DMDC Report No. 2004-011
June 2004

ECONOMETRIC ANALYSIS OF 2003 DATA ON THE POST-SERVICE EARNINGS OF MILITARY RETIREES

Patrick C. Mackin and Kimberly L. Darling
SAG Corporation

Defense Manpower Data Center
Survey & Program Evaluation Division
1600 Wilson Boulevard, Suite 400, Arlington, VA 22209-2593

Acknowledgments

This analysis benefited from the contributions and assistance provided by a number of individuals. Primary data for the study are derived from the *2003 Survey of Retired Military* (2003 SRM), which was conducted on behalf of the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD[P&R]). The 2003 SRM was conducted as part of DMDC's Human Resources Strategic Assessment Program (HRSAP), under the leadership of Anita Lancaster, Assistant Director for Program Management, and Timothy Elig, Chief of the Survey and Program Evaluation Division.

Robert Tinney of DMDC's Program Evaluation Branch served as project manager and was instrumental in providing data, documentation, and assistance investigating data issues. Thomas Tower and Saul Pleeter (OUSD[P&R] [Military Personnel Policy]) offered guidance on the study's direction and objectives. Peter Ramsberger and Ani DiFazio of HumRRO provided datasets from the *1996 Survey of Retired Military Personnel* for preliminary analyses. Paul Hogan (the Lewin Group), and Anne Polivka (Bureau of Labor Statistics)—offered valuable insights that enhanced the development of the final specifications and results.

Jackie Pitts, John Hope, and John Blayne of SAG Corporation provided able research assistance and constructed the analysis datasets.

ECONOMETRIC ANALYSIS OF 2003 DATA ON THE POST-SERVICE EARNINGS OF MILITARY RETIREES

Executive Summary

This study provides estimates of the post-service earnings experience of individuals who retired from active military service during the period 1971-2001. The findings are based on data from the *2003 Survey of Retired Military* (2003 SRM), supplemented with data on the civilian non-institutional population from the March *2003 Current Population Survey Annual Social and Economic Supplement* (CPS-ASEC).[1]

Post-service earnings are of continuing policy interest for a number of reasons. In particular, the earnings of military retirees may be lower than those of otherwise comparable civilians. A major reason for the shortfall, cited in previous studies, is military experience may not be directly transferable to civilian careers. Retirees may have to accept lower wages initially as they seek to acquire general job skills. Moreover, the discrepancy in earnings may vary depending on the retiree's military occupation; some military jobs may have relatively close civilian counterparts, while others do not. Previous empirical work has shown the retiree earnings gap disappears over time as retirees' wages approach those of their civilian counterparts.

The military retirement system is designed, in part, to offset this negative effect of a military career on an individual's earning capacity. There has been a great deal of attention focused recently on the issue of veterans' disability compensation for military retirees. Congress has acted to gradually repeal the prohibition against concurrent receipt of military retired pay and disability compensation from the Department of Veterans Affairs (VA). This study pays particular attention to the effects of possessing a VA disability rating on both the decision to work full time and on earnings.

Economic Model of Post-Service Earnings

An individual's earnings depend on a variety of factors, including personal attributes (e.g., educational attainment), work experience, and geographic location. The post-service earnings of military personnel may also be affected by service-related disabilities. This study focuses, in particular, on the impact of disabilities on the earnings of military retirees.

Typically, an earnings model is estimated for full-time workers. This model, however, ignores a potential source of bias because earnings are not observed for individuals who choose part-time over full-time work. The potential earnings of these individuals may be lower than the (observed) earnings of full-time workers. This could result in biased model estimates and lead to erroneous conclusions about the earnings gap between retirees and their civilian cohorts, as well as the impact of disabilities on post-service earnings. The estimation technique used in this study corrects for this potential bias in the earnings equation by using a two-step procedure first proposed by Heckman (1979). The first stage estimates the probability an individual will work

[1] Prior to 2002, this survey was known as the CPS March Demographic Supplement.

full time. In the second stage, information from this equation is incorporated into a linear regression model of earnings.

Data

The 2003 SRM provides detailed information on the personal characteristics and employment history of military retirees. It was distributed to a sample of 53,100 military retirees (DMDC, 2004a; Kroger, Flores-Cervantes, Jones, and Wilson, DMDC, 2004). Of these, 32,275 surveys were returned. The analysis dataset draws from these responses, although a number of observations were deleted because of missing variables. The final analysis datasets included 18,082 enlisted retirees and 6,857 officer retirees. The dataset also includes information from respondents' service, VA, and retirement records.

The CPS-ASEC—conducted by the Bureau of the Census for the Bureau of Labor Statistics—includes personal and job-related information on civilians, their families and households. The CPS-ASEC sample includes a total of 216,424 person records. The analysis dataset was obtained from the civilian sample by excluding person records where respondents were less than 38 years of age, non-high school graduates, female, military retirees, or reported negative earnings. These exclusions resulted in an analysis sample of 36,027 observations.

All results in this report are unweighted estimates, statistics, and figures based on respondents in the final analysis samples described above. DMDC (2004b) reports weighted estimates for the full population surveyed in the full 2003 SRM.

Descriptive Statistics

Demographic Characteristics

- *Military retirees are more likely to be minority and to live in the South than are civilians.*
- *Military retirees are more likely to live in urban areas.*
- *More military officer retirees are managers and professionals than are enlisted retirees or civilians.* Enlisted retirees and civilians are proportionally more likely to work in blue-collar occupations.

Service Characteristics

- *Most enlisted retirees left the military at the earliest opportunity (twenty years of service), but only about one out of four officers did so.* Most retirees were in the E7-E9 (enlisted) or O4-O5 (officer) paygrades.

Workforce Participation

- *For all groups, full-time work declines with age, most noticeably at age 65 and beyond.* There is little variation across samples in full-time labor force participation,

although individuals in the 2003 SRM samples are slightly more likely to work full time.

- *Married respondents and those with dependent children are more likely to work full time than their counterparts who are not married or who have no dependent children.*

Post-Service Earnings

The post-service earnings of individuals in all three samples vary with age, education, occupation, and geographic location.

- *Officer retirees reported higher median annual full-time wages than enlisted retirees or civilians.* Median annual earnings for officers are $70,000, compared to $39,000 for enlisted retirees and $43,000 for civilians.

- *Median annual wages fall slightly among full-time workers after age 65.*

- *Regional variation in earnings is small in the 2003 SRM samples, but individuals from the CPS-ASEC sample who live in the East earn about 18% more than those in the South.*

VA Disability Rating

- *Nearly two-thirds of all retirees have a VA disability rating. About 25% have a rating of at least 60%.*

- *A VA rating does not necessarily translate into a disability preventing full-time work.* Roughly equal proportions of retirees with no VA rating and those with ratings of 0% to 20% said they had an illness or disability preventing them from working. However, those with ratings of 30% and above were much more likely to respond affirmatively to this question.

- *VA disability ratings vary significantly by age.* Both enlisted and officer retirees under the age of 55 are least likely to have a VA rating. Retirees age 65 and over are most likely to have a rating of 60% to 100%.

- *Full-time workforce participation is lower for retirees with disability ratings over 20%.* However, part of the decline in participation across disability groups may be attributable to the high correlation between age and disability rating.

- *Earnings decline with VA rating for officer retirees.* Median annual full-time earnings for officer retirees with no VA rating are $75,000, compared to only $57,000 for retirees in the highest category (90% to 100% disabled). However, earnings vary little by VA rating among enlisted retirees.

Model Results

The two-stage estimation process specified for this study begins with a model of the factors affecting the probability of working full time. This information is subsequently included in the second-stage earnings model as a control variable, which measures the effects of age, demographics, and other factors on annual earnings. Estimates from two of the samples in this study—the officer 2003 SRM and the civilian CPS-ASEC sample—show evidence of bias (i.e., the coefficient on the control variable is statistically significant).

Workforce Participation

Key findings from the multivariate analysis of labor-force participation include:

- *Age has a strong, negative effect on the decision to work full time.* Workforce participation falls across age in all three models. For the enlisted sample, full-time participation declines dramatically at age 65. Respondents in this age range are 85% less likely to work full time than respondents who are 45 to 54 years old. An additional year of age in the officer sample translates into an 8.4% reduction in the probability an individual will work full time. An additional year of age in the civilian sample results in a 3.0% decrease in full-time work.

- *Female retirees are much less likely to work full time, particularly among officer retirees.* Female enlisted retirees are nearly 19% less likely to be employed full time than males; female officer retirees are 59% less likely to work full time than males.

- *Minorities are less likely to work full time in the enlisted and civilian samples, but there is no measurable difference among officers.*

- *Respondents who are married or who have dependent children are more likely to work full time than those who are unmarried or have no dependent children.* The differences are smallest for officer retirees. Civilians with children under the age of 6 are less likely to work full time.

- *Military retirees who live in urban areas are much more likely to work full time than other military retirees.* Urban location also has a positive, albeit much smaller, impact on full-time employment for civilians.

- *Workforce participation increases with educational attainment.* Particularly for enlisted retirees and civilians, individuals with schooling beyond a high-school diploma are more likely to work full time. Results are mixed for officer retirees, possibly because officers are generally required to have at least an undergraduate degree. About 74% of officers in the 2003 SRM sample have at least a bachelor's degree.

- *A VA Disability rating above 20% reduces the likelihood a retiree will work full time.* Retirees with VA disability ratings at 90% to 100% are 53% to 68% less likely than non-rated retirees to work full time. The estimates reveal no significant difference in

full-time participation for retirees with a VA disability rating of 20% or less. Retirees who identified proximity to military medical care facilities as a highly important factor in their decisions on where to live were 4% to 5% less likely to work full time.

- *Other household income (excludes respondent earnings) has a negative impact on workforce participation for retirees, but the magnitude of the effect is small.* For enlisted retirees, a one-percent increase in other household income (about $440) decreases the probability of full-time work by 0.1%. The magnitude of the effect on officer retiree participation is comparable. Other household income does not have a significant effect on civilian workforce participation.

Post-Service Earnings

Earnings for full-time employment generally increase with age, but the relationship is not linear. For all three groups, earnings increase at a decreasing rate, but eventually peak and decline. These findings are consistent with previous empirical research. The independent variables, however, explain only 5 to 7% of the total variation in earnings.

Workers' disabilities (either self-reported or as measured by VA disability rating) had a measurable effect on full-time earnings.

- *Most of the effect of VA disability rating appears to be on the decision to work full time, rather than on earnings per se.*

- *VA ratings of 20% or lower do not have a significant effect on earnings.*

- *Retirees with VA ratings of 30% or higher face lower post-service earnings.* Enlisted retirees with a 30% to 50% disability earn about 8% less than similar non-rated retirees, while officer retirees with the same rating earn 25% less. There is also no significant effect for enlisted retirees with a VA rating of 60% to 80% disabled. However, officer retirees in that category earn 23% less than non-disabled retirees. Enlisted retirees with a 90% to 100% rating earn substantially less; their earnings are about 32% lower. Officer retirees with the highest disability ratings (90% to 100%) have earnings about 79% lower than those of non-disabled retirees.

- *Civilians with an illness or disability that restricted the types of work they could do earned 70% less than non-disabled workers.*

Demographic and occupational characteristics also exerted a significant influence on earnings.

- *Minority enlisted retirees earn 16% less than comparable non-minority retirees.* There are no significant effects of race for officers or civilians.

- *Full time workers who live in small towns or rural areas earn less than their urban counterparts.* Urban full time workers earn 54% more than their rural counterparts in

the civilian sample; 16% more in the enlisted sample; and 34% more in the officer sample.

- *Educational attainment has a strong, positive relationship with earnings for civilians; however, the relationship between education and earnings is not as strong for the retiree samples.*

- *Military retirees in managerial and supervisory occupations earn substantially more than other retirees.* Retirees who are engaged in sales earn 37% to 40% more than blue-collar workers

Earnings Projections for Full-Time Employment

Military retirees enter the civilian workforce with a combination of military-specific and general training. Because some of their training may not be directly applicable in the civilian labor market, retirees may undergo an initial period of skill acquisition characterized by lower earnings and/or reduced labor force participation. Previous studies have revealed such a pattern; most have shown retirees are able to close the earnings gap fairly quickly and retired pay helps to offset the earnings gap. One goal of this study was to verify whether the earnings gap persists in the most recent data. Accordingly, the earning equations from this analysis were used to project annual earnings at their primary job for officer retirees, enlisted retirees, and civilians from age 38 through age 65. The civilian earnings projections were generated using the mean values of the explanatory variables from the enlisted and officer retiree samples, respectively.

Officer retirees' projected post-retirement earnings substantially exceed projected earnings for comparable civilians by approximately $986,000. The present value of this difference at the time of retirement is $492,000.[2] Previous studies have not shown such a difference. For example, Cardell, Lamoreaux, Stromsdorfer, Wang, and Weeks (1997) found the present-value of earnings streams for officer retirees and comparable civilians were nearly identical.

Enlisted retirees' post-service projected earnings exceed projected earnings for comparable civilians by $159,000. However, most of the higher enlisted retiree earnings occur in later years. As a result, the present value of earnings for enlisted retirees is approximately $11,000 lower than for comparable civilians.[3]

The analysis also compares total retiree income (earnings plus retired pay) to earnings of civilians through age 72. The additional retirement income increases the difference in projected income for officer retirees and completely eliminates the earnings gap for enlisted retirees. The retirement annuity increases the difference for retired officers to $858,000, while the enlisted retirees' earnings gap of $11,000 is replaced by a positive gap of $114,000.

[2] Based on a personal discount rate of 10%.
[3] Based on a personal discount rate of 15%.

