Experiences of women and minoritized US military veteran business owners: descriptive evidence on "vetrepreneur" survival and growth

Kristopher Deming
United States Air Force Academy, Air Force Academy, Colorado, USA
Craig Wesley Carpenter
Michigan State University, East Lansing, Michigan, USA, and
John Anders
Trinity University, San Antonio, Texas, USA

Abstract

Purpose – Publicly available datasets in the USA present data suppression issues that limit the ability to investigate entrepreneurial subgroups like military veterans, which account for about one in ten entrepreneurs in the USA. Thus, despite public desire to support veteran entrepreneurs ("vetrepreneurs"), there is a limited descriptive understanding on the relationship between veteran business owner demographics, such as gender and race, and their business survival and growth. We address this limited understanding in this article by providing descriptive evidence on veteran-owned business survival and growth, emphasizing variation across race and gender.

Design/methodology/approach – We use limited-access longitudinal microdata to provide descriptive evidence on the survival and growth of veteran-owned firms across race and gender.

Findings – Findings indicate statistically significant variation across demographic subgroups' business survival and employment growth. For example, veteran-owned firms have high women ownership rates, greater employment, revenues and payrolls, but also lower employment and revenue growth. More generally we provide descriptive evidence that military experience or the military community help women overcome the gender gap in small business survival.

Originality/value – This type of descriptive research is common among entrepreneurial researchers, however, peer-reviewed research specific to US veterans is very limited. These descriptive results are useful for policymakers and for spurring future policy research related to veteran entrepreneurs.

1. Introduction

US military veterans are more likely to own a business than nonveterans, with the share of businesses owned by veterans being twice their share of the population (Bernstein, 2016). Veterans' personal attitudes and beliefs, including entrepreneurial self-efficacy, risk propensity and tolerance of ambiguity, may increase their entrepreneurial intentions (Cater and Young, 2020). Further, the number of veteran-owned business is rapidly rising. Specifically, between 2007 and 2012, the number of veteran-owned businesses rose by 3% to 74,074, to reach 2.5 million (Bernstein, 2016). Compounding these trends are the population growth among veterans transitioning from service. The U.S. Department of Veteran Affairs (2007) estimates that more than 200,000 service members are transitioning from the military every year. In addition to the large increase in the number of veteran entrepreneurs in the USA, there are known divisions across demographic subgroups, such as age and gender, in terms of business survival and growth (Hope *et al.*, 2011). For example, women were solely responsible for the overall increase in the number of veteran-owned firms over the last decade. Specifically, from 2007 to 2012, the number of female veteran-owned firms approximately quadrupled, from 97,114 to 383,302 (Fairlie, 2012; Bernstein, 2016) [1]. Investigations into the causes of these differences within vetrepreneurs, as well as between veteran and non-veteran business owners are needed.

Despite this increasing importance and known divisions in business growth and survival, academic research even describing veteran entrepreneurs ("vetrepreneurs") remains limited in important ways. In part due to public data limitations, much of the understanding of vetrepreneurs relies on high-quality – though non-peer-reviewed – fact sheets (Fairlie, 2012; Hipple and Hammond, 2016; Sobota, 2017; Maury *et al.*, 2022). While these fact sheets are valuable for motivating this article, by the nature of short non-peer-reviewed fact sheets, their descriptions are limited and disjoint.

Using administrative data, this article examines the descriptive associations between being a vetrepreneur and business survival and growth. The understanding over these associations – especially how they vary by demographic subgroups – is limited. This article provides descriptive evidence that military service counters entrepreneurial outcome differences by race and gender. This type of descriptive research is important because it can spur additional research questions and inform practical policy questions related to supporting veteran entrepreneurs. This article will thus enhance vetrepreneur research by leveraging large limited-access federal datasets and drawing on proven techniques used in other descriptive entrepreneur subgroup research to examine a range of outcomes for vetrepreneurs, including business survival, revenue, revenue growth, and employment growth.

The rest of this article is organized as follows. In the next section, we review existing descriptive research on vetrepreneurs, as well as previous approaches to describing differences among entrepreneurial subgroups. Then, we describe the creation of or sample from federal survey and administrative data. Next, we describe our empirical approach and the results. We conclude by summarizing the article and delineating implications for future research.

2. Related veteran and entrepreneurship research

Although studying factors associated with entrepreneurship and small business has dominated the literature in general, there is a dearth of studies that investigate business and

business-owner characteristics associated with veteran-owned businesses in the USA, primarily because of difficulties obtaining access, using, and reporting results from the data. Researchers have conducted numerous studies on gender differences in business ownership and on minority-owned business using Federal Statistical Research Data Center (FSRDC) data, demonstrating the feasibility of our strategy, but those studies have not focused on veteran-owned businesses nor the intersection of veteran status and other identities such as race and gender, which we discuss in great detail below (Fairlie and Robb, 2009; Fairlie and Meyer, 1996; Carpenter and Loveridge, 2018; Yusuf, 2015; O'Brien et al., 2019). However, there are potential bidirectional effect of military service on social outcomes and research on labor market and entrepreneurial outcomes are individualistic explanations that may overlook a social structuralist perspective on labor market outcomes that may manifest in veteran entrepreneurship (Kleykamp, 2013a, b; MacLean and Elder, 2007).

The overarching context of this article is resultantly the theory of occupational choice in which individuals prefer occupations where they can be around others who they perceive as similar and in which they can use their skills and abilities, and express their values (Holland, 1966). It may be the military service helps develop leadership and risk-taking skills (or that it attracts individuals who already pursue these areas). On the other hand, it may be that entering the labor market is easier after being a veteran for women and minoritized groups because they are now perceived to share in skills and values (i.e. it may be that discrimination is diminished). Thus, we argue that the context of military veteran entrepreneurship involves both the context of skills and obstacles created during the military service, and the potential for those skill and obstacles to support (or hurt) veteran business owners. Hence, we divide this section into two parts, first reviewing research on the effects of service on veteran labor market outcomes. Second, we briefly review the descriptive entrepreneurship research on different entrepreneurial subgroups, such as entrepreneurs of different genders or racialized groups, noting the foundational role this descriptive research played in motivating later causal research.

