Factors Affecting Entrepreneurship among Veterans

by

John B. Hope, Brian Oh, and Patrick C. Mackin
SAG Corporation
Annandale, VA 22003

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Abstract

The authors investigate whether military service has a statistically significant impact on veteran entrepreneurship using three complementary data sources. The 2007 Bureau of Labor Statistics (BLS) Current Population Survey (CPS) March Supplement is used to construct the control sample, and the 2007 CPS Veterans Supplement (veterans-only sample) and the Defense Manpower Data Center's (DMDC) 2003 Survey of Retired Military (military retiree sample) are used to construct two experimental groups. The analysis tests the hypothesis that military service imparts some unique training or acculturation that makes veterans more likely to become self-employed than otherwise similar individuals.

Using the control sample, the authors find that veterans are more likely than otherwise similar individuals to be self-employed. They confirm the findings of earlier studies that show significant positive effects for military service on the probability of self-employment and are able to quantify those marginal effects in the range of 45 percent to as high as 88 percent.

Analysis of the veterans-only data, however, shows that self-employment is negatively correlated with the length of military service. This result suggests that higher rates of self-employment among veterans are due to individual characteristics, rather than training, education or other qualities imparted by military service. An exception to this negative correlation occurs among career military retirees (those with more than twenty years of military service); in this subgroup of veterans, self-employment increases with years of military service. The authors posit that this relationship may result from a wealth effect – military retirees with longer careers receive larger military pensions and may be financially better able to pursue self-employment.

The results for the control sample indicate that age, marital status, gender, occupation, home ownership, military service, and some of the regional and race variables have a significant effect on self-employment, while education and children do not. In the veterans-only sample, variables for those who chose the military as a career path, age, race, gender, and children are positive indicators of self-employment, while employment in service occupations and manufacturing occupations are negative. The military retiree sample shows single, white, enlisted and Marine Corps status are positive indicators of self-employment.

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1. Introduction

Are veterans more likely than otherwise demographically similar individuals to become entrepreneurs? Using one measure of entrepreneurship, self-employment, Fairlie (2004) found in research sponsored by SBA's Office of Advocacy that veterans did indeed have a higher rate of self-employment than did non-veterans during each year of the study period from 1979 to 2003. From 2003 through 2009, data from the Bureau of Labor Statistics show that the self-employment rate of veterans remains higher than that of non-veterans. What could account for this finding? There are a number of potential explanations for the higher rate of self-employment, most of which we will be able to test using the data sources employed in this study.

One possible explanation is that military service imparts some useful training, education or intangible psychological qualities (e.g., self discipline and leadership) that make veterans more capable of successful self-employment. Indeed, military recruiting advertisements often highlight this aspect of military service to attract enlistees.

In a similar vein, self-employment may simply seem more attractive to veterans after the rigidly hierarchical structure of the military workforce. After years of following orders, the prospect of being one's own boss may be an attractive proposition. Conversely, after years of giving orders the prospect of having to take them, perhaps from a younger or more inexperienced person, may be distasteful.

Another potential explanation is that military service simply attracts individuals who are predisposed to become self-employed later in their working lives. That is, the same qualities that lead someone to seek self-employment may make one an attractive military recruit. Military service in this scenario might serve as a selection screen, but the service itself may not necessarily impart any qualities or training that make self-employment more likely.

There could also be circumstances that may lower the marginal risk of self-employment for veterans. Some veterans sustain service-connected disabilities that may make it more difficult for them to obtain employment from existing employers even though this may be preferable to them than self-employment (Open Blue Solutions, 2007), thus making self-employment a relatively more attractive option.

Military service may also make self-employment a less-risky endeavor relative to the population as a whole because veterans (and, particularly, military retirees) have access to benefits, compensation and other resources that reduce the risk of self-employment. Military retirees who receive inflation-adjusted pensions and have access to free or inexpensive medical care for themselves, as well as their dependents, may view self-employment as a more viable option with this built-in safety net.

We use data on self employment among veterans and non-veterans to test these alternative explanations for the higher rate of self-employment among veterans. Could the higher rate be attributed to (1) intrinsic characteristics of the veterans; (2) qualities and training imparted through military service; (3) the "safety net" of veteran benefits and military pensions; or some combination of all three?

2. Literature Review

This section reviews literature on topics of interest to this study. These topics include:

- *Veteran Entrepreneurship* – we summarize previous analyses of overall entrepreneurship of veterans as compared to the population in general;
- *Veteran Earnings* – a look at some studies of how veterans fare in the labor market against similarly qualified non-veterans;
- *Psychological Causes* – some literature on the psychology of motivation, with particular concentration on entrepreneurs; and
- *Available Data* – a section on some of the sources of information available on veterans and business ownership.

2.1 Veteran Entrepreneurship

Open Blue Solutions (2007) used the Bureau of Labor Statistics' (BLS) Current Population Survey data to examine the self-employment choices of veterans and service-disabled veterans and how computer technology affects veteran self-employment. The study found that service-disabled veterans are self-employed at lower rates than those without disabilities and that the substantial differences between disabled and non-disabled veterans result from the service-connected disabilities themselves, not demographic or other differences. Controlling for the effects of service-related disabilities results in nearly identical labor force participation among disabled and non-disabled veterans. The study also found that computer use is correlated with higher employment rates for all veterans.

Haynes (2007) examined the changes in income and wealth from 1989 through 2004 of veteran and non-veteran households, veteran households with and without small business owners, and small business owning households with and without veterans. The study examined the likelihood that a household would be classified as high-income or high-wealth. Using the Federal Reserve Board's 1989 through 2004 Surveys of Consumer Finances (SCF), the study found that the overall number of veteran households and the percentage of small business owners in the population of veteran households declined. The study used regression analysis to find that:

- veteran households had lower income than non-veteran households;
- veteran small business-owning households had higher wealth than veteran non-business-owning households;
- veteran small business-owning households had lower wealth than non-veteran small business-owning households.

Moutray (2007) used the Panel Study of Income Dynamics, a longitudinal database administered by the University of Michigan's Institute for Social Research, to examine the relationship between educational attainment and self-employment. Using univariate statistical comparisons and multivariate logit modeling, he found educational attainment to be an important determinant of self-employment, with more schooling correlating with a higher likelihood of starting one's own business. The logit analysis also found that, of the variables observed, prior military service had the largest positive impact on self-employment.

Waldman Associates & REDA International (2004) used a survey administered to veterans in the U.S. residential population and to veteran business owners drawn from the Dun & Bradstreet database of businesses to study veteran and service-disabled veteran entrepreneurship. The study found that more than one-third of both new veteran entrepreneurs and current veteran business owners reported that they had gained skills from active duty service that were directly relevant to business ownership, but that prior business ownership and employment experience had an even greater positive effect than military experience. The study also found that about 22 percent of veterans in the U.S. household population were either purchasing or starting a new business or considering purchasing or starting one.

Mid-Atlantic Research (1984) used a survey administered to business school graduates to examine whether or not military service, particularly combat service, affects entrepreneurial motivations and behavior. The survey sample classified respondents as either entrepreneurs or non-entrepreneurs and either veterans or non-veterans. They found that some factors contributing to selection into self-employment among respondents include dissatisfaction with previous jobs, exposure to entrepreneurial role models, a strong sense of independence, and being a risk taker. The survey also found that entrepreneurs in the sample were more often male, older, better educated, and earned higher incomes. However, they found that, while veterans had a higher rate of entrepreneurship than did non-veterans, the survey results suggested that this was more the result of demographic distinctions between veterans and non-veterans than the experience of military service. For example, veterans are predominantly male, which is a characteristic associated with entrepreneurship in many studies.

2.2 Veteran Earnings

Hirsch and Mehay (2003) examined the effect of active-duty service on civilian earnings by comparing reservist veterans and reservists without active-duty service. Because all reservists must

meet the same entrance screening requirements as active-duty personnel, this analysis was able to control for selection effects on earnings. The study used the DOD Defense Manpower Data Center's 1986 and 1992 Reserve Components Surveys. They found that the average impact on civilian earnings is small but positive (about 3 percent) for veteran reservists, and ranged from zero impact for the enlisted community to 10 percent for officers.