Earnings Differentials for Full-Time Employment by VA Disability Rating

Retired officers with disabilities tend to earn less than members of their respective cohorts with no disabilities. For officer retirees with a disability rating from 30% to 80%, the present value of this reduction in earnings over a lifetime is approximately $200,000. For officer retirees with the highest VA disability ratings (90% to 100%), projected earnings are less than half of those for a non-rated retiree. The present value of this loss is $524,000. This represents a 54% reduction in the current value of future earnings of retired officers.

Enlisted retirees with disability ratings also face lower post-service earnings, although the difference is much smaller. The present value of post-service earnings for enlisted retirees with a 30% to 50% disability rating is about $60,000 lower than the earnings of a non-rated retiree. In relative terms, this is equivalent to the gap one observes among officer retirees with the same rating. However, the loss for enlisted retirees with ratings of 90% or 100% is smaller in both absolute and relative terms. The present value of this loss is $71,000, which amounts to a 28% reduction in the value of future earnings.

Summary and Conclusions

The analysis shows that retirees do not experience an earnings gap relative to civilians. This finding differs from the findings of previous empirical research. Beginning with Borjas and Welch (1986), studies have shown military careers cause an earnings gap that may or may not be closed over a retiree's remaining working life. It is possible the results of this study have captured a shift in the effects of military experience on post-service earnings. Military occupations may have become comparable to civilian occupations so members of the military now acquire more general human capital than previously thought.

The findings consistently show a negative relationship between VA disability rating and both workforce participation and post-service earnings for retirees with a rating of 30% or more. However, retirees with up to 20% VA disability ratings had no significant differences in earnings or workforce participation compared to retirees with no VA ratings.

The cross-sectional nature of the data means one cannot be entirely certain the effects of aging and disability on earnings have been separately and accurately measured. Disability and age both have a negative effect on earnings, but disability rating increases with age. Part of the negative impact of earnings from VA disability may occur simply because those with higher VA ratings tend to be older.

Further research is needed to address issues raised by these findings. These issues include changes over time in the earnings of military veterans in the civilian workforce, trends in the earnings gap between retirees and civilians, and the dynamic relationship between disability and earnings, and between disability and labor-force participation as retirees age.

Table of Contents

List of Tables

Table of Contents (Continued)

List of Figures

ECONOMETRIC ANALYSIS OF 2003 DATA ON THE POST-SERVICE EARNINGS OF MILITARY RETIREES

Section 1: Introduction

Compensation of the active-duty members of the Military Services is a subject of intense policy interest. Finding the proper mix of pays, incentive bonuses, non-cash compensation, and deferred pay (i.e., pensions) is crucial if the Services wish to attract, retain, and motivate a sufficient number of qualified personnel. The military retirement system is a cornerstone of the military compensation system.

Military retirement provides a lifetime, inflation-adjusted annuity to members who complete at least twenty years of active service.[4] The present value of the military pension is substantial, but it is offset to a certain extent by aspects of a military career that might have a negative effect on post-service earnings. Retirees change careers, which tends to reduce earnings; also, military experience may not be as valuable as civilian experience. Does the military pension offset this differential adequately?

This study revisits this issue using data collected in the *2003 Survey of Retired Military* (2003 SRM) (DMDC, 2004a). The 2003 SRM surveyed a stratified sample of military retirees in 2003 and asked them to provide information about (among other things) their job experiences since leaving the military (Kroger, Flores-Cervantes, Jones, and Wilson, DMDC, 2004). Tabulations of data items in the database are reported by DMDC (2004b). A descriptive analysis of the 2003 results is reported by Ramsberger, DiFazio, and McCloy (2004).

The 2003 SRM survey also provides the data required to address a second, related policy question. A substantial proportion of retired personnel receive disability ratings and disability compensation from the Department of Veterans Affairs (VA). In addition, Congress enacted the National Defense Authorization Act for Fiscal Year 2004, which will eventually eliminate the prohibition against concurrent receipt of VA disability compensation and a military pension. While several arguments have been advanced in favor of the repeal, one unanswered question remains. Do retirees with VA disability ratings earn less than otherwise similar retirees who are not disabled?

This study examines the factors affecting military retirees' labor force participation decisions and the level of earnings they receive in their full-time, post-service jobs. It also evaluates how those earnings compare to the earnings of individuals who did not serve a full career in the military and evaluates the adequacy of the military pension to offset any earnings differential.

Outline of the Report

Section 2 describes a model of post-service earnings based on previous empirical literature. This model of earnings controls for potential bias related to labor-force participation

[4] Members who suffer a service-connected disability may retire with fewer than twenty years of service (YOS). They are excluded from this analysis.

decisions. Section 2 also briefly describes the explanatory variables included in earnings and labor-force participation equations.

The third section of the report offers a brief description of the two data sets used for the analysis—the *2003 Survey of Retired Military* (2003 SRM) and the *March 2003 Current Population Survey Annual Social and Economic Supplement* (CPS-ASEC). The 2003 SRM data are divided into two samples (Officer and Enlisted). Section 3 also includes a description of the construction of explanatory variables from these data sources.

Section 4 summarizes descriptive statistics from the three analysis data sets and examines some of the key relationships between earnings and labor-force participation and other factors related to them. Patterns in the data related to respondents' disability status receive particular attention. This section also includes a simple model projecting military pensions for typical retirees from the sample.

The findings of the econometric analysis appear in Section 5 and include a summary of the effects of a variety of factors on both labor-force participation and earnings. The estimation results are applied to project post-service earnings for retirees and civilians. The econometric methodology used in this analysis is documented by Mackin and Darling (2004).

The descriptive statistics in Section 4 and econometric estimates in Section 5 are unweighted and are based on the analysis samples of respondents described in Section 3. The figures throughout the report are likewise unweighted and are based on the analysis samples.

The final section offers a summary and conclusions.

Section 2: Economic Model of Post-Service Earnings

A consistent finding of the empirical literature on post-service earnings of military members is that most military experience is an imperfect substitute for a like amount of civilian experience. Members leaving active duty may expect at least an initial period in which they do not earn as much as their civilian peers. However, lower observed earnings may result from a number of other sources as well. In particular, retirees may decide to work less than full time or choose a post-service job with lower earnings and a less intense work schedule because they can also count on receiving a monthly retirement annuity. Likewise, recent retirees may need to acquire new skills, which may require intensive training or formal education that postpones entry into the civilian labor market.

In addition to experience and education, a typical earnings model takes into account personal attributes (age, sex, race, educational level, and years of experience) and service characteristics, including years of service (YOS), Military Service, and paygrade at retirement. The model should also account for the effects of full-time work on earnings. This section offers a brief review of some previous studies of retirees' post-service earnings and a description of the economic model used in this study.

Previous Studies

Borjas and Welch (1986) conducted one of the first systematic studies of the effects of a military career on retirees' subsequent earnings. The authors liken the situation of military retirees to that of immigrants and women re-entering the labor force after an absence for childrearing. Studies of these workers have shown they face a significant pay differential that closes rapidly over time. The loss in earnings retirees suffer with respect to their civilian counterparts results from the accumulation of military-specific skills, instead of more versatile general training.

Retirees pursue new job skills intensely, even though they have a shorter period remaining in the workforce to recoup their investment than would a younger worker entering the workforce for the first time. Borjas and Welch (1986) find retirees assimilate quickly into the civilian workforce. Although they are initially at a substantial disadvantage to civilians in terms of earnings, they close the earnings gap quickly. They also found post-service earnings were positively affected by rank at retirement, but earnings were negatively impacted by YOS at retirement. The latter effect may have been due to selection—those personnel with the best civilian opportunities are likely to leave earliest.

Goldberg and Warner (1986) also looked at post-service earnings, although they did not focus exclusively on retirees. They were able to use data on the Social Security earnings over a six-year period (1972 through 1977) of a sample of veterans who left the military in fiscal year 1971. The data were merged with military history records, although they were grouped to address privacy concerns. Their data were categorized by Military Service and by occupational groups. Their key finding was military experience, in most cases, is not as valuable as civilian experience. Veterans in occupational groups with the highest degree of transferability to the civilian sector, however, experienced little or no difference in the returns to military and civilian experience.

Two studies of post-service earnings for retirees are based on data from the *1996 Survey of Retired Military Personnel* (1996 SRMP). A key difference between the 1996 SRMP and the 2003 SRM is that the 1996 study systematically excluded retirees with severe disabilities. Because one of the goals of the current study is to examine the effects of VA disability rating on earnings, the 2003 SRM did not exclude retirees with VA disability ratings. Cardell, Lamoreaux, Stromsdorfer, Wang, and Weeks (1997) compared the earnings of retirees to a sample of non-retiree veterans from the March 1994 Current Population Survey (1994 CPS). Loughran (2002) used the same data set, but employed a slightly different approach.

Cardell et al. (1997) find military retirees face an earnings gap relative to non-retiree veterans from the 1994 CPS sample. However, they find retirees' earnings catch up to civilians within ten to fifteen years of retirement. They find the present value of lower earnings for enlisted retirees ranges from $20,000 to $23,000, but officer retirees earn more post-service than do comparable non-retiree veterans. One potential reason for differences in their results and those of the earlier study by Borjas and Welch (1986) is their study used a two-stage estimation procedure to correct for selection bias related to labor-force participation decisions.

Loughran's 2002 study also relied on data from the 1996 SRMP. Loughran took advantage of a survey question asking respondents to report earnings from their primary jobs in the first year after retirement. By combining this information with reported earnings from the most recent year, Loughran is able to isolate cohort effects (evidence suggests retirees from 1970s cohorts earn substantially more than retirees from the 1990s) and estimate wage growth effects. In contrast to previous studies, Loughran finds military retirees' earnings do not catch up to those of their civilian peers.

Model of Post-Service Earnings

Earnings are a function of personal and service characteristics. Earnings depend as well on the factors affecting one's decision to participate in the workforce. For instance, one might expect those who do not have very good civilian earnings opportunities to be least likely to find jobs with wages high enough to cause them to enter the labor force.[5] In other words, wages are observed only for those with the best employment opportunities. An earnings equation estimated on a sample of full-time workers therefore excludes factors affecting employability and, hence, earnings. Unless these "left out" employability factors are accounted for, an earnings model estimated with data for full-time workers will overstate predicted earnings and may result in biased estimates of the earnings gap for retirees and the effects of specific variables (e.g., disabilities).

This effect is referred to as *selection bias* or *incidental truncation* in the econometrics literature. Heckman (1979) first proposed a simple, two-stage procedure correcting for this bias. The first step is to define and estimate a model of work-force participation. In econometric literature, the probability an individual will work full time typically depends on personal attributes, including education, age, total household income, number of dependent children, and marital status. This standard specification is used in this analysis as well.

[5] Economists refer to the wage level above which the individual chooses to work as the individual's *reservation wage*.

The second stage estimation is performed on the sample of full-time workers only. For each record in this subsample a separate variable is tabulated incorporating information from the first equation. The earnings model incorporates this information from the choice equation as a separate explanatory variable in addition to age, age squared, and a number of demographic and job-related variables that predict the natural logarithm of earnings.[6]

An individual's decision to participate in the workforce depends on expected earnings and his or her reservation wage—the wage an individual must receive to choose to use their time for work vs. unpaid activity. Previous research has shown these factors are correlated with a number of personal attributes. The model includes

- Age—labor-force participation may decline with age.
- Gender—females are typically less likely to work full time than males.
- Race—labor-force participation may vary by race.
- Marital status—married individuals may be more likely to work full time, particularly if they have a spouse who is primarily in charge of domestic duties.
- Dependents' status—retirees with dependent children should be more likely to work full time
- Other household income (excludes wage income)—increases in other household income are expected to reduce the likelihood of full-time work.
- Geographic location—employment opportunities may differ by region or type of locality (e.g., urban vs. rural). Retirees may locate themselves in less-than-ideal employment markets in order to be close to military facilities (e.g., medical care, commissary and exchange).
- Disability—individuals with disabilities may be less likely to work full time.
- Current educational attainment—educational attainment may affect participation. Higher levels of education should be positively correlated with labor-force participation for two reasons. Individuals who are more highly educated are likely to have higher wages, and individuals investing in higher levels of schooling may indicate a desire to work full time.
- Military Service—Military Service could be correlated with participation. Retirees in some Services may have more general (i.e., less military-specific) work experience than others.
- Paygrade at retirement—paygrade at retirement may be a proxy for individual quality and employability and should have a positive effect on full-time employment.

[6] The discussion in this section follows Greene (1990), p. 744.

- YOS at retirement—military tenure may have a negative effect on full-time employment. Borjas and Welch (1986) suggested members with the best civilian opportunities are the earliest retirees.

Explanatory Variables in the Earnings Equation

Many of the same factors affecting the probability of full-time work also affect earnings. Earnings rise with age or experience, but the relationship is not linear. An alternative to directly measuring the relationship between age and earnings would be to impute experience. Because data on work experience are not usually observed, experience is estimated in both the CPS-ASEC and 2003 SRM samples using age and educational attainment. Because age and educational attainment are already incorporated in the model, estimated experience does not add any additional information to the model.

- Age—wages vary with age according to a non-linear relationship.

- Gender—many studies show females earn less than otherwise comparable males. These earnings differences may be due to a combination of differences in labor-force participation behavior between males and females, as well as wage discrimination.

- Race—earnings may be lower for minorities.

- Marital status—married individuals may earn more than otherwise comparable single workers. The marriage wage premium may be the result of labor-force specialization by the primary breadwinner, wage discrimination against single workers, or unobserved productivity differences between married and single workers.[7]

- Dependents status—retirees with dependent children may have an incentive to earn more (because they have more mouths to feed). Alternatively, retirees with dependent children may seek lower-paying jobs, allowing them more time and energy for raising a family.