2.1 Background: the effects of military service on entrepreneurial skills and firm performance effects

Understanding the effects of military service has long been of policy interest. Despite this broad literature on veterans, little is known even descriptively about veteran entrepreneurs. Even though veterans are more likely to be entrepreneurs than non-veterans, some research indicates that once controlling for race and other demographic factors, veterans are actually less likely to become self-employed than their non-veteran counterparts (Fairlie and Meyer, 1996; Fairchild, 2008). Fairlie and Meyer (1996) and Fairchild (2008) did not examine the business outcomes for these groups of self-employed entrepreneurs. Furthermore, the literature also contains contradictory findings which suggest that veterans are more likely to be entrepreneurs than non-veterans (Hope et al., 2011). To better understand the existing evidence in the literature, in this section, we briefly review studies concerning the effect of military service on skill acquisition, as well studies which theorize about how those skills might impact firm performance.

It has been theorized that military service helps to develop several skills relevant to entrepreneurship, such as leadership, networking, teamwork, discipline, hard work, and independence (Crecente et al., 2021; Hardison et al., 2017; Stepanov et al., 2019; Silvala et al., 2023). In theory, these skills could each explain the link between military service and the choice of entrepreneurship as a civilian career. For example, military service as a source of leadership development could have an effect on entrepreneurship via leadership theory (Gupta et al., 2004). It has also long been theorized that women and minoritized groups disproportionately benefit from military service in terms of skill acquisition (Gade et al., 1991).

Despite this potential for skill acquisition, the labor market appears to undervalue military experience (Davis and Minnis, 2017; Greer, 2017; MacLean, 2017). Part of this apparent undervaluation could result from the perceived potential costs of military service, such as post-traumatic stress, depression, and other mental and physical health concerns (Simpson and Armstrong, 2009). Consistent with our theoretical framework of occupational choice, then, some veterans might be pushed into entrepreneurship rather than pulled by opportunities (Payne, 2015; Teachman and Call, 1996).

Regardless of whether military veterans are pushed or pulled into entrepreneurship, many of the aforementioned skills developed during military service are associated with firm performance. For example, firm leadership has a strong association with firm performance and growth (Jensen *et al.*, 2020; Koryak *et al.*, 2015; Peterson *et al.*, 2009). Similarly, business owner networking has a strong positive association with firm performance and growth (Burlina, 2020; Watson, 2007), but there are questions about inequalities for women and minoritized entrepreneurs with respect to networking (Watson, 2012). Finally, teamwork is an important factor related to firm performance. In particular, better teamwork and collective efficacy are associated with revenue and employment growth (Brinckmann and Hoegl, 2011; Hebles *et al.*, 2023; Otache, 2019). However, once again, teamwork is an entrepreneurial skill in which there are potential gender inequities (Ahmad *et al.*, 2018; Ayoko, 2020), so, once again, military service may disproportionately benefit women and minoritized groups in terms of form performance. In sum, the literature on military service skill development, entrepreneurial skill development, and entrepreneurial inequities among genders and minoritized entrepreneurs, coalesce to motivate the descriptive analysis in this article's focus on firm survival and growth for women and minoritized veteran entrepreneurs.

2.2 Background: descriptive entrepreneurship research

Describing inequalities in entrepreneurship across demographic groups plays a foundational role in entrepreneurship research. The availability of quality administrative and survey microdata accelerated this trend as essential to answering research question on the frontier of entrepreneurship research (Farhat *et al.*, 2018). For example, Fairlie (1999) provides descriptive evidence that there are fewer Black entrepreneurs and describes the association between funding and fewer intergenerational connections for Black entrepreneurs. Fairlie (2004) continued to provide descriptive evidence on the rates of entrepreneurship potentially converging between Black and White business owners, as well as descriptive evidence on self-employment rates for low-income individuals (Fairlie, 2005). As the availability of administrative data continued to improve (especially in terms of sample sizes), researchers continued to provide descriptive evidence related to immigrant entrepreneurship (Braymen and Neymotin, 2014) Black entrepreneurship (Fairlie and Robb, 2007; Fairchild, 2008), Asian entrepreneurship (Robb and Fairlie, 2009) Latino entrepreneurship (Lofstrom and Bates, 2009; Carpenter and Loveridge, 2018, 2019, 2020), entrepreneurship in different types of locations, especially the effects of rurality (Stearns *et al.*, 1995), and entrepreneurship among genders (Fairlie and Robb, 2009; Coleman and Robb, 2009; Conroy and Weiler, 2015, 2016; Birhanu *et al.*, 2022; Hundley, 2001).

Descriptive finding on differential outcomes by race and gender have been critical to further research on the respective causes of these differential outcomes. For example, drivers of entrepreneurship assistance program use varies by gender (Yusuf, 2015). Specifically, education, business/entrepreneurial knowledge and involvement in a technology-based start-up are drivers of program use by women, while personal network size, entrepreneurial experience of start-up team, and having worked for parents' business are drivers of program use by men (Yusuf, 2015). Other researchers have further found that the needs of entrepreneurs vary by race and gender (Lougui and Nyström, 2014), with under-represented

groups in entrepreneurship requiring new forms of assistance (O'Brien *et al.*, 2019). Needs also vary by rurality, with significant differences in rural-urban entrepreneurial skills and firm performance (Fortunato, 2014; Laurin *et al.*, 2020; Owoo and Naudé, 2017). Indeed, that military veterans are disproportionately likely to locate in rural areas (Holder, 2017), emphasizes the importance of including a measure of rurality in this article's analysis.

Descriptive research provided a foundation for researchers to build further evidence (then both descriptive and causal) and improve the understanding of the causes of these descriptive differences (Robb and Watson, 2012; Justo *et al.*, 2015) and associated policy prescriptions and efficacy (Van der Zwan *et al.*, 2012; Bates and Robb, 2013; Fairlie *et al.*, 2015). Much of this research is receiving important new advancement in entrepreneurship research due to increasing interest in issues of intersectionality and transitional entrepreneurship (Pidduck and Clark, 2021; Bruton *et al.*, 2021). Of course, there are also valuable theoretical contributions on minoritized firms and the barriers that they face and how that affects minoritized firm survival (Shelton, 2010; Baù *et al.*, 2017).

Despite these long lines of research across racialized and gendered groups – and the long lines of research on the labor market effects of service – as well as the fact the veterans are disproportionately likely to become entrepreneurs, there is limited peer-reviewed descriptive research on veteran entrepreneurs. We will thus fill this missing foundational descriptive role by developing descriptive evidence on veteran entrepreneur survival and growth, additionally overlaying racialized and gendered business owner interactions.

