the Current Population Survey data, the return to veterans of the all-volunteer military in the form of higher earnings is estimated using regression analysis. Males with just a high school diploma will earn, on average, about 10% more if they serve in the military. Although there is a positive effect on earnings, the effect is not as large as that attained through additional education.

INTRODUCTION

The benefits of higher education for individuals is well documented in that there is a positive correlation between higher levels of education and higher earnings for all racial/ethical groups and for both men and women (College Board, 2007). Can the same benefits be obtained for military service? That is, does business and industry value an individual's service in the all-volunteer military by awarding an earnings premium for such service—and if so, does the earnings premium exist regardless of race and gender? Can military service be a substitute for higher education? Specifically, can an individual graduating from high school make a choice to enter the military instead of going to college and reap benefits in terms of increased earnings in civilian employment? This study will attempt to ascertain if service in the all-volunteer military can provide a similar advantage in terms of higher earnings that higher education has done over the years.

The value of military service to civilian employment has been studied intensively over the past 50 years. Most early studies of veterans of World War II and Korea found that, over the long run, these veterans had higher earnings than non-veterans (Martindale and Poston, 1979; Little and Fredland, 1979). The earning premium earned by World War II and Korea veterans over non-veterans appeared to exist regardless of veterans' race (Villemez and Kasarda, 1976; Mardindale & Poston, 1979; Little and Fredland, 1979). Studies of Vietnam-era veterans suggested that military service did not have the same consistent income premium impact on civilian earnings that WWII and Korean veterans enjoyed (Schwartz, 1986; Martindale & Poston, 1979; Berger & Hirsch, 1983). Minority group veterans of the Vietnam-era, however, appeared to receive civilian earning benefits, when compared to comparable non-veterans, while many non-minority veterans suffered an income disadvantage (Poston, 1979). Interestingly, some studies found that the Vietnam-era veterans with less education often received a larger

civilian earnings premium than those with more education (Villemez and Kasarda, 1976; Rosen and Taubman, 1982; Berger and Hirsch, 1983).

After the end of the compulsory draft in 1973, researchers began to study the effect that service in the all-volunteer armed forces had on subsequent civilian earnings including protected group veterans, i.e., women and minority group members. A study in 1993 found that the impact of service in the all-volunteer military on subsequent civilian earnings differed with race and education; non-whites and high school dropouts benefited from service in the military while college graduates suffered a large earnings penalty (Bryant, Samaranayake, and Wilhite, 1993). Studies of the earnings premiums of female veterans appear somewhat mixed with one study finding an earnings advantage to female veterans (Mehay and Hirsch, 1996), another finding an earnings advantage to older female veterans and a penalty to younger female veterans (Prokos and Padavic, 2000), and another finding female veterans losing ground relative to their female nonveteran civilian counterparts (Cooney, Segal, Segal, and Falk, 2003).

PURPOSE OF THE STUDY

The purpose of this study is to determine if an earnings premium exists for veterans of the all-volunteer military, and if such exists, to estimate the increase in earnings that results from serving in the all-volunteer military, and to compare that return to the benefit from attaining additional education.

METHODOLOGY

This study employs a variant on the standard human capital wage equation used by most researchers by including a variable to capture the effect on wages from military service. Although most studies typically exclude women from the analysis due to their intermittent labor force participation which renders age an inappropriate measure for experience, we have elected to include females in the first model since they are becoming an increasingly important part of the all-volunteer armed services. Model 2 is the more traditional form which excludes females from the analysis so these results can be compared to the more traditional estimating equation. Model 3 replicates the analysis on just females to compare to the results in Model 2. The regression analysis is also done separately by education groups defined as 1) those with a high school diploma or equivalent, 2) those who had some college education, 3) those who graduated college with a Bachelor's degree, 4) those who attained a Master's degree, and 5) those who attained a Professional or Doctoral level degree. The equations estimated are as follows:

Model 1

$$LogWage = a + b_1\,Age + b_2 Age^2 + b_3 Married + b_4 Black + b_5 Other + b_6 Male + b_7 Military + \epsilon$$

Models 2 and 3

$$LogWage = a + b_1\,Age + b_2 Age^2 + b_3 Married + b_4 Black + b_5 Other + b_6 Military + \epsilon$$

where:

LogWage = natural log of the hourly wage
Age = the age (in years) for the individual and Age^2 is the square of Age
Married = 1 if the individual is married, spouse present
Black = 1 if the individual is only Black
Other = 1 if the individual is neither just Black nor just White
Male = 1 if male
Military = 1 if the individual served in the military

Thus, the base group in Models 1 and 3 consists of single white females who did not serve in the military, while in Model 2 the base group is single white males without military service.

