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Occupational licensing and the impact on veteran mobility

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OCCUPATIONAL LICENSING AND THE IMPACT ON VETERAN MOBILITY

by

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March 2018

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The purpose of this study is to determine if occupational licensing affects the state in which veterans choose to live after separating from the military. Veterans receive specialized training while in the military, which has the potential to translate easily into civilian occupations. States that mandate licensing requirements for occupations, however, may act as barriers that prevent veterans from easily entering occupations for which they have received military training, causing unnecessary market inefficiencies.

Occupational licensing has historically resulted in increased wages for workers in those occupations, and this study empirically confirms this trend, utilizing data regressions of veterans in the census. Additionally, as this study examines a sample composed entirely of veterans, I am able to compare multivariate relationships of our veteran sample to those of previous civilian samples.

As this field is fairly narrow, and relatively new, there are numerous opportunities to further develop these relationships in future studies. New data collection from outside entities would also enable more useful studies to be conducted in this area.

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OCCUPATIONAL LICENSING AND THE IMPACT ON VETERAN MOBILITY

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LIST OF ACRONYMS AND ABBREVIATIONS

ASVAB	Armed Services Vocational Aptitude Battery
COOL	Credentialing Opportunities On-Line
IPUMS	Integrated Public Use Microdata Series
MCLTF	Military Credentialing and Licensing Task Force
NLSY79	National Longitudinal Survey of Youth, 1970
SOC	standard occupational codes

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I. INTRODUCTION

A. PROBLEM

The military spends a considerable amount of money training individuals in specific fields. Whether they are medics, electricians, or mechanics, the taxpayers are investing money into enhancing these individuals' industry-specific capital. Occupational licensing requirements prevent these service members from easily transferring the skills they have acquired in the military into the civilian labor market once they separate from the military. These veterans must then choose to enter an unlicensed occupation or fulfill the additional requirements necessary for them to practice their trade in a specific state. If the veteran chooses to enter an unlicensed occupation, he is not utilizing the training that the taxpayers have provided. Should the veteran decide to fulfil the additional requirements in order to enter the licensed occupation, he is wasting his time and/or money to work in a field that for which he is already at least partially trained.

B. BACKGROUND

Occupational licensing is generally regarded as a market inefficiency. By imposing unnecessary requirements upon workers entering a particular industry, licensing committees are able to artificially manipulate labor supply for their industry, thereby reducing supply and increasing wages for workers already in that industry. Licensing is typically practiced with the intention of imposing a quality threshold for an industry, in order to "protect" the public from incompetent workers. In time, however, due to the free market, these workers would eventually be forced to exit the industry. Due to the poor quality, incompetent workers and firms would be noted by consumers, who would reduce consumption of these services until those firms go out of business. Additionally, considering price discrimination, there are consumers who specifically intend on consuming lower-quality services for lower prices. When licensing committees eliminate these service providers, the prospective consumers of lower-quality services are either forced to pay more for higher-quality services, forego the services, or attempt to procure services outside of the market.

C. METHODOLOGY AND FINDINGS

In this study, I use multivariate analysis to explore the relationships present within a sample of military veterans, collected by the census. My focus is to highlight the relationships involving wage, occupational licensing status, and veteran's state of residence, in an attempt to explain whether occupational licensing status affects where a veteran chooses to live after separating from the military. Additionally, by highlighting wage statistics, I am able to compare our data sample to previous studies, which have analyzed similar statistics for civilian samples.

I find that veterans experience increased wages in licensed occupations, often referred to as a "wage premium." The concept of a wage premium associated with licensed occupations is in keeping with both economic theory and previous research regarding civilians who work in licensed occupations. By grouping our veteran sample by occupational categories, I find that there is a large variation in the manner that licensing affects wages for different occupational groups. Some groups experience large wage premiums, while other groups experience smaller wage penalties. Finally, by regressing licensing status and state of residence, I find that there are approximately two veterans working in licensed occupations for every one veteran working in an unlicensed occupation.

II. LITERATURE REVIEW

A. OCCUPATIONAL LICENSING IN THE CIVILIAN MARKET

According to Gittleman and Kleiner, "In 2003, the Council of State Governments estimated that more than 800 occupations were licensed in at least one state, and more than 1,100 occupations were licensed, certified, or registered" (2013, p. 6). While these terms are often used interchangeably, they use the following definitions to distinguish these forms of occupational regulation. Registration is the least restrictive, involving an individual submitting their name and relevant information to an agency for filing. Certification requires an individual to complete an examination and/or schooling, attesting to the fact that the individual has acquired the requisite skills required to work in their field. Licensure is the strictest form of occupational regulation, and the individual is legally prohibited from working in a licensure-required industry prior to obtaining one (Gittleman & Kleiner, 2013). Occupational regulations are typically regarded as a method to prevent low-quality service providers from negatively affecting a particular industry, or the members of the public who consume its services. By imposing certain restrictions on prospective labor entering the market, whether it is in the form of fees, education, or standardized testing, the licensing committee chooses to impose a type of standard on labor providers, theoretically improving the quality of service in an industry.