Angrist and Kruger (1994) examined the so-called "veteran premium," i.e., the expectation that WWII veterans earn more than non-veterans and Vietnam-era veterans. They used econometric techniques to control for non-random selection into the military (conscription priority was based on date of birth). They hypothesized that the skills learned in the military during WWII were better rewarded in the civilian labor market than were those learned in Vietnam. However, they found that WWII veterans would have earned more than non-veterans even had they not served in the military and that positive estimates of the WWII veteran premium are entirely due to non-random selection into the military.

Angrist (1993) also examined the effects of veteran education benefits on earnings. Using data from a 1987 survey of veterans, he found that veteran benefits increased schooling by roughly 1.4 years, which translated to an increase of 6 percent in civilian annual earnings.

In an earlier study, Angrist (1990) examined the effect of random selection into the military, via the Vietnam era draft, on civilian earnings. The study found that WWII veteran premiums may be due to selection bias and that the actual effect on civilian earnings may be zero or negative.

Mangum and Ball (1989) investigated the effects of military-provided training on post-service employment for those enlisted in the all-volunteer force. The study used data from the Bureau of Labor Statistics (BLS) National Longitudinal Survey of Youth. They found that within two years of their return to civilian life, those with military training earned more than those with civilian training. Their results found skill transferability from the military to civilian sector of 45-50 percent, although they admitted that their results may only apply to veterans due to the possibility of selection bias.

De Tray (1982) attempted to answer the question of whether or not civilian employers use veteran status as a screening device to identify productivity. He hypothesized that veterans must meet certain standards of behavior and performance to receive an honorable discharge and veteran status. Tray's findings are inconclusive, but he still identified veteran status as a valuable screening device, although not sufficient to confirm the observed positive impact of the supposed veteran premium.

2.3 Psychological Causes

Evans and Leighton (1989) examined the process of selection into self-employment and the factors that influence the decision. They used data from the BLS National Longitudinal Survey of Young

Men (an earlier version of its Survey on Youth) and the BLS Current Population Survey. They observed the impact on selecting into self-employment of age, prior labor-market experience, wealth, and the psychological locus of control. Some of their findings are inconsistent with current models of occupational choice, such as the probability of entering self-employment being independent of age or experience for the first 20 years. Their findings that are consistent with conventional wisdom included: people who switch from wage-work to self-employment tend to be those receiving low wages, changing jobs frequently, and unemployed frequently; and those with an internal locus of control are more likely to be self-employed. The study found that when the Rotter score (a measure of locus of control) is controlled for, the impact of prior military service on self-employment increases, suggesting that members of the military have a more external locus of control than civilians.

Pandey and Tewary (1979) conducted a survey of 44 subjects identified as entrepreneurs by their applications for industrial loans. They used their observations to measure achievement values, which reflect the subject's "activistic, future-oriented and individualistic point of view," and locus of control. Their study found that those with higher measured achievement values and an internal locus of control were more likely to be successful with their loan applications and be classified as entrepreneurs.

Durand and Shea (1974) conducted a similar study of 29 African-American small business owners to observe the effects of achievement motivation and locus of reinforcement control on entrepreneurial activity. They found that those with a high need to achieve and an internal locus of control were significantly more active than those with low achievement motivation and an external locus of control. Their results indicate that those with a "perception of personal responsibility" are more likely to be entrepreneurs than those without an internal locus of control.

2.4 Available Data

The United States Census Bureau released in July 2010 preliminary estimates based on its 2007 Survey of Business Owners (SBO), part of the Economic Census conducted once every five years. These estimates include data on the number of firms owned by veterans and by non-veterans, and on firms owned equally by veterans and non-veterans. Data are available by location (United States and individual state totals, including the District of Columbia), industry (two-digit NAICS codes), employer/non-employer status, sales, number of employees, and payroll. A special report with more detailed information on veteran-owned firms is scheduled to be published in May 2011, and yet another report, Characteristics of Business Owners, is scheduled to be published in June 2011.

The Bureau of Labor Statistics (BLS) publishes a special Veterans Supplement to its Current Population Survey (CPS) series. These have been issued biennially for odd-numbered data years until 2009, but pursuant to new legislation they will be issued annually in the future. The supplements include data on self-employment and unemployment among veterans. Information is

presented for all veterans, veterans of different service eras, and non-veterans, in addition to the total civilian non-institutional population aged 18 and over. Also reported are demographic data on race, ethnicity, gender, age, and disability status, in addition to distributions by class of worker and industry. BLS does not count incorporated individuals in its estimates of self-employment, while some other sources, including the SBA Office of Advocacy, tend to include all self-employed individuals, both incorporated and unincorporated. This reflects the fact that Subchapter S corporations and other pass-through entities are very popular types of business organization.

Before the 2010 Census SBO data release, the SBA's Office of Advocacy (2007) identified two reports published by the Census Bureau in 2007, Characteristics of Veteran-Owned Businesses and Characteristics of Veteran Business Owners, as the most detailed and important data on veterans and service-disabled veterans in business since an earlier 1992 Census report. Both reports were based on data from the Bureau's 2002 Survey of Business Owners and Self-Employed Persons (SBO). Advocacy also published its own summary of the 2002 Census SBO data.

Jack Faucett Associates and Eagle Eye Publishers (2004) examined the current established data sources on veteran business ownership, compared their quality, and reviewed the existing literature on veteran entrepreneurship. They concluded that, at the macroeconomic level, the Census Bureau's 1992 Characteristics of Business Owners survey was the best, if dated, source available at that time, and that, at the microeconomic level, the Dun & Bradstreet and Austin-Tetra proprietary databases included information on the largest number of veteran-owned businesses. The study concluded that most data sources available at that time were inaccurate and incomplete. They suggested that improvements were needed in the quality of data and in the reporting of veteran and disability status of firm owners.

Fairlie (2004) used microdata extracted from the BLS Current Population Survey to produce a more complete dataset on self-employment than that of the standard data published by the BLS. The dataset tracked self-employment from 1979 to 2003. The analysis found that male veteran self-employment fell from 2.9 million to 1.4 million, while the male veteran labor force fell from 20.2 million to 10.4 million over the 24-year period. The self-employment rate for veterans did vary somewhat from a little over 14 percent near the start of the study to 13.7 percent at the end. The data also showed that male veterans' self-employment rates were higher than those of non-veterans through the entire study period. The data included the incorporated self-employed, and excluded those who listed a secondary occupation as self-employment, spent less than 15 hours a week in self-employment, or who were engaged in agricultural self-employment.

Eagle Eye Publishers (2004) surveyed the Federal Procurement Data System's Individual Contract Action Report (ICAR) database to create a master lookup file containing the names of all businesses identified as veteran-owned (VOBs). They also included in this file VOBs identified in databases maintained by Dun & Bradstreet, the government's Central Contractor Registration (CCR) system, and SBA's Pro-Net database, which at the time was being merged into the CCR. After eliminating

duplicate entries (those firms identified as VOBs in multiple sources), the newly constructed lookup file was matched with the ICAR database to identify contracts to VOBs, regardless of the source of their VOB identification. Eagle Eye found that the inclusion of all firms identified as veteran-owned from these three databases, in addition to those already identified in the ICAR, had the potential to double the number of VOBs receiving federal contracts. In their study, however, Eagle Eye Publishers noted that the veteran-owned business sector was still underutilized (80 percent of veteran-owned business contract dollars went to just five businesses). Eagle Eye suggested improvements to veteran business utilization in a combined agency-company education and marketing program.

3. Data Description

In order to address the question of whether or not military service increases veterans' likelihood of selecting into self-employment, this model uses samples derived from three complementary data sources:

1. The BLS Current Population Survey (CPS) March Supplement
2. The BLS Current Population Survey Veterans Supplement
3. The Defense Manpower Data Center's (DMDC) 2003 Survey of Retired Military

All three datasets contain corresponding demographic variables with which we are able to create comparable populations. They also contain the experimental variable: the rate of self-employment. The CPS March Supplement is used to construct the control dataset, and the CPS Veterans Supplement and the DMDC Survey are used to construct the two experimental datasets on which our hypothesis is tested.

We define self-employed workers as those who respond to survey questions regarding worker status as specifically self-employed and not as government (federal, state, and local) or private workers. In all three of the databases used in this study, the survey asks the respondent to self-classify as an employee of a for-profit or non-profit private company; an employee of a federal, state, or local government; as being self-employed; or working without pay. Our study defines the self-employed as those who indicate the self-employed option and the rest of the workforce as those who indicate all other options, excluding those working without pay and non-responses.