3. Data

The Survey of Business Owners (SBO) is conducted by the US Census Bureau as part of its economic census (U.S. Census Bureau, 2016). This article uses the data 1997–2016, with surveys every five years to provide detailed information on selected economic and demographic characteristics for businesses and business owners [2]. The universe of firms included are all non-farm businesses filing IRS tax forms as individual proprietorships, partnerships, or any type of corporation, and with receipts of at least $1,000. Included are both firms with paid employees and those without. In 2012 the survey was distributed to 1.75 million businesses of which approximately 66.2% responded [3].

In addition to the SBO, we also use data from the Longitudinal Business Database (LBD) from the US Census Bureau (Jarmin and Miranda, 2002). The LBD is an annual census of business establishments and firms in the USA with paid employees covering all industries and states. The LBD contains the universe of tax-filing firms and establishments annually from 1976 to 2019. For example in 2013, the LBD contain over 8.5 million firms. The LBD allows us to observe start-up year, closure year, location, as well as annual measures of employment and revenue for all firms in the SBO. Table 1 lists and defines each of the variables which were gathered from these sources and how they are measured.

Out of the approximately 27,000 firms, 22.7% are veteran owned. Interestingly, veteran owned businesses are more likely to have female ownership [4] than their non-veteran counterparts, but both are just as likely to have minority ownership. Previous research has been inconsistent on whether women veterans are more likely to enter entrepreneurship because descriptively, veterans are over represented (Bernstein, 2016), but some research indicates that one researchers control for race and other individual factors, being a veteran actually reduces odds of becoming an entrepreneur (Fairlie and Meyer, 1996; Fairchild, 2008). The summary statistics (Table 2) also show that veteran owned firms exhibit greater employment, greater revenues, and higher payrolls. Veteran firms also have lower employment and revenue growth than their non-veteran owned counterparts as well as being more likely to have ceased operating during our sample period. We explore these unconditional differences further in our empirical analysis.

Variable	Description
Employment growth	Year-to-year percentage change in the number of paid employees at the firm
Revenue ($1,000s)	Real firm revenue (2020 base) from sales revenue, service revenue, and other income streams
Revenue growth	Year-to-year percentage change in the amount of revenue a firm collects
Veteran	Indicator variable for whether the firm owner is a veteran. For firms where there are more than one owner, the firm must have an ownership group where veterans comprise more than half of the ownership
Female	Indicator variable for whether the firm owner is female. For firms where there are more than one owner, the firm must have an ownership group where women comprise more than half of the ownership
Minority	Indicator variable for whether the firm owner is a non-white minority. For firms where there are more than one owner, the firm must have an ownership group where non-white minorities comprise more than half of the ownership
Micro	Indicator for whether the county in which the firm is located is a micropolitan county using the 2020 definitions. A micropolitan county is part of a micropolitan statistical areas. These areas are determined by the Office of Budget and Management and are associated with at least one population center of at least 10,000 people but less than 50,000 people
Rural	Indicator variable for whether the firm is located in a county that is neither part of a metropolitan statistical area or a micropolitan statistical area
Firm age	The age in years since the firm was established
Employment	The number of paid employees at a firm. Paid employment consists of all full and part-time employees, including those on sick leave, holidays, and vacation. Proprietors and partners of unincorporated businesses are not included
Payroll ($1,000)	Real total compensation (2020 base) paid to employees at the firm

Table 1.
Data description for variables

Variable	All mean ± SD Obs = 520,000	Veteran owned mean ± SD Obs = 118,000	Non-veteran owned mean ± SD Obs = 402,000
Veteran	0.227 ± 0.419		
Female	0.61 ± 0.488	0.688 ± 0.463	0.588 ± 0.492
Minority	0.123 ± 0.328	0.119 ± 0.324	0.124 ± 0.329
Employment	17.78 ± 51.4	19.15 ± 44.26	17.37 ± 53.31
Employment growth	0.067 ± 0.55	0.051 ± 0.524	0.071 ± 0.556
Revenue ($1,000s)	4,600 ± 15,000	5,000 ± 17,000	4,400 ± 14,000
Revenue growth	−0.055 ± 0.344	−0.062 ± 0.354	−0.054 ± 0.342
Firm age	12.95 ± 9.442	13.59 ± 9.665	12.76 ± 9.367
Died	0.618 ± 0.486	0.658 ± 0.474	0.606 ± 0.489
Payroll ($1,000s)	2,000 ± 50,000	2,600 ± 72,500	1,900 ± 41,500
Metropolitan	0.775 ± 0.418	0.776 ± 0.417	0.775 ± 0.418
Micropolitan	0.122 ± 0.327	0.134 ± 0.34	0.119 ± 0.323
Rural	0.103 ± 0.304	0.09 ± 0.287	0.107 ± 0.309

Note(s): Veteran, Female, Minority, Died, Metropolitan, Micropolitan, and Rural are indicator variables for if a firm is owned by a veteran, female, or minority, for it a firm did not survive during the observation period, and for if an establishment is located in a Metropolitan, Micropolitan, or rural area (based on the 2,000 OMB metropolitan classification codes). Employment is a total number of employees and employment growth is the 1-year percent employment change. Revenue is the total revenue in thousands of dollars and revenue growth is the 1-year change in total revenue. Payroll is the total payroll in thousands of dollars. Firm age is the number of years that a firm has existed. Data is 1997–2012 waves of the SBO matched to 1977–2016 years of the LBD
Source(s): Authors' own work

Table 2.
Summary statistics of sample

4. Empirical approach

We descriptively examine the relationship between veteran ownership of firms and firm performance outcomes. We emphasize that our analysis is descriptive rather than causal and that whatever factors drive selection into military service may also be correlated with entrepreneurial proclivities or with business acumen or other factors relevant to firm outcomes. In particular, we examine the relationship between veteran ownership of firms and employment growth, firm revenue, revenue growth, and firm survival using two approaches. For employment growth, firm revenue, and revenue growth we employ a panel random effects model. This method allows us to estimate the relationship between the time-invariant owner characteristics, such as whether the owner is a veteran, on these outcomes. To empirically test these relationships we estimate:

$$
\begin{aligned}
Y_{it} = \alpha &+ \beta_1 Veteran_i + \beta_2 Female_i + \beta_3 Veteran_i \times Female_i + \beta_4 Minority_i \\
&+ \beta_5 Veteran_i \times Minority_i + \beta_6 Micro_i + \beta_7 Veteran_i \times Micro_i + \beta_8 Rural_i \\
&+ \beta_9 Veteran_i \times Rural_i + \beta_{10} FirmAge_{it} + \beta_{11} X_{it} + U_i + \varepsilon_{it}
\end{aligned}
\tag{1}
$$

where i indexes firms and t indexes years. Here Y_{it} is the outcome of interest: employment growth, yearly firm revenue, or revenue growth. We estimate the random effects model because the main relationships that we are interested in are the correlations between these business outcomes and time invariant characteristics of the business owners. We include the indicators for veteran, minority, and female ownership and make them interact to assess if there are differences across these demographic subgroups of firm owners. In addition to the full specifications, we also test dropping some coefficients [5].