In practice, however, as the licensure board is generally composed of individuals already in the given profession, they have ample opportunity to heavily regulate the industry after they have secured their own position in the market. Imposing additional restrictions in this fashion then adds additional barriers for new entrants, thereby reducing market supply of labor, leading to an artificial increase in wages (Kleiner, 2000). These restrictions come in the form of additional fines, additional schooling, or stricter "pass rates" on qualification tests, and are all examples of additional barriers to entry. By regulating the supply of new entrants, occupational licensing boards can in theory capture more economic rents in the labor market. Gittleman and Kleiner discuss the ultimate effects of occupational licensing: "seekers of high-quality services gain by regulation and seekers

of low-quality services are worse off because prices are higher and choices more limited" (Gittleman & Kleiner, 2013, p. 8).

In fact, Wiswall (2007) argues that in some instances, occupational licensing can even be detrimental to the industry as a whole. For instance, suppose higher amounts of general human capital lead to more proficient teachers. However, additional investment into licensing requirements for teaching is considered to be industry-specific, rather than general human capital, and cannot be transferred readily into non-teaching occupations. Therefore, prospective teachers will forego investments in general human capital for additional investment in industry specific capital, leading to a decrease in the overall quality of teachers in the industry.

Teaching is also an attractive industry to analyze as, in more recent years, the number of license-waivered teachers has increased, facilitating comparison between the quality of output between licensed and non-licensed teachers. Research into this area is currently inconclusive; some research has determined that licenses do not affect education outcomes and student quality, while other research has shown that there is a correlation between teacher license status and student performance. However, these relationships are not necessarily causal, as there is heavy self-selection bias as to which potential entrants decide to become licensed teachers.

In order to more accurately determine the effects of occupational licensing on the labor market, Kleiner and Krueger analyzed a 2008 survey conducted by Westat, a statistical survey company (2009). Initially, 2,513 individuals were surveyed; however, the final response rate and completion percentage was approximately 17.9 percent. While such a low participation rate is potentially worrisome, the authors do not believe that occupational licensing is strongly associated with the probability of completing the survey in question. From analysis of the data, they determined that licensing rates typically rise with education and with union membership, and do not typically vary with race or gender. The authors also estimated a regression with licensing as the independent variable and log wages as the dependent variable. With only standard control variables, such as age, education, union membership, gender, work experience, and race, the licensing coefficient is determined to be 0.139. With occupational controls, the coefficient falls to 0.119. The

coefficient estimates thus indicate that being licensed is associated with twelve to fourteen percent higher income. This result is consistent with the above assertion that the restriction of labor supply due to licensure regulations results in an increased wage for workers in the licensed industry.

Gittleman and Kleiner (2013) also utilized multivariate analysis to study the effects of occupational licensing on the labor market. They use data from the National Longitudinal Survey of Youth, 1970 (NLSY79), whose respondents are between 14 and 22 in 1979 and were surveyed annually from 1979 to 1994, and biennially from 1994 to 2010. Unfortunately, the survey did not include whether the individuals' current occupations were licensed, so the authors were required to bridge occupation and state of residence with a state occupational licensure list.

While not explicitly apparent, there is concern for the presence of omitted variables bias within the sample used by Gittleman and Kleiner. Individuals who are more likely to enter an occupation that is licensed are also more likely to earn more, with other circumstances being equal. In order to attempt to control for this omitted variables bias, the authors employ five techniques. The first is to run a standard regression, in order to compare their results to past results. Secondly, they utilize the Armed Services Vocational Aptitude Battery (ASVAB) scores as a proxy for ability. The third and fourth methods involve utilizing the structure of the NLSY79 data set to compare wage growth in individuals moving in or out of a licensed occupation. Finally, the authors utilize a fixed-effects approach in order to attempt to control for individual ability. Upon analyzing the data set, the authors observe that licensed individuals tend to be older, have more education, are more likely to be in a union, more likely to be female, and are somewhat less likely to be African-American. While not identical to the study conducted by Kleiner and Krueger, they are fairly consistent.

After running a simple regression of licensure on log wage, the authors obtain a licensing coefficient of 0.281 log points. Upon adding controls for education, experience, state, year, and demographic variables, the licensing coefficient falls to 0.123 log points, which is similar to the results obtained by Kleiner and Krueger. When the authors add major occupation dummies to the regression, however, this coefficient falls to 0.078 log

points. The authors explain that the sample is extremely heterogeneous, so there is a possibility that the regression compares licensed and unlicensed individuals from different industries; for example, "licensed electricians to unlicensed plumbers" (Gittleman & Kleiner, 2013, p. 18).

The effects of occupational licensing are typically compared to the effects of unionization. Both unionization and occupational licensing typically result in higher wages for market labor suppliers, however, the wage increase is for distinctly different reasons. As discussed above, the wage increase for licensed occupations is typically due to regulation decreasing the supply of market labor. Wage increases due to unionization are typically attributed to the collective labor supply organizing and bargaining for higher wages. Additionally, according to Kleiner (2000), wage differentials to due occupational licensing are considerably more visible for occupations with higher base wages, such as dentists, and less visible for occupations such as cosmetologists and barbers.

