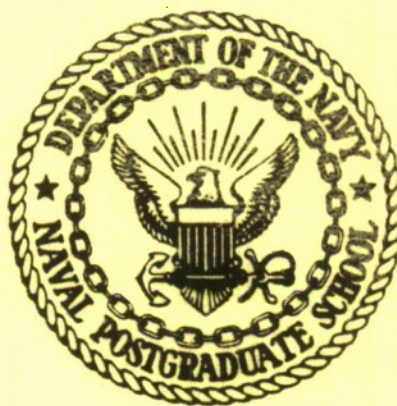NPS54-82-001

NAVAL POSTGRADUATE SCHOOL
Monterey, California

CIVILIAN EARNINGS OF VIETNAM VETERANS

by

Stephen Chamarette
and
George Thomas

January, 1982

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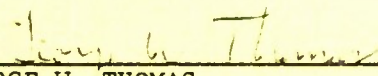
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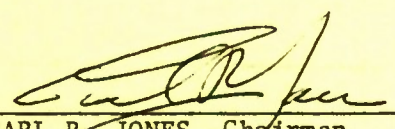
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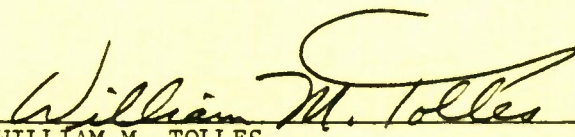_____
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The relationship between military service and post-service earnings of Vietnam veterans was analyzed using the 1976 data of the National Longitudinal Survey of Young Men (14 to 24 years of age in 1966). When earning attributes were examined, black Vietnam veterans entered the military from relatively socio-economically advantaged families while the reverse was true for white Vietnam veterans. The Post-service earnings analysis of this sample of Vietnam veterans indicated the absence of positive effects of military service on subsequent

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ABSTRACT

The relationship between military service and post-service earnings of Vietnam veterans was analyzed using the 1976 data of the National Longitudinal Survey of Young Men (14 to 24 years of age in 1966). When earning attributes were examined, black Vietnam veterans entered the military from relatively socio-economically advantaged families while the reverse was true for white Vietnam veterans. The Post-service earnings analysis of this sample of Vietnam veterans indicated the absence of positive effects of military service on subsequent civilian income. Additional analysis utilizing military service specific variables indicated that neither length of military training nor length of service in the military could be associated with positive post-service earnings returns for Vietnam veterans.

CIVILIAN EARNINGS OF VIETNAM VETERANS

The Department of Defense is the single largest employer of youth
in America. With the inception of the All Volunteer Force in 1973, the
military has been required to compete in the labor market to recruit ap-
proximately 350,000 young men and women each year to meet its authorized
strength. Approximately ninety percent of those young men and women will
be between 17 and 21 years of age. This is a critical period in the de-
velopment of their personal and vocational goals.

In excess of ninety percent of these young men and women will attend
a formal course of instruction in the skills required for their specialized
military occupation (Gay, 1978). This will be followed by intensive on-
the-job training and possibly advanced training at a later date. Except
for the public educational system, the military training organization is
the largest training system in America. In 1977 the Congressional Budget
Office estimated that training costs at formal military training centers
and academic institutions were at least $6.25 billion. In addition, it was
estimated that at any one time 18 percent of all active duty military per-
sonnel are involved in the training system as students, instructors, or
supporting staff. This estimate did not include on-the-job and unit train-
ing activities. For this reason the armed forces have continually emphasized
their ability to provide valuable job training and work experience to the
potential recruit.

Clark and Sloan (1964) indicate that 85 percent of all enlisted per-
sonnel job specialities have a direct civilian counterpart. They also state

that 60 percent of all military training and education had direct application to civilian life. Many young people may see the military as a method of gaining work skills and experience.

Approximately 78 percent (Binkin, and Kyriakopoulos, 1979), of enlistees do not complete more than one tour of duty. Therefore, the economic returns in subsequent civilian employment that accrue to an individual as a result of his military service is of considerable interest to both the potential enlistee and the military recruiter. Clearly, if there were lifetime civilian earnings benefits to be gained through military service, recruitment would be enhanced. If, instead, there were lifetime earnings losses from military service, we have identified an additional issue on the burden of military service (Who pays - who serves?) to be addressed.

PROBLEM

Much of the research estimating the benefits of military service took place in the late sixties as part of the debate over conscription versus the All Volunteer Force. Recent impetus for further research in the area has been a result of calls for the reintroduction of the draft or national service to raise military manpower. Demographic and economic trends for the 1980's indicate that the military may have difficulty in recruiting suitable young males. As the supply of males 17 to 21 years of age lessens, substantial increases in wages and incentives will be required for the military to remain competitive and obtain the quality and quantity of young people needed.

In addition to the political and emotional reactions that arise with consideration of conscription or national service, there are the very real

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economic and social issues of "Who serves when all don't" and the "tax

benefit to those who serve". Unfortunately, there have been no con-

clusive findings on the earnings effect of military service due to the

variety of data sources and methodologies employed. Many of the studies in

the sixties were conducted by economists [Oi (1967), Renshaw (1960),

Hansen and Weisbrod (1967)] who found that the effect of military ser-

vice on earnings was negative. In contrast, later studies by Little and

Fredland (1979), Martindale and Poston (1979) and Lapreato and Poston (1977)

found socio-economic benefits accruing to veterans. The benefits were

especially attributed to minority veterans who had used their military

training to improve their socio-economic status.