Given differences in entrepreneurship across rurality (Faggio and Silva, 2014; Freire-Gibb and Nielsen, 2014), we are also interested in differences how the location of these veteran-owned firms impacts the outcomes of interest. To capture these associations, we include two geographic indicators, one identifying firms in micropolitan counties ($Micro_i$) and one identifying firms in rural counties ($Rural$) as well as their interactions with the veteran indicator [6]. As is common to entrepreneurship research (Millán *et al.*, 2012; Rocha *et al.*, 2015; de Jong and Marsili, 2015; Baù *et al.*, 2017; Tavassoli *et al.*, 2022), to examine the probability of survival for vetrepreneurs, we also estimate a Cox proportional hazard model for firm survival:
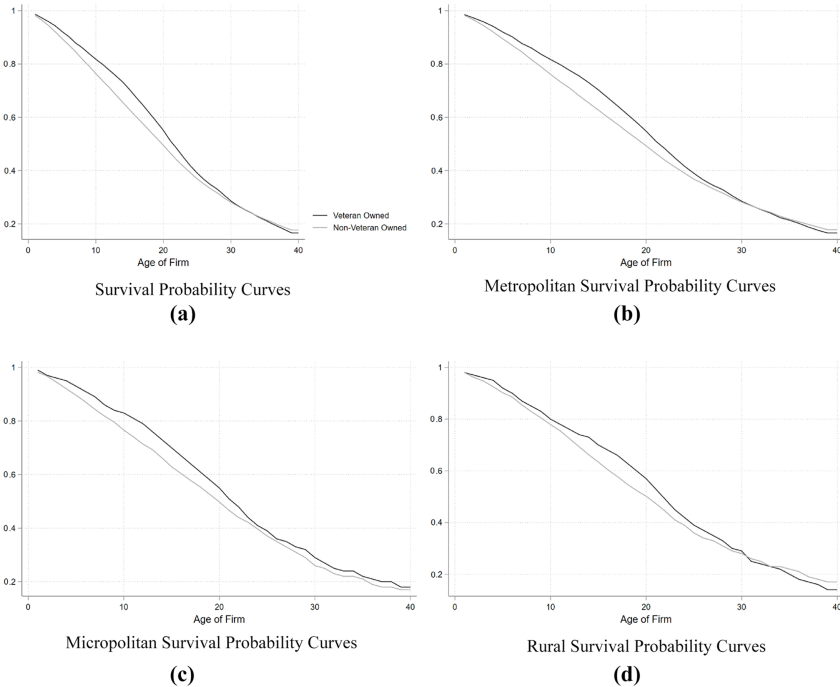
$$
\begin{aligned}
h(t) = h_0(t) \times \exp(&b_1 Veteran + b_2 Female + b_3 Veteran \times Female + b_4 Minority_i \\
&+ b_5 Veteran_i \times Minority_i + b_6 Micro._i \\
&+ b_7 Rural_i + b_8 Veteran_i \times Micro._i + b_9 Veteran_i \times Rural_i + b_{10} Payroll)
\end{aligned}
\tag{2}
$$

where $h(t)$ is the hazard rate of a firm death at time t and $h_0(t)$ is the baseline hazard rate of firm death. As we are concerned with how ownership characteristics affect the survival of firms we include a similar set of variables as in the Equation (1). We include indicators for veteran ownership, female ownership and racial minority ownership, to examine if these firms have different survival rates than their complements. We also interact these indicators to assess if there are different survival rates across different subgroups of vetrepreneurs. Firm location may also affect firm survival, so we include indicators for whether the firm is in a micropolitan or rural county, using the same population delineations as before. These indicators are interacted with the veteran ownership indicator to test for differences in geographic location of vetrepreneurs as well. Average payroll over the life of the firm is included to control for how the size of a firm's payroll may affect its survival [7].

5. Results

5.1 Vetrepreneur survival

Figure 1a plots the survival curves for veterans compared to non-veterans, showing that veteran-owned firms are more likely to survive than non-veteran-owned firms. (Note that survival models are interpreted as odds of non-survival, so lower numbers are increased odds of survival.) However, the increased survival appears to be driven by firms that are less than 30 years old. Figure 1 b–d show limited variation across rurality status of the firm's location. Interacting rurality with owner demographics, Figure 2 (and Table A1) plots the coefficients estimates using the Cox Proportional Hazard Model. We find that, specifically, compared to non-veteran-owned firms, the probability of a veteran owned dying in the next year is about 5% lower conditional on payroll (Table A1 Column 1). When this reduction is compared to the sample rate of firm death from Table 2, this translates to reduction in the likelihood of firm death by about 8.2% relative to the mean. When we control for other demographic and geographic characteristics of the business owners, the likelihood of the firm dying decreases by about 7% for owners who are veterans, male, and racialized as White.