In summary, occupational licensing is an inefficiency on the labor market, leading to artificially increased wages, decreased labor supply, and in some cases, decreased labor quality. Both studies, conducted by Gittleman and Kleiner, and Kleiner and Krueger, experimentally experience wage premiums for workers in licensed occupations.

B. OCCUPATIONAL LICENSING WITH RESPECT TO MILITARY VETERANS

In contrast, little to no academic research has been conducted in regards to occupational licensing and military veterans. A large focus of public concern and some research has been on occupational regulations and military spouses. As military spouses are required to move frequently across state lines, those in licensed occupations typically face considerable difficulties maintaining employment in their chosen occupation. According to a 2012 report by the Department of Treasury and Department of Defense, almost thirty-five percent of military spouses work in licensed occupations and they are ten times as likely as the average American to move from state-to-state (p. 3). This report analyzed a sample of approximately 2,800 military spouses from 2007 to 2011.

The report hones in on the requirements to obtain a nursing certification, in particular, and the requirements to transfer that nursing certification across states. While some mechanisms exist for this purpose, such as a temporary license that allows the nurse to practice while awaiting review and transfer of his or her permanent license, these mechanisms can still be costly and time-consuming. The report then describes additional mechanisms that can increase the portability of state occupational licenses, such as licensure by endorsement, temporary or provisional licensing, and expedited application processes.

Additionally, a 2012 report published by the Executive Office of the President underscores the importance of streamlining the transition of military veterans to the civilian market. There are some programs created for this purpose, for instance, the Army and Navy have developed Credentialing Opportunities On-Line (COOL) to enable military service members to achieve civilian credentialing while still participating in their relevant military career. In an effort to continue pursuing related possibilities for service members, the Obama administration created the Military Credentialing and Licensing Task Force (MCLTF).

In addition to the MCLTF, the Obama administration implemented other policies to better enable military service members to transition to the civilian sector, such as rewarding employers who hired veterans with additional tax credits, issuing a challenge to the private sector to hire military veterans, and facilitating additional government hiring of veterans and veteran entrepreneurship. Unfortunately, since former President Obama exited the office, information and activities of the MCLTF task force have diminished.

While literature does exist regarding occupational licensing—and, in some ways, how licensing impacts military veterans—there is potential for further research in this field. Analyzing occupational licensing and how it affects the civilian market provides a general understanding as well as basis for comparison regarding how occupational licensing affects military veterans. Additionally, while some avenues are provided for military veterans transitioning to the civilian labor market, there are opportunities to further ease the transition, in order to reduce the amount of loss of veteran resources and taxpayer dollars.

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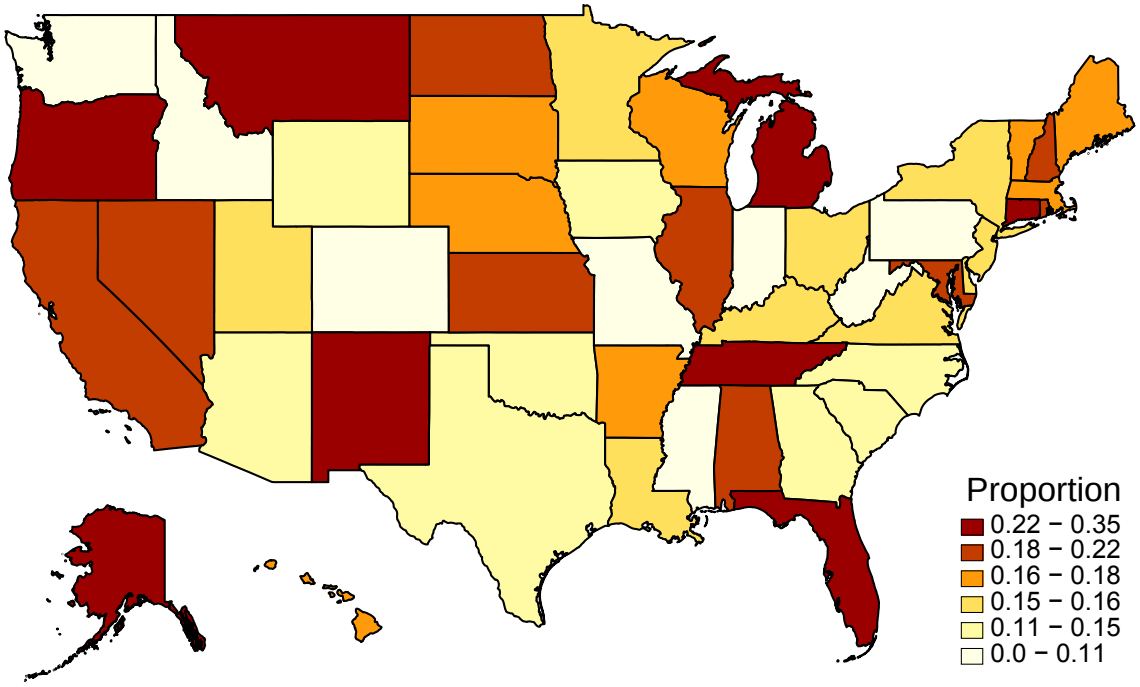
III. DATA AND METHODOLOGY