The BLS Current Population Survey is a monthly survey of about 60,000 households or occupied units with an interview rate of 92 – 93 percent. The March Supplement includes detailed data on individuals and their labor-market experience. It contains data pertaining to employment, earnings, demographic characteristics, education, and occupation. As noted above, we use the CPS to construct the control dataset on which the model will be based. The control dataset will be used to provide baseline statistics for basic sample characteristics such as age, sex, educational attainment,

income, and other pertinent variables. Table 1 provides basic descriptive statistics for the control dataset that was derived from the 2007 CPS March Supplement sample.

The control dataset is much larger than the analysis datasets that were derived from the Veterans Supplement and the DMDC Survey. The control dataset returns the expected values for the basic demographic points; its population contains the expected proportion of male to female, average age, race distributions, and average number of children. The control population is 6 percent self-employed; the veterans-only and military retiree analysis populations return higher percentages (Table 2), the implications of which will be discussed in this study. These standard values reflected in the control dataset population are the basis for the analysis of the veterans-only and military retiree population comparison.

Table 1: Selected Statistics from the Control Dataset
(Current Population Survey March Supplement, 2007)

Variable	Mean	Count
Age	34.13	206,639
% Male	49%	206,639
% High School Graduate	78.8%	155,954
% Married	41.4%	206,639
% White	79.8%	206,639
% Black	11.4%	206,639
% Other Race	8.8%	206,639
% Hispanic	17%	206,639
Number of Own Children	1.21	206,639
% Ever Served in Military	9%	147,972
Veterans Payments	$11,600.90	1,555
Disability Income	$13,132.77	31
Total Earnings	$20,870.61	206,387
% Self-Employed	6%	155,954
Earnings of Self-Employed	$40,449.57	8,941

The use of the DMDC data provides this study with a unique advantage, as it includes detailed information on the personal characteristics and employment history of military retirees. The survey was distributed to 53,100 military retirees, of which 32,275 were returned. In addition to pertinent demographic information, the survey included questions relevant to veteran entrepreneurship, such as whether or not the respondent was self-employed and for how long, whether or not the respondent had a service-related disability, and various other details of military experience. Table 2 provides basic descriptive statistics for the military retiree analysis dataset derived from the DMDC sample.

Table 2: Selected Statistics from the Military Retiree Analysis Dataset
(Defense Manpower Data Center's Survey of Retired Military, 2003)

Variable	Mean	Count
Age	54.90	53,100
% Male	94%	31,886
% High School Graduate	78.1%	29,573
% Married	79.5%	32,241
Total Earnings (2002)	$43,931.77	18,374
Years of Service for Retirement	19.57	53,100
% Hispanic	5%	31,147
% White	80.5%	31,177
% Black	16.5%	31,177
% American Indian	2.5%	31,177
% Asian	2.9%	31,177
% Pacific Islander	0.2%	31,177
% Disabled	66.6%	53,100
%VA Compensation	37.6%	53,100
% Self-Employed	10.1%	20,102

The DMDC data provides a demographic profile of the retiree population. The military retiree analysis sample is predominantly male, white, and high school graduates. Compared to the control group sample, the military retiree analysis sample is older, has a higher rate of high school graduates, and is more likely to be married. In addition, the survey shows that the self-employed have a higher average income from pensions than those not self-employed. As expected with an older sample, the military retiree analysis sample is more likely to be self-employed.

The CPS Veterans Supplement is an extension of the standard CPS dataset to include specific information regarding veterans. It includes additional data such as the respondent's service-connected disability status, whether or not the respondent is self-employed and for how long, when and where the respondent served in the military, if the respondent served in combat, and the respondent's industry and occupation. The Veterans Supplement will be used to construct the veterans analysis dataset with which the model will test the hypothesis that military service produces higher rates of self-employment among veterans. Table 3 provides basic descriptive statistics for the veterans analysis dataset derived from the 2007 Veterans Supplement sample. Note that the sample used for this analysis excluded government workers and included self-employed individuals from the agricultural sector. Therefore, the sample statistics will not match statistics reported by the BLS from the larger CPS Veteran Supplement sample.

Table 3: Selected Statistics from the Veterans Analysis Dataset
(Current Populations Survey Veterans Supplement, 2007)

Variable	Mean	Count
Age	60.5	10,766
% Male	94%	10,766
% High School Graduate	92.1%	10,766
% Married	70.5%	10,766
Number of Own Children	0.36	7,924
Total Income	$47,572.80	1,197
% Ever Served in Military	100%	10,766
Total Active Duty	3.72	9,110
% Disabled	13.7%	9,358
% Hispanic	3.73%	10,766
% White	87.8%	10,766
% Black	7.8%	10,766
% Other Race	4.3%	10,766
% Disabled	86.3%	9,358
% Self-Employed	16.0%	5,769

Both the military retiree analysis dataset population and the veterans analysis dataset population are different from the control dataset in several key demographic points. Veterans and military retirees are much older than the average age for the control and are almost entirely male. They are more likely to be high school graduates and married, but the average number of children is lower than that for the control population. The respondents in the veterans analysis dataset also exhibit an even higher rate of self-employment than do retirees in the military retirees analysis dataset. Whether or not this increased rate of self-employment is a result of military service is part of the hypothesis that this study will investigate.

Figures 1 through 7 are a series of charts displaying the differences in selected variables between those who are self-employed and those who are not:

Figure 1: Male Percentage of Self-employed vs. Not Self-employed in the Three Datasets
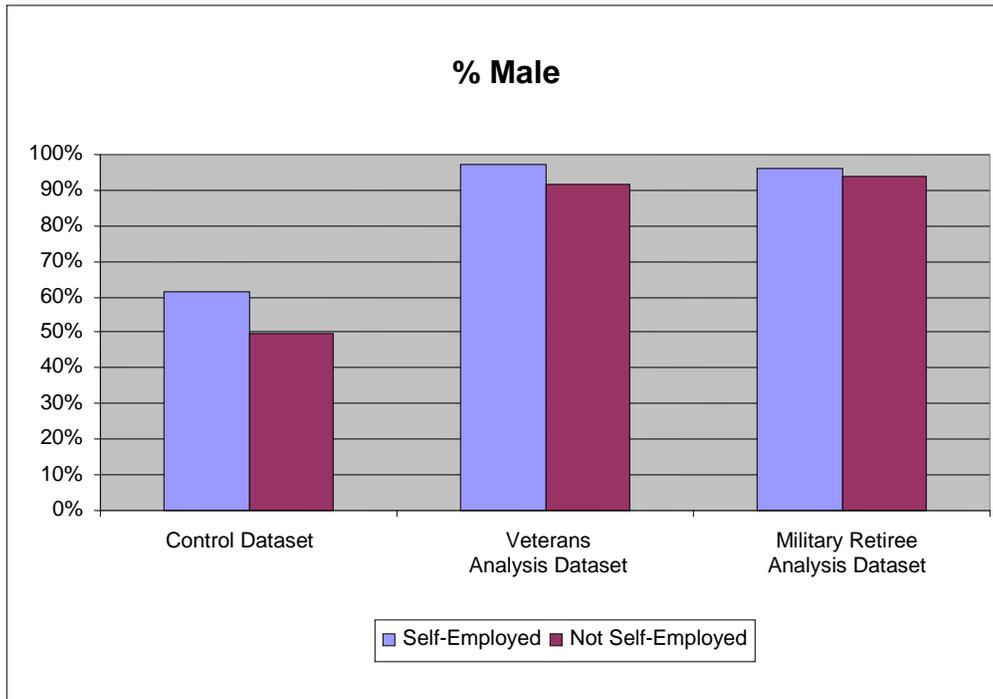
Although about half (49.7 percent) of workers in the control dataset who are not self-employed are male, a significantly greater percentage (61.6 percent) of self-employed individuals are male. The veterans analysis dataset and the military retiree analysis dataset are overwhelmingly (> 90 percent) male for both employment categories, although the percentage of males is slightly higher in each sample for the self-employed.