- Other household income—increases in other household income may reduce the incentive to seek a higher paying job.

- Geographic location—wage differences exist across regions and type of locality (e.g., urban vs. rural). Retirees may locate themselves in less-than-ideal employment markets in order to be close to military facilities (medical care, commissary, and exchange).

- Disability—individuals with disabilities who nevertheless work full time may have lower earnings than retirees who are not disabled.

- Current educational attainment—educational attainment is expected to increase earnings.

[7] The argument for this last reason is the qualities that make one an attractive mate also make one a better worker. Alternatively, individuals may consider the ability to earn a good living to be a desirable trait in a mate.

- Current occupation—wages will vary by occupation.

- Military Service—Military Service could be correlated with earnings if retirees in some Services have more general (i.e., less military-specific) work experience than others.

- Paygrade at retirement—paygrade at retirement may be a proxy for individual quality and, therefore, should be positively correlated with earnings.

- YOS at retirement—military tenure may also have a negative effect on earnings. Most studies show military experience is not as valuable as civilian experience. Also, longer military tenure (past the earliest retirement point) may be evidence of selection on relative attractiveness to civilian employers.

Section 3: Data

The data for this research are from two sources: the *2003 Survey of Retired Military* (2003 SRM) and the *March 2003 Current Population Survey Annual Social and Economic Supplement* (CPS-ASEC).[8] The 2003 SRM provides detailed information on the personal characteristics and employment history of military retirees (DMDC 2004a, 2004b). The data provided also include information from respondents' Service, VA, and retirement records.

2003 SRM Data

The 2003 SRM was distributed to a sample of 53,100 military retirees. Of these, 32,275 surveys were returned. The analysis dataset draws on these responses, although a number of observations were eliminated from the final data set because of missing variables. Table 1 describes the 2003 SRM sample and summarizes the selections made for the analysis.

Table 1.
Definition of 2003 SRM Sample

Sample	Number of Observations		
	Enlisted	Officer	Total
Total Sample Frame	41,174	11,925	53,099
Excluding nonrespondents	23,680	8,594	32,274
Excluding missing race and sex	23,011	8,400	31,411
Excluding YOS at retirement < 20	19,282	7,708	26,990
Excluding age < 38	19,282	7,708	26,990
Excluding self-employed	18,082	6,857	24,939
Full-time employed only[a]	7,988	3,062	11,050

[a] Sample used to estimate earnings equation.

The CPS-ASEC sample, based on the civilian noninstitutional population of the United States, covers about 99,000 households, including the standard monthly CPS sample of 60,000 households, 4,500 Hispanic households added specifically for the ASEC, and another 34,500 households sampled to improve state-level estimates of children's health insurance coverage. There are a total of 216,424 person records in the 2003 CPS-ASEC.

For earnings comparability, there are two key differences between the CPS-ASEC sample and the 2003 SRM sample used for this study. The CPS-ASEC analysis dataset excludes data on females and non-high school graduates. These populations are not comparable between the two surveys. Many civilian women have the option of leaving and reentering the workforce (e.g. to have a family). However, military women must have at least 20 years of concurrent service to be eligible for retirement. The cumulative labor force experience of women in the civilian labor

[8] Prior to 2002, this survey was called the Annual Demographic Supplement or the March Supplement of the CPS.

force is, therefore, not comparable to that of women who are military retirees. The CPS-ASEC data do not provide the kind of information on cumulative labor force experience needed to account for this lack of comparability. As a result, females were excluded from the CPS dataset.

Non-high school graduates were also excluded from the CPS-ASEC data to achieve comparability with the military retiree sample in terms of "employability" (i.e., employment and earnings potential). High school graduates in the CPS-ASEC are either high school diploma graduates (HSDG) or have a GED, but the two groups are not separately identified in the survey. Almost all military (enlisted) retirees have a high school diploma or a GED. High school graduates in the CPS-ASEC (i.e., HSDG plus GEDs) therefore appear to be much more "like" military retirees than a comparison group that also includes non-high school graduates.

Previous post-service earnings studies have restricted the comparison sample group to veterans only. The main reason to do so is because military service implies at least some minimum level of employability screening; all individuals in the 2003 SRM samples passed the military's screening process (a combination of physical and mental standards). Not all individuals in the CPS-ASEC sample would necessarily meet the same standards. Analysis based on a veterans-only sample from the CPS-ASEC data, however, did not yield reasonable results (Mackin and Darling, 2004). Table 2 summarizes the CPS-ASEC sample used in the analysis.

Table 2.
Definition of CPS-ASEC Sample

Sample	Number of Observations
Total Sample Frame	216,424
Excluding age < 38	93,274
Excluding non-high school graduates	78,346
Excluding females	36,927
Excluding military retirees	36,372
Excluding respondents with earnings < 0	36,027
Full-time employed only[a]	22,310

[a] Sample used to estimate earnings equation.

A number of constructed variables were used in the analysis of both the 2003 SRM and the CPS-ASEC samples. Table 3 and Table 4 provide brief definitions of the variables used in the analysis.

Table 3.
Variables in 2003 SRM Analysis File

Variable Name	Definition
FULLTIME	= 1 if respondent worked full time in 2002
LOGEARN	= log of annual earnings in 2002
AGE	= Age in years as of 1 January 2002
FEMALE	= 1 if respondent is female
MINORITY	= 0 if respondent is White
MARRIED	= 1 if respondent is married at time of survey
DEPKIDS	= 1 if respondent has dependent children at time of survey
URBAN	= 1 if respondent lives in an urban area or large town (pop. > 10,000)
EAST	= 1 if respondent lives in the East Census Region
WEST	= 1 if respondent lives in the West/Pacific Census Region
SOUTH	= 1 if respondent lives in the South Census Region
MIDWEST	= 1 if respondent lives in the Midwest Census Region
DIS0020	= 1 if respondent has a VA disability rating from 0% to 20%
DIS3050	= 1 if respondent has a VA disability rating from 30% to 50%
DIS6080	= 1 if respondent has a VA disability rating from 60% to 80%
DIS90100	= 1 if respondent has a VA disability rating from 90% to 100%
SELFDIS	= 1 if respondent could not work because he/she was ill or disabled
MEDLOC	= 1 if respondent cited proximity to military medical care as highly important in decision to live at current location
ARMY	= 1 if respondent retired from the Army
NAVY	= 1 if respondent retired from the Navy
USMC	= 1 if respondent retired from the Marine Corps
USAF	= 1 if respondent retired from the Air Force
SOMECOLL	= 1 if respondent attended college but did not receive a bachelor's degree
BACH	= 1 if respondent received a bachelor's degree
BACHPLUS	= 1 if respondent attained schooling beyond a bachelor's degree
MANAGER	= 1 if respondent worked in a managerial occupation
PROF	= 1 if respondent worked in a professional occupation
SERV	= 1 if respondent worked in a service-sector occupation
SALES	= 1 if respondent worked in a sales occupation
OFFICE	= 1 if respondent worked in a office support/clerical occupation
FARM	= 1 if respondent worked in an agricultural occupation
TRANSPRT	= 1 if respondent worked in a transportation-sector occupation
BLUECOLL	= 1 if respondent worked in a blue-collar occupation
OTHER	= Other household income, excluding retiree's wage income
RET20	= 1 if respondent retired with 20 YOS
RET2126	= 1 if respondent retired with 21 to 26 YOS
RET27UP	= 1 if respondent retired with 27 or more YOS
O4O5	= 1 if respondent retired with paygrade of O4 or O5 (Officer sample only)
O6PLUS	= 1 if respondent retired with paygrade of O6 or higher (Officer sample only)
WARRANT	= 1 if respondent retired as a warrant officer (Officer sample only)
E1E4	= 1 if respondent retired at paygrade E4 or below (Enlisted sample only)
E5E6	= 1 if respondent retired at paygrade E5 or E6 (Enlisted sample only)
E7E9	= 1 if respondent retired at paygrade E7, E8, or E9 (Enlisted sample only)

Table 4.
Variables in CPS-ASEC Analysis File

Variable Name	Definition
FULLTIME	= 1 if respondent worked full time in 2002
EARNLN	= log of annual earnings in 2002
AGE	= Age in years as of 1 January 2002
MINORITY	= 0 if respondent is White
MARRIED	= 1 if respondent is married at time of survey
WITHKIDS	= 1 if respondent has dependent children at time of survey
FOWNU18	= Number of children under the age of 18
FRELU6	= Number of children under the age of 6
URBAN	= 1 if respondent lives in an urban area or large town (pop. > 10,000)
EAST	= 1 if respondent lives in the East Census Region
WEST	= 1 if respondent lives in the West/Pacific Census Region
SOUTH	= 1 if respondent lives in the South Census Region
MIDWEST	= 1 if respondent lives in the Midwest Census Region
SELFDIS	= 1 if respondent could not work because he/she was ill or disabled
DISWORK	= 1 if illness or disability prevents work or restricts type of work
SOMECOLL	= 1 if respondent attended college but did not receive a bachelor's degree
BACH	= 1 if respondent received a bachelor's degree
BACHPLUS	= 1 if respondent attained schooling beyond a bachelor's degree
MANAGER	= 1 if respondent worked in a managerial occupation
PROF	= 1 if respondent worked in a professional occupation
SERV	= 1 if respondent worked in a service-sector occupation
SALES	= 1 if respondent worked in a sales occupation
OFFICE	= 1 if respondent worked in a office support/clerical occupation
FARM	= 1 if respondent worked in an agricultural occupation
TRANSPRT	= 1 if respondent worked in a transportation-sector occupation
BLUECOLL	= 1 if respondent worked in a blue-collar occupation
OTHER	= Other household income, excluding respondent's wage income
VETERAN	= if respondent served on active duty in the Armed Forces
VETPAY	= 1 if respondent receives VA payments

Section 4: Descriptive Statistics

Summary descriptive statistics help illuminate some of the underlying relationships between labor-force participation or earnings and key explanatory variables. These statistics highlight some of the key differences among the three samples of individuals (CPS-ASEC, 2003 SRM-Officer, and 2003 SRM-Enlisted). Table 5 displays the demographic characteristics of the three samples.

Table 5.
Demographic Characteristics

Variable Name	2003 SRM - Enlisted	2003 SRM - Officer	CPS - ASEC
Average Age	57.065	60.709	52.368
Minority	23.21%	18.26%	15.70%
Female	4.42%	5.89%	0%
Married	79.49%	85.58%	76.30%
Dep. Children	31.50%	26.32%	46.15%
Education			
High School Diploma,GED, or Less	38.80%	15.47%	36.82%[a]
Some College	43.90%	10.27%	28.49%
Bachelor's Degree	9.43%	11.35%	20.95%
Postgraduate Education	7.87%	62.91%	13.74%
Census Region			
EAST	6.05%	5.51%	22.11%
SOUTH	55.15%	59.19%	27.62%
WEST	25.69%	25.73%	25.29%
MIDWEST	13.11%	9.57%	24.98%
Urban	86.48%	90.30%	75.91%

[a] This is the percent of respondents with high school diplomas and GEDs in the CPS. Sample respondents with less education in the CPS were excluded from the sample used to estimate earnings equations.

Retired officers are oldest, with an average age of just under 61. The average age for enlisted retirees is 57. Respondents from the CPS-ASEC sample are substantially younger (average age is 52). Both retiree samples have a larger percentage of minority respondents than the CPS sample. Over 23% of enlisted retirees and 18% of officers are minorities, compared to nearly 16% of respondents from the CPS-ASEC sample. Females are excluded from the CPS-ASEC sample, but they comprise a small proportion of the retiree samples—4% of the enlisted respondents and 6% of the officers. While the CPS-ASEC sample is geographically diverse, over half of all military retirees live in the South. Only 6% of enlisted and officer retirees live in the East, compared to over 20% of the CPS-ASEC sample. Military retirees are also more likely

to live in urban areas—86% of the enlisted respondents and 90% of the officer respondents live in urban areas, compared to 76% of the CPS-ASEC sample.

Each of the three samples has a distinct labor force participation pattern. Table 6 lists employment and earnings statistics for the three samples. Earnings and occupation statistics in the table are for those who reported full-time employment. Disability statistics are for those who were unable to work.

Table 6.
Employment and Earnings of Sample Members Working Full Time

Variable Name	2003 SRM - Enlisted	2003 SRM - Officer	CPS - ASEC
Full-Time Employed	53.53%	51.39%	61.93%
Annual Full-Time Earnings	$27,944	$49,247	$41,665
Annual Other Household Income	$43,940	$72,395	$100,834
Annual Retirement Pay	$8,093	$17,471	—
Occupation: Full-Time Workers			
MANAGER	10.44%	24.03%	16.51%
PROF	11.77%	22.43%	14.74%
SERV	8.98%	3.27%	6.75%
SALES	3.76%	2.51%	8.70%
OFFICE	9.21%	2.98%	4.23%
FARM	0.20%	0.10%	0.49%
TRANSPRT	5.51%	3.35%	6.62%
BLUECOLL	11.56%	2.32%	18.96%
Labor Force Status: Effect of Disability or Illness			
Unable to Work, Not looking for Work: Disability or Illness	14.71%	8.05%	4.70%
Unemployed or Not looking for Work: Disability or Illness	—	—	9.67%

There is little variation in labor force participation among retirees. Enlisted respondents had the highest full-time labor participation rates (53%) followed by officer respondents at more than 51%. However, nearly 62% of respondents in the CPS-ASEC sample worked full time in 2002. Average annual full-time earnings were highest among officer retirees ($49,247); enlisted retirees reported average annual earnings of $27,944. In contrast, workers in the CPS sample had the highest annual other household income reported at $100,834.[9] Enlisted retirees had the

[9] Other household income in both the 2003 SRM and CPS surveys is constructed from responses to questions about other income sources (e.g., social security, pensions) for respondents and spouses.

lowest annual average other household income ($43,940) Officer respondents reported an annual retirement pay more than twice the pay reported by the enlisted respondents—$17,471, versus $8,093.