A. DATA

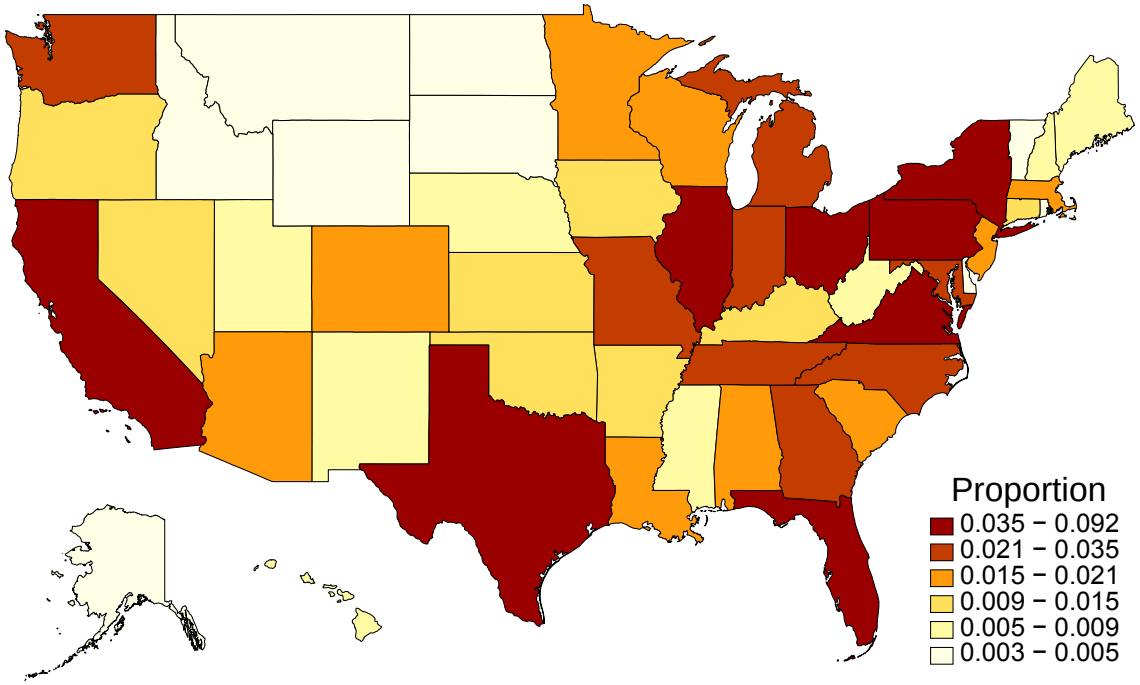
In order to estimate the relationship between a veteran's state of residence and the state's occupational stringency, I use data obtained from the Integrated Public Use Microdata Series (IPUMS) database. This database compiles census microdata—that is to say, each observation represents a specific individual with encoded characteristics, rather than an aggregated number of random observations. However, as the IPUMS data do not keep record of military occupation or training history, I am unable to prove that veterans do or do not enter licensed occupations that the military has trained them for. Although estimating a causal relationship with my current data set is impossible, comparing Figure 1 and Figure 2 allows a simple view into a state's mean occupational licensing level and the percentage of veterans who choose to live in a particular state. The District of Columbia is not included in this graph, as it is not technically a state, although it does specify occupational licensing requirements similar to a state.

Figure 1 illustrates the proportion of veterans who work in licensed occupations by state. As noted by the darkest red, the states with the highest proportion of veterans that work in licensed occupations are Washington, Montana, New Mexico, Michigan, Tennessee, Florida, and Connecticut, and Alaska. Figure 2 illustrates veterans living in a particular state, organized as a proportion of the veterans contained in the IPUMS database sample. The states with the highest amounts of veterans are California, Texas, Florida, Illinois, Ohio, Pennsylvania, New York, and Virginia.



Data obtained from the IPUMS database.