Figure 2: White Percentage of Self-employed vs. Not Self-employed in the Three Datasets
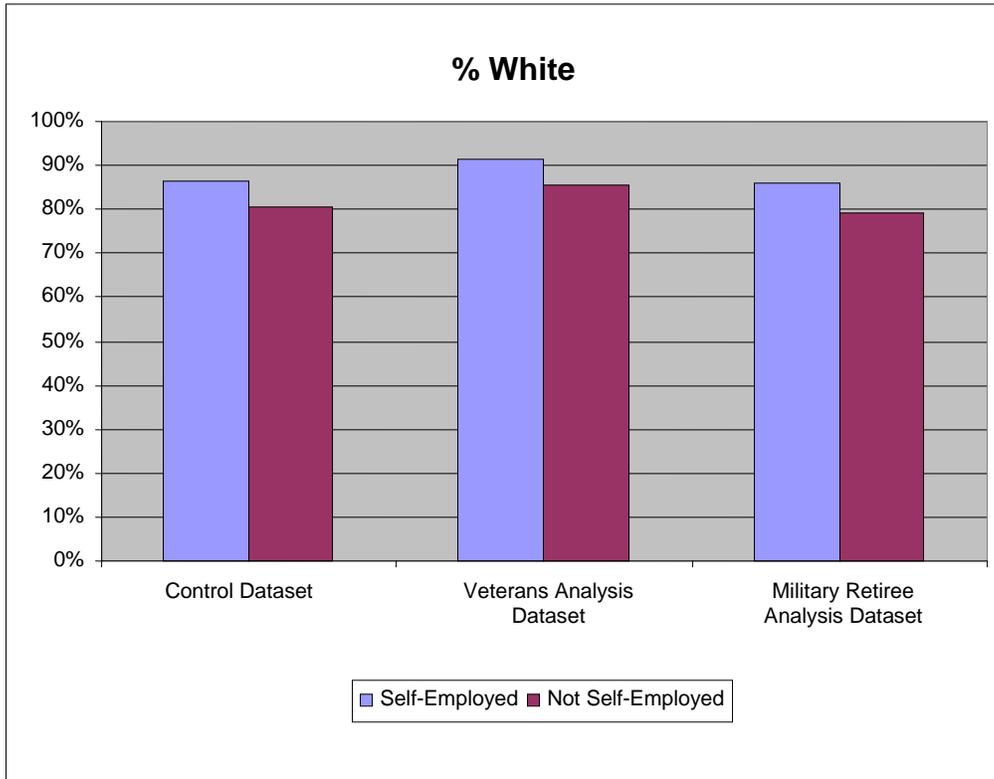
Self-employed individuals are also more likely to identify themselves as white than are other workers in the data. For the control dataset, 80.5 percent of workers who are not self-employed are white, compared to 86.3 percent of self-employed workers. The percentage of white individuals is higher (about 6 percentage points) for self-employed individuals in both of the other samples as well.

Figure 3: Married Percentage of Self-employed vs. Not Self-employed in the Three Datasets
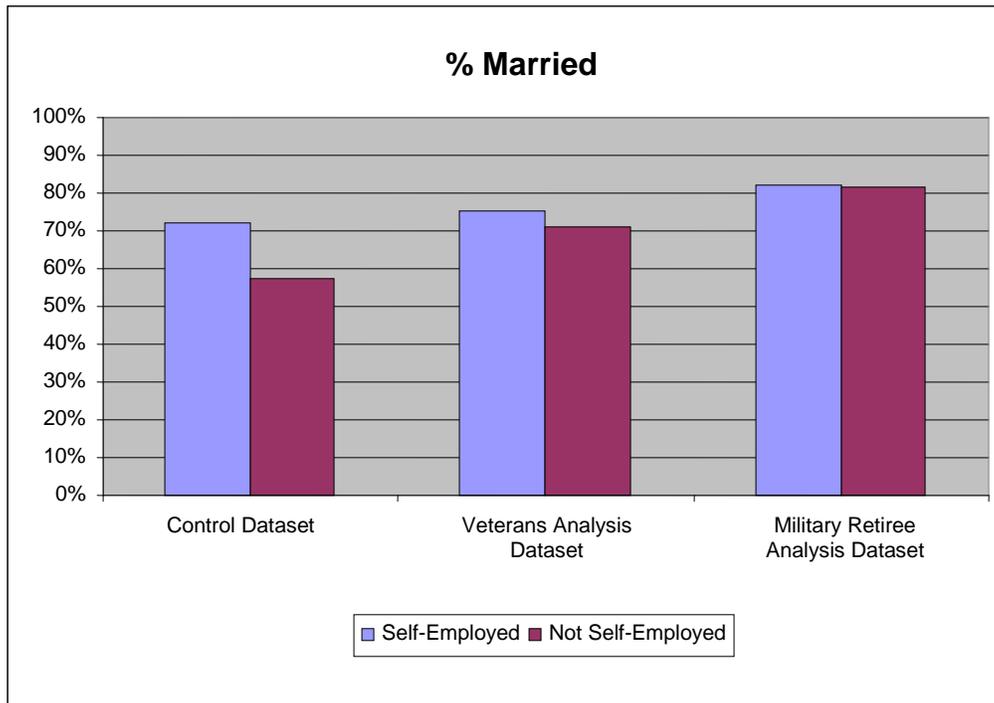
Self-employed workers are more likely to be married as well: 72.2 percent of workers who are self-employed are married according to the control dataset, compared to only 57.5 percent of those who are not self-employed. The veteran analysis dataset shows a higher marital rate for both employment categories – 75.3 percent for the self-employed versus 70.9 percent for those not self-employed – with those in the military retiree analysis dataset equally likely (about 82 percent) to be married regardless of their self-employment status. The differences in the percentage of those married can be attributed largely to the 20-plus years mean age differences in the datasets: an average age of 34.1 years for the control dataset, 54.9 years for the military retirees analysis dataset, and 60.5 years for the veterans analysis dataset.
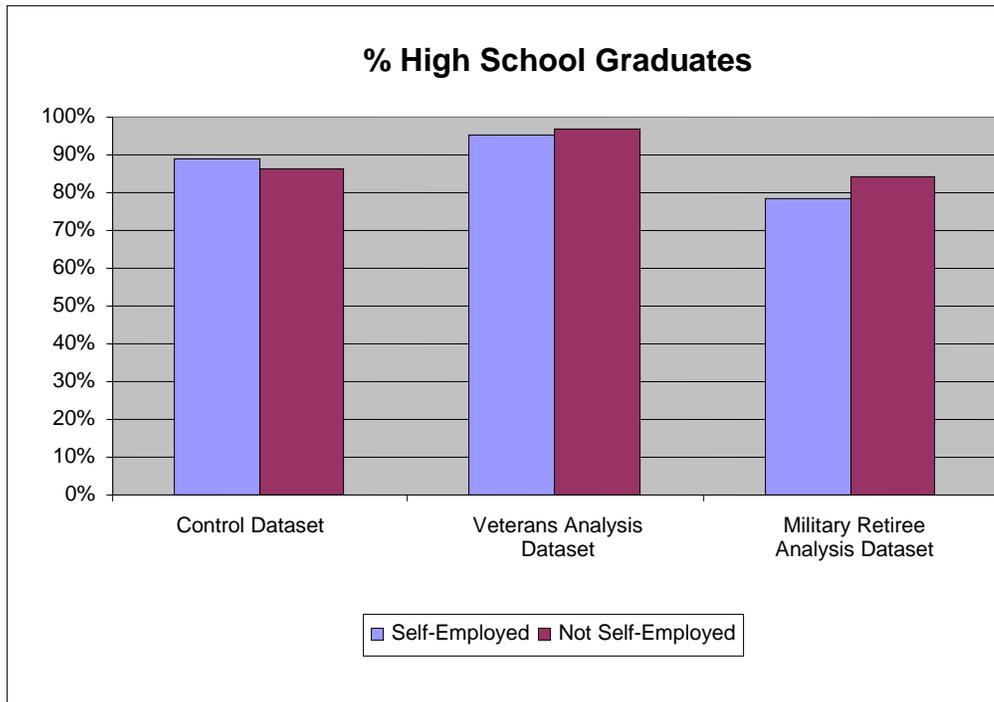
Unexpectedly, although self-employed workers in the general population sample from the control dataset are more likely to be high school graduates – 89.0 percent versus 86.2 percent – than workers who are not self-employed, self-employed veterans are slightly less likely to have finished high school than veterans who are not self-employed. The military retiree analysis dataset data has lower graduation rates than the non-veteran sample from the control dataset – 78.4 percent self-employed workers versus 84.2 percent not self-employed. The veteran analysis dataset has much higher high school graduation rates than the general population sample for both employment categories – 95.3 percent for self-employed workers and 96.8 percent not self-employed. We posit that this variation in veterans' high school graduation rates may be due to changes in the unemployment rate and/or the enlistment requirements of the services over the years; these may have caused the recruiting commands to adjust the minimum share of high school graduates recruited.