Survival Probability Curves
(a)

Metropolitan Survival Probability Curves
(b)

Micropolitan Survival Probability Curves
(c)

Rural Survival Probability Curves
(d)

Note(s): Figure shows survival curves for veteran and non-veteran entrepreneurs by rurality. Figure 1a shows the survival curves estimated using all observed firms. Figure 1b, 1c, and 1d show the survival curves comparing veterans and non-veterans for firms located in metropolitan, micropolitan, and rural areas, respectively. The metropolitan and micropolitan definitions follow the U.S. Office of Management and Budget's (OMB) county-level definitions, with rural counties those not otherwise defined by OMB. Data is the quinquennial Survey of Business Owners (1997-2012) linked to the annual Longitudinal Business Database 1976-2020

Source(s): Authors' own work

Figure 1.
Vetrepreneur survival curves by rurality
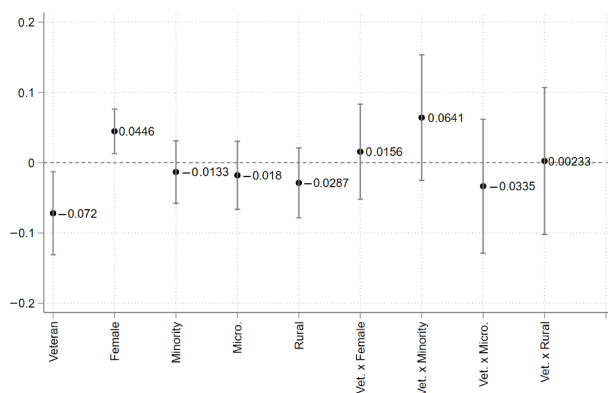
Note(s): Figures shows a coefficient plots based on a Cox Proportional Hazard Model (Equation 2). A positive coefficient indicates an increased odds of business exit. Estimates control for firm payroll amounts. Data is the quinquennial Survey of Business Owners (1997-2012) linked to the annual Longitudinal Business Database 1976-2020. Tabular results are available in Table A1
Source(s): Authors' own work

Consistent with the previous research differences in survival rates by owner gender, we find that female-owned firms are less likely to survive to the next year. Non-veteran female-owned firms are about 4.6% less likely to survive when compared non-veteran male-owned firms. However, veteran female-owned firms fare better when compared to non-veteran female-owned firms. We find that these firms have an increased likelihood of survival of about 5.5% (Veteran + Veteran $\times$ Female = -0.0564; SE = 0.02265) versus a non-veteran female-owned firm. We also find descriptive evidence that being a veteran offsets the female penalty that non-veteran female owned firms encounter. Veteran female-owned firms are not statistically different than the non-veteran male-owned firms (Veteran + Female + Veteran $\times$ Female = -0.0118; SE = 0.0237). When we examine non-veteran non-minority-owned firms and veteran minority-owned firms we do not find evidence that these firms have different likelihoods of firm survival. Given previous research indicating substantial differences across racialized groups in business survival rates, the lack of significance here provides descriptive evidence that military service is able to reduce or even eliminate well known racial gaps in business survival. This finding is analogous to the findings related to service's effect on labor market outcomes in which service provides labor market benefits to racialized groups. Overall, our results suggest that veteran-owned firms have better survival outcomes and that military service benefits business owners from marginalized groups.

5.2 Vetrepreneur revenue
Revenue is newly available in the LBD for the years 1997–2015 (Haltiwanger *et al.*, 2019). For this reason, revenue has not been used in descriptive entrepreneurial research based on the LBD to our knowledge. Figure 3 (and Table A2) show the coefficients and standard errors with revenue as the outcome variable. For all veterans, we do not observe statistically significant differences in real firm revenues. We do observe differences though for firms owned by male veterans who are racialized as White. These firms have 13% higher annual revenues than the non-veteran-owned counterparts. This advantage also extends to female owned firms who have revenues that are 1.014 million dollars greater than male owned firms
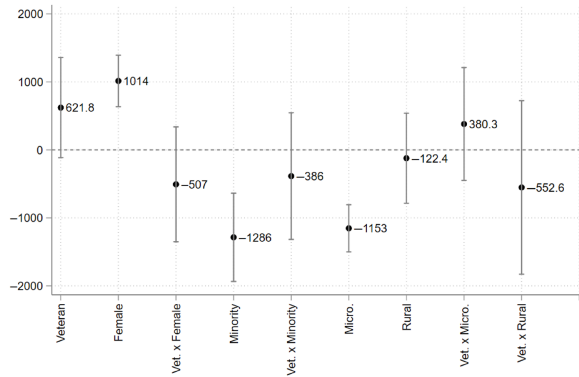
Note(s): Figure shows a coefficient plot for a specification of Equation 1 in which the outcome variable is firm revenue. Data is the quinquennial Survey of Business Owners (1997-2012) linked to the annual Longitudinal Business Database 1976-2020. Estimates are expressed in thousands of dollars and control for employment amounts
**Source(s):** Authors' own work

(22% relative to average firm revenues). Revenues of veteran female-owned firms are not statistically different from veteran male-owned firms, nor are they statistically different from non-veteran female-owned firms. When compared to non-veteran male-owned firms, the veteran female owned firms have revenues which are 1.128 million dollars greater (Table A5). This again provides evidence that military service accrues benefits to female owned business as revenues are even greater than if the owners had not be military members. On the other hand, firms owned by minoritized individuals have revenues that are 1.286 million dollars on average. These business owners do fare better in terms of total revenues if they are also a veteran. Minoritized veteran business owners have revenues which are 1.05 million dollars (Table A5) lower than to non-minoritized non-veteran business owners. This again provides evidence of entrepreneurial benefits of service accruing to minoritized groups, analogous to the service benefits minority groups in the labor market as measured by employment and income (Section 2.1). The evidence of benefits to minoritized entrepreneurs holds for both revenue growth and nominal revenue.

5.3 Vetrepreneur revenue growth
Figure 4 (and Table A3) show the coefficients and standard errors with real revenue growth as the outcome variable. Even though the revenues of veteran-owned firms are no different than non-veteran-owned firms, on average, they grow at slower than their non-veteran-owned counterparts. This difference appears to be driven by differences in growth rates for different demographic groups of veterans, as the difference disappears as we control for these characteristics. Consistent with previous research on entrepreneurship, (non-veteran) minoritized entrepreneurs have lower revenue than entrepreneurs racialized as White. Again, the findings provide descriptive evidence of a service benefit accruing to minority entrepreneurs, with the negative minority coefficient become insignificant for veteran minority entrepreneurs (Table A5), which is consistent with previous researchers findings labor market benefits as measured by employment and income accruing to minority veterans. Benefits of service also accrue to female vetrepreneurs. Revenue growth rates are positive and significant
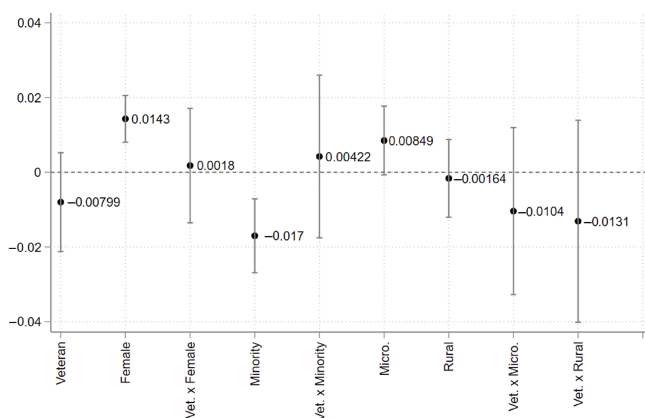
Note(s): Figure shows a coefficient plot for a specification of Equation 1 in which the outcome variable is annualized firm revenue growth. The growth rate is the one year change in the outcome divided by the average of the two values. Estimates control for employment size. Data is the quinquennial Survey of Business Owners (1997-2012) linked to the annual Longitudinal Business Database 1976-2020
Source(s): Authors' own work