The best indication as to the cost and benefits of military service

would be to randomly assign individuals to groups then compare earnings

before, during, and after military service to develop a life time earnings

path. Unfortunately, longitudinal earnings data on randomly assigned groups

are not available. Although some of the studies reviewed do attempt to re-

duce this deficiency by using longitudinal multivariate analysis, most

studies are cross-sectional in nature.

Table 1 contains a short summary of the studies reviewed. Briefly

stated are the purpose, data base, methodology and findings. In addition,

Table 2 details the earnings factors or attributes that were considered in

these studies.

A review of tables 1 and 2 reveals why results as to the benefits of

military training and work experience in post-service earnings vary in their

conclusions. In addition to using different data sets, different periods

of military service, and different lengths of military service, most of

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TABLE 1

A SUMMARY OF STUDIES REVIEWED

AUTHORS AND DATE	TITLE AND PURPOSE	DATA BASE	METHODOLOGY	RESULTS AND CONCLUSION
1. Cutright, P. 1972	Achievement, mobility & the draft: Their impact on earnings of men. Analyzed the determinants of earnings to measure the effects of military service on post service earnings.	Selective Service Files, 1% sample in 1953. Linked with Social Security Data in 1958 and 1964.	Comparison of Army veterans & non-veterans with controls for age, education, race and IQ (AFQT) at two time points, 1958 and 1964.	The earnings of veterans are not higher than earnings for comparable non-veterans. Programs that remove men from the labor market depress post program earnings.
2. Norrblom, E. 1976	The Returns to Military & Civilian Training. Examines the economic effects of formal military training & on-the-job training acquired while in the military.	Post Service Information File for FY 71. 25% of all Army, Navy, and Air Force separatees who left military service after one term.	Regression analysis semi-log function. Blacks excluded from the analysis. No comparison of veteran/non-veteran was conducted.	Formal vocational training tends to have a positive significant effect on post-service wages.
3. Browning, H. Lopreato, S. and Poston, D. 1973	Income & Veteran Status Variations Among Mexican Americans, Blacks and Anglos. Examines the effect of military service on minority men with emphasis on the "bridging environment"	1960 Public Use Sample. 1% of all men over 14 years classified as veterans in the five southwestern states.	Comparison of mean income controlling for race, education and occupation.	Income advantages displayed for minority group veterans over non-veterans support the bridging environment hypothesis.

TABLE 1 (CONT)

AUTHORS AND DATE	TITLE AND PURPOSE	DATA BASE	METHODOLOGY	RESULTS AND CONCLUSION
4. Lopreato, S 1977	Differences in Earnings and Earnings Ability Between Black Veterans and Non-Veterans in the United States. Study tests effects of "bridging hypothesis" of military service.	1% sample of 1970 U.S. Census of Population aged 25 & 54.	Comparison of annual earnings after running two separate regression analyses by veteran status, controlling for education. Other controls for age and employment were imposed by sample selection	Black veterans are better able than black non-veterans to convert educational attainment into earnings advantage.
5. Martindale, M. Poston, D. 1979	Variation in Veteran/Non-Veteran Earning Patterns Among World War II, Korea and Vietnam War Cohorts. Study test effects of civilian attainment by color and varying political & economic influences.	1% sample of 1970 U.S. Census Population Sample restricted by age & period. WW II (1940-1947) Korea (1950-1955) Vietnam (1964-1970).	Comparison of annual earning after running two separate regression analyses by veteran status, controlling for education, employment, marital status & of course, race.	Black and Mexican American Veterans are better able to convert characteristics into earnings than their non-veteran counterparts. For whites the Vietnam period gave non-veterans an income advantage.
6. Little, R. Fredland, J. 1979	Veteran Status, Earnings, & Race: Some Long Term Results. Study examines earnings of veterans/non-veterans some 20 years after most served.	NLS of men aged 45-59 in 1966.	Regression Analysis controlling for many factors that contribute to earnings. Study was cross sectional.	Veterans had a 5% to 10% premium on earnings.

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TABLE 1 (CONT.)

AUTHORS AND DATE	TITLE AND PURPOSE	DATA BASE	METHODOLOGY	RESULTS AND CONCLUSION
7. Detray 1980	Veteran Status and Civilian Earnings. A detailed examination into causes of differences in civilian earnings between veterans and men with no military service.	NLS of Young Men aged 14-24 in 1966. 1971 data set used.	Regression analysis controlling for many factors that contribute to earnings. Study was cross sectional.	Veterans earn more than non-veterans Training received in the military increases civilian wages.
8. Bolin, P. 1980	Military Service and Military Vocational Training Effects on Post Service Earnings Utilizes human capital approach to compare the values of civilian vocational training over time.	NLS of Young men aged 14-24 in 1966, 1969, and 1971 data is used.	Regression analysis controlling for many factors that contribute to earnings, in particular the use of civilian and military training.	Use of military training does not have a positive income effect. Those veterans who receive no training but have military service have a negative influence on their earnings.

