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ABSTRACT

The Nurse Licensure Compact forged an environment of multi-state professional licensing. Under the compact, registered nurses licensed in one of the now twenty-five party states may legally practice in the other participating states. This paper examines how mutual reciprocity of occupational licensing reduces barriers to employment. A sample of active duty military spouses, who do not have the luxury of making relocation decisions based on license transferability, was constructed using the American Communities Survey from 2001 to 2015 in order to identify effects on labor market participation. One would otherwise be confounded by the influence of employment opportunities on location selection. Both logistic regression and a linear probability model with state and year fixed effects are used to estimate the effect of multistate licensing. The treatment group consists of nurses whose military spouse was relocated from one party state to another participating state and consequently would be eligible for license reciprocity. The control group is composed of similar nurses whose spouse's military reassignment was not between compact states for whom re-entering the workforce would require certification in the new state. Results indicate significant reductions in departures from the labor force, identifying the labor market inefficiencies created by single-state professional licensing.

1 INTRODUCTION

The domestic labor market has experienced an explosion of licensed occupations. In 1952, there were 80 state-licensed professions (Gellhorn, 1956). The 2005 report from the Council of State Governments indicated nearly 1,000 state regulated occupations (Brinegar, 2005) resulting in about one in every four workers requiring a "permission slip to do certain work" (Cottle, 2017). Occupational licenses serve to both protect the consumer and the (already licensed) practitioner. While there may be strong public support for regulation of airline pilots and medical professionals, the burden is greater on the middle or working class to cover the costs of lengthy training and exams in order to be legally employed trimming trees or hair, depending on the state (Friedersdorf, 2017). The inconsistent requirements across state lines discourage internal migration and build barriers to labor market re-entry for mobile segments of the population (Cottle, 2017).

The negative consequences of professional licensing- driving up practitioners' wages by restricting market entry (Friedman, 1962, Stigler, 1971)- are a longstanding position. This paper provides a better understanding of these negative effects by measuring the market entry hurdle erected by professional licensing at the state level by analyzing the labor market outcomes following the relocation of nurses afforded license reciprocity under the nurse licensure compact. The inherent endogeneity is overcome by examining a sample of military spouses in nursing occupations whose relocation is in conjunction with an active duty service member and dictated by the operational requirements of the military rather than the employment options for the accompanying civilian spouse.

The nurse licensure compact (NLC), initiated in 2000, is the first example of multi-state professional licensing. The model is one of mutual recognition in which individual states maintain control of requirements and discipline (Nurse Licensure Compact Administrators, 1998). The

mutual recognition[1] framework creates an environment where nurses moving within the compact face a much lower market (re)entry hurdle than those relocating across or outside compact lines. However, measuring the effect of license reciprocity on labor market entry decisions is confounded by how the agreement itself might factor into the decision to move. Nurses choosing to relocate and desiring to continue working as a nurse might systematically prefer the now 25 states within the NLC, mapped in Figure 1. At the same time, those with a strong attachment to the labor market might view the re-licensing process as an inconsequential requirement and instead seek residence and employment in non-party states where wages are, on average, higher. Exogenously determined military relocations create a natural experimental setting facilitating the evaluation of the NLC and license reciprocity with regards to continued participation in the labor force.

Among military spouses participating in the labor market, healthcare, and specifically nursing, is the predominant industry. Unlike their non-military affiliated counterparts, move locations are not chosen, but are a result of their partner's military assignments. Approximately one-third of the military moves each year and the frequent relocations have a documented negative impact on spouses' employment (Castaneda and Harrell, 2008). Using this group of nurses overcomes the otherwise inherent endogeneity to measure the effect of license reciprocity on labor market (re)entry and employment. This source of external variation has been used in other lines of research; this paper employs it in an empirical study on occupational licensing and labor market friction. The NLC has previously been studied by Depasquale and Stange [2016] but with a focus on the impact of compact licensure on labor force mobility. Using other healthcare workers as a comparison group they find little change in the geographic dispersion of nurses as a results of

[1] As documentation on the program intermixes terminology – multi-state, reciprocity, portability, and recognition – the same language is integrated into this paper to all refer to the same model of state based licensing recognized for legal practice in all states party to the NLC.

states' participation in the NLC. Focusing on an already mobile subset of nurses enables the identification of the compact licensure influence on labor market reentry. Reducing re-licensing requirements increases the one-year probability of labor force participation by 0.2 and employment by 0.3 for military spouses employed in nursing when compared to spouses in these occupations experiencing a move that did not facilitate state license reciprocity.

These results have implications for military retention, the provision of nursing care, and occupational management. The military operates under the structure of a single breadwinner household while society has progressed to a dual-income norm. Policies that facilitate the portability of spousal careers are potentially important factors in the recruitment and retention of an all-volunteer force (Castaneda and Harrell, 2008, U.S. Departments of the Treasury & Defense, 2012, Sloman, 2013). Generalizing these findings to the nurse population as a whole, increasing nurses continued participation in the labor market by reducing entry barriers could improve access to care as nationwide demand for health care grows with an aging baby-boomer population and increased insurance accessibility under the Affordable Care Act. A 30% increase in the employment of relocated nurses equates to approximately one-third of the nursing shortfall predicted by Buerhaus et al. (2009). These results also provide insight into the nature of market restriction due to professional licensing practices and the potential of alternatives to state levels of profession management.

2 BACKGROUND

2.1 Occupational Licensing

By definition, occupational licensing prohibits commercial practice without demonstrating a minimum level of competency, as determined by the state or by delegation, a self-governing board (Kleiner, 2000). Certifications and registries are the primary alternatives to licensing.

Certifications, which should provide a similar signal of practitioner skills and meet the paternalistic goals of licensure, are not always government awarded, nor required in order to practice legally (Friedman, 1962). However, in most fields consumers do not clamor for government restrictions on a market; the more politically concentrated service providers do. Fees and education or training requirements associated with licensing raise the cost of entry into the labor market, reducing the supply of practitioners. By becoming their own gatekeepers, members of a licensed profession are able to enjoy higher wages as articulated most notably by Friedman (1962), and Stigler (1971), and modeled in Maurizi (1974). Burdensome entry requirements are borne most heavily by middle or working class would-be practitioners (e.g. florists and cosmetologists) and by more mobile populations that must navigate the inconsistent requirements across state borders, not by those where the public health and safety arguments are strongest: doctors and airline pilots (Friedersdorf, 2017). Occupational licensing, as an example of government regulation, "serves the private interests of politically effective groups" (Posner, 1974) legislating away the right to work (Gellhorn, 1956, Gellhorn, 1976).