Figure 1. Proportion of Veterans Who Work in Licensed Occupations, by State

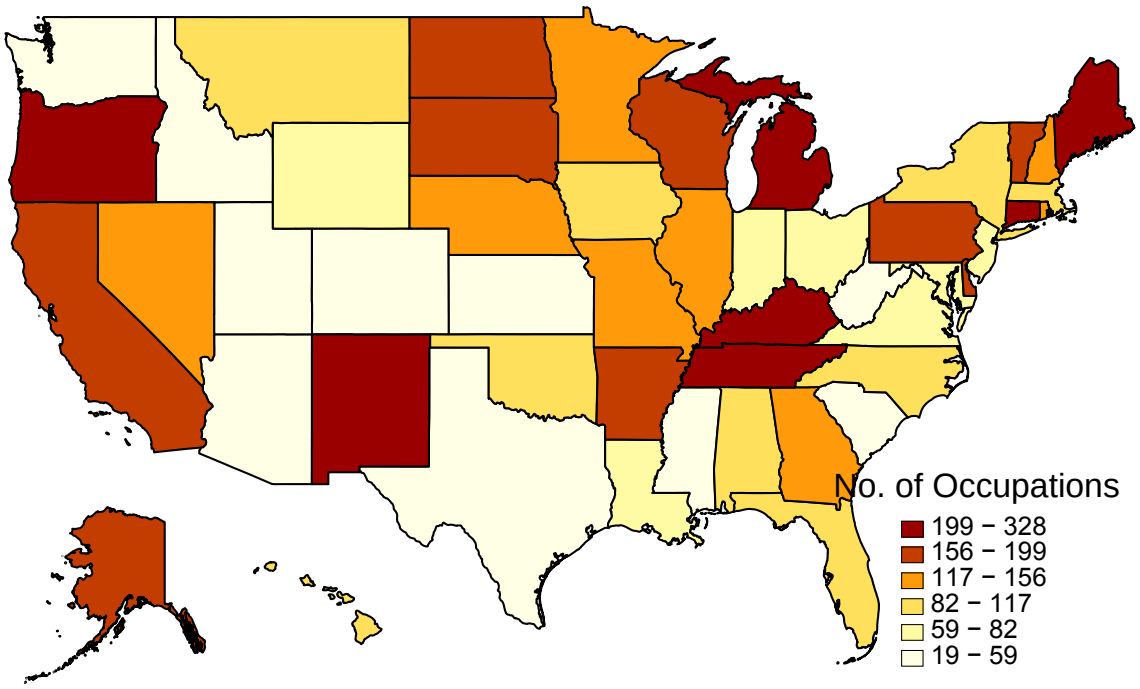


Data obtained from the IPUMS database.

Figure 2. Veteran Concentration, by State

The only state present in both categories, highest proportion of licensed veterans and highest proportion of veteran residence, is Florida. Of the remaining states with the highest veteran proportion, Pennsylvania is in the category with the lowest proportion of veterans working in licensed occupations, Texas is in the next to lowest category, Ohio, Virginia, and Pennsylvania are in the third lowest category, and California and Illinois are in the second highest category. Excluding Florida, the other states with the highest proportions of veterans working in licensed occupations are Washington, Montana, New Mexico, Michigan, Tennessee, Connecticut, and Alaska. Montana is in the lowest category of veteran residence proportion, New Mexico is in the second to lowest, Connecticut and Washington are in the third to lowest, and Michigan and Tennessee are in the second highest categories. While I am unable to simply conclude any pattern by comparing these two graphs, I am also able to conclude that veterans working in licensed occupations and veteran distribution are not easily correlated by state.

Figure 3 is a graphical representation of the number of occupations in each state that require a license, using standard occupational codes (SOCs), which were codified in 2002. By using the number of licensed occupations in a state as a proxy for state licensing stringency, I am able to compare veteran geographic distribution to state licensing stringency by comparing Figure 2 to Figure 3. Of the states with the highest proportion of veteran residence, California and Pennsylvania are in the second highest category for occupational stringency, Illinois is in the third highest, New York and Florida are in the third to lowest, Ohio and Virginia are in the second to lowest, and Texas is in the lowest category for occupational stringency. Again, there are no readily discernable patterns in comparing these two figures, making a multivariate analysis of these data necessary. Additionally, the width of this category ranges from approximately 3.5 percent to 9 percent, which is significantly more range than the other categories displayed by the graph.



Data obtained from the IPUMS database.

Figure 3. Occupations Requiring a License, by State

The sample data contains 2,584,577 military veterans obtained from the IPUMS database, collected through the U.S. census. The pertinent variables recorded in the sample are year, region, state, age, gender, marital status, race, education, occupational licensing status, hours worked, and wage. I cleaned and encoded most of these variables into binary dummy variables representing race, geographic area, education and employment in a licensed field. These variables are summarized in Table 1.

Table 1. Variable Distribution

Variable	Mean	Std Dev	Median	Min	Max
Year	1999.06	7.65	2000	1990	2012
Age	47.58	10.91	49	18	65
Weeks Worked	48.25	9.68	52	0	52
Black	0.09	0.28	-	0	1
Asian	0.01	0.11	-	0	1
Female	0.06	0.24	-	0	1
Married	0.74	0.44	-	0	1
North East	0.17	0.38	-	0	1
Midwest	0.24	0.42	-	0	1
South	0.37	0.48	-	0	1
West	0.22	0.41	-	0	1
Less Than HS	0.07	0.26	-	0	1
HS Graduate	0.31	0.46	-	0	1
Some College	0.37	0.48	-	0	1
Postgraduate	0.1	0.3	-	0	1
Weekly Wage	858.05	1275.9	671.43	0	339000
Log Weekly Wage	6.52	0.79	6.55	-3.95	12.73
Occupational Licensing	0.16	0.37	-	0	1

Data obtained from the IPUMS database.