TABLE 2

VARIABLES USED IN STUDIES REVIEWED

EXPLANATORY VARIABLES	CUTRIGHT 1972	NORRBLOM 1976	BROWNING et al. 1973	LOPREATO et al. 1977	MARTINDALE et al. 1979	LITTLE et al. 1979	DeTRAY 1980	BOLIN 1980
Age	X	X	X	X	X	X	X	X
Education	X	X	X	X	X	X	X	X
IQ/AFQT	X	X						X
Married or Dependents		X			X			X
Residence-Geographic	X	X	X	X	X	X	X	
SMSA							X	X
Comparison of Civilian Job		X	X					
Veteran vs Non-Veteran	X		X	X	X	X	X	X
Use of Military Training		X				X		X
Duncan Index						X		
Tenure						X	X	X
Experience							X	
Race	X	X	X	X	X	X		X
Health							X	X
Vocational Training							X	X
EARNINGS MEASURES								
Earnings from Wages and Salaries	X		X	X	X	X		X
Hourly Earnings		X					X	X

the studies used different explanatory variables. Analysis procedures which delete discriminating variables can invalidate or confound research results. The latter aspect is highlighted by the DeTray (1980) and Bolin (1980) studies which used the same data base but had conflicting results.

Using the studies shown in Table 1 as a framework, two hypotheses were developed and tested. The first hypothesis questioned whether earnings related factors possessed by veterans were similar to those in the population from which they were drawn. The second hypothesis questioned the existence of post-service earnings premiums to veterans. If military training and work experience is to be seen as a means of accumulating human capital, then those who undertook military service should show positive earnings premiums over individuals with similar attributes who chose not to enter the military. Thus, the presence or absence of an earnings premium will be used to judge the value of military service in subsequent civilian employment.

DATA BASE

The data used in this analysis are from the 1976 National Longitudinal Survey (NLS) of young men who were aged 14 to 24 years in April 1966. This survey is one of many conducted by the Center for Human Resource Research of the Ohio State University.* It was designed to obtain extensive information as to the process of schooling and vocational choice. In addition to the respondents' labor market behavior and experience, a substantial quantity of data was collected on the respondents' personal characteristics and family circumstances.

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* Information on this and other NLS surveys is available in The National Longitudinal Surveys Handbook, Center for Human Resources Research, the Ohio State University, Columbus, Ohio, 1980.

The original NLS sample did not include anyone who was serving in the military in 1966. Fortunately, this group of 14 to 24 year olds covered in the survey contains the primary age group from which the military services draw recruits. Thus, actual numbers who experienced military service were sufficient for statistical analysis.

An original sample of 5,225 non-institutional young men 14 to 24 years of age was randomly selected by the Bureau of Census from sampling units that had been selected to conduct the experimental Monthly Labor Survey during 1964 and 1966. However, to ensure sufficient minorities were included, the sample was biased to over-represent minorities in the sample by a three to one ratio to their proportion in this population. To ensure results are not biased, most of the analyses presented in our study are produced separately by race.

VETERAN STATUS

Veteran status was assigned to those who had served twenty-four months or more in the military. Most previous studies, due to data limitations (small number of veterans), were forced not to apply any minimum length of service requirement. The two year minimum service requirement in this study is considered an appropriate measure of military service for the following reasons:

a. Veterans have a greater period of time to receive additional or advanced training.

b. There is a longer indoctrination period for veterans to absorb those desirable work values often attributed to military work experience, and general training.

c. It removes members of the Enlisted Reserves from the sample. These members did only six months full-time service and would not have suffered the disruption of typical military service on employment, or received advanced training.

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d.   It removes from the "veteran sample" those personnel who are actually unsatisfactory for military service. Most early attrition or discharges, within the first two years are due to psychological and physiological deficiencies, fraudulent enenlistment or criminal activities.

e.   There is a better assessment as to the possible effects of the draft. Traditionally, the two-year draft period has been considered one that is economically viable to the services with regard to returns on training.

An important observation for our research endeavor is that the net effect of the two-year service minimum is to bias the in-service attainment of human capital by veterans in an upward direction.

REPRESENTATIVENESS OF EARNINGS FACTORS OF VETERAN COHORT

Hypotheses concerning the distribution of earnings factors among veterans were tested by examining a number of earnings factors having available measures. Each factor was examined in turn to establish if the distribution of the factor was similar in both the veteran and non-veteran samples. If all the factors proved not to be statistically different, any observed difference in income between veterans and non-veterans could therefore be assumed, in part, to be attributable to the influence of military training and experience. If some earnings factors were distributed differently among veterans and non-veterans, then those factors will be included in a multivariate examination of earning differences. The factors chosen include individual traits, family circumstances, personal characteristics, and job environment.

> Health
> Age
> Intelligence
> Socio-economic Home Environment
> Marital tatus
> Education

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Vocational Training
           Labor Market Size
           Geographic Region
           Length of Service with Current Employer
           Weeks of Employment
           Hours Worked per Week

EARNINGS MEASUREMENTS

     Two measures of earnings are used in this study. Hourly pay,

HRLYPAY, measured the respondent's hourly rate of pay in 1976 at his

current or last job. Yearly income, Y(INCOME), measured sampled members

total income received from wages, salaries, commissions, tips and gratu-

ities, and bonuses during 1976.

EARNINGS FACTORS RESULTS

     Table 3 summarizes the variables and the levels of significance in

tests for differences between veterans and non-veterans within race. An

examination of Table 3 indicates that the veteran and non-veteran samples

for both blacks and whites have many significant dissimilarities.