In the absence of the quality signal provided to consumers via certification or licensing, the costs of an uninformed decision to "person or purse" could be so severe as to justify licensure as a means of quality control (Gellhorn, 1976). An alternative to the theory of industry capture is one in which licensing is driven by information asymmetries. Practitioners are an extension of Akerlof's lemons problem and state regulation ensures a minimum quality level while preventing the market from degenerating into one solely served by "quacks and charlatans". However socially desirable, licensing cannot achieve a first best outcome as industry groups have an incentive to make entry standards too stringent (Leland, 1979). In reality, consumers do not operate in an information void, and over time sellers develop reputations. Licensing raises the costs for low

quality providers. While average service quality increases, consumers with low quality thresholds must now pay more (Shapiro, 1986). Additionally, the expansion of licensing is presented as the result of the growth in professional knowledge and increased specialization beyond which consumers can aptly make quality judgments (Lam and Kim, 2005).

This paper does not attempt to promote any one of these theories as the dominant underlying driver of the expansion of occupational licensing. Rather, they all assert that licensing creates a barrier to entry, restricting labor market participation. Nurse wages by state, as reported in the American Community Survey, behave as theory would suggest. Nurses in states not party to the NLC, which would facilitate the flow of nurses into the local labor market, on average, earn higher wages than those employed in compact states. This pattern is displayed in Figure 2. The wage disparity increases in conjunction with the expansion of the NLC. While patients in party states may benefit from increased access to care, nurses in these states do not enjoy the higher wages paid to their counterparts in states which enforce greater restrictions on nurse licensing.

While licensing has a growing presence, impacting more workers than minimum wage or labor unions, the attention paid to it in the literature has dwindled, perhaps due to the difficulty in estimating the associated costs and benefits (Kleiner, 2000). As Freidman noted, "the case for licensure is stronger in medicine than for most other fields" (before then asserting the damages licensure inflicts upon the industry in the forms of reduced occupational freedoms, quality of care, and incentives for scientific advancements) (1962).[2] Much of the empirical work on this topic focuses on applications in the health care industry, especially with respect to the wages and returns on investment for physicians, dentists, and nurse practitioners (Friedman, M.; Kuznets, 1939,

[2] The medical industry is also described as having devolved into one in which providers use licensing to segment skills and functions in order to protect their professional turf at the expense of the actual provision of care (Gellhorn, 1976)

Kugler and Sauer, 2005). More recent studies have looked beyond wages to measure the effects on prices and quality (Kleiner and Kudrle, 2000, Kleiner et al., 2016). Findings tend to be consistent with theory – licensing deters market entry and more regulated occupations enjoy higher wages.

The consumer faces higher prices despite the lack of evidence of quality improvement. Common across regulation theories is the assertion that licensure erects a barrier to labor market entry. The goal of this paper is to quantify the magnitude of the effect this hurdle has on labor market participation by focusing on the decision to re-enter the workforce and the effect of licensing separately from that of the additional education and training prerequisites. There are few cases of relaxing occupational licensing (Thornton and Timmons, 2015); the NLC provides an opportunity to study the effects of these regulations in reverse.

This is not the first paper to examine the influence of occupational regulation in the context of the NLC. DePasquale and Stange (2016) construct triple-difference models using the staggered adoption by states to identify the influence of the reduction in licensure barriers on labor force migration and commuting outcomes. They use a comparison group of other, unaffected, health care workers to determine the compact induces little change in the supply or mobility of nurses across states lines, even when refining the sample to nurses in counties bordering other compact states. Their results suggest the changes to occupational management initiated by the NLC will not have a significant impact on the availability of health care workers or nurse shortages. The identification strategy applied in my paper focuses on an already mobile population of nurses, which may not be representative of the career field as a whole, but facilitates a more exact comparison group, enabling a study of labor market re-entry rather than the influence of the NLC on migration.

2.2 The Nurse Licensure Compact

Prior to the formation of the Nurse Licensure Compact at the beginning of the twenty-first century, registered nurses, licensed practical and vocational nurses were required to maintain separate state licenses for each state in which they practiced. Relocating to a new state necessitated a new state license prior to working (Nurse Licensure Compact Administrators, 1998). This process could put nurses out of work for many months while they re-verified all of their credentials and waited for acceptance from the new state's board of nursing. This single-state model is still the norm for half of the country. In a 1995 Pew Commission report on healthcare workforce regulation, this system was described as a "complex and often irrational organizational patchwork". The report further criticized the status quo as a barrier to access to care while increasing costs and restricting practitioner flexibility and called for standardization across states (Finocchio et al., 1995).

To avert a Congressional solution to jurisdiction concerns as distance nursing expanded, and to maintain state level governance of nurse licensing, the National Council of the State Boards of Nursing (NCSBN) developed a model of mutual recognition of state licensure, allowing nurses to practice across state lines while retaining authorities for licensing, discipline, and enforcement at the state level (Evans, 2015). Adoption was initiated by Maryland, Texas, Wisconsin, and Utah in 2000. NLC membership stalled at 24 states and was stagnant after 2010 until revisions in 2015. The NCSBN has since progressed to promoting an enhanced compact as the needs for intra-state practice and the jurisdictional concerns of telehealth under a state based system remain (Evans, 2015, NCSBN.org, 2016). Figure 1 maps the NLC membership as of 2015. The NCSBN's implementation timeline is included in the appendix.

A 2013 National Workforce Survey identified more than four million registered nurses.

Among the survey respondents living in compact states, 36% indicated utilization of the multi-state license (Budden et al., 2013). In addition to enabling practice across state lines, the NLC should facilitate workforce mobility. However, in a comparison to other health- care workers, the compact license has not been found to significantly increase nurse migration and job mobility (DePasquale and Stange, 2016). The flowchart included as Figure 3 was constructed to illustrate the processes detailed by the NCSBN and the NLC Administrators' Licensure Webinar and supporting policies (Nurse Licensure Compact Administrators, 2017, Nurse Licensure Compact Administrators, 1998).

The following is a summary of the NLC policies with respect to relocation. When a nurse moves from one party state to another, he or she may legally practice with the origination state's license and has, in most cases, a 90-day grace period to update the new state of residence with the local state board of nursing. If the destination state is not a member of the compact, the multi-state license reverts to a single state license, authorizing privileges only in the previous state of residence, assuming the relocated nurse chooses to maintain it. These nurses must also go through the licensure by endorsement process in the new state prior to practicing, as would also be required for those moving between non-compact states. Generally, this involves re-accomplishing all licensing requirements and verification of education and testing accomplishment. Similarly, nurses moving from a non-compact state into a party state must apply for a new state license. In this case, the new license would have multi-state privileges (Nurse Licensure Compact Administrators, 2017). The licensure by endorsement experience is not as fluid as the policies indicate. Interviewed nurses describe the process as frustrating, with unexpectedly long wait times. In some cases it was deemed not worth the cost or the hassle, despite already having job offers. In comparison, entering the workforce following an intra-compact move was described as nearly seamless.