Across all three datasets, self-employed workers are more likely to be male, white, and married than are other individuals. The next series of charts examines the demographic characteristics of self-employed individuals in the three samples.

Figure 5: Percent of Self-employed by Gender in the Three Datasets

% Self-Employed by Gender
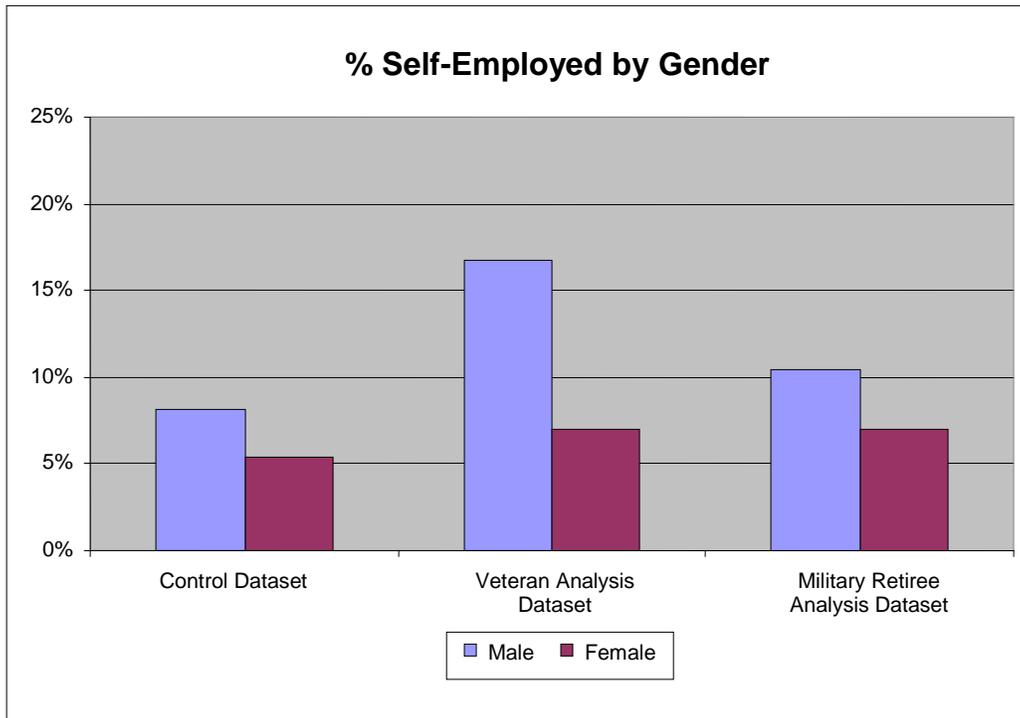
The rate of self-employment is consistently higher for males than for females. In the control dataset sample, 8.2 percent of males and 5.3 percent of females were self-employed. Self-employment rates are somewhat higher for the military retiree analysis sample – 10.4 percent of males and 7.0 percent of females. The veteran analysis sample showed the highest levels of self employment – 16.8 percent of males and 7.0 percent of females – and it also shows the biggest difference by gender.[1]

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[1] As noted before, the sample used for this analysis excluded government workers and included self-employed individuals from the agricultural sector. Therefore, the sample statistics in our analysis will not match those appearing in BLS reports on its larger CPS Veterans Supplement sample.

Figure 6: Percent of Self-employed by Race in the Three Datasets
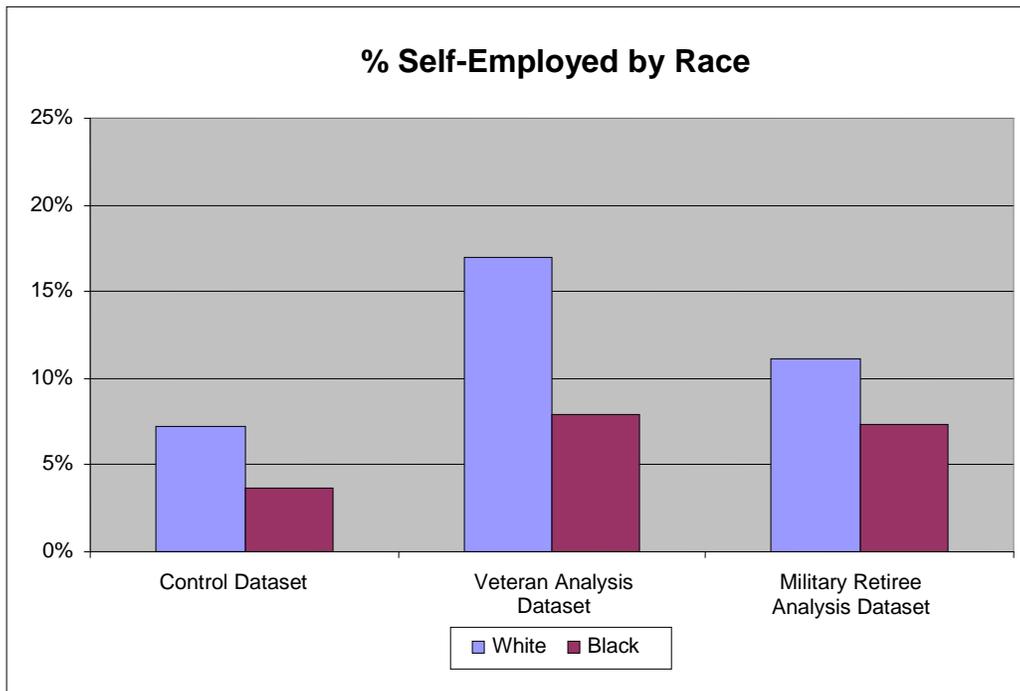
White workers are more likely to be self-employed by a significant margin. The control dataset has 7.3 percent of white workers in the general population sample self-employed, which is almost twice the rate of black workers at 3.7 percent. Veterans also have a higher rate of self-employment among whites. The veteran analysis dataset has a 9 percent self-employment rate gap between whites and blacks – 17.0 percent for white workers and 7.9 percent for black workers – and the military retiree analysis data has an almost 4 percent difference – 11.1 percent for white workers and 7.4 percent for black workers.
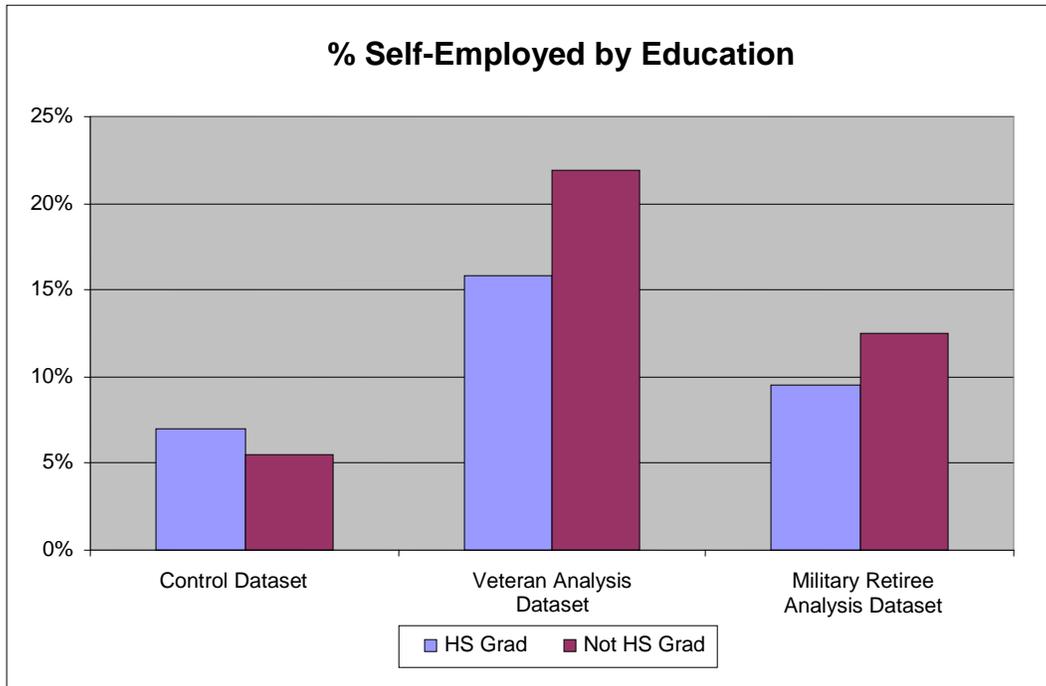
Consistent with the results in Figure 4, non-veteran high school graduates are more likely to be self-employed (7.0 percent) than non-graduates (5.5 percent) – while veterans who are self-employed and non-high school graduates outnumber graduates by 21.9 percent to 15.8 percent in the veterans analysis dataset and by 12.5 percent to 9.5 percent in the military retirees analysis dataset.