B. METHODOLOGY

My sample data is composed strictly of veteran observations, and therefore the relationships I have discovered through regression analysis should only be considered when referencing veterans.

In order to discern the nature of the multivariate relationship between a veteran's state of residence and occupational licensing requirements in the state, I first estimate regression equations attempting to explain wage as a function of licensing status, in order to compare the results and data sets to those obtained from previous research. For this purpose, I analyze the equation

$$\ln(\text{wage}) = \beta_0 + \beta_1 \text{occupational license} + \mu..$$

This equation allows me a baseline with which to compare research discussed in the literature review, with no controls such as demographic data or educational proxies. Next, I add controls to more accurately determine the effects of occupational licensing on wage, by adding variables discussed above. The regression equation is represented by

$$\ln(\text{wage}) = \beta_0 + \beta_1\text{occupational license} + \beta_2\text{year} + \beta_3\text{black} + \beta_4\text{asian} + \beta_5\text{female} + \beta_6\text{married} + \beta_7\text{North East} + \beta_8\text{Mid-West} + \beta_9\text{South} + \beta_{10}\text{West} + \beta_{11}\text{Less than High school Education} + \beta_{12}\text{Highschool Graduate} + \beta_{13}\text{Some College} + \beta_{14}\text{College Graduate} + \beta_{15}\text{Postgraduate Education} + \beta_{16}\text{Age} + \beta_{17}\text{Age}^2 + \mu..$$

As a majority of these control variables are binary, there is less of a tendency for the explanatory variable, occupational licensing, to become "washed out" by too many control variables in the equation. After comparing the regression coefficient results to previous research, I quantify the relationship between state of residence and occupational licensing status, simplified to

$$\text{state} = \beta_0 + \beta_1\text{occupational license} + \mu..$$

This regression equation allows us to quantify the correlation between veteran state of residence and whether the veteran works in a licensed occupation or not. The equation does not, however, allow us to identify any causal relationship between the two variables. I am only able to specify that a relationship does or does not clearly exist, not that occupational licensing directly leads to veterans living in certain states.

IV. RESULTS

A. WAGE PREMIUM

I discovered three main findings through my regression analyses. The first is that on average, veterans experience a wage premium by working in licensed occupations. The second is that there is substantial heterogeneity in licensing premiums, when veterans are organized by occupation. Finally, there is a correlation between occupational licensing status and veteran state of residence. For the sake of exposition, I limit the tables and discussion below to licensing coefficients. The full set of regression results are reported in the Appendix.

The first finding is that on average, veterans are observed to obtain a wage premium by working in licensed occupations. The relationship between occupational licensing and earnings as measured by log weekly wage are reported in Table 2. Without conditioning on any control variables, the licensing coefficient yields a 0.237 significant increase in log weekly wage. This indicates that on average, veterans who worked in licensed occupations earn 23.7% higher wages than veterans in unregulated occupations.

Table 2. Wage Premium

lwklywage						
	(1)	(2)	(3)	(4)	(5)	(6)
occ_license	0.237***	0.0967***	0.0961***	0.0928***	0.0940***	0.0925***
Std Error	-0.00145	-0.00213	-0.00211	-0.00237	-0.00239	-0.00239
Demographic Controls	No	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes	No
Industry FE	No	No	No	Yes	Yes	Yes
State FE	No	No	No	No	Yes	No

Data obtained from the IPUMS database.

Moving across columns in Table 2 while controlling for various factors, we see that the licensing coefficient remains statistically significantly larger than zero. In particular, including standard demographic controls and proxies for human capital as outlined in the previous chapter, the licensing coefficient falls to 0.0967; further controlling for industry fixed effects drops the occupational licensing coefficient to 0.0925. In other words, a veteran in a licensed occupation earns on average 9% higher wages than a similar veteran in an unlicensed occupation, even conditional on the two of them working in the same industry and holding constant all other factors relating to their human capital and demographic characteristics (such as age, gender, and education).

For comparison, Kleiner and Krueger (2009) found an occupational licensing coefficient of 0.139 with demographic controls and 0.119 with occupational controls. Comparing the results obtained by Kleiner and Krueger with the results I obtained, there is a 0.0423 difference between the occupational licensing coefficients with demographic controls, and a .0265 difference between coefficients with occupational/industry controls. This indicates that veterans' wage premiums obtained by working in licensed occupations are, on average, approximately 4% lower with demographic controls and 2.5% lower with occupational controls than their civilian counterparts. Additionally, the coefficients obtained by Gittleman and Kleiner (2013) using the NLSY79 sample were 0.281 log points when regressing occupational licensing on log wage, 0.123 points upon the addition of demographic controls, and 0.078 log points on the inclusion of occupational controls. The differences between the coefficients I obtained and the coefficients Gittleman and Kleiner found are 0.044, 0.0263, and 0.0145 for no controls, demographic controls, and occupational controls, respectively, indicating that on average, veterans earn 4.4% less, 2.63% less, and 1.45% more than their civilian counterparts by working in licensed occupations.