2.3 Military Personnel and Assignments

In 2015, the active duty military force numbered 1,340,533 representing less than 0.05% of the total population (Parker et al., 2017). According to the 2015 Demographics Report, the military is still predominately composed of white males, although the proportions of women and racial minorities has increased to 15.5% and 31.3% respectively. Just over half of the military members are married. The single status, without dependents, dominates among the most junior ranks implying that the families studied in this paper are less likely to be serving out an initial service commitment and will instead have experienced one or more permanent changes of station. Although the military lifestyle is generally characterized by frequent moves and time spent overseas, the majority of the stateside assignments place personnel in California, Virginia, Texas, and North Carolina (Demographics, 2010).

Each branch of the military internally manages the allocation of it personnel within the direction prescribed in Department of Defense Instruction 1315.18.[3] It stipulates that permanent changes of (duty) station are to be driven by the member's skill sets and qualifications to fill current vacancies. Volunteering for an assignment (i.e. listing it under one's preferences) and recency of last move, or time on station, are secondary considerations when generating assignments. The military services are expressly forbidden from considering demographic or marital characteristics including the employment, school enrollment, volunteer activities, or health of a service member's family member (DOD, 2014). Exceptions are permitted to allow for considering the military chaplains' religious preferences, dual military married couples, and family member's requiring access to specialized medical facilities under the exceptional family member policy. The description of the Army's process and exemptions in Lleras-Muney (2010) is characteristic of all

[3] Service specific guidance can be referenced in AFI 36-2100, Army Regulation 614-200, and MILPERSMAN.

the military branches. That paper, as well as Carrell & Zinman (2014), show that base assignments are uncorrelated with observables on personnel and provide evidence in support of the position that relocations are not chosen.

The military's own regulations, as well as existing academic work using military personnel, support the assumption that military relocations are exogenously determined. This mechanism for identification has been used by others, notably Angrist & Johnson, 2000, Lyle, 2006, and the above referenced papers. This present analysis relies on the assumption that military spouses cannot make move decisions based on license transferability.

3 DATA

The ideal data set would be a panel on military families, tracking relocations, career progression, and family outcomes. Although the Defense Manpower Data Center can provide extensive longitudinal data on military service members it is lacking the requisite information on spousal occupations and labor force participation. The American Communities Survey (ACS) captures a small sample of military families with sufficient variables to examine the effects of the NLC. The survey is not longitudinal, however the migration look-back questions are adequate to identify treatment status. The first year of available ACS data is 2001, the year following the enactment of the NLC. The period of study extends from 2001 to 2015, at which time the compact was revised in an attempt to increase state participation (Evans, 2015).[4]

To construct the analytical sample, military members are identified according to

[4] Montana entered the compact, following the revision, in late 2015, thus moves into Montana are not classified as treated.

their employment status in the Armed Forces. Using household identifiers, service members are linked to their spouses. Dual military families are not included as military nurses, working in military or federal facilities, are subject to different licensure requirements.[5] Civilian nurses are identified using occupation codes for RNs and LPN/LVNs. Using occupation codes may not fully capture the military spouses trained as nurses as one might not list an occupation if not employed. To address this concern I conduct a supplemental analysis on the period from 2009 to 2015 when degree field data was collected from respondents with at least a four-year degree. Among those surveyed with a bachelor of science in nursing (BSN), 87% list an occupation and the majority work either in an applicable nursing position or in related health fields.

Of the 63,438 military families surveyed between 2001-2015, 35% relocated in the previous year. Among the 2,651 military spouses who listed nursing occupations, the final sample is composed of the 717 who recently moved within the United States. The treatment group is composed of the 184 of these military spouses working in nursing who previously and currently reside in a NLC party state. The comparison group is all other military spouses listing an applicable nursing occupation experiencing a recent, non-compact, state-side move.

Descriptive statistics are displayed in Table 6 for the military and civilian data. The military being a male-dominated organization, it is not surprising that the military spouses working in nursing, a predominantly female field, are almost all women. (There are only 13 male nurses in the sample.) Compared to the military spouse population as a whole, the nurse subset is more educated, and thus slightly older. They also exhibit higher rates of employment and wages. The average age of the military service members sampled was 36; their spouses are thus much younger

[5] Per Nurse Licensure Compact Administrators Policy, Chapter 3.7, nurses working in federal facilities are required to maintain a license but it does not have to be state specific unless they also moonlight in civilian facilities.

than their civilian nurse counterparts. The civilian nurses have fewer children and are more likely to have completed an advanced degree than military spouses in the career field. Less than 10% of the civilian nurses moved in the past year compared to a relocation rate above 30% experienced by the military spouses. The labor market outcomes observed in the data align with the findings of Castaneda & Harrell (2008); military spouses experience greater rates of unemployment and earn lower wages. Although those in nursing appear to do better in these areas than the typical military spouse, they are still below that of the average comparable civilian nurse.

4 EMPIRICAL MODEL

4.1 Research Design

This paper exploits the military's manpower allocation decisions to estimate the casual effects of license reciprocity on the labor market outcomes of nurses. The key identifying assumption is that the geographical pattern of moves experienced by military families is not associated with the labor market preferences, skills, or constraints of the non-military spouse.

Among the general population of nurses, there is little reason to suspect relocations occur at random, or at least independent of the evaluated outcomes. The direction of the selection bias is also not clear. The hire average wages paid to nurses in non-compact states might entice migration. At the same time, nurses with a less inherent attachment to the labor force might systematically chose to move to another NLC state if already residing in a party state in order to avoid going through the re-licensure process in a non-compact state. The prospect of gaining a compact license and the ability to work across state lines might also entice movement from non-compact states into compact states. During the

period of study, 87% of moves from compact states were within the NLC.

Wages are greater on average for nurses working in non-compact states. As illustrated in Figure 2, the difference has increased since the establishment of the NLC, as predicted by Friedman (1962) that practitioners in states with stricter occupational licensing requirements would enjoy higher rents. This average wage differential might draw nurses to relocate to states not party to the NLC. It is reasonable to expect a nurse to consider the utility generated by these factors when making relocation decisions. Consequently treatment status is not independent of the outcome variable, or the unmeasured factors captured in the error term, and the resulting estimated effect would be biased. However, relocation and destination state are directed, not chosen, for military spouses, creating a natural experimental setting for this analysis.

It is worth noting that the assignment of military personnel can actually be quite deliberate. Personnel managers match service members to jobs based on "mission requirements, officer professional development, individual career field direction" (Director Personnel Operations, 2017) before taking member's preferences into consideration. Simply put, the military's objective function is to maximize force readiness (Asch and Heaton, 2008) despite numerous reports documenting the negative impacts of military service on spousal employment, to include its potential effect on retention. At the same time, the restrictions and lack of flexibility afforded to force managers inhibit the efficient utilization of service members' skill sets (Asch et al., 2007). If the military assignment system cannot maximize utilization of service members' capabilities, it is unreasonable to expect that the same process could conceive of managing spouses' careers, incorporating license portability into the process of directing military orders. This scenario falls under the third identification argument made in Imbens, 2004, in which if the "objective of the decision maker is distinct from the outcome that is of interest" then the conditional independence

assumption holds.