     1. Blacks

          It would appear that for blacks, veterans have earnings factor

disadvantages over non-veterans in tenure and weeks of employment. Sig-

nificant earnings factors advantages that black veterans possess over black

non-veterans are higher levels of education, intelligence, and socio-economic

family backgrounds. They also undertake more vocational training, and tend

to reside in less rural areas. From this analysis, it could be inferred

that the black veteran sample is generally superior to the black non-

veteran group in most factors that contribute to employability, and income

generation. The non-veteran superiority in tenure,and weeks of employment,

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TABLE 3

SUMMARY OF EARNINGS FACTOR RESULTS

VARIABLE NAME	DESCRIPTION OF VARIABLE	BLACKS		WHITES	
		NON-VETS	VETS	NON-VETS	VETS
HEALTHY	Poor Health = 0; Good Health = 1	92.4	95.1	91.7**	94.8
AGE 76	Age in 1976	28.0	27.7	28.2	28.6**
IQ	IQ Score	86.2	90.5*	105.9***	103.3
SES	Socio-economic status	8.03	8.68***	10.65*	10.47
MARRY	Never married=0; Married=1	78.3	78.7	82.4	86.9**
HGHSTED	Highest grade of schooling	11.4	12.5***	13.6***	13.2
VOCTRG	No Voctrg=0 Voctrg=1	49.0	68.9***	68.5	75.6***
SMSA	Non SMSA=0 In SMSA=1	60.1	78.7***	70.6	74.9*
REGION	Non South=0 in South=1	74.9	67.8	31.7	32.2
TENURE	Years with same employer	5.37***	3.58	5.45	4.47
WKSEMP	Weeks employed	48.1*	45.7	49.7	49.4
HOURS	Number of hours worked per week	43.0	42.2	44.8**	43.7
HRLYPAY	Hourly pay rate	$4.40	$4.77*	$6.20	$6.09
Y(INCOME)	Total wages and salaries earned	$8,430	$8,900	$12,830**	$12,010

The difference between VETS and NON-VETS is
* significant at ≤ .10 level and favors higher income and earnings.
** significant at ≤ .05 level and favors higher income and earnings.
*** significant at ≤ .01 level and favors higher income and earnings.

is one that should be expected. Loss of tenure, and employment, by veterans would be a natural result of their military service, and the transition employment period into the civilian sector.

2. Whites

For whites, the data would indicate that white veterans have earnings factor disadvantages over non-veterans with regard to intelligence, tenure, family socio-economic status and education. White veterans have earnings factor advantages with regard to health, age, marriage and vocational training. Moreover, white veterans tend to reside more often in SMSA areas helping them have greater access to employment opportunities. With regards to income, the data indicate that white non-veterans earn significantly higher income than do white veterans.

From the viewpoint of our analysis, the most remarkable feature of Table 3 is the racial reversals in significant differences between veterans and non-veterans. Black veterans' average IQ's, average socio-economic status, and average highest grade of schooling are significantly higher than black non-veterans. For each of these attributes, the opposite relationship holds for white veterans and non-veterans.

CONSTRUCTED EARNINGS PROFILES

One limitation of these results is that the data are cross-sectional. We are taking a "snap shot" of respondents' earnings and their earning attributes as reported in the 1976 survey. These data limitations do not make it possible to determine disadvantages or benefits accruing to individuals as a result of their military service over time.

In an attempt to give a possible indication of longitudinal benefits, annual income data for our veteran groups have been disaggregated by age

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and plotted graphically. For this graphical presentation to represent a segment of lifetime earnings benefits, it is necessary for two assumptions to hold:

1. The distribution of earnings factors between large groups is not affected by time.

2. Economic factors like inflation, recession or industrial disputes, do not have systematic or differential effects on the contrasted subgroups.

The first assumption implies that in four years time the distribution of attributes of the current 28 year olds in the population will be the same as those of the current 32 year olds. It is appreciated that this is a tenuous assumption for the veteran group. In particular, not only have veterans been selected because they met some basic selection criteria, but historical circumstances have led to variation in these selection standards. Historically, this era (1966-1974) saw the draft, draft avoidance, lottery selection, and a military buildup and drawdown.[1] These factors possibly led to systematic changes over time in the characteristics of the individuals becoming veterans. The resultant constructed earnings profiles are valid to the extent assumptions one and two hold.

Despite these limitations, the constructed earnings profiles may give us some insight into the time dependent nature of any possible veteran's earnings premium. Figure 1 gives annual income by age (time). Numbers on the curves give the number of individuals in each group at the indicated age. Due to the low number of black veterans in many age groups it was considered inappropriate to produce the earnings curves for black veterans.