DATA

The source of the data for this study is the 2009 Current Population Survey March Supplement. The CPS is a monthly survey of over 50,000 households conducted by the Bureau of the Census for the Bureau of Labor Statistics and is the official Government statistics on employment and unemployment. The sample is scientifically selected to represent the civilian non-institutional population of the United States. The sample population is located in 792 sample areas comprising 2,007 counties and independent cities with coverage in every State and in the District of Columbia. Currently CPS interviews about 57,000 households monthly. The CPS is the primary source of information on labor force characteristics of the U.S. population and CPS data are used by government policy makers and legislators as important indicators of our nation's economic situation (US Census Bureau, 2009).

Since this study attempts to determine the impact that service in the all-volunteer military has upon civilian pay, the samples we used for analysis were limited by three decision rules. First, only year-round, full-time workers were included in the sample. The U.S. Bureau of Labor Statistics defines year-round workers as being employed for at least 50 weeks a year and full-time workers as working 35 or more hours a week. Second, a minimum age restriction of 25 years was imposed to permit personnel sufficient time to complete their military service and enter the civilian workforce. Third, a maximum age restriction of 53 years was imposed to ensure that only military personnel who volunteered for military service were included in the sample. The military draft was eliminated in 1973, thus any veteran between the ages of 25 and 53 at the time the CPS data was collected would have voluntarily joined the military.

Table 1 presents the sample mean age and percentages for each of the education groups. A few interesting results are readily noticeable. First, the percentage of individuals who are

married increases as education level increases. Second, the percentage Black falls with education level while the percentage Other rises, peaking at the Professional/Doctoral level. Finally, the percent with military service rises to those with some College education but then falls for those with even higher levels of education.

Table 1
Sample Averages

Variable	HS Grad	Some College	College Grad	Masters	Prof/Doctorate
Age	40.2	39.8	39.4	40.3	41.4
Married	63.80%	64.10%	69.10%	73.70%	77.10%
Black	12.30%	12.40%	8.10%	8.90%	5.70%
Other	7.00%	7.90%	10.50%	12.70%	16.10%
Male	60.30%	52.80%	54.80%	52.10%	62.90%
Military	6.70%	8.40%	4.60%	5.00%	3.50%
Num obs	14,317	14,651	12,129	4,480	1,879

RESULTS

Table 2 reports the estimated coefficients from Model 1. The first six rows report the usual regression coefficients from earnings equation estimates. Age and its square term are both significant at greater than the 1% level across all education groups and the signs imply the usual age-earnings profile; the log of wages increases at a decreasing rate. The coefficient estimates on Married are also positive and significant at greater than the 1% level across all education groups. This premium to being married is commonly interpreted to exist because being married serves as a proxy for things such as stability and motivation. It should be noted that the size of the coefficient is somewhat less than commonly reported (see for example, Newman 1988), since those equations are usually estimated with just males. The coefficient estimates in Model 2 indicate a higher premium, similar to other studies.

The race coefficients, Black and Other, are negative across all education groups, but the significance of the coefficients falls from being significant at greater than a 1% level at low education levels to being insignificant (less than 10%) at higher education levels. That would indicate that any bias against minorities tends to diminish as those individuals attain jobs that require higher levels of education.

The coefficients associated with Male are positive across all education levels and indicate a highly significant (greater than 1%) difference in the earnings of males versus females ranging from about 23% to approximately 26%. As mentioned above, including females in these earnings equation estimates is somewhat unusual, but the result that males earn more than females is well known (See, for example, BLS 2009).