Figure 4.
Vetrepreneur revenue
growth coefficient plot

for female business owners, and they are even higher for veteran female-owned firms (Table A5) when compared to their male counterparts. Female vetrepreneurs fare just as well on average as male non-veteran business owners in terms of revenue growth rates. Despite the negative association between veteran ownership and revenue growth rates, minoritized business owners still tend to benefit from veteran status.

5.4 Vetrepreneur employment growth

Figure 5 (and Table A4) plots the coefficients and standard errors with employment growth as the outcome variable. The employment growth of veteran-owned firms is substantially different than the revenue growth findings. Specifically, veteran-owned firms grow 1.38% points slower (20% lower than the mean) than non-veteran-owned firms. When we include the other demographic and geographic variables the difference remains for male veteran business owners who are racialized as White (-1.12% points).

Additionally, female-owned firms grow 1.21% points faster (18.2% greater relative to the mean) all else equal. Non-minorty, female, veteran-owned business have a lower employment growth rate than non-minorty, female, non-veteran business owners (-2 percentage points), and a lower growth rate than non-minority, male, non-veterans (-0.8% points). Unlike the other business outcomes, female veteran business owners do not accrue additional benefits from their past service, and instead have lower employment growth than their male and non-veteran counterparts (Table A5). This suggests that for minority owned firms past military service benefits them and negates the disadvantages these firms face in the absence of past military experience.

On the other hand, minority-owned firms have slower employment growth on average. These firms have employment growth rates that are 1.3% points lower than non-minority owned firms (19% lower relative to the mean). We also observe that military service benefits minority firm owners in terms of employment growth too. Again, veteran minority owned firms do not have statistically different employment growth rates veteran business owners who are racialized as
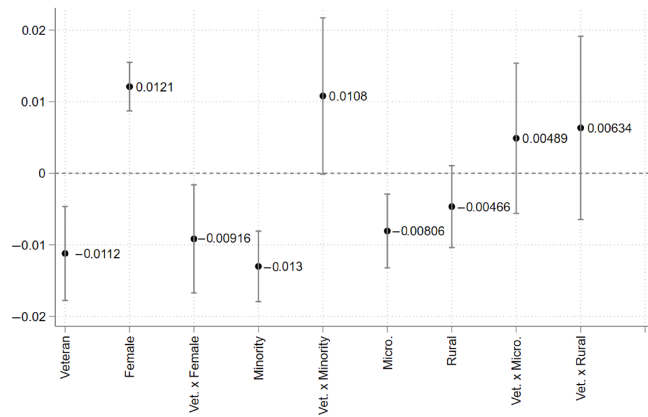
Note(s): Figure shows a coefficient plot for a specification of Equation 1 in which the outcome variable is employment growth rate. The growth rate is the one year change in the outcome divided by the average of the two values. Estimates control for firm payroll amounts. Data is the quinquennial Survey of Business Owners (1997-2012) linked to the annual Longitudinal Business Database 1976-2020
Source(s): Authors' own work

White (Table A5). Our findings are consistent with previous research indicating slower growth for firms located in micropolitan areas, but veteran-own firms in micropolitan areas appear to exceed average growth rates in micropolitan areas, partially offsetting this difference.

6. Conclusions and implications for research

There are many efforts in the USA to develop public policies that support military veterans. But even though veterans are more likely to own a business than non-veterans, little is known – even descriptively – about veteran entrepreneurs. As more service members transition to civilian life, understanding the behavior of these firms is increasingly important. This article is among the first efforts to describe veteran entrepreneurs and represents a foundational step for spurring future causal research into veteran-owned entrepreneurs. Using limited access federal survey and administrative tax data, we provide new insight into the survival, revenue, revenue growth, and employment growth of veteran-owned firms. We find that veteran owned firms have: (1) greater likelihood of survival; (2) higher revenues; (3) similar revenue growth; and (4) lower employment growth.

These findings have policy implications. Entrepreneurial theory suggests that the associations we find between prior military experience and improved firm performance is partially attributable to the specific skills gained from their service. Given that entrepreneurship is an important strategy for regional growth, policies should be implemented to support and encourage vetreprenreurship as the founders of these firms have the requisite skills to be more successful. Further, to help non-veteran entrepreneurs be more successful in their ventures, trainings should be made more widely available to encourage these non-veteran entrepreneurs to develop some of the skills their vetrepreneur counterparts developed during their service. More research is needed, however, to measure the existence and strength of the relationship between the skills obtained during military service and entrepreneurial success.

Research indicates female-owned businesses are less successful than male-owned businesses because they have less startup capital, lower educational attainment, less

experience in a similar business, and less prior work experience in a family business (Fairlie and Robb, 2009; Conroy and Weiler, 2015). Military experience may help address the average experience differential for both groups, but not alleviate the capital limitations that minoritized entrepreneurs are more likely to experience (Fairlie and Robb, 2007). Aggregation of minoritized groups in this article may also be obscuring group-specific effects (but was unfortunately necessary due to improper disclosure prevention limitations). Investigation into more specific minoritized groups is also essential, as research indicates substantial heterogeneity (Carpenter and Loveridge, 2018). This article is limited in its ability to do this by Census disclosure rules, but this is an area for future research. Other factors of interest for future research may include age, time in service, time since separation, and education prior to joining the military. Similarly, this article is limited in how much it can disclose by industry, so it is unable to examine reduced sectorization as a potential mechanism for effects. For example, Hundley (2001) finds that the earning differences of women in self-employment result from a lower proportion in construction and professional practice and a higher proportion in the personal services sector. An area for future research is the extent to which military service diminishes sectorization of women and minoritized groups. Relatedly, other important areas for future research include examining if women or minoritized entrepreneurs are more likely to choose different sectors for their businesses, and examining the extent to which the business cycle differentially affects survival rates of vet and non-vets.