The ideal, albeit infeasible, experimental setting to measure the effect of multi-state licensing would be one where nurses were randomly moved across the county. Relative to the civilian nurses, the relocation of military spouses is as good as random. Neither the benefit of license portability nor wage differentials across states is a factor in the move decision that it otherwise would be for a rational civilian nurse. The identifying assumption is that military relocations are exogenously determined. Conditional on moving in conjunction with a reassigned military spouse, treatment is independent of the employment outcomes studied. Since the treatment and control groups are drawn from the same population, the unobserved counterfactual outcome for the treated group, on average, should be that which is observed for the control group.

In this case it is also important to include state and year effects. The period of study spans the economic dip following September 11th and the recession later that decade. Additionally, differences in labor market conditions across state borders, both within and across the NLC, would also influence nurse employment separately from the effect of license portability.

4.2 Sample Balance

Identification of the treatment effect relies on the assumption that military assignments are essentially random. Previous papers using the exogenous variation in military assignments have been limited to a single service; for example, Carrell & Zinman (2014), use U.S. Air Force assignments to examine payday loan legislation and Lleras-Muney, (2010) uses Army relocations to measure the effects of air pollution.[6]

[6] Additional notable papers include Angrist & Johnson, 2000; Antecol & Cobb-clark, 2008; Lyle, 2006.

Unfortunately, the ACS records are not granular enough to delineate by branch of service or military rank.

The sample balance is assessed using Cohen's D – a standardization of the differences among group means with respect to standard deviation. It can be interpreted as a measure of nonoverlap where lower values coincide with greater balance between the two groups. For example, at d = 0.1, the overlap of the treatment and control groups would be off by at most 7.7% (Cohen, 1988). The absolute values of this statistic are presented in Figure 4. For the range of available covariates, the differences between the intra-compact movers compared to other movers is below the 0.2 small effect size threshold.

Table 2 presents the group means and t-tests for the military spouses in nursing, columns 1-3, and for comparison, their married civilian counterparts in columns 5-7. The differences across treatment status are numerous and significant for the civilians. For the military spouses, there are small differences noted for those with only a high school education and among families with children too young to attend school. To determine if these factors could be due to chance rather than selection bias a linear probability model in which treatment status is the dependent variable and the available controls are included as predictors was constructed. The results are presented in column 4 of Table 2. The absence of significant predictors of treatment status among the military and spouse samples supports the assumption of exogenous movement and the F-tests reject the null hypothesis of joint significance. For comparison, the same regression is accomplished using the sample of married civilian nurses; the results reported in column 8 indicate treated moves are not as random for civilian nurses.

The same set of independent variables were used to construct a covariate index to predict labor force participation and employment. This index, tabled in the appendix, is not a significant

predictor of either outcome. For labor force participation among military spouse nurses, the estimated coefficient using the index is -0.01 with a standard error of 0.04. When the dependent variable is employed, the estimated coefficient value is -0.025 with an error of 0.023. For the purposes of this analysis, it is reasonable to assume that military assignments observed within the ACS database are as good as random with regards to relocations within the NLC.

4.3 Econometric Model

Within the structure of the NLC, there are four types of moves: compact to compact, compact to non-compact, non-compact to compact, and non-compact to non-compact. Only those who move between compact states receive license reciprocity. In the subsample of recently relocated nurses, each nurse i, indexed from $i = 1, 2, \ldots n$, has an origin and destination state. The combined compact status determines the license portability for the nurse. Let C_o be an indicator for origin states party to the NLC and C_d be an indicator the destination state's membership. Treatment status, D_i is a function of both C_o and C_d; $D_i(C_o, C_d) = 1$ if $C_o = C_d = 1$ and 0 otherwise.

Each nurse has a potential outcome in the absence of, as well as, under treatment, y_{0i} and y_{1i}, where the numerical subscript represents the state of treatment for respondent i. The difference between these two outcomes is the individual treatment effect; however, it is not actually possible to observe both the realized and counterfactual outcomes for any given nurse. If D_i and Y_i are independent, such that $D_i \perp Y_{1i}$ and $D_i \perp Y_{0i}$, as is the case under random assignment, then $E[Y_{1i}|D_i] - E[Y_{0i}|D_i] = E[Y_{1i}] - E[Y_{0i}]$ and the average treatment effect can be measured.[7] The foundation for the econometric model is then $Y_i = Y_{0i} + D_i (Y_{1i} - Y_{0i})$.

To estimate the effect of license reciprocity on labor market outcomes I use an individual-level linear probability model.

[7] This proof is more eloquently explained in Angrist & Pischke, 2015.

$$Y_i = \alpha + \delta D_i + \beta X_i + \theta location_i + \gamma year_i + \varepsilon_i$$

The dependent variable, Y, is an indicator for a labor market outcome (e.g. employed). The indicator variable, D, marks nurses experiencing treated moves, where $D_i(C_o, C_d) = 1$ if $C_o = C_d = 1$ and 0 otherwise. Again, treated moves are those in which a relocated nurse's current and previous states of residence were members of the NLC. These nurses were eligible to retain their multi-state licenses and, consequently, faced lower hurdles to entering their local labor markets. The control group is composed of all other recently relocated military spouses in nursing. The exogenous variation in military assignments allows me to identify the average treatment effect of license reciprocity, δ.

The model also includes demographic, location, and year control variables. Observable individual characteristics – age, age^2, gender, race, highest level of education, citizenship, and veteran status, number of own children and the number under the age of five, and the active duty service member's wages, logged – are captured in the X matrix. The model includes origination and destination state effects, each interacted with an indicator for post-compact entry to separately account for potential differences in local labor market conditions preceding compact entry. This results in 75, rather than 51, possible states.[8] Additionally, the destination state's ratio of nurses per capita is included among the location controls.

Even with the inclusion of origination and destination state fixed effects, the possibility of variation within clusters remains. This can result in smaller standard errors and over rejection of the null hypothesis. In this scenario, treatment is assigned both as a function of current and previous states of residence. To best adjust for this, the two-way clustering described in Cameron & Miller (2011) is used.[9]

[8] 27 non-compact states, 24 compact states pre- and post- NLC entry for 75 total

[9] Although there are 75 possible clusters on destination (or origination) states, only 48 destination

5 RESULTS

5.1 Full Sample Results

Labor force participation and employment status are the two primary outcomes evaluated. The results of the linear probability model using the sample of nurses who recently relocated with their active duty military spouse are presented in Table 3. The first three columns show the probability one is in the labor force (either employed or unemployed and searching for work). Columns 4-6 capture the results when the dependent variable is an indicator for employed. All models presented include location and year effects; variation is in the inclusion of demographic controls and standard error calculations. Controlling for individual and family characteristics reduces the magnitude of the treatment effect slightly.