Occupation varies substantially in the samples. Approximately 46% of all employed officer respondents are in either managerial or professional occupations, compared to about 21% of both the enlisted and CPS samples. The CPS sample has the largest percentage of full-time workers in blue-collar occupations (19%); nearly 12% of the enlisted retirees who worked full time were in the same occupational group. Enlisted respondents also had a higher percentage of workers in both service and office occupations than either of the other samples.

Enlisted respondents were most likely to report they were unable to work due to an illness or disability, followed by officer retirees. Civilians from the CPS-ASEC were least likely to report being unable to work due to a disability.[10] In addition, nearly 10% of CPS-ASEC respondents reported an illness or disability affects the type of work they do or prevents them from working.

Table 7 displays service characteristics for retirees. Officers and enlisted retirees have similar disability rating patterns. A little more than one-third of both groups have no disability rating. Almost 27% of enlisted retirees have a disability rating of more than 50%, compared to a little over 24% of officer retirees. Over half of enlisted retirees retired at 20 years, compared to a little over one-third of officer retirees. Officer retirees are much more likely to have stayed for 27 or more years. They were also more likely to retire at a mid-grade level (O4-O5) than enlisted retirees. Over half of the officers retired at this level, while over 72% of the enlisted personnel retired at the E7-E9 grades.

[10] The two samples were asked slightly different questions, which may contribute to this difference. The 2003 SRM asked respondents who were not working or looking for work (i.e., not in the labor force), "In 2002, which ONE of the following is the MAIN REASON that you did not work or did not look for work?" One possible response was "Disabled or ill, and unable to work." CPS-ASEC respondents who were not working were also asked for the main reason they did not work in 2002. One possible response was "Ill or disabled." However, the CPS respondents also included those who were not working but looking for work (i.e., were unemployed). It is possible CPS-ASEC respondents who were looking for work would still cite illness/disability as the main reason they were not working, The structure of the 2003 SRM, however, did not permit respondents looking for work to provide an answer to the question.

Table 7.
Service Characteristics

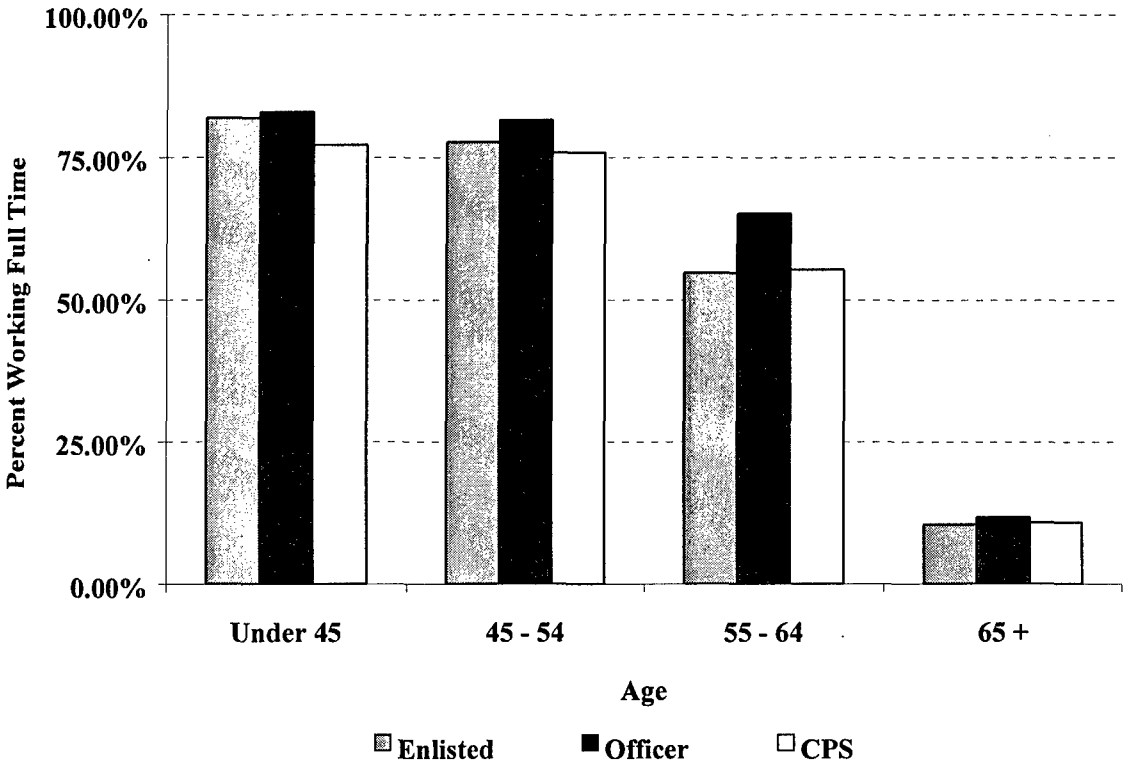
Variable Name	2003 SRM - Enlisted	2003 SRM - Officer
VA Disability Rating		
None	36.44%	37.41%
0 - 20 Percent	13.90%	16.46%
30 - 50 Percent	22.78%	21.61%
60 - 80 Percent	14.96%	14.83%
90 - 100 Percent	11.92%	9.68%
YOS at Retirement		
20	53.77%	34.08%
21 - 26	38.28%	42.41%
27 or more	7.95%	23.51%
Paygrade at Retirement		
O1 - O3	—	6.88%
O4 - O5	—	54.82%
O6 or higher	—	23.95%
Warrant	—	14.29%
E1 - E4	0.13%	—
E5 - E6	27.34%	—
E7 - E9	72.53%	—

[a]Veterans may receive a disability rating of 0%, which is distinguished from veterans who did not receive a disability rating at all.

Workforce Participation

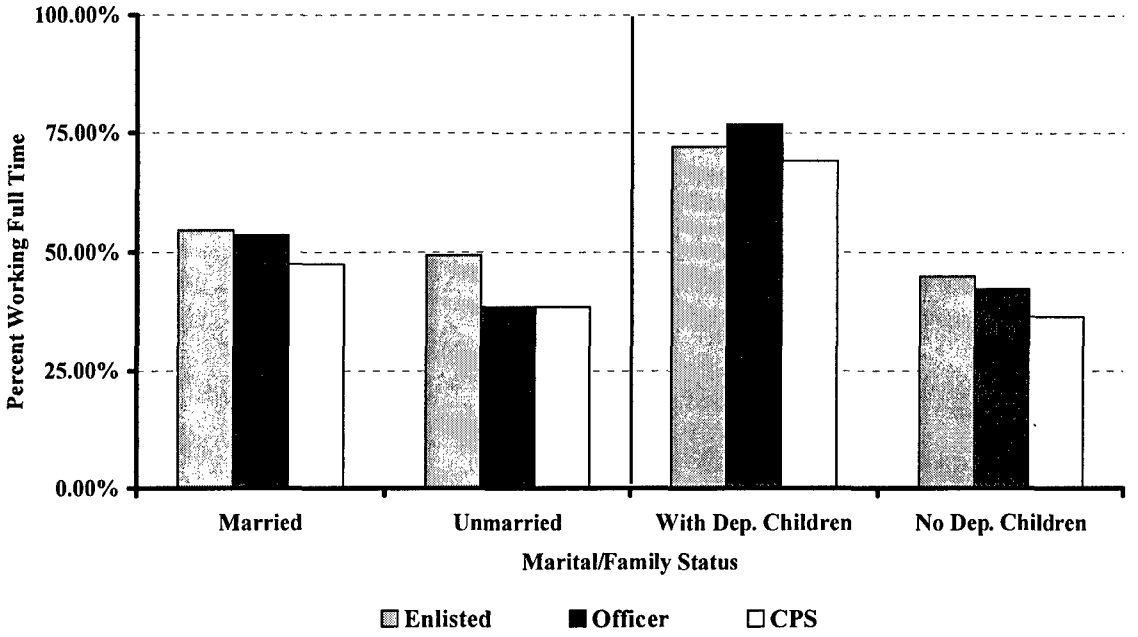
Workforce participation varies by demographics, such as age, marital status, and whether the respondent has dependent children. Figure 1 and Figure 2 show the percentage of each sample that reported working full time by various demographic breakouts.

Figure 1.
Percent Working Full time by Age



For all three samples, age is highly correlated with workforce participation. The younger the respondent the more likely they were to report working full time. In all age categories, CPS respondents were least likely to report working full time, while officer respondents were most likely to report working full time

Figure 2.
Percent Working Full time by Marital/Family Status



Married individuals were more likely to be working full time than unmarried individuals in all three samples. Respondents with dependent children were much more likely to be working full time than respondents without dependent children.

Post-Service Full-Time Earnings

The post-service full-time earnings of retirees and civilians vary with age, education, occupation, and geographic location. Officers reported higher median annual wages than enlisted retirees or civilians in the CPS-ASEC sample. Table 8 and Table 9 display the median annual wages for all full time workers by age and region. Table 10 lists the median annual wages for full-time military retirees by disability rating.

Table 8.
Median Annual Full-Time Wages by Age

	Median Annual Wages		
	Enlisted	**Officer**	**CPS**
Age			
Under 45	$40,070	$70,000	$43,000
45 - 54	$38,594	$72,000	$45,000
55 - 64	$40,000	$70,000	$42,000
65 +	$32,000	$61,248	$33,000
Total	$39,000	$70,000	$43,000

A notable characteristic of these samples is earnings appear to be relatively flat across age groups, particularly among those under the age of 65. Median annual earnings are roughly equal for the CPS-ASEC and enlisted retiree samples, but are substantially higher for officer retirees. A large part of this difference may be attributed to the higher average level of educational attainment among officer retirees. All three samples report the lowest median annual wages in the 65 and up category.

Table 9.
Median Annual Wages by Region

	Median Annual Wages		
	Enlisted	**Officer**	**CPS**
Region			
East	$40,000	$70,000	$49,000
South	$38,000	$72,000	$41,500
West	$40,000	$70,000	$44,000
Midwest	$39,000	$65,000	$42,000
Total	$39,000	$70,000	$43,000

Enlisted retirees do not appear to experience a wide variation in median annual wages by location. Only $2,000 separates the regions with the highest reported median (East and West) from the lowest (South). There is more regional variation for officer retirees; the South has the highest reported median annual wage at $72,000 and the Midwest has the lowest at $65,000. There is significantly more variation in the CPS sample, with the East region reporting a median wage of $49,000 and the South region reporting the lowest at $41,500.

Table 10.
Median Annual Wages by VA Disability Rating

	Median Annual Wages	
	Enlisted	**Officer**
VA Disability Rating		
No Rating	$38,000	$75,000
Rated 0 - 20 Percent	$38,675	$70,000
Rated 30 - 50 Percent	$40,000	$69,000
Rated 60 - 80 Percent	$40,000	$63,000
Rated 90 - 100 Percent	$39,000	$57,000
All Retirees	$39,000	$70,000

Officer retirees have median annual wages are highly correlated with degree of disability rating. Those with no rating report the highest wages with a median of $75,000. Those with a 90-100% rating report the lowest with a median of $57,000. This may also be related to the average age of retirees in each disability category (see Figure 4 below). Enlisted retirees with a disability rating actually report slightly higher median annual wages than those with no rating.

VA Disability Ratings in the 2003 SRM Samples

One of the main objectives of this study was to determine whether retirees who are rated as disabled by the Department of Veterans Affairs (VA) are worse off economically than are otherwise similar retirees who are not disabled. Their disabilities may reduce potential earnings, or even affect the likelihood of obtaining employment. Conversely, they receive a monthly, tax-free disability payment (and other benefits) from the VA.

As of FY 2002, the tax-free monthly income paid under VA disability to veterans with no dependents ranged from $103 (based on a 10% rating) to $2,163 (100% rating). Veterans with at least a 30% disability rating get more money for their spouses and for each child. They may also receive additional amounts for dependent parents. These rates are adjusted to account for cost-of-living increases annually. A veteran may also apply for an increased rating at any time. Table 11 shows the rates by VA rating category.

Table 11.
VA Disability Pay Rates in 2002

	Monthly Compensation (FY 2002)
VA Rating	
None	$0
0	- -
10	$103
20	$199
30	$306 - 429
40	$439 - 604
50	$625 - 831
60	$790 - 1,037
70	$995 - 1,284
80	$1,155 - 1,485
90	$1,299 - 1,670
100	$2,163 - 2,576

Veterans who do not qualify for military disability (an evaluation made by the Department of Defense) might qualify for VA disability and vice versa. Moreover, the VA rating process is voluntary; the veteran may elect to receive a VA rating, but is not compelled to do so.

Department of Veterans Affairs (2001) lists other VA benefits for which military retirees with a VA disability rating may be eligible:

- Grants to purchase or remodel specially adapted homes
- Grants to adapt or purchase a specially adapted automobile
- Clothing allowances (e.g., for veterans with prosthetic devices)
- Vocational rehabilitation and employment program
- Pensions for indigent disabled veterans
- Dependency and Indemnity Compensation (DIC) payable to a surviving spouse and dependent children if the veteran dies as a result of a service-connected disability
- Service-disabled veterans insurance provides up to $10,000 of coverage without a physical examination

Additionally, disabled veterans may be entitled to other federal benefits not administered by the VA. The Disabled Veterans Outreach Program serves as a job placement network. Federal laws prohibit companies doing business with the Federal government from discriminating against disabled veterans and, in certain cases, require the contractors to take affirmative action to hire veterans with disability ratings of thirty percent or greater. Veterans with VA-rated disabilities receive priority enrollment status within the VA medical care system. Disabled veterans may also receive higher priority enrollment status for VA dental care, nursing home care, outpatient pharmacy service, and beneficiary travel for treatment. Veterans with VA disability ratings may have to undergo examinations every few years to reevaluate the conditions upon which their disability ratings were based. The veterans' disability status—and with it their VA compensation—could change based on those exams.