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[1] less than five of our veteran groups entered the military after the end of the draft.
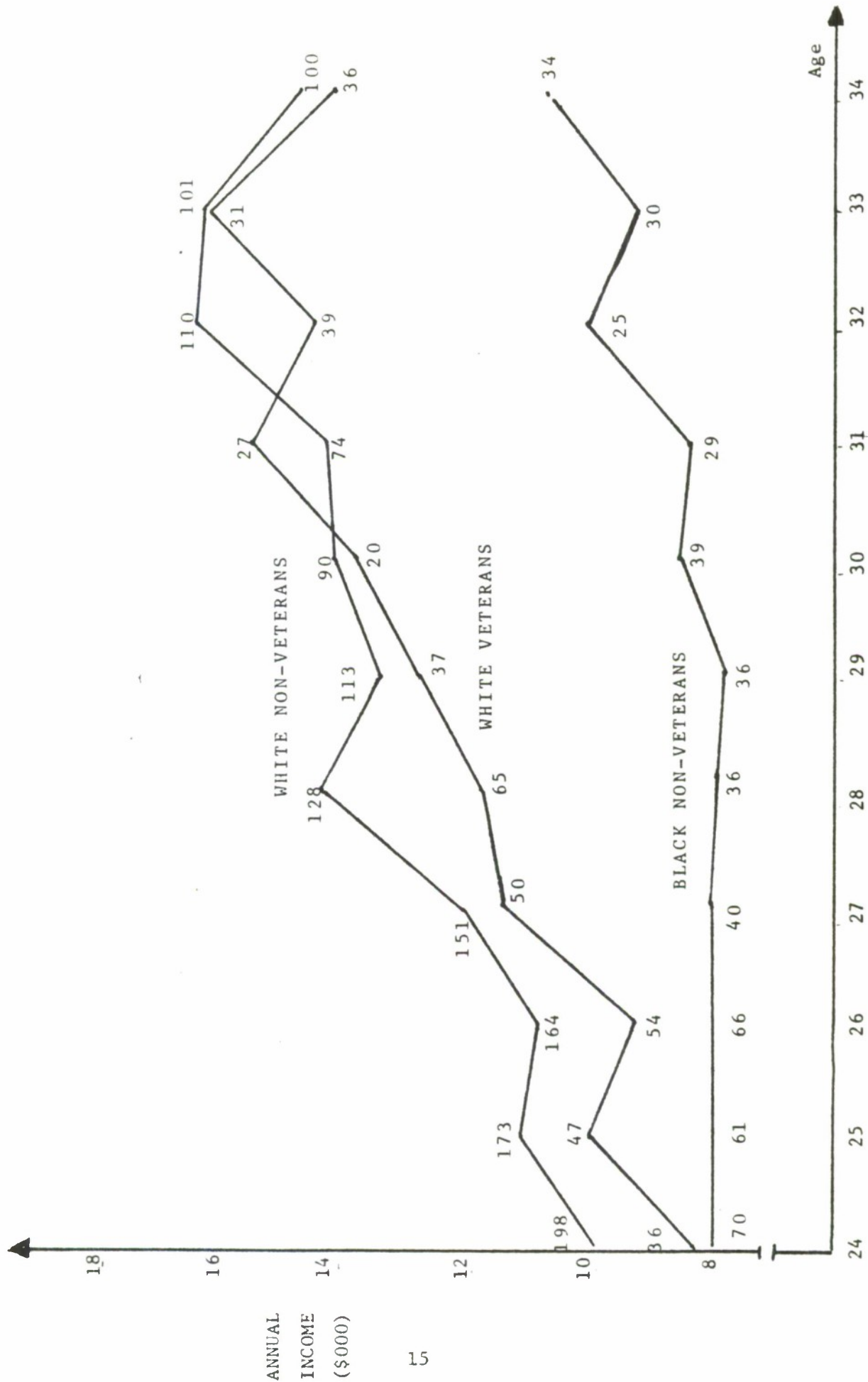
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Figure 1. Annual Income by Age, Race and Veteran Status

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Figure 1 indicates income obtained by non-veterans is consistently
higher for all age groups except for the 32 year olds. For black non-veterans,
the curves show a remarkable consistency of little or no increase in the
younger ages. This graph raises many interesting questions as to the
qualities and reasons that contribute to the apparent disparity in wages
between veterans and non-veterans, blacks and whites. In the next section,
multivariate analysis is conducted to control statistically for the vari-
ability of each factor or attribute simultaneously, in order to identify
those attributes that contribute or detract from earning capacity, and the
extent of their influence.

SUMMARY AND CONCLUSIONS CONCERNING EARNINGS FACTORS

In summary, it would appear that black veterans on average display em-
ployment and income generating qualities that are superior to their non-veteran
counterparts. However, for whites, the reverse is generally true, as non-
veterans on average show superior income-generating qualities to veterans.
If the sample of black and white veterans and non-veterans are representative,
three conclusions can be drawn about the period, 1966 - 1974.

1. The draft used in this era did not produce a military that was repre-
sentative of society.

2. The military recruited the better quality blacks, but the poorer
quality whites.

3. The average income (by age) generated by white veterans was less
than that of white non-veterans.

The first two of these observations are supported by Reaghard (1980).
He found black veterans were from higher socio-economic indexed families
and displayed superior socio-economic qualities to those of their civilian

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counterparts. For white veterans, however, the reverse was generally true. Moreover, Reaghard concluded the draft did not produce a military representative of the society. Moskos (1979) stated the same conclusions about the All Volunteer Force.

An attempt to precisely identify and quantify the contribution, if any, of veteran status to income will be conducted in the next section.

REGRESSION ANALYSIS OF INCOME WITH VETERAN STATUS

A regression model was constructed to test the hypothesis that military service is no different in impact from obtaining work experience and training in the civilian sector when impact is measured by income received in post-service employment. The model used a total income from wages and salaries as a dependent variable. The model is typical of the Mincer (1974) human capital estimating equation which may be expressed by

$$\text{Ln } (Y) = a_o + b_o V + \sum b_i EF_i \qquad (1)$$

where Y is income, a_o is the constant, V is a dummy variable and EF_i is the ith earning factor. The semi-logarithmic form is primarily used to reduce the positive skewness found in most earning distributions. By reducing the skewness, it is possible to enhance the statistical fit of the equation. $\text{Ln}(Y)$ was derived by taking the natural logarithm of annual income or total wages and salaries received in 1976. The structure of the equation was to identify the effects of the explanatory earnings factors on total earnings from all employment sources.