Results using a logistic regression model, included in Table A4, are similar in direction and significance. Additionally, simplified specifications using the standard 51 destination states (and DC) and both origin and destination states are included in Table A3. In these specifications, the identified effects are smaller in magnitude and not as consistently significant.

The probability of a nurse's participation in the labor force increases by 0.2 following a move in which the nurse's license is essentially portable compared to those who experienced a move that required completing the full application for a new state license. The effect of license reciprocity on one-year employment is greater. Following a treated move, in which a nurse continues to reside in a state party to the NLC, the probability of employment increases by 0.3 compared to nurses experiencing other moves. Compared to the unconditional mean of 67% employed, this is a 25% or more increase in employment of military spouses in nursing.

5.2 Alternative Specifications

states are observed in the data.

Nurses in families with children are suspected to have lower levels of attachment to the labor force since returning to work must additionally exceed the costs of childcare.[10] Among the sample of recently relocated military spouses who are nurses, 451 have children. The baseline labor force participation rate is 0.15 lower, starting at 0.59. Estimation results using this restricted sample indicated the effect is slightly greater in magnitude; the probability of employment is lower by 0.35 for nurses with children who do not receive license reciprocity following a move. The effect on labor force participation is an increased probability of 0.23 when moves are within the NLC. These results are in Panel A of Table 4.

In order to address the concern that using occupation codes to identify nurses in the ACS would fail to capture trained nurses now working on other jobs due to the single-state licensure model, the effects on military spouses with degrees in nursing were examined. A BSN is not the only route to a career as a nurse. In a separate survey of registered nurses conducted in 2013, 40% entered the occupation with less than a Bachelors of Science while 15% earned degrees in non-nursing fields (Budden et al., 2013). Starting in 2009, the ACS was expanded to include field of study for respondents completing a 4-year degree program. About 60% of the BSNs captured in the ACS work in nursing positions covered under the NLC. Other top occupations include the related work as midwives, home health aids, anesthetists, and physicians; only 13% do not list an occupation.

The same model was estimated using a smaller subsample of military spouses educated in nursing. Between 2009 and 2015, 276 relocated military spouses indicated completion of degrees in nursing. The dependent variables were modified to represent not just labor force participation and employment, but specifically in the field of nursing as indicated by the respondent's listed

[10] As a reminder, all of the nurses in the sample have a spouse actively employed by a branch of the armed forces and are not the sole breadwinner.

occupation. The probability of labor force participation increases by an insignificant 0.24. The effect of license reciprocity on employment persists. The probability a relocated military spouse with a degree in nursing is employed as a nurse increases by 0.33 when the move is to a state where license portability under the NLC exists, compared to similarly educated spouses experiencing non-treated moves. The results by degree field are included as Panel B of Table 4. For comparison, the results for the subsample without children are included in the appendix. At first glance it appears the results are driven by families with children. However this specification, as well as the degree field variation described below, should be interpreted with caution; it suffers from a lack of degrees of freedom (Green, 1991) as the potential number of estimated parameters in the model nearly outnumbers the included observations.

5.3 Falsification Tests

If the effects on employment and labor force participation measured here are causal, similar effects should not be noted when the analytical sample is composed of relocated military spouses in other prevalent, yet unaffected, occupations such as cashiers, childcare providers, hairdressers, and retail managers. For these occupations, the results presented in Table 5 correspond to columns 3 and 6 of Table 3, using all model controls and standard errors clustered on both origination and destination states. The ratio of nurses per capita, included as a location effect, was replaced in each falsification test by the occupational ratio being evaluated. None of the measured effects are significant.

6 CONCLUSION

Regardless of the economic theory justification- be it paternalist, market capture, or information asymmetries- licensing stands as a barrier to entry and a restriction on occupational

freedom. However, the nurse licensure compact reduces the height of this hurdle for re-entry into the local labor market in party states as illustrated through measuring the effects on military spouses who are nurses. When not required to re-authenticate their medical credentials, nurses are more likely to remain employed in the industry following a move.

The findings reported are for military spouses in nursing occupations since the establishment of the NLC. The effects may not be directly generalizable to the civilian nursing population as the military spouses in the ACS sample are younger and more likely to be female with young children. However, in as much as nurse employment facilitates access to health care, state participation in the NLC should positively impact state health outcomes and reduce nurse shortages.

Annually, 9-10% of civilian nurses relocate. If all states were to enter the NLC, the effects estimated here indicate as many as 85,715 more nurses would be employed.[11] This represents approximately one third of the nurse shortfall projected to reach 260,000 by the year 2025 (Buerhaus et al., 2009). As these are all nurses who have previously completed the licensing requirements in at least one other state, the costs with regards to quality are questionable when compared to the potential benefits in an already strained career field.

While necessary for military readiness, professional development, and career progression, frequent relocations are a documented source of career disruption for military spouses. Although the military has only just recently opened all career fields to both genders, women are a well-established component of the civilian labor force. A military member's career is no longer the only one considered when families make service longevity decisions. License reciprocity, and the resulting increased probability of employment, reduce the negative impact of military

[11] Estimate determined using the BLS's 2016 estimated 2,857,180 RNs.

reassignment on spousal careers. Policies that improve family outcomes can positively impact service member retention, essential for maintaining experience levels within military specialties and the manning essential to providing an all-volunteer defense force.

The effects of the NLC identified here shed light on the influence of alternative models of occupational regulation on labor market outcomes. The license reciprocity model, utilized by the NLC, may also be applicable to other state-level licensed professions in which manpower shortages exist such as teachers and childcare providers. In the case of medical services and military spouses the opportunities for societal gains are clear.