In sum, while we emphasize this research is descriptive (rather than causal), this research provides suggestive evidence and develops a foundation to build upon to explore the causal mechanisms for these differences – and thereby development public policies to enhance support to veteran entrepreneurs. Specifically, we find descriptive evidence that the benefits of service for minority groups in labor market outcomes – a consistent finding in veteran research – extend to entrepreneurial outcomes. This calls for future research on the causal impact of military service on *entrepreneurial* outcomes, not only labor market outcomes common to current research. We also find descriptive evidence that past military experience offsets some of the documented negative outcomes that female entrepreneurs experience. For the outcomes where we find female business owners have the advantage, we find that being a veteran further benefits these firms for revenue and revenue growth, but these firms perform worse for employment growth. Further research is needed to understand the causal mechanisms associated with these outcomes and why there are apparent heterogeneous effects across business outcomes.

Notes

1. While the number of female veteran-owned businesses was rising, the number of male veteran-owned firms actually fell, from 2.3 million to 2.1 million (ibid.). Furthermore, the total number of all U.S. firms increased only 2.0 percent during the same period, from 27.1 million to 27.6 million (ibid.).

2. These years also correspond to the years for which revenue data is linked to the Longitudinal Business Database.

3. Although this response rate is imperfect, to the author's knowledge the SBO remains the largest and most representative business owner demographic survey in existence for the Unites States (U.S. Census Bureau, 2016). From the SBO we obtain information on the characteristics of the business owners such as gender, ethnicity, race, and veteran status.

4. In the SBO there are three designations for owner sex or gender: "Female Owned", "Male Owned" or "Equally Male and Female Owned". To operationalize "female ownerships" we use the category "Female Owned" rather than "Equally Male and Female Owned".

5. Specifically, in addition to the full specification, we test other specifications that examine only veterans, veteran-female, veteran-minority, and veteran-minority-female associations. Results of each specification are available in Appendix Tables A1–A4

6. We follow the definitions of metropolitan and micropolitan counties set by the Office of Budget and Management (OMB), and rural counties are those which are otherwise not defined by OMB. The age of the firms may influence these outcomes, so we control for it with $FirmAge_{it}$. Depending on the specification, X_{it} is either employment or payroll. We include employment in the revenue and revenue growth regressions because greater firm revenues are correlated with larger firms and more employees and firms whose revenues are growing more quickly are able to hire more employees. We include payroll in the employment growth regression to control for how increased wages can impact how quickly a firm hires new employees, and we exclude payroll in revenue and revenue growth specifications.

7. In all of these regressions, we do not control for other factors like education of the business owner. It is important to show the direct connections between race and military status unconditional on control variables, since we believe the values of those control variables is itself correlated with race, gender, and military status. More specifically, variables like education would represent "bad control variables" because systemic discrimination implies that education represents a collider variable through which racialization interacts with educational attainment (Merolla and Jackson, 2019; Wooldridge, 2005). Furthermore, given this article provides descriptive evidence and we do not interpret these estimates as causal effects, potential concerns related to a potentially moderating effect (even though regardless, controlling for education would not consistently estimate an "effect" in this context) are less severe.

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Appendix

	(1)	(2)	(3)	(4)
Veteran	−0.0528***	−0.0702**	−0.0615***	−0.072***
	(0.0159)	(0.0284)	(0.0172)	(0.0301)
Female		0.0445***		0.0446***
		(0.0162)		(0.0162)
Veteran × Female		0.0187		0.0156
		(0.0344)		(0.0345)
Minority			−0.00931	−0.0133
			(0.0226)	(0.0227)
Veteran × Minority			0.0697	0.0641
			(0.0453)	(0.0456)
Micropolitan				−0.018
				(0.0247)
Rural				−0.0287
				(0.0254)
Veteran × Micropolitan				−0.0335
				(0.0486)
Veteran × Rural				0.00233
				(0.0533)
Payroll ($1,000s)	−0.148***	−0.149***	−0.148***	−0.151***
	(0.0171)	(0.0172)	(0.0172)	(0.0174)
N	26,500	26,500	26,500	26,500

Note(s): Table shows coefficient estimates of a Cox Proportional Hazard Model (Equation (2)). A positive coefficient indicates an increased odds of business exit. Data is the quinquennial Survey of Business Owners (SBO, 1997–2012) linked to the annual Longitudinal Business Database (LBD, 1976–2020). The sample size varies across tables due to missing data; for example some individuals may not indicate racial identification, but will indicate veteran status. Or, for example, revenue is drawn from the "Augmented LBD" (with Firm-Level Revenue), which uses data from the detailed tax receipts contained in the Standard Statistical Establishment List (SSEL) and the Business Register (BR), but this data starts in 1997 and ends in 2015. Regardless, we emphasize that the SBO linked to the LBD is likely to be the largest and most representative entrepreneurship dataset (that contains demographic information) available in the United States (U.S. Census Bureau, 2016)
Source(s): Authors' own work

Table A1.
Proportional hazard
model results

	(1)	(2)	(3)	(4)	(5)
Veteran	322.5	619.1*	358.2	610.6*	621.8*
	(204.9)	(340.5)	(223.6)	(341.2)	(375.7)
Female		10,006***		1,017***	1,014***
		(192.3)		(193.7)	(193.2)
Veteran × Female		−583.6		−514.5	−507
		(430.6)		(432.2)	(431.1)
Minority			−1,224***	−1,243***	−1,286***
			(328.4)	(330.1)	(331.2)
Veteran × Minority			−336.2	−366.2	−386
			(470.9)	(472.4)	(475)
Micropolitan					−1,153***
					(176.9)
Rural					−122.4
					(338.1)
Veteran × Micro					380.3
					(423.5)
Veteran × Rural					−552.6
					(650.9)
Firm age	20.8***	20.76***	20.72***	20.68***	20.71***
	(7.683)	(7.683)	(7.682)	(7.681)	(7.671)
Employment	100***	99.99***	100***	99.98***	99.96***
	(20.03)	(20.03)	(20.02)	(20.02)	(20.02)
N	194,000	194,000	194,000	194,000	194,000