Does a VA disability rating translate into lower rates of employability? The 2003 SRM asked respondents who were not working to cite the major reason they were not working. Overall, about 15% of enlisted respondents and 8% of officers were not working because of illness or disability. Table 12 shows this self-assessment appears to be substantially higher for respondents with VA disability ratings over 50%. Respondents with ratings of 20% or lower were no more likely to be out of work because of illness or disability than were retirees with no rating at all. Those respondents with VA ratings from 30% to 50% were slightly more than twice as likely to be out of work because of illness or disability as non-rated retirees.

Table 12.
VA Disability Rating and Self-Assessment of Work-Related Disability

	Percent Unable to Work Due to Illness or Disability	
	Enlisted	**Officer**
VA Disability Rating		
No Rating	3.05%	1.25%
Rated 0 - 20 Percent	2.75%	1.24%
Rated 30 - 50 Percent	6.55%	3.51%
Rated 60 - 80 Percent	33.46%	18.78%
Rated 90 - 100 Percent	56.31%	39.61%
All Retirees	14.71%	8.05%

VA disability ratings vary significantly by age. Figure 3 and Figure 4 graphically display the VA ratings by age category. Both enlisted and officer retirees under the age of 55 are least likely to have a VA rating. Retirees age 65 and over are most likely to have a rating 60%—100%

Figure 3.
VA Disability Status by Age (Enlisted Sample)

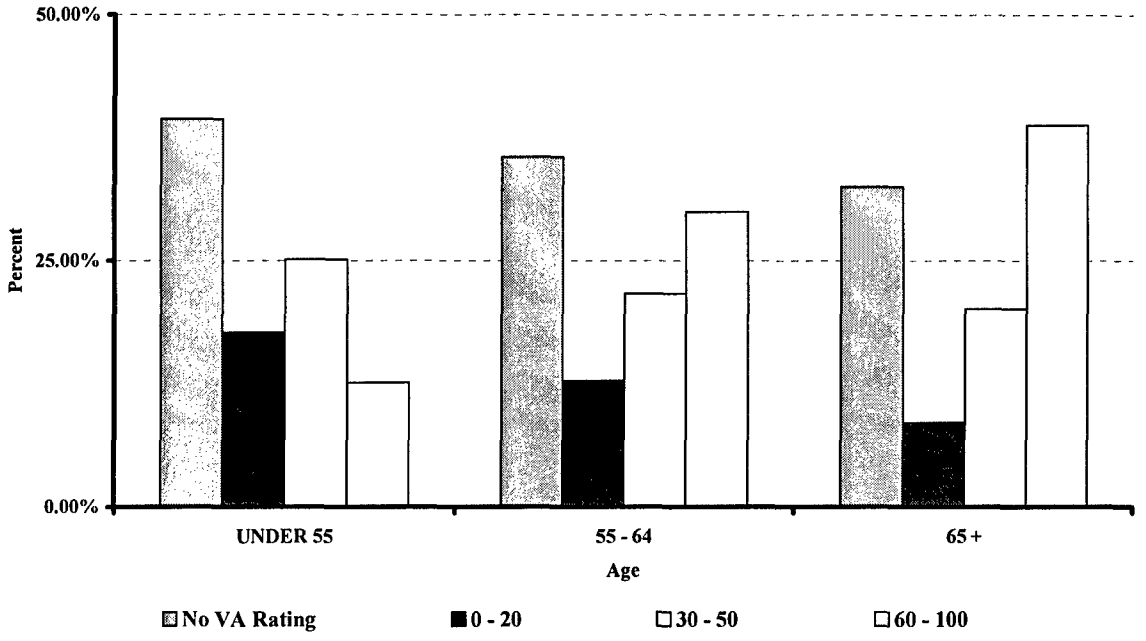
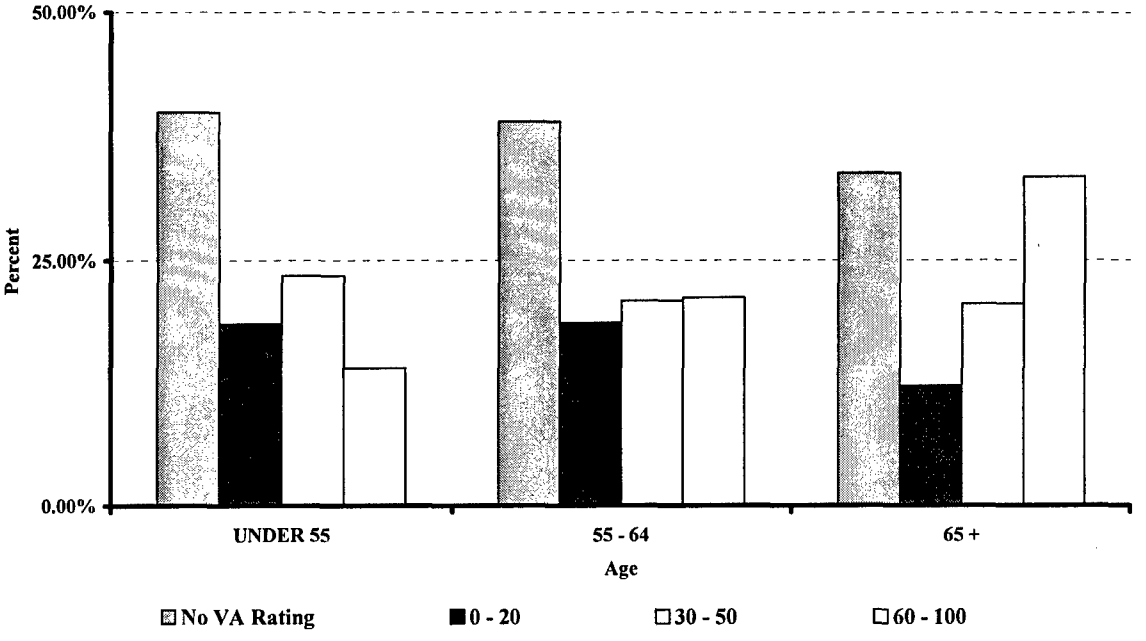
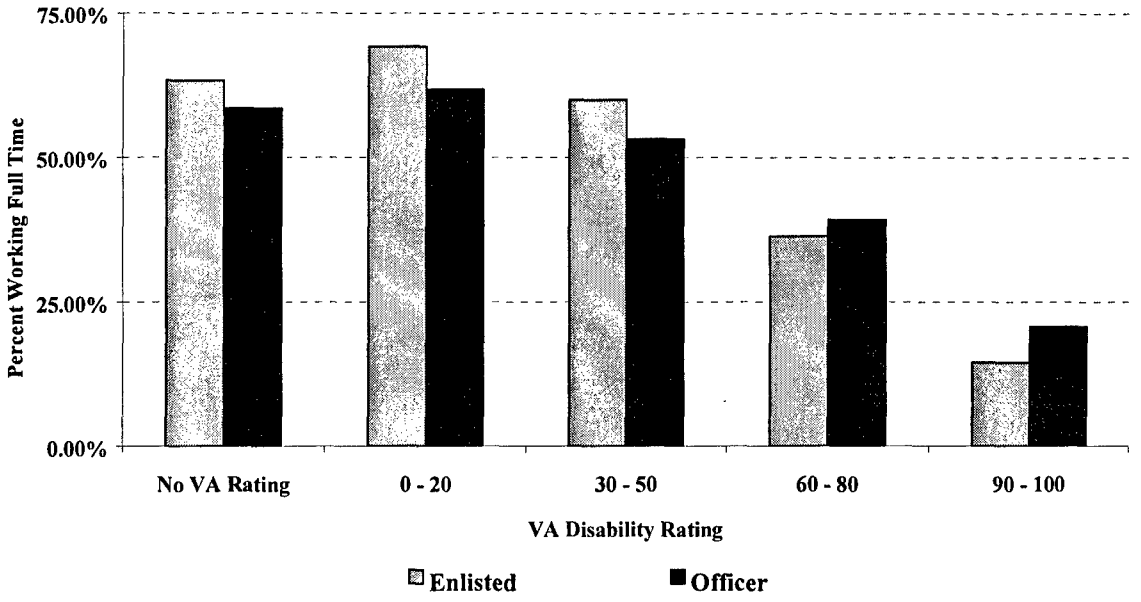


Figure 4.
VA Disability Status by Age (Officer Sample)



Full-time employment decreases with higher VA disability ratings. Figure 5 illustrates that, while there are few differences in labor-force participation among those with no VA rating and those with ratings up to 20%, participation rates fall significantly for retirees with higher ratings. However, part of the decline in participation across disability groups may be attributable to the high correlation between age and disability rating. Recall from Figure 1 that labor-force participation falls dramatically with age.

Figure 5.
Percent Working Full Time by VA Disability Rating



Retirement Pay in the 2003 SRM Samples

The military pension is meant to offset losses in post-service earnings associated with a military career. Military members who complete at least twenty years of military service are eligible for an immediate, inflation-adjusted annuity. There currently are three military retirement systems:

- The original retirement system applies to members who entered on active duty prior to September 1980 and pays an annuity equal to 0.025 times YOS times the highest year of annual Basic Pay. A retiree with twenty years' service receives 50% of Basic Pay, and a retiree with thirty YOS receives an annuity equal to 75% of Basic Pay.

- The High-Three retirement system pertains to members who entered onto active duty between September 1980 and July 1986. It is identical to the original system, except the annuity is based on an average of the three highest years of Basic Pay.

- The final (Redux) retirement system covers personnel who entered onto active duty in August 1986 or later. Under the current rules, these members may elect to participate in the High-Three system. Alternatively, they may receive a $30,000 lump-sum Career Status Bonus at 15 YOS. If they choose the bonus, their annuity formula is equal to (.035 * YOS)-0.30. Therefore, those retiring at twenty years receive 40% of Basic Pay and those who retire at thirty years receive 75% of Basic Pay. The inflation adjustment, however, is reduced to one percentage point below the Consumer Price Index, with a one-time inflation "catch-up" at age 62.

A retiree's annuity depends on Basic Pay at the time of retirement, YOS at retirement, paygrade at retirement, and the retiree's year group. Average retired pay increases with YOS and paygrade, as shown in Table 13.

Table 13.
Average Retired Pay by Paygrade and YOS at Retirement

	Mean Annual Retired Pay	
Variable Name	**Enlisted**	**Officer**
Years of Service at Retirement		
20	$15,802	$31,706
21 – 26	$21,542	$40,611
27 or more	$33,700	$59,136
Paygrade at Retirement		
O1 – O3	—	$28,998
O4 – O5	—	$38,207
O6 or higher	—	$62,079
Warrant	—	$28,807
E1 – E4	$9,130	—
E5 – E6	$14,320	—
E7 – E9	$21,364	—

Section 5: Model Results

The multivariate analysis of the effects of disability and other factors on retirees' post-service earnings uses a two-stage estimation process to control for potential bias resulting from the relationship between factors affecting an individual's decision to work full time, and the factors helping to determine the wages the individual would receive if he or she worked full time. Wages are observed only for full-time workers; the potential wages of individuals who chose not to work full time may differ systematically from these observed wages.

This section presents results for both the choice and earnings equations. In addition, the results of the earnings equations are used to generate projected earnings profiles for both enlisted and officer retirees which, in turn, are compared to projected earnings for otherwise similar workers who did not complete a full career on active duty.

Workforce Participation

The main objective of this study is to gain insight into the factors affecting the post-service earnings of military retirees. However, the estimation procedure also yields some information about the decision to work full time. Table 14 summarizes the marginal effects of the significant explanatory variables from the choice equations.[11]

Age has a strong, negative effect on the decision to work full time. Workforce participation falls uniformly across age groups for enlisted retirees, particularly at age 65 and beyond. Enlisted retirees over the age of 64 are nearly 85% less likely to work full time than retirees between the ages of 45 and 54. For officers, each additional year of age results in an 8% reduction in the probability he or she will work full time. For civilians, however, the decrease is much smaller, only 3% for each additional year.

Female retirees are much less likely to work full time, particularly among officer retirees.[12] Female enlisted retirees are 19% less likely to be employed full time than males; female officer retirees are 59% less likely to work full time than males. The discrepancy between enlisted and officer retirees may be explained in part by the higher retired pay of officers. Higher other household income may increase the likelihood officer retirees choose to work less than full time.

Minorities are less likely to work full time in the enlisted and CPS-ASEC samples, but there is no measurable difference among officers. Respondents who are married or who have dependent children are more likely to work full time than those who are unmarried or have no dependent children. The differences are smallest for the officer retirees. Retirees who live in urban areas are much more likely to work full time than other retirees. The difference for both

[11] For categorical variables, the dummy variable has been omitted for the modal category because it represents the baseline case or "typical" member of the sample. The discussion focuses on marginal effects for all other groups relative to the typical case. Designating a category with a smaller number of observations as the omitted category would result in a higher sampling variance among estimated differences. This would increase the chance of significance tests missing true differences among categorical variables.

[12] The CPS-ASEC sample excludes females.

officers and enlisted retirees is about 19%. Urban location also has a positive, albeit much smaller, impact on full-time employment for the CPS-ASEC group.