FIGURES & TABLES

Table 1: Descriptive Statistics: American Communities Survey, 2001-2015

Demographic Variables	Military Spouses	Military Spouses in Nursing	Relocated Military Spouse Nurses	Civilian Nurses	Relocated Civilian Nurses
Age	32.759	34.781	32.164	45.834	38.943
	(8.580)	(7.830)	(7.357)	(11.56)	(11.67)
Female	0.928	0.978	0.978	0.888	0.864
	(0.258)	(0.145)	(0.146)	(0.315)	(0.343)
Non-White	0.229	0.201	0.184	0.188	0.232
	(0.420)	(0.401)	(0.388)	(0.390)	(0.422)
Some College	0.345	0.422	0.413	0.424	0.406
	(0.475)	(0.494)	(0.492)	(0.494)	(0.491)
College Graduate	0.233	0.426	0.440	0.360	0.387
	(0.423)	(0.494)	(0.496)	(0.480)	(0.487)
Master's Degree	0.073	0.076	0.073	0.093	0.090
	(0.260)	(0.265)	(0.260)	(0.291)	(0.286)
PhD or Professional Degree	0.016	0.013	0.017	0.035	0.032
	(0.127)	(0.111)	(0.128)	(0.184)	(0.176)
U.S. Citizen	0.947	0.966	0.979	0.964	0.918
	(0.225)	(0.182)	(0.144)	(0.187)	(0.274)
Veteran	0.146	0.168	0.151	0.194	0.162
	(0.353)	(0.373)	(0.358)	(0.395)	(0.369)
Number of Own Children	1.360	1.404	1.205	1.171	1.100
	(1.191)	(1.144)	(1.123)	(1.184)	(1.185)
Number of Children <5	0.501	0.481	0.524	0.232	0.361
	(0.713)	(0.701)	(0.735)	(0.542)	(0.643)
Recently Moved	0.362	0.301	-	0.091	-
	(0.481)	(0.459)	-	(0.287)	-
Labor Market Outcomes					
In the Labor Force	0.582	0.799	0.748	0.890	0.868
	(0.493)	(0.401)	(0.434)	(0.313)	(0.339)
Employed	0.513	0.760	0.668	0.876	0.841
	(0.500)	(0.427)	(0.471)	(0.329)	(0.366)
Wages	16294.99	33111.66	28611.49	47787.97	43375.95
	(24551.8)	(28467.3)	(23614.0)	(39655.9)	(36552.7)
Usual Hours Worked	23.818	31.656	31.625	34.529	35.148
	(19.99)	(15.93)	(16.41)	(14.32)	(14.00)
Unemployed	0.068	0.038	0.079	0.013	0.027
	(0.253)	(0.192)	(0.270)	(0.115)	(0.163)
Looking for Work	0.087	0.055	0.115	0.019	0.040
	(0.282)	(0.227)	(0.319)	(0.137)	(0.196)
Worked Last Year	0.658	0.869	0.849	0.924	0.923
	(0.474)	(0.337)	(0.358)	(0.266)	(0.267)
Not Employed but Previously Worked	0.340	0.240	0.332	0.124	0.159
	(0.474)	(0.427)	(0.471)	(0.329)	(0.366)
Sample Size	63438	2651	717	380797	29640

Standard deviations in parenthesis. Statistics calculated using survey weights. All samples restricted to married observations.