Table 2
Regression Coefficient Estimates – Model 1

Variable	HS Grad	Some College	College Grad	Masters	Prof/Doctorate
Intercept	1.5415*	1.5832*	1.1370*	1.5127*	0.59
Age	0.0425*	0.0479*	0.0873*	0.0747*	0.1265*
Age Squared	-0.0005*	-0.0005*	-0.0010*	-0.0008*	-0.0014*
Married	0.0762*	0.0994*	0.1153*	0.1072*	0.1325*
Black	-0.0670*	-0.648*	-0.0904*	-0.0759**	0.0767
Other	-0.0713*	-0.0631*	0.0151	-0.0101	-0.0631
Male	0.2447*	0.2269*	0.2446*	0.2605*	0.2271*
Military	0.1230*	0.0975*	0.016	0.0608	0.0418
F-Statistic	130.60*	151.27*	114.46*	60.04*	16.09*

Note: * = Significant at the .01 level, ** = Significant at the .05 level

The variable Military measures the impact from military service on earnings. The coefficient estimates are positive across all education levels, but only for those with Some College or less are the estimates significant. This indicates that military service has a much greater impact for those who do not pursue higher education. Although military service does have a positive impact on earnings, the effect is clearly greater for those who just graduate from high school or only spend some time in college. There is a 12% premium to those with just a high school degree and a nearly 10% premium if they attend, but never graduate from college. A typical teenager who graduates from high school faces a decision about whether to join the military, go directly to college, or simply enter the workforce. Our results indicate that a white male who is 40 years old, married and only has a high school education will receive, on average, an hourly wage of approximately $15.84. But a married, 40 year old white male with only a high school education who also served in the military can expect an hourly wage of approximately $17.91. However, that increase in wages due to military service pales in comparison to what the same person with a college degree will earn (i.e., $29.63 per hour).

Table 3 reports the regression coefficients for Model 2 which estimates the earnings equation for males alone. Interestingly, the age variables are essentially the same so the argument that these sorts of studies should be done only on males seems questionable. However, our results from Model 3 show that the size of the coefficient estimates for females alone are significantly less than for males. More study would be necessary to further examine these results.

One major difference in the results in Model 2 compared to Model 1 is the impact from being married. The premium for males alone appears to be almost double than what is estimated for all workers.

Table 3 Regression Coefficient Estimates – Model 2					
Variable	HS Grad	Some College	College Grad	Masters	Prof/Doctorate
Intercept	1.5734*	1.6121*	1.1050*	1.6275*	0.8677
Age	0.0519*	0.0568*	0.0967*	0.0771*	0.1204*
Age Squared	-0.0006*	-0.0006*	-0.0011*	-0.0008*	-0.0013
Married	0.1409*	0.1653*	0.2202*	0.1570*	0.2576*
Black	-0.1264*	-0.1229*	-0.2313*	-0.1555*	0.1096
Other	-0.1196*	-0.1058*	0.0318	-0.0206	-0.1546**
Military	0.0934*	0.0790*	0.0055	0.0607	0.0016
F-Statistic	63.81*	71.98*	67.92*	20.22*	8.44*
Note: * = Significant at the .01 level, ** = Significant at the .05 level					

Another interesting difference in the estimates for just males compared to all workers is the size of the negative coefficients on Black. The negative impact from race on just males is nearly twice as large as it is for all workers. Thus, it appears that any discrimination that still exists in terms of earnings is directed mostly at black males.

Finally, comparing the Military variable in the two models we see that the effect from military service disappears at higher education in both. We also see that the estimated increase in wages is lower for males than for everyone. That result becomes clearer when considering the estimates from Model 3.

Table 4 reports the regression coefficients for Model 3 which estimates earnings for females only. Interestingly, although the size of the coefficient estimates for Age and Age Squared are smaller than they are for males alone, they generally still indicate the same earnings profile. The effect of being married is also much lower and in most cases, insignificant. Thus, although being married is seen as a positive influence on earnings for males, it doesn't make any real difference for females. There also appears to be less racial bias for females than males but that result is not uncommon, especially for CPS-type data (Neal, 2004). Most importantly for our purposes here, the coefficients on Military have the same pattern we observed for males, there is a positive and significant impact on earnings for those with Some College or less, but that effect disappears once a college degree has been attained. However, the size of the coefficients are significantly larger, indicating a 16% and 12% wage premium from military service for females with a high school degree or some college respectively. Thus, it appears that female military service is more highly rewarded than military service by males. That could be due to supply effects in the sense that there are many fewer females with military service than males. There is also the "novelty" factor in that female veterans are still a relatively new group.