The resulting coefficients of variables from this equation yield direct measures of two useful relationships:

1. The expected percentage change in income that would occur if one unit change in an earning factor was implemented.

2. The rate of return accruing to the acquisition of another unit of an earning factor.

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Years of work experience, which was derived by subtracting years of schooling plus five years from age, was not used as a variable. This is a departure from Mincer's traditional earning equation; the reasons for this departure were two-fold. First, Binder (1976) found the work experience estimation to be unsuitable for members who are subject to broken work experience or labor market activity like "women" and "military" personnel. Secondly, when a Pearson correlation was computed using a derived work experience variable, work experience was found to be highly correlated with age (r=.76), and years of education (r=.63). This high level of inter-correlation or multi-collinearity between the earning factor variables would increase the variance of the estimate and reduce the reliability and the significance of the coefficients of the earning factors.

Two variables that were detailed in an earlier section were not utilized in this regression model: mental ability (IQ) and socio-economic status of the respondent's parental home (SES). There were two reasons for the deletion of those variables from the analysis. First, both IQ (r=.46) and SES (r=.55) were highly correlated with education. Second, many cases did not have these data recorded, and the reduction in the usable sample size was considerable.

Pearson correlation coefficients for the variables in the multiple regression equations were computed. As indicated in table 4, except for tenure squared, TENSQ, which is obviously highly correlated with tenure, no other pair of explanatory variables had a correlation coefficient exceeding .40. TENSQ was introduced in an attempt to account for the diminishing returns one would expect to find with increased length of employment with the same employer. Of particular significance was the low correlation, never greater than .21, of veteran status with any of

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TABLE 4

CORRELATION COEFFICIENTS FOR RACIAL GROUPS

WHITES

	VETERAN	REGION	HEALTHY	VOCTRG	SMSA	MARRY	AGE76	HGHSTED	TENURE	WKSEMP	CJOBHRS	TENSQ	LOGINCO
VETERAN		-0.02	0.06	0.10	0.03	0.03	0.06	-0.07	-0.11	-0.03	-0.05	-0.11	-0.04
REGION	-0.06		-0.04	-0.04	-0.13	0.04	-0.03	-0.14	-0.07	0.01	0.04	-0.06	-0.13
HEALTHY	0.03	-0.05		0.03	0.08	-0.03	-0.001	0.10	0.01	0.03	-0.04	0.01	0.12
VOCTRG	0.21	-0.04	-0.05		0.09	0.10	0.10	0.11	-0.02	0.09	-0.02	-0.03	0.16
SMSA	0.18	-0.40	-0.03	0.15		-0.08	0.01	0.14	0.00	0.04	-0.06	-0.003	0.17
MARRY	0.03	0.10	0.05	0.05	-0.02		0.22	-0.13	0.14	0.11	0.07	0.12	0.21
AGE76	-0.06	0.02	-0.004	-0.06	-0.07	0.27		-0.01	0.38	0.12	0.03	0.39	0.31
HGHSTED	0.15	-0.16	0.07	0.35	0.32	-0.01	-0.16		-0.10	0.06	0.05	-0.12	0.25
TENURE	-0.22	-0.11	0.04	-0.06	-0.01	0.18	0.34	-0.12		0.27	-0.02	0.95	0.31
WKSEMP	-0.11	0.01	0.03	0.08	0.08	0.06	0.04	0.06	0.30		0.01	0.19	0.53
CJOBHRS	-0.05	0.05	0.07	-0.03	-0.15	0.03	0.05	-0.002	0.02	0.03		-0.02	0.08
TENSQ	-0.18	-0.06	0.04	-0.10	-0.04	0.15	0.33	-0.16	0.93	0.18	0.02		0.24
LOGINCO	-0.04	-0.21	0.13	0.16	0.30	0.16	0.08	0.33	0.28	0.60	0.07	0.17	

BLACKS

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the other explanatory variable. This low correlation reinforces the efficacy of multiple regression as a method for isolating the unique contribution of veteran status to earnings.

It was assumed that the variables operationalizing age, education, tenure, hours, and weeks of employment approximated continuous variables. Variables for vocational training, veteran status, marriage, health status, geographical regions, and SMSA retained their dichotomous nature, and were introduced as dummy variables into the equation.

RESULTS OF THE BASIC MODEL

The model was run for each racial grouping. Table 5 details the results obtained. Generally, it was found that:

1. All equations were significant at the .001 level of significance.

2. The model yielded greater R^2 values for blacks than for whites.

3. The model showed particular earnings factors had greater or lesser significance, depending upon the race.

Earlier analysis had indicated that the black veterans were socio-economically superior to black non-veterans, while the reverse was true for whites. It was therefore to be expected that earning attributes had different degrees of influence in the earnings equation due to race. For this reason, it is appropriate to discuss the results by race.