Note(s): Table shows coefficient estimates of a random effects model (Equation (1)). Data is the quinquennial Survey of Business Owners (SBO, 1997–2012) linked to the annual Longitudinal Business Database (LBD, 1976–2020). The sample size varies across tables due to missing data; for example some individuals may not indicate racial identification, but will indicate veteran status. Or, for example, revenue is drawn from the "Augmented LBD" (with Firm-Level Revenue), which uses data from the detailed tax receipts contained in the Standard Statistical Establishment List (SSEL) and the Business Register (BR), but this data starts in 1997 and ends in 2015. Regardless, we emphasize that the SBO linked to the LBD is likely to be the largest and most representative entrepreneurship dataset (that contains demographic information) available in the United States (U.S. Census Bureau, 2016)
Source(s): Author's own work

Table A2.
Vetrepreneur revenue model results

	(1)	(2)	(3)	(4)	(5)
Veteran	−0.00714*	−0.00929	−0.00802	−0.0103	−0.00799
	(0.00366)	(0.00638)	(0.00392)	(0.00643)	(0.00675)
Female		0.014***		0.0142***	0.0143***
		(0.00319)		(0.00319)	(0.00319)
Veteran × Female		0.00127		0.00172	0.0018
		(0.00778)		(0.00782)	(0.00782)
Minority			−0.0168***	−0.0172***	−0.017***
			(0.00503)	(0.00503)	(0.00504)
Veteran × Minority			0.00648	0.00501	0.00422
			(0.011)	(0.0111)	(0.0111)
Micropolitan					0.00849*
					(0.0047)
Rural					−0.00164
					(0.00531)
Veteran × Micro					−0.0104
					(0.0114)
Veteran × Rural					−0.0131
					(0.0138)
Firm age	−0.00402***	−0.00402***	−0.00402***	−0.00403***	−0.00403***
	(0.000128)	(0.000128)	(0.000128)	(0.000128)	(0.000128)
Employment	−0.000187***	−0.00019***	−0.000188***	−0.000191***	−0.000191***
	(0.0000418)	(0.000042)	(0.0000419)	(0.0000421)	(0.0000422)
N	167,000	167,000	167,000	167,000	167,000

Note(s): Table shows coefficient estimates of a random effects model (Equation (1)). Data is the quinquennial Survey of Business Owners (SBO, 1997–2012) linked to the annual Longitudinal Business Database (LBD, 1976–2020). The sample size varies across tables due to missing data; for example some individuals may not indicate racial identification, but will indicate veteran status. Or, for example, revenue is drawn from the "Augmented LBD" (with Firm-Level Revenue), which uses data from the detailed tax receipts contained in the Standard Statistical Establishment List (SSEL) and the Business Register (BR), but this data starts in 1997 and ends in 2015. Regardless, we emphasize that the SBO linked to the LBD is likely to be the largest and most representative entrepreneurship dataset (that contains demographic information) available in the United States (U.S. Census Bureau, 2016)
Source(s): Authors' own work

Table A3.
Vetrepreneur revenue
growth model results

	(1)	(2)	(3)	(4)	(5)	(6)
Veteran	−0.0138***	−0.00864**	−0.0151***	−0.00992***	−0.0112***	−0.0112***
	(0.00178)	(0.00316)	(0.00189)	(0.00321)	(0.00335)	(0.00335)
Female		0.0121***		0.0122***	0.0121***	0.0121***
		(0.00173)		(0.00173)	(0.00173)	(0.00173)
Veteran × Female		−0.0092**		−0.0092**	−0.00917**	−0.00916**
		(0.00383)		(0.00383)	(0.00383)	(0.00383)
Minority			−0.0123***	−0.0124***	−0.013***	−0.013***
			(0.00251)	(0.00251)	(0.00251)	(0.00251)
Veteran × Minority			0.0104*	0.0103*	0.0108*	0.0108*
			(0.00555)	(0.00556)	(0.00557)	(0.00557)
Micropolitan					−0.00806***	−0.00806***
					(0.00263)	0.00263
Rural					−0.0465	−0.00466
					(0.00292)	(0.00292)
Veteran × Micro					0.00491	0.00489
					(0.00535)	(0.00535)
Veteran × Rural					0.00635	0.00634
					(0.00653)	(0.00653)
Payroll ($1,000s)	−0.0000185**	−0.0000185**	−0.0000186**			−0.0000187***
	(0.00000787)	(0.00000786)	(0.00000788)			(0.0000787)
Firm age				−0.0122***	−0.0122***	−0.0122***
				(0.0000929)	(0.0000929)	(0.0000929)
N	520,000	520,000	520,000	520,000	520,000	520,000

Note(s): Table shows coefficient estimates of a random effects model (Equation (1)). Data is the quinquennial Survey of Business Owners (SBO, 1997–2012) linked to the annual Longitudinal Business Database (LBD, 1976–2020). The sample size varies across tables due to missing data; for example some individuals may not indicate racial identification, but will indicate veteran status. Or, for example, revenue is drawn from the "Augmented LBD" (with Firm-Level Revenue), which uses data from the detailed tax receipts contained in the Standard Statistical Establishment List (SSEL) and the Business Register (BR), but this data starts in 1997 and ends in 2015. Regardless, we emphasize that the SBO linked to the LBD is likely to be the largest and most representative entrepreneurship dataset (that contains demographic information) available in the United States (U.S. Census Bureau, 2016)
Source(s): Authors' own work

Null hypothesis	Firm death	Revenue	Outcome Revenue growth	Employment growth
Female Veterans = Male Veterans	0.0602**	506.7	0.0161**	0.0030
	(0.0304)	(398.9)	(0.0071)	(0.0034)
Female Veterans = Female Non-Veterans	−0.0564**	114.8	−0.0062	−0.0203***
	(0.0227)	(310.1)	(0.0051)	(0.0025)
Female Veterans = Male Non-Veterans	−0.0118	1,128***	0.0081	−0.0082***
	(0.0237)	(308.7)	(0.0053)	(0.0026)
Minority Veterans = Non-Minority Veterans	−0.0079	235.9	−0.0038	−0.0004
	(0.0499)	(554.9)	(0.0121)	(0.0060)
Minority Veterans = Minority Non-Veterans	0.0508	−1,672***	−0.0128	−0.0022
	(0.0397)	(352.8)	(0.0099)	(0.0050)
Minority Veterans = Non-Minority Non-Veterans	−0.0212	−1,050**	0.0208*	−0.0134**
	(0.0460)	(434.6)	(0.0112)	(0.0056)

Table A5.
Joint hypothesis tests

Corresponding author
Craig Wesley Carpenter can be contacted at: cwcarp@msu.edu