Table 4
Regression Coefficient Estimates – Model 3

Variable	HSGrad	Some College	College Grad	Masters	Prof/Doctorate
Intercept	2.09*	1.77*	1.51*	1.50*	0.42
Age	0.01	0.04*	0.07*	0.08*	0.14*
Age Squared	-0.00009	-0.0004*	-0.0009*	-0.0009*	-0.0015*
Married	0.009	0.040*	0.017	0.063**	0.014
Black	-0.029	-0.053*	-0.004	-0.016	0.063
Other	-0.034	-0.041	0.054**	0.004	0.87
Military	0.158**	0.117*	-0.035	0.023	0.098
F-Statistic	13.58*	26.73*	13.54*	9.31*	4.19*
Note: * = Significant at the .01 level, ** = Significant at the .05 level					

CONCLUSIONS

Our results indicate that there is a definite increase in earnings for those who choose to serve in the military and that female veterans are more highly rewarded than male veterans. The increase is strongest among those with lower education attainment and fades as the level of education increases. If an individual is either unable to go to college or chooses not to go, then that individual should certainly consider joining the military as a way to increase lifetime earnings. Although military service is not a substitute for education, we've estimated that it can be somewhat of a complement in that wages will be about 10% higher for males with military service, at least at lower education levels. In addition, the increase in wages from military service at lower education levels is even more pronounced for females (about 12%).

REFERENCES

Berger, Mark C. and Barry T. Hirsch. 1983. "The Civilian Earnings Experience of Vietnam-Era Veterans." *The Journal of Human Resources, 17(4)*: 455-479.

Bryant, Richard R, V.A. Samaranayake and Allen Wilhite. (1993). "The Effect of Military Service on the Subsequent Civilian Wage of the Post-Vietnam Veteran." *The Quarterly Review of Economics and Finance, 33(1)*: 15-31.

College Board. 2007. *Trends in Higher Education Series*. Washington, D. C.: The College Board.

Cooney, Jr., Richard T., Mary Wechsler Segal, David G, Segal, and William W. Falk. 2003. "Racial Differences in the Impact of Military Service on the Socioeconomic Status of Women Veterans." *Armed Forces and Society, 30(1)*: 53-86.

Little, R.D. and J.E. Fredland. (1979). "Veterans Status, Earning, and Race," *Armed Forces & Society, 5(2)*: 244-260.

Martindale, Melanie and Dudley L. Poston, Jr. 1979. "Variations in Veteran/Nonveteran Earnings Patterns Among World War II, Korea, and Vietnam War Cohorts." *Armed Forces and Society, 5*: 219-243.

Mehay, Stephen L. and Barry T. Hirsch. 1996. "The Postmilitary Earnings of Female Veterans." *Industrial Relations, 35(2)*: 197-217.

Neal, Derek. 2004. "The Measured Black-White Wage Gap among Women Is Too Small." *Journal of Political Economy, 112(S1):* S1-S28.

Poston, Jr., Dudley L. (1979). "The Influence of Military Service on the Civilian Earnings Patterns of Blacks, Mexican Americans, and Anglos." *Journal of Political and Military Sociology, 7*: 71-88.

Prokos, Anastasia and Irene Padavic. 2000. "Earn All That You Can Earn: Income Difference Between Women Veterans and Non-Veterans." *Journal of Political and Military Sociology, 28(1)*: 60-74.

Rosen, Sherwin and Paul Taubman. 1982. "Changes in Life-Cycle Earnings: What Do Social Security Data Show?" *Journal of Human Resources, 17*: 321-38.

Schwartz, Saul. 1986. "The Relative Earnings of Vietnam and Korean-Era Veterans." *Industrial and Labor Relations Review, 39(4)*: 564-572.

U.S. Department of Labor, U.S. Bureau of Labor Statistics, July 2009, Report 1017, "Highlights of Women's Earnings in 2008".

Villemez, W.J. and J.D. Kasarda. 1976). "Veterans Status and Socioeconomic Attainment," *Armed Forces & Society, 2(3)*: 407-420.