1. Blacks

The model for blacks could explain 54 percent of the variance in annual income, (R^2 = .54). Education with a rate of return of 5.8 percent for an additional year of schooling, and tenure with a rate of return of five percent for an additional year of employment with the same employer. However, this model also had three factors whose coefficients were not

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TABLE 5

REGRESSION ANALYSIS OF ANNUAL INCOME BY RACE

	COEFFICIENTS	
INDEPENDENT VARIABLES	BLACK	WHITE
HEALTHY	.201**	.174***
AGE76	.009	.035***
MARRY	.177***	.220***
HGHSTED	.058***	.045***
VOCTRG	.020	.076***
SMSA	.220***	.160***
REGION	-.170***	-.101***
TENURE	.050***	.065***
WKSEMP	.032***	.032***
HOURS	.006**	.004***
TENSQ	-.002**	-.003***
VETERAN	-.053	-.035

EARNINGS EQUATION CHARACTERISTICS	BLACK	WHITE
R^2	.54	.47
d.f.	(12;490)	(12;1565)
F	48.6***	112.7***
N	503	1578
VETERANS	92	363
NON-VETERANS	411	1215
AVERAGE INCOME	$8,480	$12,770

```
***   significant at    .01 level
 **   significant at    .05 level
  *   significant at    .10 level
```

significant at the .05 level: age, vocational training, and veteran status. Veteran status had a negative 5.3 percent return, which for the average veteran would mean a loss of $450 on his annual income $[(\$8484) \times -.53 = -\$450]$.

2. Whites

For whites, the model was capable of explaining 47 percent of the variation in annual income. All explanatory variables were significant at the .01 level, except veteran status. Factors that were among the most influential in the determination of income were: tenure, weeks of employment, and education, with respective returns of 6.5, 3.5, and 3.2 percent for each additional unit possessed. Veteran status on the other hand had a negative influence of $447 per year for the average white veteran, $(\$12,769 \times -.035)$.

Our conclusion on the effect of military service on earnings is that veteran status by itself does not contribute to earnings. A black or white veteran who entered military service and did not either gain further education or vocational training in the military could expect no earnings benefit from military service. The white veteran who could either increase his education or obtain vocational training could make contributions to his civilian earnings. However, for black veterans, the obtainment of vocational training in the military yielded no civilian earnings payoff.

SPECIFIC MILITARY INFLUENCES ON POST SERVICE EARNINGS

This section examines the influence of various methods of participation in military service on post-service earnings. Options for an individual contemplating military service vary from the selection of the branch of service and the enlistment period one desires, to specifying particular skills and training one wishes to undertake. Due to the draft many veterans in the 1976 sample did not have freedom of choice over all of these options. However, many did have some discretion over branch of service and the type and length of training.

A regression model similar in design to that used in the previous section was employed. A set of three dummy variables was created by treating service in the Navy, Air Force, and Marine Corps as separate variables. Three continuous variables specifying type of military service were constructed to capture the effect of various patterns of participation in the military.

a. MILTIME

This variable was constructed to gauge the effect of the various periods of time spent in the military. The range extended from 24 months to those who had completed 8 years of service. As most services have varying terms of enlistment, one would have expected to find specific periods of time spent in the military correlated with a particular service. This, however, was not so, the highest correlation being $r = .03$ for the Navy.

b. MILTRG

This variable accounts for the months of formal training that were additional to "boot camp" or basic training. Months of training, according to human capital theory, should enhance future earnings if the member chose to enter a comparable civilian occupation. Training undertaken may

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also indicate to an employer that an individual possesses attributes that are conducive to additional training. This last statement is confirmed by Norrblom (1976) who found that the more able servicemen were selected for training. In this study we were not able to identify specifically the various type of training undertaken.

   c.   LASTMIL

To indicate the number of years since a respondent completed his military tour, a variable was constructed by subtracting his year of discharge from 1977. This is an important variable because the longer a veteran has been out of the service the greater the opportunities he has had to take advantage of the G.I. Bill benefits, search for a job that optimizes his attributes, and increase his tenure with an employer.

The dependent variable utilized in the regression analysis was annual income. Other variables retained for the military specific regression model were the independent variables for education, tenure, and weeks of employment. These three independent variables had considerable influence in the determination of income. Their retention seemed essential if the influence and the variability of these factors were to be controlled.

The dichotomous variables used for health and geographic effects were not employed in this model. It was thought that the influence of these particular variables would detract from simplifying, and focusing attention on the military specific variables. Moreover, the number of regressors was still ten, but the sample size was only 394. Consequently it was considered prudent to keep Cohen's (1975) rule of thumb, with regard to a one to forty ratio of regressors to sample size.

Other variables deleted from this model were age and the square of tenure. Age was deleted due to its high correlation with the variable that expressed the period of time since the member last served in the

military (LASTMIL). The square of tenure was deleted because of the
relatively short period of tenure reported. Veterans in the sample
averaged only four years tenure, which was considered insufficient to incur
diminishing returns.

It had been anticipated that the sample for veterans should have
numbered approximately 500. However, many veterans failed to respond to
specific military questions and the sample was reduced to 393. Only cases
having responses to all variables were considered in the regression equation.
There were 74 black veterans and 393 white veterans in the sample analyzed.
Hence, we could no undertake separate racial analysis as in the previous
section. A dummy variable was created for RACE. Blacks were assigned the
value zero and whites the value one.

The main purpose of this section is to use multiple regression analysis
to identify the effects of specific patterns of participation in the mili-
tary. To give the regression results a more meaningful perspective, average
values of the variable by branch of service are given in Table 6 and corre-
lation coefficients are given in Table 7.