Overall, the small differences between licensing coefficients suggests that our sample may not be drastically different from the samples used by Kleiner and Krueger, and by Gittleman and Kleiner in their studies. On the other hand, the consistently lower wage premium for licensing among the veteran population compared to civilians indicates that on average, veterans tend to make less money by working in licensed occupations than

civilians working in the same licensed occupations. Additionally, all the regressions, both from our study as well as those mentioned in our Literature Review, estimate positive and statistically significant licensing coefficients, illustrating that for all three samples, there exists a wage premium associated with being occupationally licensed. This notion empirically confirms the principle discussed in our Literature Review: occupational licensing ultimately results in a wage premium for workers in those licensed occupations.

B. OCCUPATIONAL VARIATION

However, the licensing coefficient reflects a wide variation of distinct occupations contained within the sample. Even with industry fixed effects, in order to better represent the ways in which the licensing coefficient have heterogeneous effects across occupations, I separate the industries into the major categories presented by the IPUMS codebook. These categories are managers, technical, sales, and administrative occupations, service occupations, production crafting and repair occupations, and operators, fabricators, and laborers. The impact of licensing categories on log weekly wage, with only demographic controls, are summarized in Table 3. There is a wide variation in licensing coefficients, from 0.280 for service occupations to -0.0927 for operators, fabricators and laborers. Broadly generalized, in our sample, it appears that white-collar jobs have larger positive licensing premiums, compared to blue-collar occupations. This relationship differs from the expected effects of unionization, in which those in blue-collar jobs tend to benefit more from the effects of unionization than white-collar occupations.

Table 3. Occupation Categories

	Occupation				
	Managers	**Technical, Sales, Admin**	**Service**	**Production, Craft, and Repair**	**Operators, Fabricators, Laborers**
occ_license	0.0290***	0.0808***	0.280***	0.00265	-0.0927***
Std Error	(0.00321)	(0.00662)	(0.00489)	(0.00492)	(0.00842)
Demographic Controls	No	Yes	Yes	Yes	Yes

Data obtained from the IPUMS database.

It is important to remember that my sample is not comprised of a normal cross-section of average U.S. citizens. Every observation in my sample is a military veteran, so the relationships I determine through my analysis may not be applicable to general U.S. society. Additionally, as this is a veteran sample, I highlight some occupations that have the possibility to transfer more easily into the civilian sector. In Table 4, I explore the relationships between some of the occupations that I believe may translate well from the military to civilian sectors of the market. These occupations are those in the health industry, i.e., doctors, dentists, therapists, etc., health technicians, i.e., nurses, engineering technicians, and mechanics. The veterans in these occupations have received specialized training, and in theory, could transition to a similar civilian occupation. Occupations in the health and mechanic industries exhibit high licensing coefficients, 0.197 and 0.141, respectively, while health and engineering technicians present much lower licensing coefficients, -0.0645 and -0.0931, respectively. This suggests that for some occupations they have been trained for, veterans may benefit from higher wage premiums due to licensing, however, in other occupations that veterans may have been trained for, they experience lower wages due to licensing.

Table 4. Specified Occupation Categories

	Occupation			
	Health	**Health Technicians**	**Eng Technicians**	**Mechanics**
Occ1990 Code	84-106	203-208	213-208	505-519
occ_license	0.197***	-0.0645***	-0.0931***	0.141***
Std Error	(0.0196)	(0.0128)	(0.0174)	(0.0131)
Demographic Controls	Yes	Yes	Yes	Yes

Data obtained from the IPUMS database.

Finally, in an effort to determine how occupational licensing affects the state in which veterans choose to live after separating from the military, I analyze our final regression which, holding year constant, describes the effect of concentration of veterans across states on occupations, categorized in licensed versus unlicensed occupations. The coefficient from this regression is 1.998, indicating that on average, there are roughly two veterans in licensed occupations per state for every one veteran that works in an unlicensed occupation. The data does not support drawing a causal relationship between state residence and occupational licensing status, but as a correlative statistic, it is interesting to note that there is a disproportionate spread of licensed versus unlicensed veterans in any given state.

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V. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The three main findings of our analysis of the data present three relationships: workers in licensed occupations experience a wage premium, on average, veterans experience a lower wage premium than their civilian counterparts, and that there are roughly twice as many veterans in licensed occupations versus unlicensed occupations per state. We expect to experience a wage premium for veterans in licensed occupations, as this factor is in keeping with prior research. However, our second and third findings present new and statistically interesting relationships. There are no obvious reasons that a veteran should make less money than a civilian in the same licensed occupation, other than perhaps less job experience. While these relationships are statistically significant, due to the nature of our data set, asserting that any of these findings are causal in nature would be statistically irresponsible.

B. RECOMMENDATIONS

However, as little research currently exists on this subject, there are great opportunities to further develop this topic. Specifically, the MCLTF began to develop important studies regarding the transferability of military training into licensed civilian occupations. However, as the task force has not been reestablished by the current presidential administration, research that could benefit a large proportion of our military veterans has yet to be reinstituted. Therefore, we recommend that the current administration further develop this or a similar task force, in order to ensure military training is being utilized in the most efficient manor for our veterans.