Figure 1: Map of NLC Membership, 2015

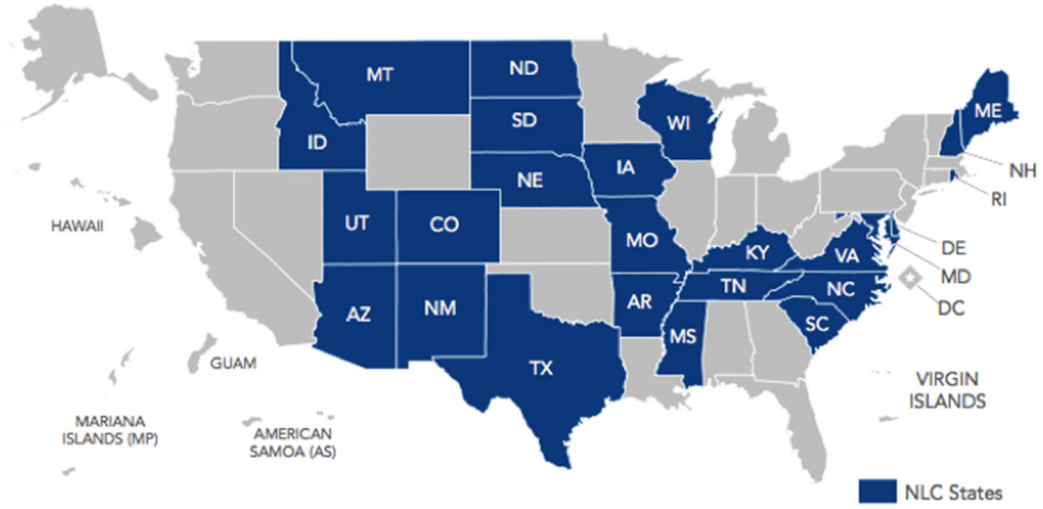

Image from National Council of State Boards of Nursing

Figure 2: Average Civilian Nurse Wages over Time, by NLC Status

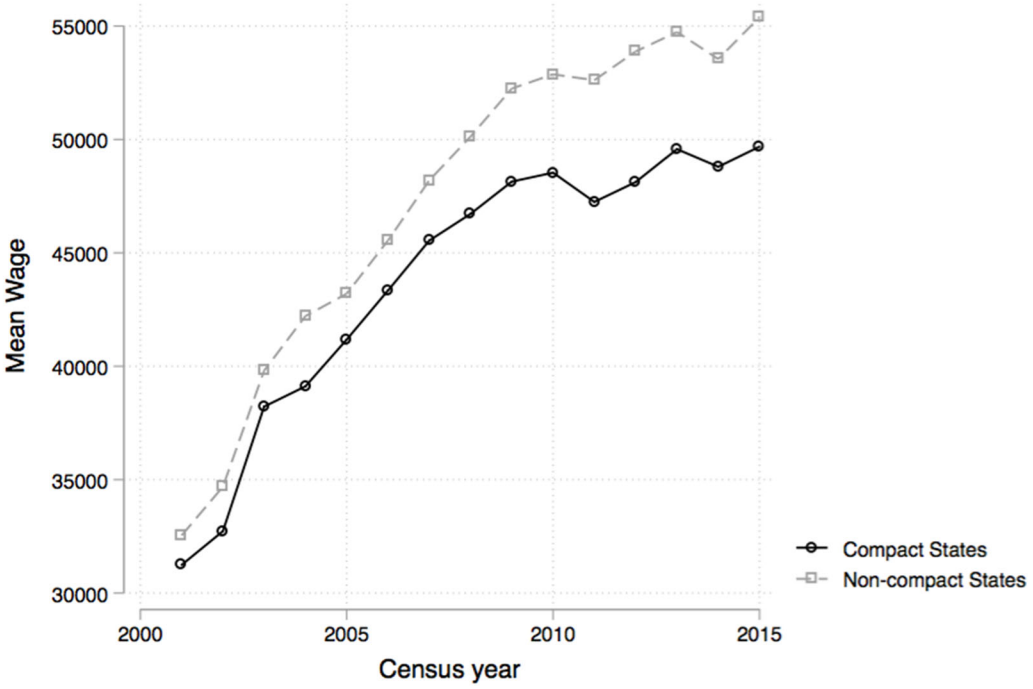

Figure 3: License Requirements Following Nurse Relocation

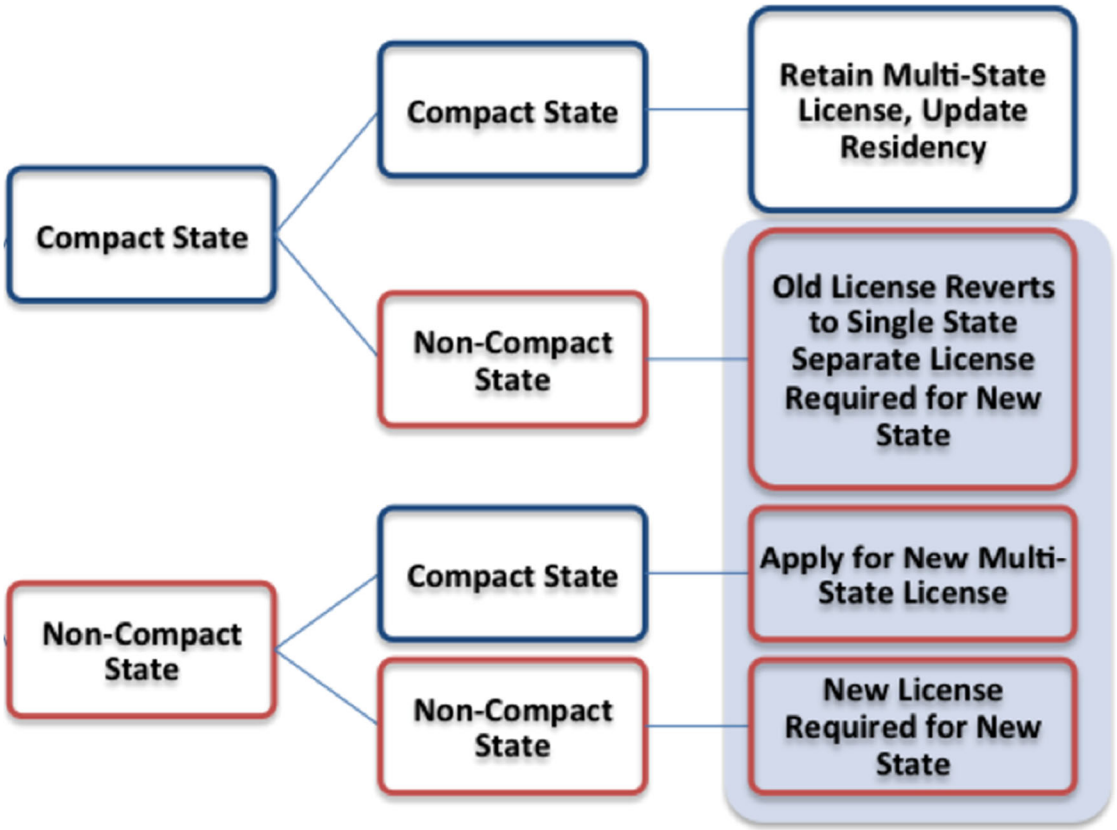

Figure 4: Standardized Mean Differences

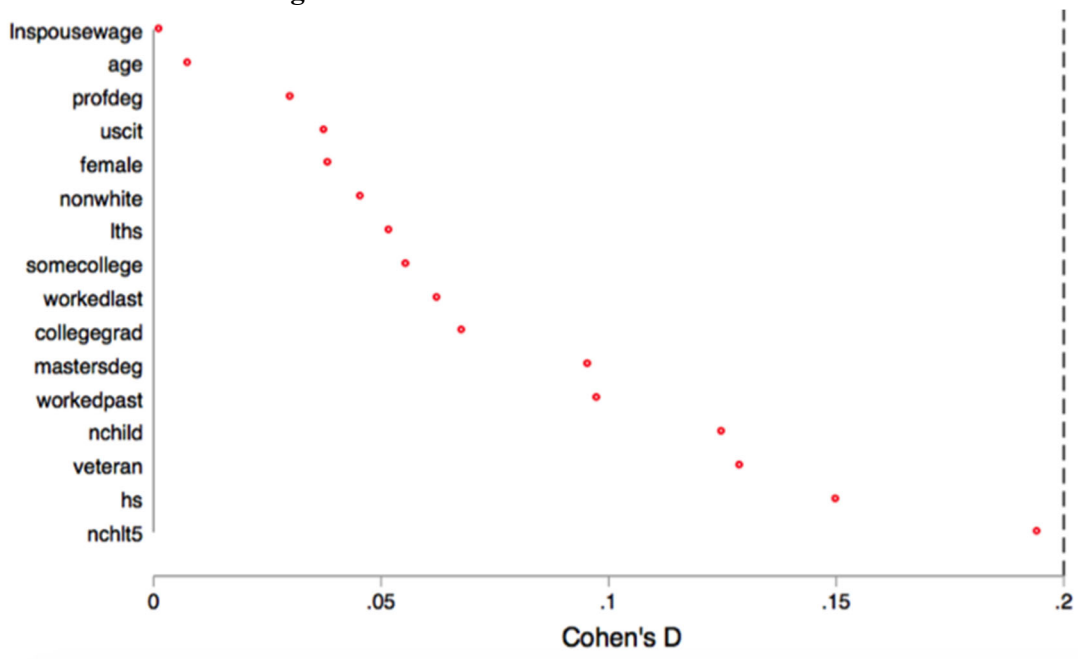

Table 2: Sample Balance across Compact and Non-Compact Moves

	Military Spouses in Nursing				Married Civilian Nurses			
	Intra-Compact Move (sd)	Non-Compact Move (sd)	Difference (t)	Regression on Treatment (se)	Intra-Compact Move (sd)	Non-Compact Move (sd)	Difference (t)	Regression on Treatment (se)
Age	32.119	32.177	0.075	0.002	38.371	39.151	1.137***	-0.002***
	(7.791)	(7.227)	(0.114)	(0.003)	(11.79)	(11.63)	(7.291)	(0.000)
Female	0.982	0.977	-0.002	0.023	0.862	0.866	0.004	-0.017
	(0.132)	(0.150)	(-0.215)	(0.124)	(0.345)	(0.340)	(0.855)	(0.012)
Non-White	0.198	0.180	-0.018	0.026	0.180	0.241	0.066***	-0.062***
	(0.399)	(0.384)	(-0.594)	(0.057)	(0.384)	(0.428)	(13.063)	(0.010)
Some College	0.392	0.420	0.043	-0.121	0.442	0.395	-0.043***	0.023
	(0.488)	(0.493)	(1.032)	(0.102)	(0.497)	(0.489)	(-6.760)	(0.015)
College Graduate	0.415	0.448	0.008	-0.116	0.372	0.390	0.015*	-0.003
	(0.493)	(0.497)	(0.197)	(0.101)	(0.483)	(0.488)	(2.382)	(0.015)
Master's Degree	0.094	0.067	-0.016	-0.029	0.079	0.094	0.015***	-0.016
	(0.292)	(0.249)	(-0.663)	(0.128)	(0.269)	(0.292)	(3.861)	(0.019)
PhD or Professional Degree	0.014	0.018	0.004	-0.169	0.026	0.034	0.010***	-0.035
	(0.117)	(0.131)	(0.412)	(0.173)	(0.160)	(0.181)	(4.417)	(0.024)
U.S. Citizen	0.974	0.980	0.001	-0.048	0.956	0.926	-0.031***	0.057***
	(0.159)	(0.139)	(0.066)	(0.116)	(0.206)	(0.261)	(-9.919)	(0.015)
Veteran	0.118	0.160	0.020	-0.069	0.162	0.165	0.0035	-0.004
	(0.323)	(0.367)	(0.645)	(0.046)	(0.368)	(0.371)	(0.741)	(0.011)
Number of Own Children	1.308	1.175	-0.149	0.005	1.112	1.100	-0.023	0.007
	(1.064)	(1.137)	(-1.514)	(0.021)	(1.205)	(1.181)	(-1.521)	(0.004)
Number of Children <5	0.633	0.493	-0.123*	0.062	0.352	0.367	0.008	-0.022**
	(0.720)	(0.736)	(-1.970)	(0.035)	(0.627)	(0.652)	(0.988)	(0.007)
Worked Last Year	0.865	0.844	0.010	0.057	0.924	0.927	-0.002	-0.068***
	(0.341)	(0.363)	(0.318)	(0.062)	(0.264)	(0.260)	(-0.581)	(0.019)
Not Employed, Previously Worked	0.297	0.342	0.006	-0.041	0.139	0.155	0.020***	-0.050***
	(0.457)	(0.474)	(0.149)	(0.049)	(0.345)	(0.362)	(4.199)	(0.013)
Sample Size	184	533	717	717	8731	19919	28650	23534
F				0.857				10.774
p				0.62				0.000

Samples restricted to respondents who relocated from another state in the last year. For columns 4 & 8, the dependent variable is an indicator for moving from a compact state to another compact state. Statistics calculated using survey weights where applicable. Standard deviations or errors in parentheses. $p < 0.05, **p < 0.01, ***p < 0.001$

Table 3: Robust Linear Probability Model, N=717

	In the Labor Force			Employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional Mean	0.741			0.669		
Treated Move	0.236*	0.195**	0.195+	0.325**	0.291***	0.291***
	(0.0956)	(0.0663)	(0.104)	(0.101)	(0.0671)	(0.0693)
Demographic Controls		X	X		X	X
Location Effects	X	X	X	X	X	X
Year Effects	X	X	X	X	X	X
Adjusted R^2	0.106	0.233	0.229	0.117	0.204	0.185