Table 14.
Marginal Effects of Explanatory Variables in the Choice Equations

Variable	Enlisted	Officer	CPS
AGEUND44	6.5%*	———	———
AGE5564	-25.4%*	———	———
AGE65UP	-84.6%*	———	———
AGE	———	-8.4%*	-3.0%*
FEMALE	-18.6%*	-59.0%*	———
MINORITY	-6.4%*	———	-11.9%*
MARRIED	22.6%*	22.7%*	25.8%*
DEPKIDS	11.0%*	———	———
FOWNU18	———	———	4.1%*
FRELU6	———	———	-4.9%*
URBAN	19.1%*	42.8%*	4.7%*
DIS0020	———	———	———
DIS3050	-7.1%*	-9.1%**	———
DIS6080	-39.9%*	-23.6%*	———
DIS90100	-68.4%*	-51.1%*	———
NAVY	———	-10.1%**	———
USMC	———	———	———
USAF	———	-9.6%*	———
SOMECOLL	6.3%*	-15.8%**	4.6%*
BACH	8.3%**	———	18.6%*
BACHPLUS	24.6%*	———	20.4%*
MEDLOC	-4.0%**	-10.1%*	———
OTHER	-0.1%*	-0.1%*	———
RET2126	6.2%*	15.2%*	———
RET27UP	13.0%*	16.3%*	———
E1E4	———	———	———
E5E6	-9.9%*	———	———
O1O3	———	———	———
O6PLUS	———	9.5%**	———
WARRANT	———	———	———
VETERAN	———	———	-2.8%**

*Significant at the 0.01 level; **Significant at the 0.05 level; ***Significant at the 0.10 level

Education also has a generally positive effect on full-time workforce participation. Particularly for the enlisted retirees and civilians, individuals with schooling beyond a high-school diploma are more likely to work full time. Results are mixed for officer retirees, because their educational attainment is more homogeneous (about 74% have at least a bachelor's degree).

Disability has a negative effect on full-time work, but only for those who have VA ratings above 20%. Retirees with VA disability ratings at 90% to 100% are 53% to 68% less likely than non-rated retirees to work full time. The findings reveal no significant difference in full-time participation for retirees with a VA disability rating of 20% or less. Also, retirees who identified proximity to military medical care facilities as a highly important factor in their decisions on where to live were 4% to 5% less likely to work full time. These retirees are likely to have disabilities or illnesses that make it harder for them to work full time.[13] The CPS-ASEC survey does not provide any information on VA disability ratings, but there is a survey item questioning whether a respondent receives VA disability compensation. Those who do are nearly 44% less likely to work full time.

Paygrade at retirement does not seem to have a significant effect on workforce participation. The lone exception occurs in the enlisted sample; respondents who retired at paygrade E5 or E6 are about 10% less likely to work full time than those who retired at paygrades E7 through E9. Enlisted retirees who had more than 20 YOS are more likely to work full time, but there is a smaller, positive effect among officer retirees in the YOS 21 to 26 category.

Household income other than the respondents' earnings had significant effects on workforce participation, but the magnitude of the effects is small. For enlisted retirees, a 10% increase in other household income (about $4400) only decreases the probability of full-time work by 1%. For officer retirees and the CPS-ASEC workforce, other household income has a positive effect on workforce participation. Finally, veterans in the CPS-ASEC sample were about 3% less likely to work full time than otherwise similar individuals.

Post-Service Earnings

The analysis employs a two-stage estimation to control for potential bias in the earnings equation. Earnings are only observed for full-time workers; it is likely individuals who did not work full time had lower potential earnings. The variable included in the earnings equation to control for this bias had a significant effect for the officer retiree and CPS-ASEC samples, but not for enlisted retirees. For all three equations, the effects of age are significant. In addition, when age is plotted against earnings, the graph looks like an inverted-U curve. This is the expected shape of the relationship between age and earnings. However, the included independent variables do not have much explanatory power. The adjusted R^2 ranges from 0.050 for the CPS-ASEC to .074 for the officer equation. This means that the statistical models estimate only 5% to 7% of the variance in post-service earnings. The model estimates are presented in Table 16 for the 2003 SRM equations and in Table 16 for the CPS-ASEC equation.

[13] Conversely, it is possible those who have decided not to work (or to work less than full time) have greater latitude in choosing a location in which to live. If they do not have a full-time job that provides health insurance, living close to military medical facilities could become more important.

Table 15.
Earnings Equation Results for Enlisted and Officer 2003 SRM Samples

	Enlisted		Officer	
Variable	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**
Constant	7.675188*	0.9745	8.352686*	1.5115
AGE	0.111583*	0.0370	0.127095**	0.0588
AGESQ	-0.001214*	0.0004	-0.001759*	0.0006
DEMOGRAPHIC				
FEMALE	-0.327204*	0.0791	-0.604294*	0.2018
MINORITY	-0.163978*	0.0403	-0.016169	0.0624
MARRIED	-0.105995**	0.0458	0.108685	0.0926
DEPKIDS	-0.042207	0.0370	-0.037572	0.0548
URBAN	0.161988*	0.0527	0.341137*	0.1171
EDUCATION				
SOMECOLL	0.087321**	0.0383	-0.156992	0.1211
BACH	0.054104	0.0584	0.031620	0.1017
BACHPLUS	0.139796**	0.0639	0.055541	0.0801
OCCUPATION				
MANAGER	0.200365*	0.0522	0.469291*	0.0974
PROF	0.203705*	0.0512	0.319738*	0.0988
SERV	-0.162227*	0.0559	0.130191	0.1368
SALES	-0.375119*	0.0761	-0.405213*	0.1537
OFFICE	-0.093354***	0.0543	-0.009703	0.1333
FARM	-0.118471	0.3034	-0.270584	0.6012
TRANSPRT	-0.145090**	0.0672	0.452274*	0.1385
DISABILITY				
DIS0020	-0.046206	0.0448	-0.029899	0.0650
DIS3050	-0.078552***	0.0409	-0.250796*	0.0661
DIS6080	-0.117044	0.0714	-0.233847**	0.1028
DIS90100	-0.323211**	0.1323	-0.785276*	0.2147
MEDLOC	-0.026992	0.0334	-0.204874*	0.0560
SERVICE				
NAVY	0.110834**	0.0434	-0.082514	0.0679
USMC	0.106870	0.0806	-0.074172	0.1093
USAF	0.181327*	0.0404	-0.128906**	0.0648
RET2126	-0.046010	0.0375	0.117875***	0.0616
RET27UP	0.122497	0.0748	0.219449**	0.0907
E1E4	-3.661470*	0.7086	———	
E5E6	-0.224021*	0.0430	———	
O1O3	———		-0.063755	0.0909
O6PLUS	———		0.395321*	0.0751
WARRANT	———		-0.195501**	0.0842
OTHER	0.000005*	0.0000	0.000000	0.0000
LAMBDA	-0.044963	0.1236	0.892587**	0.3848
Adjusted R2	0.059		0.074	

Note. The omitted groups in the dummy variables are Nonminority, Unmarried, NoKids, Rural, No VA Disability Rating, Army, High School Diploma or less, Blue Collar, Retired with 20 YOS, Retired as E7-E9 (Enlisted), and Retired as O4-O5 (Officer)

*Significant at the 0.01 level; **Significant at the 0.05 level; ***Significant at the 0.10 level

Table 16.
Earnings Equation Results for CPS-ASEC Sample

Variable	Coefficient	Standard Error
Constant	3.464002	2.4333
AGE	0.229627**	0.0935
AGESQ	-0.002902*	0.0010
DEMOGRAPHIC		
MINORITY	-0.074466	0.0808
URBAN	0.548239*	0.0528
MARRIED	0.357988*	0.1203
FOWNU18	0.003246	0.0258
FRELU6	-0.008119	0.0493
EDUCATION		
SOMECOLL	0.278226*	0.0566
BACH	0.712998*	0.1022
BACHPLUS	0.682692*	0.1206
OCCUPATION		
MANAGER	-0.198963*	0.0616
PROF	0.073542	0.0687
SERVICE	0.022696	0.0781
SALES	-0.392779*	0.0708
OFFICE	0.430145*	0.0920
FARM	-0.539295**	0.2706
TRANSPT	0.297066*	0.0779
OTHER		
VET_VAL	-0.000015	0.0000
DISWORK	-0.696833*	0.1692
OTHER	0.000005*	0.0000
VETERAN	0.245337*	0.0520
LAMBDA	1.472765**	0.6035
Adjusted R^2	0.050	

Note. The omitted groups in the dummy variables are Nonminority, Unmarried, Rural, High School Diploma or less, and Blue Collar. *Significant at the 0.01 level; **Significant at the 0.05 level; ***Significant at the 0.10 level

Marginal Effects of the Explanatory Variables

Effects of disability on post-service earnings. VA disability rating appears to have more substantial effect on the decision to work full time than on earnings. The earnings of retirees with ratings of 0% to 20% do not differ significantly from the earnings of non-rated retirees. Enlisted retirees with a 30% to 50% disability earn about 8% less than similar non-rated retirees, while officer retirees with the same rating earn 25% less. There is also no significant effect for

enlisted retirees with a VA rating of 60% to 80% disabled. However, officer retirees in that category earn 23% less than non-disabled retirees. Enlisted retirees with a 90% to 100% rating earn substantially less than similar non-rated retirees—their earnings are about 32% lower. Officer retirees with the highest disability ratings (90% to 100%) have earnings about 79% lower than those of non-disabled retirees. However, retirees with the highest disability rating who also work full time are probably atypical for their disability rating group; only about 21% of officer retirees and 15% of enlisted retirees with ratings of 90% or 100% work full time. The importance of proximity to military medical facilities has a negative relationship with full-time workforce participation. It also related to lower earnings for officers who are working full time. Officer retirees who stated proximity to military medical facilities was highly important earn about 20% less than other officer retirees. There appears to be no measurable effect on the earnings of enlisted retirees.

The CPS-ASEC survey does not provide information on VA disability rating; however, it does include self-reported information on illnesses or disabilities affecting the individual's ability to work (DISWORK). Workers who reported that illness or disability restricted the types of work they could do earned about 70% less than those who did not cite a disability.[14]

Effects of other factors on earnings. Many of the included demographic variables have no significant impact on earnings. Female retirees earn 33% (enlisted) to 60% (officer) less than comparable male retirees. However, recall the number of female retirees in the sample is extremely small (between 4% and 7%). Minority enlisted retirees earn 16% less than comparable non-minority retirees. There are no significant effects for race in the officer or CPS-ASEC equations. Married enlisted retirees earn about 11% less than unmarried retirees, and married workers in the CPS-ASEC sample earn about 36% more than their unmarried counterparts. Dependents status has no measurable impact on earnings in any of the three equations.

A variable indicating urban/rural residence gave better results for all three samples than an alternative specification using variables representing the four Census regions. Workers in urban areas earn more than similar workers in rural areas. The urban/rural differences in earnings are 55% for the CPS-ASEC sample, 16% for the enlisted sample, and 34% for the officer sample.

Educational attainment has a strong, positive relationship with earnings in the CPS-ASEC equation. Workers with some college earn about 28% more than workers with a high school diploma; the earnings premium for workers with a bachelor's degree or better is 68% to 71%. The relationship between education and earnings is not as strong for the retiree samples, however. For enlisted retirees, some college results in 9% earnings premium and a 14% increase over high school graduates for those with greater than a bachelor's degree. None of the coefficients on educational variables are significant for the officer sample. This last result is perhaps predictable given that nearly 63% of officer retirees fall into the highest educational

[14] Using self-reported disability may be somewhat problematic. Some analysts—e.g., Kreider (1999)—have found labor market outcomes can affect how individuals respond to disability-related questions. Those who are not working full time may be more inclined to report a disability affected their ability to work. Accordingly, the strong negative relationship observed in the results may overstate the true effect.

attainment category (see Table 5). There may therefore not be enough variation in educational attainment among the office corps for the model to detect the effects of education.

Occupation also has an effect on earnings. Enlisted and officer retirees who are in managerial/supervisory or professional occupations earn 20% to 47% more than blue-collar retirees. Workers who are engaged in sales earn 37% to 40% less than blue-collar workers in all three samples. Enlisted retirees in the transportation sector earn 15% less than blue-collar workers. CPS-ASEC workers in this sector earn 30% more and officer retirees earn 45% more. This difference may be due to the fact officer retirees in the transportation sector may include such high earners as commercial airline pilots. Office workers in the CPS-ASEC sample earn 43% more than blue-collar workers. While Veteran status has a negative impact on workforce participation, it has a strong, positive effect on earnings. Veterans earn 25% more than otherwise similar nonveterans.