Again it is clear that white males are consistently more likely to be self-employed. Figure 7, however, indicates that non-high school graduates are more likely to be self-employed among the veteran analysis samples. This is possibly due to the fact that the veteran analysis dataset and the military retirees analysis dataset have much smaller non-graduate sample sizes than does the control dataset after filtering. With few exceptions, the military services do not recruit or accept non-high school graduates, so it is unsurprising that there are fewer respondents with that level of education.

4. Hypothesis

This study tests the hypothesis that military service imparts some unique training or acculturation that makes veterans more likely to become self-employed than otherwise similar individuals. The hypothesis will be tested by estimating models of the probability of self-employment using separate survey samples for non-veterans and veterans. Additionally, we will estimate a model for military retirees using data from a 2003 Defense Manpower Data Center (DMDC) Survey of Military Retirees.

5. Model Description

This model seeks to answer the question of whether veterans are more likely than otherwise similar civilians to become entrepreneurs and, if so, why. It attempts to control for other factors that contribute to entrepreneurship which are unrelated to military service in determining a statistically significant relationship between past military service and the likelihood of being self-employed. The model incorporates military characteristics such as experience and service-related disabilities along with other demographic and employment characteristics in estimating the probability that an individual is self-employed.

The underlying assumption of the model is that the probability that an individual is self-employed (P_{SE}) is a function of individual attributes (I), labor market experience (L), military service characteristics (M), and a set of parameters (β):

$$P_{SE} = f(I, L, M, \beta).$$

The probability that an individual is self-employed is not observed; rather, we observe a binary outcome (self-employed/not self-employed) we denote as *SE*.

$$\Pr[SE = 1] = f(I, L, M, \beta).$$

We estimate this model as a probit:

$$\Pr[SE = 1] = \Phi(\beta_I' I + \beta_l' L + \beta_m' M).$$

6. Results

In this section we present the results of our regression analysis using the three datasets described above: the control dataset derived from the 2007 CPS March Supplement data, the veteran's analysis dataset derived from the 2007 CPS Veterans Supplement, and the military retirees analysis dataset derived from the 2003 DMDC Survey of Military Retirees.

6.1 Control Dataset Baseline

The initial PROBIT regression from the control dataset was used to establish the baseline and to determine the significant variables. The results, shown in Table 4, indicate that age, marital status, sex, occupation, home ownership, military service, and some of the regional and race variables have a significant effect on self employment, while education and children do not.

Table 4: Control Dataset PROBIT Results

Description		Variable	Coeff.	St.Er.	b/St.Er.	Significance Level	Mean of X
		Constant	-2.556	0.114	-22.459	0.000	
Age	*	AGE	0.016	0.001	11.743	0.000	38.341
High school graduate		HSEDUC	0.029	0.030	0.947	0.344	0.510
College graduate		Omitted					
Married	*	MARRIED	0.106	0.035	3.004	0.003	0.593
Male	*	MALE	-0.330	0.033	-9.916	0.000	0.405
Professional occupation	*	PROFOCC	0.273	0.041	6.715	0.000	0.255
Service occupation	*	SVCOCC	0.183	0.038	4.847	0.000	0.395
Manufacturing occupation		Omitted					
Home owner	*	HOMEOWN	0.192	0.033	5.798	0.000	0.582
Children		CHLD	0.026	0.033	0.785	0.433	0.499
Military service	*	MILSERV	0.306	0.076	4.025	0.000	0.959
East region		Omitted					
Midwest region	*	MIDWEST	-0.128	0.058	-2.200	0.028	0.123
South region		SOUTH	0.085	0.045	1.900	0.057	0.338
West region		WEST	0.027	0.044	0.616	0.538	0.372
Hispanic		Omitted					
White	*	WHITE	-0.130	0.033	-3.982	0.000	0.686
Black		BLACK	-0.228	0.136	-1.680	0.093	0.017
* Variables that are significant at the 0.05 level.							

Marginal effects for the significant variables are displayed in Table 5. In each case, we calculated a baseline probability based on the mean values of each explanatory variable. We then calculated a test probability in which the value of each explanatory variable was increased. For categorical

variables like sex, race or marital status, the baseline probability sets the value for that variable to 0; for the test probability, the value was set to 1. For continuous variables like age, we simulate the effect by calculating a base probability at the mean value of the variable and a test probability at the mean value plus one.

For example, the regression indicates that marriage increases the probability of self-employment by 23.0 percent at the margin, and home ownership increases the probability by 45.7 percent. However, military service exhibits one of the largest marginal effects on self-employment: the probability of self-employment increases by 88.0 percent for those with previous military service over those without.

Table 5: Control Dataset Marginal Results

Description	Marginal % Change
Age	3.17%
Married	23.03%
Male	-47.74%
Professional occupation (relative to manufacturing occupation)	70.05%
Service occupation (relative to manufacturing occupation)	43.65%
Homeowner	45.68%
Military Service	88.01%
Midwest Region (relative to East Region)	-22.80%
White (relative to Hispanic)	-22.05%

6.2 Veterans Analysis Dataset

The next step is to take a closer look at the aspects of military service that may influence a tendency to self-employment to determine whether similar pre-existing traits make both self-employment and military service attractive, or whether the military provides some training or discipline that encourages veterans to start their own businesses. We analyze the veterans analysis dataset to determine whether the distribution of the sample of military veterans is substantively different from the distribution taken from the larger civilian sample and, if so, what characteristics may be responsible for the differences. The results of this analysis are displayed in Table 6.

Table 6: Veterans Analysis Dataset PROBIT Results

Description		Variable	Coeff.	St.Er.	b/St.Er.	Significance Level	Mean of X
		Constant	-2.795	0.100	-28.075	0.000	
Age	*	**AGE**	0.032	0.001	24.414	0.000	51.881
Married		**MARR**	-0.047	0.031	-1.527	0.127	0.724
Male	*	**MALE**	0.296	0.064	4.614	0.000	0.932
White	*	**WHITE**	0.140	0.044	3.148	0.002	0.882
High school graduate		**Omitted**					
College graduate		**COLEDUC**	-0.017	0.030	-0.552	0.581	0.281
Disabled		**DISAB**	-0.050	0.044	-1.137	0.255	0.110
Career service 5+ years	*	**CAREER**	-0.243	0.034	-7.149	0.000	0.223
Non-career service		**Omitted**					
Has children	*	**CHILD**	0.142	0.037	3.837	0.000	0.251
Professional occupation		**Omitted**					
Service occupation	*	**SVCOCC**	-0.412	0.033	-12.621	0.000	0.300
Manufacturing occupation	*	**MANOCC**	-0.473	0.033	-14.140	0.000	0.348
* Variables that are significant at the 0.05 level.							

Several differences between the control dataset and the veterans analysis dataset are apparent. As illustrated in Table 7, veterans who chose the military as a career path (those with five or more years of service) are about 33 percent less likely to be self-employed than those who left after one enlistment. This could be due to more lucrative opportunities with defense and other contractors for experienced military veterans than for those with less experience. However, this finding argues against the hypothesis that military service and training increase the likelihood that individuals will become self-employed.

The marginal impact of the age variable almost doubles (from 3.17 percent to 5.18 percent) when we compare the control dataset to the veterans dataset (Tables 5 and 7, respectively); marital status is no longer significant; and the male and white effects both now have a positive effect on self-employment. Veterans with children are also more likely to be self-employed. Veterans employed in service occupations are 46.9 percent less likely to be self-employed, and those in manufacturing occupations are 52.3 percent less likely to be self-employed in relation to veterans in professional occupations.