TABLE 6

AVERAGE VALUES OF VARIABLES BY SERVICE

	MONTHS MILTIME	MONTHS MILTRG	LASTMIL	EDUC	TENURE	WKSEMP	YRLY WAGES
Navy	42.4	4.45	7.18	13.2	3.9	49.0	$11,500.
Army	31.6	3.24	7.33	13.0	4.4	48.0	$11,170.
Air Force	46.0	3.62	6.12	13.4	4.2	49.8	$12,120.
Marines	38.9	2.66	6.77	12.2	4.4	48.1	$10,070.

TABLE 7

CORRELATION COEFFICIENTS FOR VARIABLES IN MILITARY MODEL

	RACE	LASTMIL	NAVY	MARN	AIRF	MILTRG	MILTIME	WKSEMP	HGHSTED	TENURE	LOGINCO
RACE	1.00	0.19	0.14	-0.05	-0.05	0.11	-0.05	0.19	0.13	0.14	0.27
LASTMIL		1.00	0.05	-0.03	-0.12	0.38	-0.16	0.10	-0.08	0.42	0.26
NAVY			1.00	-0.16	-0.26	0.09	0.20	0.02	0.06	-0.07	-0.02
MARN				1.00	-0.18	0.02	0.03	-0.03	-0.16	-0.01	-0.08
AIRF					1.00	-0.04	0.31	0.06	0.09	0.02	0.09
MILTRG						1.00	0.01	0.05	-0.05	0.16	0.10
MILTIME							1.00	-0.01	0.02	-0.13	-0.03
WKSEMP								1.00	0.10	0.37	0.67
HGHSTED									1.00	-0.05	0.22
TENURE										1.00	0.40
LOGINCO											1.00

Table 8 gives the regression results for our analysis. Race, highest year of education, time since military service, tenure, and weeks employed were significant explanatory variables for yearly pay. The equation for yearly pay had an acceptable fit to the data, $R^2 = .54$.

TABLE 8

REGRESSION RESULTS OF MILITARY MODEL

INDEPENDENT VARIABLE	B	EQUATION CHARACTERISTICS
RACE	.189***	$R^2 = .54$
HGHSTED	.056***	
NAVY	-.090	df (10,382)
MARN	-.074	
AIRF	.060	F 44.2***
MILTIME	.0005	
MILTRG	-.0002	N 319 White
LASTMIL	.029***	74 Black
TENURE	.027***	
WKSEMP	.039***	
CONSTANT	6.090	

When race is examined, white veterans are found to have a 19 percent earnings premium over black veterans. Education, tenure, and weeks of employment, as anticipated, had high positive returns of six, three, and four percent, respectively, to each additional unit possessed of those variables.

Time since active duty gave approximately a three percent return on each extra year since discharge. As time of service became relatively more distant, one would expect that the effects of service life diminish as veterans are integrated closer into society. LASTMIL in the equation, however, may also be capturing some of the effects of age and experience on earnings.

The most interesting result of this analysis is the absence of significant returns to either military training or branch of service. The earnings return from military training is approximately zero and not statistically significant. The earnings returns from branch of service do vary in sign but are not statistically significant at even the .10 level.

Possibly the most surprising aspect of the results were the returns to training. In 1976 the military devoted 80,000 man years of trainee time, at a cost of $2 billion in initial specialty training (Gay, 1979). It would appear from this analysis that those typically huge expenditures of time and money in military training have failed to enhance veteran earning power in subsequent civilian employment. The loss of civilian experience and training does not appear to be compensated for by military work experience and training.

For policy makers these results would indicate a need to scrutinize the post-service value of service training. Particular attention may need to be given to military occupations for which the training has little general application. Short term enlistments, 2 years, with post-service education benefits for occupations that are military specific, e.g., infantry, may be

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appropriate. This may be an attractive alternative to young men who cannot afford post-secondary education or training but do not want to invest four years of their time in the military.

Summary

The value of a tour of military service as a method of investing in human capital was analyzed in this study. A literature review highlights the fact that results on the earnings effect of military service are highly dependent upon the samples investigated, variables and methodology utilized, and time period of analysis.

For the NLS cohort utilized in our study: Black Vietnam veterans were superior to black non-veterans in earning characteristics, while the reverse relationship was true for whites. Perhaps the "better" whites could generally afford to avoid the draft, possibly through their easier access to tertiary education. The "better" blacks, however, who perhaps could not afford this extra education were drafted or enlisted in the military. Unfortunately, both the whites and blacks who were in the military for a short term of service during the Vietnam War would have been better off economically had they instead been able to gain work experience or education in the civilian sector. Multiple regression analysis with the standard earnings factors indicated that veteran status provided no positive post-service earnings effect. Additional analysis utilizing military service specific variables indicated that length of military training and length of service in the military could not be associated with positive post-service earnings returns.

To the extent our results are generalizable to the population of Vietnam veterans, the study infers that military service during the Vietnam War era was not a good method of investing in human capital. Civilian earnings of Vietnam veterans were not enhanced by military service. By 1976 the average

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Vietnam veteran had not gained any earnings premium in civilian employment.
A selective service program that removed members from the civilian sector
and paid a minimum wage during that period imposed not only a "conscription
tax" on those who served, but also did not improve the Vietnam veteran's
earnings in the post-program period.

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