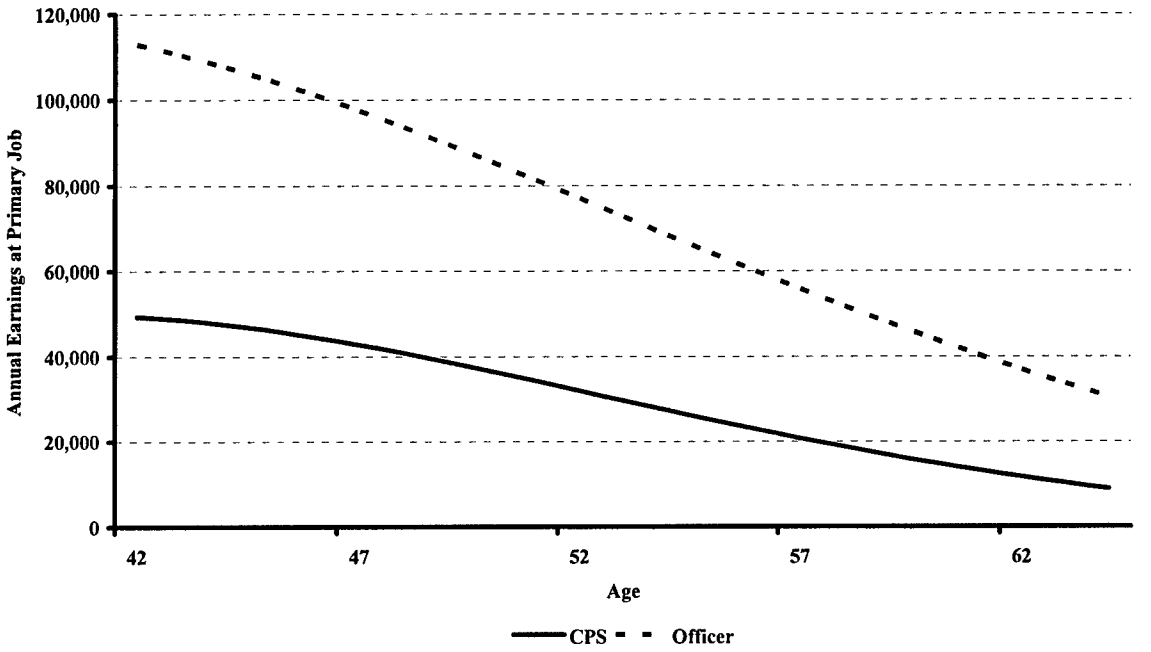
Earnings Projections

A primary objective of the analysis is to assess whether committing to a full career in the military imposes an earnings "penalty" on retirees. Do retirees earn less than otherwise similar workers? The training and job experience members of the military receive are a combination of general skills and military-specific skills. To the extent the training is specific to military jobs and not applicable to subsequent post-service jobs, retirees will enter the civilian workforce at a disadvantage. Much like other "new" workers, retirees may decide to enter into a short period of intensive investment in general skill acquisition. This acquisition may be either explicit formal education (e.g., return to school for another degree) or it may take the form of on-the-job training (OJT). Workers receiving OJT of a general (rather than firm-specific) nature can expect to receive a lower wage from their employers during the period of skill acquisition.

With the exception of Loughlan (2002), previous empirical studies, such as Borjas and Welch (1986) and Cardell et al. (1997), have shown that retirees' initial post-service earnings fall below the levels projected for otherwise similar workers, but their earnings quickly catch up. This pattern, however, is not evident in the present analysis. There is a small, negative gap in projected earnings for enlisted retirees, but the gap for officer retirees is large and positive (i.e., predicted earnings for officer retirees are higher than those for similar civilians). Moreover, the enlisted retirees' gap disappears entirely once military retired pay is taken into account.

Annual earnings for officer retirees, enlisted retirees, and civilians from ages 38 through 65, are projected using the earnings equations presented in the previous section. Figure 6 and Figure 7 display these earning profiles. The earnings projections for civilians in the CPS sample were generated using the mean values of the explanatory variables from the enlisted and officer retiree samples, respectively.

Figure 6.
Projected Annual Earnings at Primary Job--Officer Retirees vs. Civilians



Officer retirees' projected post-retirement earnings substantially exceed projected earnings for civilians. Overall, the cumulative difference (i.e., area under the retiree earnings curve) is much larger; the present value of the earnings gap is about $490,000.[15] Previous studies have not shown such a substantial difference. For example, Cardell et al. (1997) found the present value of CPS and officer retiree earnings to be nearly identical. One possible explanation for this difference is the CPS sample might not be representative of a typical officer retiree. In particular, the CPS sample is not screened on veteran status or other factors affecting eligibility for military service.

[15] The estimate of the earnings gap is based on a personal discount rate of 10%.

Figure 7.
Projected Annual Earnings at Primary Job--Enlisted Retirees vs. Civilians

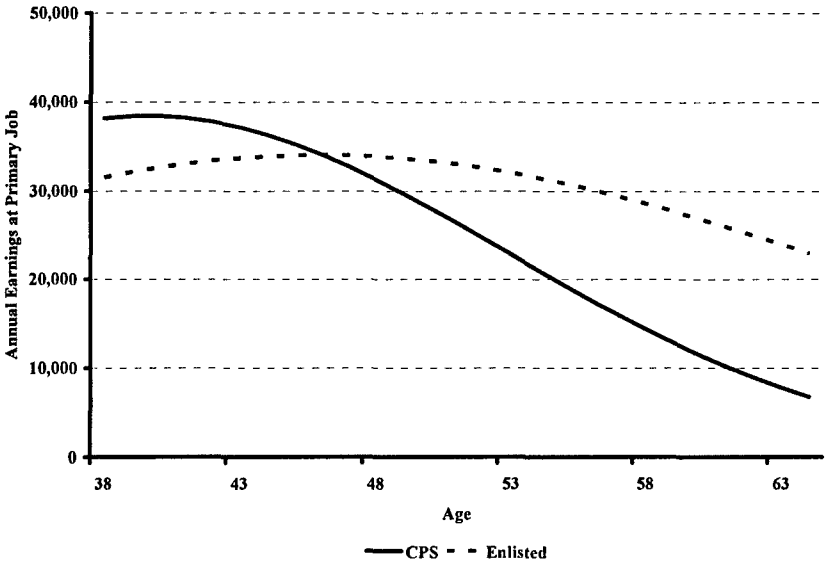


Figure 7 tells a somewhat different story about enlisted retirees. For about the first ten years after retirement, retirees earn less than their counterparts. Eventually, however, a swifter decline in non-retiree earnings causes the non-retiree earnings to fall below retiree wages. Overall, enlisted retirees earn about $11,000 less than civilians in present-value terms.[16] This negative gap does not account for retired pay, however.

Figure 8 and Figure 9 compare total retiree income (earnings plus retired pay) to earnings by civilians from retirement from the military through age 72. The estimates project neither enlisted nor officer retirees are likely to suffer an earnings gap compared to civilians; the additional retirement income increases the difference in projected income. The retirement annuity increases the difference in cumulative earnings for officer retirees from $490,000 to $858,000 with respect to their civilian counterparts. The difference in cumulative earnings for enlisted retirees, when compared with similar civilians, grows from a deficit of $11,000 to a positive gap of $114,000.

[16] The estimates of differences in earnings are based on a personal discount rate of 15%.

Figure 8.
Non-Retiree Earnings vs. Officer Retiree Earnings plus Pension

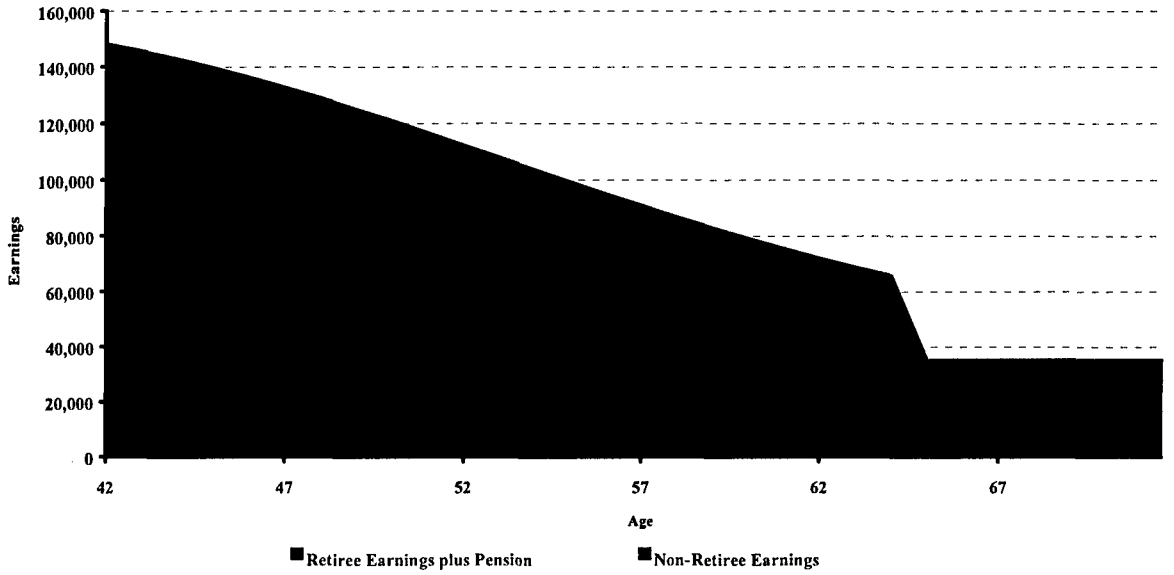
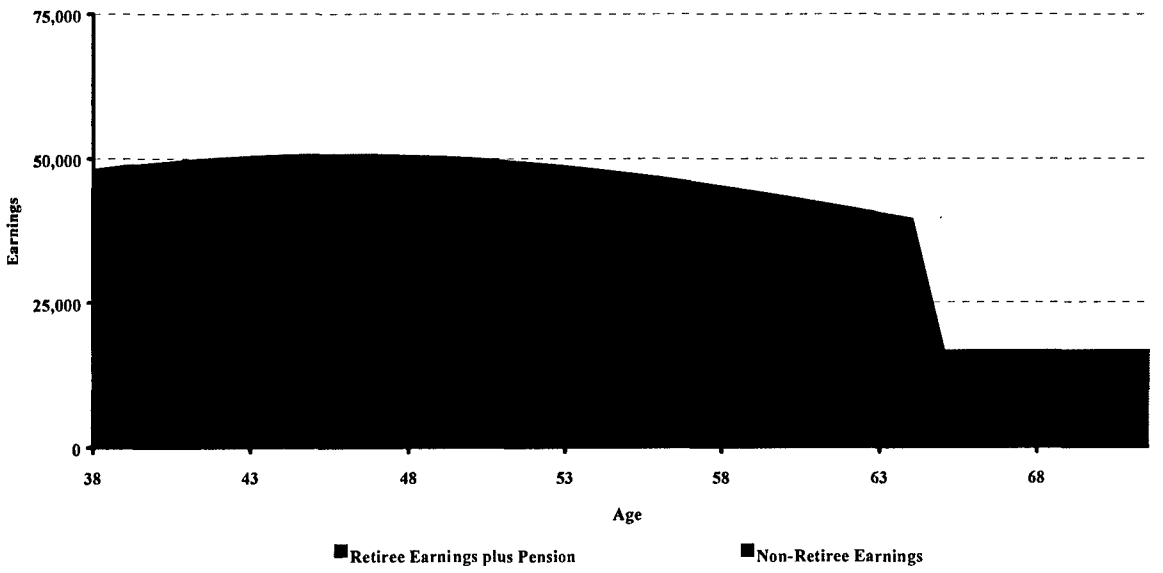


Figure 8 shows the gap between retiree and non-retiree earnings for officers. A much smaller, but still positive, gap for the enlisted retirees is depicted in Figure 9.

Figure 9.
Non-Retiree Earnings vs. Enlisted Retiree Earnings plus Pension



Earnings Differentials by VA Disability Rating

Figure 10 and Figure 11 summarize the present value of projected post-service earnings by VA disability rating. Categories for which the earnings difference was statistically insignificant are omitted. One consistent finding is VA disability ratings of 20% or lower affect neither the probability a retiree will work full time nor the retiree's full-time earnings.

For officer retirees with a disability rating from 30% to 80%, the projected reduction in earnings over a lifetime is equal to about $200,000 (present value at the time of retirement). For officer retirees with the highest VA disability ratings (90% to 100%), projected earnings are less than half of those for a non-rated retiree (net loss of about $524,000 in present value terms).

Enlisted retirees with disability ratings also face lower post-service earnings, although the absolute difference is much smaller. The present value of post-service earnings for enlisted retirees with a 30% to 50% disability rating is about $60,000 lower than the earnings of a non-rated retiree. In relative terms, this is equivalent to the gap observed among officer retirees with the same rating. However, the disability "penalty" for enlisted retirees with ratings of 90% or 100% is smaller in both absolute and relative terms. These retirees would expect to earn about $71,000 less in present-value terms. This is a 28% reduction in the value of earnings; the reduction for officer retirees is 54%.