Table 7: Veterans Analysis Dataset Marginal Results

Description	Marginal % Change
Age	5.18%
Male	65.99%
White (relative to Hispanic)	25.93%
Career service 5+ years	-33.16%
Has children	25.06%
Service occupation (relative to professional occupation)	-46.94%
Manufacturing occupation (relative to professional occupation)	-52.25%

The data in the veterans analysis dataset include the calendar year of separation, which allowed us to create dummy variables for whether the individual was a Vietnam War era veteran (VVET), a veteran of the pre-Vietnam War era (PREVVET), or served after the war ended (POSTVVET). We ran an alternative PROBIT regression using these variables and years of service zone dummies instead of AGE. ZONEA includes up to 4 years of service; ZONEB includes 5 to 10 years of service; ZONEC includes 10 to 15 years of service; and ZONED (the omitted category) includes veterans with over 15 years of service. The results for this equation are shown in Table 8.

Table 8: Veterans Analysis Dataset Alternate PROBIT Regression

Description	Variable		Coeff.	St.Er.	b/St.Er.	Significance Level	Mean of X
	Constant	*	-1.538	0.079	-19.548	0.000	
Married	**MARR**		0.019	0.030	0.616	0.538	0.724
Male	**MALE**	*	0.335	0.064	5.217	0.000	0.932
White	**WHITE**	*	0.140	0.045	3.113	0.002	0.883
College graduate	**COLEDUC**		0.046	0.030	1.507	0.132	0.283
Disabled	**DISAB**		-0.020	0.044	-0.447	0.655	0.111
Vietnam veteran	**VVET**	*	0.389	0.032	12.316	0.000	0.352
Pre-Vietnam veteran	**PREVVET**	*	0.860	0.038	22.753	0.000	0.146
Up to 4 years of service	**ZONEA**	*	0.083	0.030	2.734	0.006	0.510
5 to 10 years of service	**ZONEB**		-0.012	0.048	-0.245	0.807	0.110
Over 15 years of service	**ZONED**		-0.068	0.060	-1.134	0.257	0.081
Service occupation	**SVCOCC**	*	-0.417	0.033	-12.730	0.000	0.300
Manufacturing occupation	**MANOCC**	*	-0.493	0.034	-14.614	0.000	0.345
* Variables that are significant at the 0.05 level							

Table 9 displays the marginal effects for the significant variables in the alternative regression. These results further illustrate that additional military service does not appear to increase the likelihood of self-employment. Veterans with four or fewer years of service were most likely to be self-employed. This finding suggests that, while military training and education during initial

indoctrination may encourage entrepreneurship, military retirement pay and other benefits may make self-employment more financially feasible.

Table 9: Veterans Analysis Dataset Alternative Marginal Results

Description	Marginal % Change
Male	77.03%
White (relative to Hispanic)	25.60%
Vietnam veteran (relative to post-Vietnam veteran)	89.24%
Pre-Vietnam veteran (relative to post-Vietnam veteran)	249.67%
Zone A (up to 4 years of service)	14.01%
Service occupation (relative to professional occupation)	-46.91%
Manufacturing occupation (relative to professional occupation)	-53.39%

The cohort of veterans who served in World War II, the Korean War, and the Vietnam-era were more likely to be self-employed relative to veterans serving since 2001, or Gulf War veterans, (10.9 percent vs. 3.6 percent; BLS, 2010). Interestingly, this last group of veterans served only during the period of the All Volunteer Force, while a large percentage of veterans from the first cohort groups were probably conscripts.

6.3 Military Retirees Analysis Dataset

Given the results of the veterans analysis dataset, it is useful to focus more closely on a sample of military retirees. The DMDC survey data on retirees from 2003 include several fields that offer a unique perspective that is not available in the CPS Veterans data. The dataset is restricted to individuals who receive military retired pay (generally, but not exclusively, with 20 or more years of service). The data include relatively more information about the nature of that service than is available in the CPS Veterans Supplement data.

The results of the initial regression on these data shown in Table 10 are similar to the findings from the veterans analysis dataset. Single and white retirees are more likely than married or black retirees to be self-employed. This model included dummy variables for branch of service; Marine Corps retirees were most likely to be self-employed, while Air Force retirees were least likely to be self-employed. Enlisted retirees were less likely than retired officers to be self-employed. This result is not surprising, given the previous findings on education, as enlisted service members are generally required to be high-school graduates and officers to be college graduates. Occupation effects were insignificant as were, for the most part, regional differences.

Table 10: Military Retiree Analysis Dataset PROBIT Regression Results

Description		Variable	Coeff.	St.Er.	b/St.Er.	P[|Z|>z]	Mean of X
		Constant	-3.343	0.124	-27.026	0.000	
Married	*	MARRIED	-0.122	0.035	-3.428	0.001	0.816
Hispanic	*	HISP	-0.161	0.078	-2.063	0.039	0.036
Homeowner	*	OWNHOME	0.091	0.041	2.205	0.027	0.845
Army branch		Omitted					
Navy branch		SVCNAVY	-0.046	0.034	-1.332	0.183	0.261
Marine branch		SVCMC	0.110	0.057	1.914	0.056	0.052
Air Force branch	*	SVCAF	-0.092	0.032	-2.918	0.004	0.334
White	*	WHITE	0.173	0.036	4.767	0.000	0.804
Black		Omitted					
Enlisted		Omitted					
Officer	*	OFC	0.250	0.028	8.786	0.000	0.246
Age	*	AGE	0.040	0.002	24.949	0.000	53.250
Midwest region		MIDWEST	0.021	0.063	0.332	0.740	0.125
West region	*	WEST	0.129	0.056	2.287	0.022	0.244
South region	*	SOUTH	0.135	0.053	2.536	0.011	0.553
East region		Omitted					
Career service 5+ years		CAREER	-0.401	0.084	-4.785	0.000	0.974
* Variables that are significant at the 0.05 level							

Table 11 shows the marginal effects of the significant variables from this model. Career retirees are about 50 percent less likely to be self-employed. However, one should note that military retirees with fewer than five years of service constitute a very small percentage of the sample (about 2.5 percent); these military retirees are likely to be disabled. Because active-duty military personnel must accumulate 20 years of service to qualify for non-disability retired pay, those in the sample with fewer than twenty years of service are undoubtedly receiving a disability retirement. Officers are 55.6 percent more likely to be self-employed than the enlisted. While home ownership still has a positive correlation on self-employment, the size of the effect is only about half of the effect seen in the control dataset model – just over 18 percent. In contrast, the effect of race is much more pronounced: white retirees are almost 40 percent more likely to be self-employed than are black retirees. Consistent with previous studies, older military retirees are more likely to be self-employed: an additional year in age increases the probability of self-employment by about 7.5 percent.

Table 11: Military Retiree Analysis Dataset Marginal Results

Description	Marginal % Change
Married	-19.58%
Hispanic (relative to Black)	-26.26%
Homeowner	18.40%
Air Force retiree (relative to Army)	-15.55%
White (relative to Black)	38.19%
Officer (relative to Enlisted)	55.62%
Age	7.48%
West region (relative to East)	27.10%
South region (relative to East)	28.43%
Career service 5+ years	-48.73%

The next regression iteration examines the effects of education and length of military service directly rather than through the officer/enlisted and career/non-career variables. The Armed Forces Qualification Test (AFQT) variable is a measure of general aptitude. Higher scores generally indicate an ability to perform well at more technical jobs. We also measure the length of military service directly using the years of service (YOS) variable. The results are reported in Table 12.