In addition to the reimplementation of a task force dedicated to optimizing the impact of military training on the civilian labor market, we recommend that organizations such as the Defense Military Data Center and the Department of Veterans Affairs record data that would facilitate further studies in this area, specifically, recording current veteran occupation would greatly benefit future studies.

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APPENDIX. WAGE DATA

VARIABLES	(1) lwklywage	(2) lwklywage	(3) lwklywage	(4) lwklywage	(5) lwklywage	(6) lwklywage
occ_license	0.237***	0.0967***	0.0961***	0.0928***	0.0928***	0.0940***
	(0.00145)	(0.00213)	(0.00211)	(0.00237)	(0.00237)	(0.00239)
age			0.0863***	0.0724***	0.0724***	0.0729***
			(0.000582)	(0.000634)	(0.000634)	(0.000633)
age2			-0.000907***	-0.000745***	-0.000745***	-0.000752***
			(6.43e-06)	(6.98e-06)	(6.98e-06)	(6.96e-06)
black			-0.116***	-0.0983***	-0.0983***	-0.122***
			(0.00264)	(0.00276)	(0.00276)	(0.00278)
asian			-0.0323***	-0.0399***	-0.0399***	-0.0781***
			(0.00698)	(0.00739)	(0.00739)	(0.00765)
female			-0.291***	-0.237***	-0.237***	-0.238***
			(0.00309)	(0.00318)	(0.00318)	(0.00315)
married			0.183***	0.139***	0.139***	0.142***
			(0.00184)	(0.00193)	(0.00193)	(0.00192)
NEast				0.0178***	0.0178***	0.114***
				(0.00283)	(0.00283)	(0.0169)
MWest			-0.108***	-0.0878***	-0.0878***	-0.0586***
			(0.00249)	(0.00255)	(0.00255)	(0.0193)
South			-0.0853***	-0.0653***	-0.0653***	-0.00343
			(0.00230)	(0.00225)	(0.00225)	(0.0140)
o.West				-	-	-
o.LessThanHS				-	-	-
HSgrad			-0.680***	0.109***	0.109***	0.111***
			(0.00307)	(0.00498)	(0.00498)	(0.00497)
SomeCollege			-0.547***	0.218***	0.218***	0.217***
			(0.00296)	(0.00495)	(0.00495)	(0.00494)
College			-0.259***	0.489***	0.489***	0.485***
			(0.00334)	(0.00533)	(0.00533)	(0.00531)
PostGrad				0.768***	0.768***	0.756***
				(0.00572)	(0.00572)	(0.00571)
_Iyear_2000			0.266***	-0.213***	-0.213***	-0.218***
			(0.00130)	(0.00342)	(0.00342)	(0.00339)
_Iyear_2001			0.296***	-0.189***	-0.189***	-0.193***
			(0.00357)	(0.00468)	(0.00468)	(0.00465)
_Iyear_2002			0.323***	-0.158***	-0.158***	-0.162***
			(0.00391)	(0.00490)	(0.00490)	(0.00486)
_Iyear_2003			0.333***	-0.153***	-0.153***	-0.156***
			(0.00397)	(0.00490)	(0.00490)	(0.00487)
_Iyear_2004			0.355***	-0.128***	-0.128***	-0.130***
			(0.00404)	(0.00496)	(0.00496)	(0.00493)
_Iyear_2005			0.382***	-0.103***	-0.103***	-0.106***

VARIABLES	(1) lwklywage	(2) lwklywage	(3) lwklywage	(4) lwklywage	(5) lwklywage	(6) lwklywage
			(0.00290)	(0.00413)	(0.00413)	(0.00410)
_lyear_2006			0.408***	-0.0777***	-0.0777***	-0.0799***
			(0.00271)	(0.00401)	(0.00401)	(0.00398)
_lyear_2007			0.447***	-0.0382***	-0.0382***	-0.0397***
			(0.00278)	(0.00405)	(0.00405)	(0.00402)
_lyear_2008			0.454***	-0.0279***	-0.0279***	-0.0287***
			(0.00283)	(0.00408)	(0.00408)	(0.00405)
_lyear_2009			0.470***	-0.0107***	-0.0107***	-0.0124***
			(0.00293)	(0.00411)	(0.00411)	(0.00408)
_lyear_2010			0.475***	-0.0101**	-0.0101**	-0.0110***
			(0.00304)	(0.00418)	(0.00418)	(0.00414)
_lyear_2011			0.481***	-0.00705	-0.00705	-0.00704
			(0.00345)	(0.00444)	(0.00444)	(0.00440)
o._lyear_2012				-	-	-
Industry FE	No	No	No	Yes	Yes	Yes
State FE	No	No	No	No	No	Yes
Constant			4.809***	4.412***	4.412***	4.320***
			(0.0131)	(0.0251)	(0.0251)	(0.0280)
Observations			2,374,029	1,520,105	1,520,105	1,520,105
R-squared			0.201	0.264	0.264	0.274

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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