Figure 10.
Differences in Present Value of Post-Service Earnings by VA Disability Rating--Officers

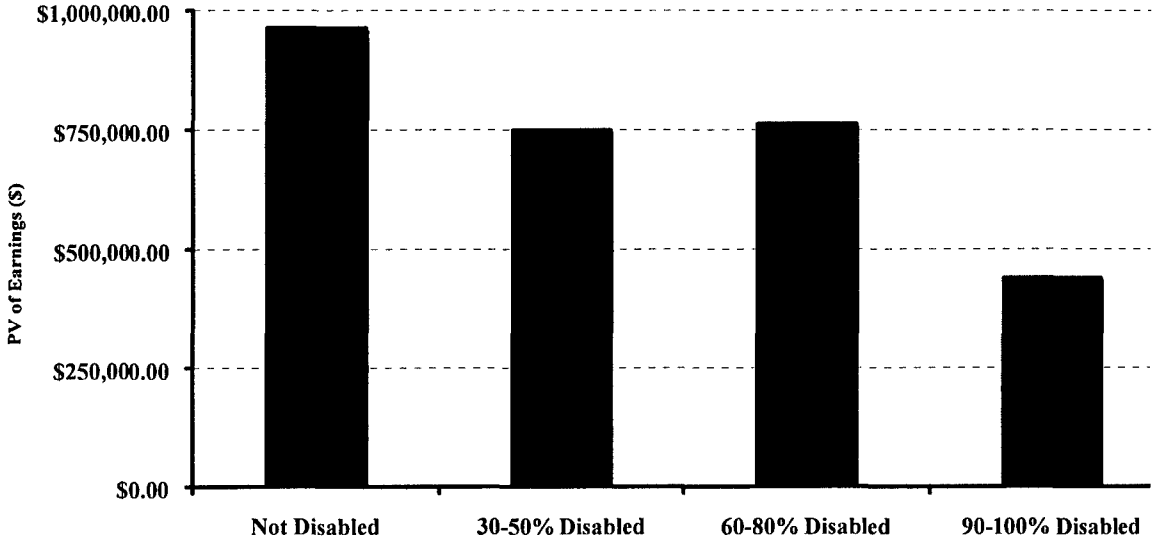
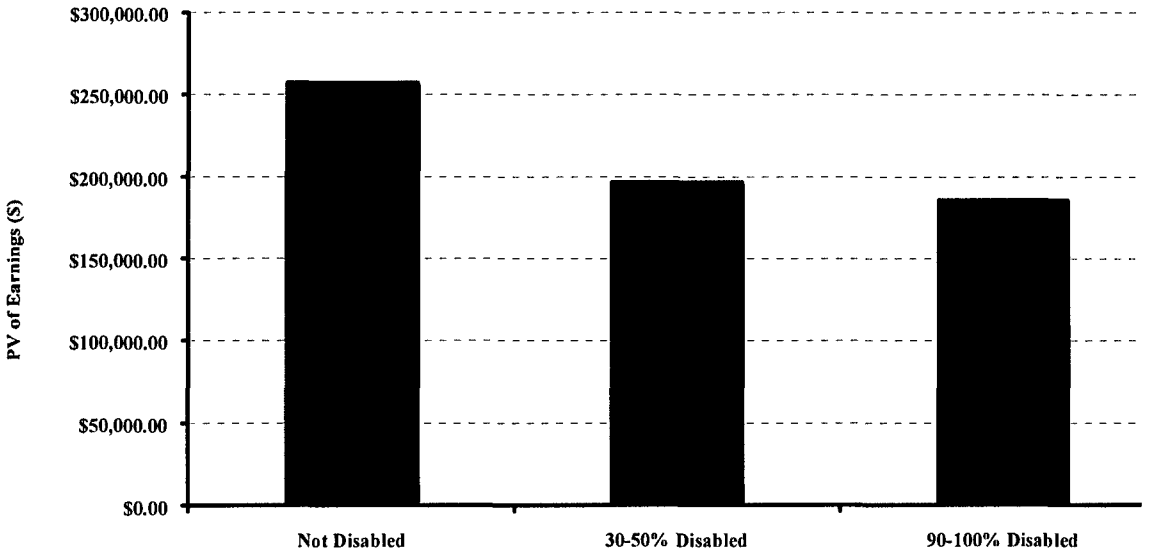


Figure 11.
Differences in Present Value of Post-Service Earnings by VA Disability Rating--Enlisted



Section 6: Summary and Conclusions

The analysis yields two key findings for policy makers: retirees do not experience an earnings gap relative to civilians, and VA disability ratings are associated with lower earnings and reduced workforce participation—but only for retirees with ratings above 20%. The first finding differs from the findings of previous empirical research. Beginning with Borjas and Welch (1986), these studies have shown military careers cause an earnings gap that may or may not be closed by the end of a retiree's working life. One explanation for this difference may be the results of this study capture a shift in the effects of military experience on post-service earnings. Military occupations may be changing to be comparable to civilian occupations, so the experience military members acquire is general, rather than specific, *human capital.*[17] The more recent empirical work by Cardell, et al. (1997) consistently finds smaller differentials than earlier work (e.g., Borjas & Welch, 1986; Goldberg & Warner, 1997), which could be indicative of a trend that continues in the 2003 SRM data.

The findings consistently show a relationship between VA disability rating and both workforce participation and post-service earnings. However, there are no observable differences in workforce participation or earnings between retirees with no VA disability rating and those who possess ratings of 0% to 20%. Retirees with the highest disability ratings are particularly less likely to work full time. When they do work full time, their earnings fall substantially below those of the non-disabled retirees. However, the cross-sectional nature of the data means the separate effects of aging and disability on earnings may not be accurately measured. Disability and age both have a negative effect on earnings, but disability rating increases with age. A portion of the negative impact of earnings from VA disability may occur simply because those with higher VA ratings tend to be older.

Finally, a significant departure in this analysis from previous empirical work is the inclusion of non-veterans in the comparison CPS sample. Alternative economic models restricted to veterans-only samples did not yield earnings estimates consistent with previous empirical research (e.g., Borjas & Welch, 1986; Goldberg & Warner, 1997; Cardell, et al., 1997). A possible reason for this is the demographic composition of the veteran population has changed over time. For previous studies, this population included a large proportion of veterans who served for brief periods under conscription. Conscription ended more than thirty years ago; most draftees would be at or near retirement age. Remaining veterans in the CPS sample are largely from the all-volunteer era. These veterans make up a smaller proportion of the general workforce and may be more homogeneous in characteristics and workforce experience.

Further research is needed to address issues raised by these findings. These include: (a) assess alternatives to veteran status in identifying comparison groups; (b) analyze the changes over time in characteristics and changes in earnings of the veteran population in the civilian workforce (c) evaluate trends in the earnings gap between retirees and civilians; (d) evaluate the dynamic relationship between disability and earnings, and between disability and labor-force participation as retirees age

[17] Human capital refers to the personal assets, such as knowledge, skill, and experience, that allow an individual to receive a flow of income.

References

Borjas, G. J., & Welch, F. (1986). The postservice earnings of military retirees: Evidence from the U.S. Air Force. *Research in Labor Economics, 8*(A).

Cardell, N. S., Lamoreaux, D., Stromsdorfer, E. W., Wang, B., & Weeks, G. (1997). *The post-service earnings of military retirees: A comparison of the 1996 retired military personnel sample with a statistically comparable sample from the March 1994 Current Population Survey* (Contract No. DASW01-97-C-0076). Arlington, VA: DMDC.

Department of Veterans Affairs. (2001). *Federal benefits for veterans and dependents* (2001 Edition). Washington, DC: Author.

DMDC. (2005). *Econometric Analysis of 2003 Data on the Post-Service Earnings of Military Retirees: Methodology report* (Report No. 2004-012). Arlington, VA: Author.

DMDC. (2004a). *2003 Survey of Retired Military: Administration, datasets, and codebook* (Report No. 2004-009). Arlington, VA: Author.

DMDC. (2004b). *2003 Survey of Retired Military: Tabulations of responses* (Report No. 2004-007). Arlington, VA: Author.

Goldberg, M. S., & Warner, J. T. (1986). Military experience, civilian experience and the earnings of veterans. *Journal of Human Resources, 22*(1), 62-81.

Greene, W. H. (1990). *Econometric analysis*. New York: Macmillan Publishing Company.

Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica, 47,* 153-161.

Kreider, B. (1999). Latent work disability and reporting bias. *Journal of Human Resources, 34*(4), 734-769.

Kroeger, K. R., Flores-Cervantes, I., Jones, M. E., & Wilson, M. J. (2004). *2003 Survey of Retired Military: Statistical methodology report* (Report No. 2003-022). Arlington, VA: DMDC.

Loughran, D. S. (2002). *Wage growth in the civilian careers of military retirees* (MR-1363-OSD). Santa Monica, CA: RAND.

Mackin, P. C., & Darling, K. L. (2004). *Econometric analyses of 2003 data on the post-service earnings of military retirees: Methodology report* (Report No. 2004-012). Arlington, VA: DMDC.

National Defense Authorization Act for Fiscal Year 2004, H.Res. 1588, 108th Cong., 160 Cong. Rec. H10563 (2003) enacted, Public Law 108-136, section 641(a).

Ramsberger, P. F., Difazio, A. S., & McCloy, R. A. (2004). *2003 Survey of retired military: Overview of findings* (Report No. 2004-010). Arlington, VA: DMDC.

U.S. Department of Commerce, Census Bureau. (2003). *Current Population Survey annual social and economic supplement.* Retrieved from http://www.bls.census.gov/cps/asec/adsmain.htm.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
30-06-2004	Final Report	August 2002-October 2003

4. TITLE AND SUBTITLE

ECONOMETRIC ANALYSIS OF 2003 DATA ON THE POST-SERVICE EARNINGS OF MILITARY RETIREES

5a. CONTRACT NUMBER

M67004-98-D-0002

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Mackin, Patrick C., Darling, Kimberly L., SAG Corporation

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Westat
1650 Research Boulevard
Rockville, MD 20850

SAG Corporation
4115 Annandale Road
Suite 200
Annandale, VA 22203

8. PERFORMING ORGANIZATION REPORT NUMBER

2004-011

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Defense Manpower Data Center
1600 Wilson Blvd, Suite 400
Arlington, VA 22208-2593

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

This study provides estimates of the post-service earnings experience of individuals who retired from active military service during the period 1971-2001. The findings are based on data from the 2003 Survey of Retired Military (2003 SRM), supplemented with data from the March 2003 Current Population Survey Annual Social and Economic Supplement (CPS-ASEC). The study focuses on the effects of possessing a VA disability rating on both the decision to work full time and on earnings. It also addressed the question of whether or not there is a retirees earnings gap found in previous empirical studies of post service earnings that tends to disappear over time.

15. SUBJECT TERMS

Benefits, Career, Compensation, Demographic, Employer, Employment, Job Characteristics, Retirement

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Robert W. Tinney
U	U	U	SAR		19b. TELEPHONE NUMBER *(Include area code)* 703-696-6765

INSTRUCTIONS FOR COMPLETING SF 298

1. REPORT DATE. Full publication date, including day, month, if available. Must cite at least the year and be Year 2000 compliant, e.g. 30-06-1998; xx-06-1998; xx-xx-1998.

2. REPORT TYPE. State the type of report, such as final, technical, interim, memorandum, master's thesis, progress, quarterly, research, special, group study, etc.

3. DATES COVERED. Indicate the time during which the work was performed and the report was written, e.g., Jun 1997 - Jun 1998; 1-10 Jun 1996; May - Nov 1998; Nov 1998.

4. TITLE. Enter title and subtitle with volume number and part number, if applicable. On classified documents, enter the title classification in parentheses.

5a. CONTRACT NUMBER. Enter all contract numbers as they appear in the report, e.g. F33615-86-C-5169.

5b. GRANT NUMBER. Enter all grant numbers as they appear in the report, e.g. AFOSR-82-1234.

5c. PROGRAM ELEMENT NUMBER. Enter all program element numbers as they appear in the report, e.g. 61101A.

5d. PROJECT NUMBER. Enter all project numbers as they appear in the report, e.g. 1F665702D1257; ILIR.

5e. TASK NUMBER. Enter all task numbers as they appear in the report, e.g. 05; RF0330201; T4112.

5f. WORK UNIT NUMBER. Enter all work unit numbers as they appear in the report, e.g. 001; AFAPL30480105.

6. AUTHOR(S). Enter name(s) of person(s) responsible for writing the report, performing the research, or credited with the content of the report. The form of entry is the last name, first name, middle initial, and additional qualifiers separated by commas, e.g. Smith, Richard, J, Jr.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES). Self-explanatory.

8. PERFORMING ORGANIZATION REPORT NUMBER. Enter all unique alphanumeric report numbers assigned by the performing organization, e.g. BRL-1234; AFWL-TR-85-4017-Vol-21-PT-2.

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES). Enter the name and address of the organization(s) financially responsible for and monitoring the work.

10. SPONSOR/MONITOR'S ACRONYM(S). Enter, if available, e.g. BRL, ARDEC, NADC.

11. SPONSOR/MONITOR'S REPORT NUMBER(S). Enter report number as assigned by the sponsoring/ monitoring agency, if available, e.g. BRL-TR-829; -215.

12. DISTRIBUTION/AVAILABILITY STATEMENT. Use agency-mandated availability statements to indicate the public availability or distribution limitations of the report. If additional limitations/ restrictions or special markings are indicated, follow agency authorization procedures, e.g. RD/FRD, PROPIN, ITAR, etc. Include copyright information.

13. SUPPLEMENTARY NOTES. Enter information not included elsewhere such as: prepared in cooperation with; translation of; report supersedes; old edition number, etc.

14. ABSTRACT. A brief (approximately 200 words) factual summary of the most significant information.

15. SUBJECT TERMS. Key words or phrases identifying major concepts in the report.

16. SECURITY CLASSIFICATION. Enter security classification in accordance with security classification regulations, e.g. U, C, S, etc. If this form contains classified information, stamp classification level on the top and bottom of this page.

17. LIMITATION OF ABSTRACT. This block must be completed to assign a distribution limitation to the abstract. Enter UU (Unclassified Unlimited) or SAR (Same as Report). An entry in this block is necessary if the abstract is to be limited.

Field 34 - Serial Code (5th on EDMS template)

The Serial Code is not used unless several Component reports might be linked, for example, parts 1 and 2 of the same study.

Field 35 – Source Code (12th on EDMS template)

Individual Source Codes are assigned to each Component item. The Source Code is particular to that paper/article. The Component source may not be the same organization as the Compilation item. Do not use the source code from the Compilation (i.e. the source of the conference proceedings, a document clearing house or a publisher).

The source code is determined by the first listed (primary) author on the Component and that author's affiliation. If several authors are listed from different countries/institutions, the first listed author still takes precedence, even if a collaborating author is from a U.S. company or institution.

If an author does not have an affiliation, such as a private consultant, a separate source code must be established for that name. In the case of a large corporation or institution that has many sub-divisions or departments, the source code of the main entity, such as "Virginia University, Charlottesville, VA," is acceptable.

Revised: 28 December 2005