Table 12: Military Retiree Analysis Dataset Alternative Regression Results

Description		Variable	Coeff.	St.Er.	b/St.Er.	P[|Z|>z]	Mean of X
		Constant	-1.992	0.121	-16.498	0.000	
Married	*	**MARRIED**	-0.079	0.039	-2.037	0.042	0.812
Hispanic		**Omitted**					
Homeowner	*	**OWNHOME**	0.115	0.044	2.603	0.009	0.838
Army branch	*	**SVCARMY**	0.112	0.035	3.204	0.001	0.349
Navy branch		**SVCNAVY**	0.034	0.038	0.908	0.364	0.269
Marine branch	*	**SVCMC**	0.137	0.067	2.043	0.041	0.046
Air Force branch		**Omitted**					
White	*	**WHITE**	0.315	0.075	4.225	0.000	0.790
Black		**BLACK**	0.039	0.080	0.486	0.627	0.176
AFQT score	*	**AFQT**	-0.004	0.000	-9.037	0.000	37.680
Midwest region		**Omitted**					
West region	*	**WEST**	0.185	0.051	3.610	0.000	0.243
South region	*	**SOUTH**	0.185	0.047	3.954	0.000	0.556
East region		**EAST**	0.068	0.073	0.929	0.353	0.064
Years of service	*	**YOS**	0.011	0.003	3.204	0.001	21.155
* Variables that are significant at the 0.05 level							

The alternate PROBIT regression on the military retirees analysis data displays a few unexpected results but overall is similar to the original regression. As shown in Table 13, each additional year

of military service increases the probability of self-employment by 2.1 percent. While previous findings suggested that careerists are less likely to be self-employed, this model shows a positive relationship between length of service and self-employment. Because virtually all of the military retirees in this sample have at least 20 years of service, this result may indicate a wealth effect; that is, military retirees with greater years of service receive a larger military pension and can therefore more easily weather any risk of income fluctuation associated with self-employment. Additionally, years of service will be highly correlated with age at entry into the civilian workforce. AFQT score has a small but significant marginal effect on self-employment probability; retirees are 0.73 percent less likely to be self-employed for each additional point in their AFQT scores.

Table 13: Military Retiree Analysis Dataset Alternative Marginal Results

Description	Marginal % Change
Married	-13.56%
Homeowner	24.35%
Army retiree (relative to Air Force retiree)	23.28%
Marine Corps retiree (relative to Air Force retiree)	28.92%
White (relative to Hispanic)	84.82%
AFQT score	-0.73%
West region (relative to Midwest region)	42.72%
South region (relative to Midwest region)	42.64%
Years of service	2.04%

6.4 Summary of Results

Next, we show a side-by-side comparison in Table 14 of the marginal regression results to give an overview of those variables that seem to have significant impact on self-employment. The marginal results are shown only for variables that were statistically significant at the .05 level; negative effects are shown in red. The control data show that military service has a significant positive effect on self-employment: veterans are at least 45 percent more likely than those with no active-duty military experience to be self-employed. The marginal effects for the veteran analysis and military retiree analysis data shed some light on why that differential exists.

Table 14: Comparison of Model Marginal Effects

Variable	Control Dataset 1	Control Dataset 2	Control Dataset 3	Veteran Analysis Dataset 1	Veteran Analysis Dataset 2	Military Retiree Analysis Dataset 2	Military Retiree Analysis Dataset 3
AGE	0.0317	0.0313	0.0320	0.0518		0.0748	
COLEDUC			-0.1791				
MARRIED	0.2303	0.2986	0.3004			-0.1958	-0.1356
MALE	-0.4774	-0.5690	-0.5739	0.6599	0.7703		
PROFOCC	0.7005	0.4778	0.2218				
SVCOCC	0.4365	0.3245		-0.4694	-0.4691		
MANOCC			-0.2838	-0.5225	-0.5339		
HOMEOWN	0.4568	0.5610	0.6372				
MILSERV	0.8801	0.4653	0.4532				
EAST		-0.1836					
MIDWEST	-0.2280	-0.2225					
SOUTH		-0.2308				0.2843	0.4264
WEST			0.1957			0.2710	0.4272
WHITE	-0.2205			0.2593	0.2560	0.3819	0.8482
HISP		0.3575				-0.2626	
CAREER				-0.3316		-0.4873	
VVET					0.8924		
PREVVET					2.4967		
ZONEA					0.1401		
CHILD				0.2506			
SVCARMY							0.2328
SVCMC							0.2892
SVCNAVY							
SVCAF						-0.1555	
ENL							
OFC						0.5562	
AFQT							-0.0073
YOS							0.0204

One interesting finding is that, for the control sample including non-veterans, males are consistently less likely to be self-employed than otherwise similar females. However, we find the opposite effect among the veterans-only analysis sample (results on gender were insignificant in the military retiree analysis sample). Likewise, the effects of marital status are positive for the control sample, negative for the military retiree analysis sample.

By far the most interesting results are those from the veterans-only analysis and military retiree analysis samples relating to length of military service. Among all veterans, those with longer military careers are less likely to be self-employed. The exception is among the subgroup of

veterans who are career military retirees with service of twenty years or more. In this case, additional years of service are correlated with a higher probability of self-employment. Military pensions increase with length of service; a member who retires with twenty years of service will receive a pension equal to 50 percent of Basic Pay, while a member who retires with thirty years of service will receive a pension equal to 75 percent of Basic Pay. Therefore, a positive relationship between self-employment and tenure within this sample may simply be due to a wealth effect – i.e., larger pensions allows some military retirees to better undertake potentially risky self-employment.

Taken together, these findings suggest that military service does not impart, through education and training, or through indoctrination, qualities that encourage self-employment and entrepreneurship. While the control sample results reaffirm that veterans are more likely to be self-employed than are non-veterans, probability of self-employment decreases with the length of the military career.

7. Comments & Conclusion

We confirmed, as has been previously shown (Moutray, 2007), that military service is highly correlated with self-employment probability. We extend the analysis to consider which aspects of military service (if any) seem to encourage entrepreneurship. Among the education and training variables, the only significant difference is the vastly higher probability of self-employment by officers compared to enlisted veterans. We suspect that this higher probability of self-employment is attributable to differences in education, as most officers hold a bachelor's degree or higher and most enlisted veterans are high school graduates or better. The measured differential between officers and the enlisted is similar to the differential between high school graduates and college graduates in the broader control sample.

We have shown that veterans are more likely to be self-employed, but we did not find any evidence in the veteran or military retiree samples that would suggest that it is military training, education, or culture that predisposes individuals toward entrepreneurship. If that were the case, careerists would be more likely than one-term veterans to be self-employed. Consistently positive self-employment effects with respect to military service are limited to variables related to length of service, age, and membership in the Marine Corps. One explanation for this may be that those who enter the military and have an entrepreneurial predisposition toward self-employment may tend to leave the service earlier, rather than continue their career in a large organization with many bosses.

An alternative, albeit less likely, explanation is that military training and education do have a positive effect on the self-employment decision, but that effect is largely due to inculcation of the military culture and discipline, which occurs during the first few years of service. The most intense military training occurs in the first year (more or less depending on the chosen military community) at boot camp and initial training for the member's military specialty. However, the data available do not permit us to test this explanation directly.

Age and home ownership among the other general demographic variables show consistent positive and significant effects on self-employment and are highly correlated to stability and maturity as well as providing a potential supply of risk capital for those veterans that save their money. Race is statistically significant for whites and Hispanics; white members of the population are more likely to be self-employed while Hispanics are more likely to be self-employed in the control dataset but less likely in the veterans analysis dataset. The effect of other races on self-employment was statistically insignificant.

Regional and occupational variables had mixed effects with the exception of the West region, which had consistently positive effects on self-employment, and the manufacturing occupations, which had consistently negative effects.

In sum, for the broad control dataset, the strongest candidates for self-employment will be older married homeowners who are military veterans from the West who work in professional or service occupations. For the veteran analysis and military retiree datasets, the strongest candidates will be older white former first-term Marine Corps officers from the Vietnam War era or earlier that are homeowners from the West or South.

The results offer some potential avenues for encouraging entrepreneurship among veterans and non-veterans as well. The model findings increase understanding of the attributes of individuals who are predisposed to start their own businesses. We confirm the findings of earlier studies that show significant positive effects for military service on the probability of self-employment, and we are able to quantify those marginal effects in the range of 45 percent to as high as 88 percent.

Some of the demographic variables (such as age and homeownership) that are correlated with self-employment are also indicators of highly stable individuals. These types generally are the preferred customers of lending institutions and may have greater access to loans for business. The higher probability of self-employment for short-term veterans may indicate that they initially preferred a highly structured environment (which caused them to join the service) but then discovered that they prefer the view from the top (giving orders vs. taking them).

Further study using richer data on the nature of military service and post-service employment history might shed additional light on this important topic. The results of this analysis suggest that, if military service does inculcate qualities conducive to entrepreneurship, the process occurs within the first few years of service. We cannot reject the hypothesis that veterans' innate characteristics, rather than any effect of military service, lead to higher rates of self-employment.

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