Individual controls include age, age2, female, nonwhite, less than high school, high school graduate, some college, master's degree, professional degree, and veteran. White and college graduate are the reference categories. Family variables are number of own children, number of children under 5, and activeduty service member's wages, logged. Location effects encompass origination state, destination state both with separate indicators for compact states pre- and post-entry, and the state ratio of nurses per capita. Estimates calculated using survey weights. N= 717 relocated nurse military spouses. Standard errors in parentheses: models 1 & 4 are robust, 2 & 5 are clustered by origin state, and 3 & 6 use two-way clustering on origin and destination states. $+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001$

Table 4: Linear Probability Models - Restricted Samples

Panel A: Families with Children, N = 451

	In the Labor Force			Employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional Mean	0.585			0.650		
Treated Move	0.371**	0.233*	0.233	0.476**	0.353***	0.353**
	(0.143)	(0.111)	(0.143)	(0.146)	(0.0980)	(0.114)
Demographic Controls		X	X		X	X
Location Effects	X	X	X	X	X	X
Year Effects	X	X	X	X	X	X
Adjusted R^2	0.083	0.204	0.184	0.109	0.204	0.178

Panel B: By Nursing Degrees, 2009-2015, N=276

	In the Labor Force			Employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional Mean	0.591			0.663		
Treated Move	0.276	0.238	0.238	0.361*	0.330*	0.330*
	(0.175)	(0.144)	(0.154)	(0.163)	(0.153)	(0.146)
Demographic Controls		X	X		X	X
Location Effects	X	X	X	X	X	X
Year Effects	X	X	X	X	X	X
Adjusted R^2	0.172	0.243	0.238	0.192	0.257	0.255

Individual controls include age, age^2, female, nonwhite, less than high school, high school graduate, some college, master's degree, professional degree, and veteran. White and college graduate are the reference categories. Family variables are number of own children, number of children under 5, and active duty service member's wages, logged. Location effects encompass origin state, destination state, both with separate indicators for compact states pre- and post-entry, and the state ratio of nurses per capita. Estimates calculated using survey weights. Panel A: N= 451 relocated nurse military spouseswith children. Panel B: N= 276 relocated military spouses with degrees in nursing. Standard errorsin parentheses: models 1 & 4 are robust, 2 & 5 are clustered by origin state, and 3 & 6 use two-way clustering on origin and destination states. $+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001$

Table 5: Falsification Tests

	Hairdressers		Cashiers		Childcare		Retail Managers	
	In Labor Force	Employed	In Labor Force	Employed	In Labor Force	Employed	In Labor Force	Employed
Unconditional Mean	0.622	0.541	0.454	0.327	0.530	0.406	0.633	0.554
Treated Move	-0.610	-0.475	0.045	0.034	0.074	0.099	0.121	0.095
	(0.397)	(0.415)	(0.067)	(0.065)	(0.088)	(0.086)	(0.131)	(0.135)
Demographic Controls	X	X	X	X	X	X	X	X
Location Effects	X	X	X	X	X	X	X	X
Year Effects	X	X	X	X	X	X	X	X
N	148	148	1,089	1,089	707	707	406	406

Individual controls include age, age^2, female, nonwhite, less than high school, high school graduate, some college, master's degree, professional degree, and veteran. White and college graduate are the reference categories. Family variables are number of own children, number of children under 5, and active duty service member's wages, logged. Location effects encompass origin state, destination state, both with separate indicators for compact states pre- and post-entry, and the state ratio of occupation per capita. Estimates calculated using survey weights. Samples limited to relocated military spouses in each occupation. Robust standard errors in parentheses. $*p < 0.05, **p < 0.01, ***p < 0.001$

APPENDIX

Table A1: NLC ImplementationDates

Arizona	7/1/2002
Arkansas	7/1/2000
Colorado	10/1/2007
Delaware	7/1/2000
Idaho	7/1/2000
Iowa	7/1/2000
Kentucky	6/1/2007
Maine	7/1/2001
Maryland	7/1/1999
Mississippi	7/1/2001
Missouri	6/1/2010
Montana	10/1/2015
Nebraska	1/1/2001
New Hampshire	1/1/2006
New Mexico	1/1/2004
North Carolina	7/1/2000
North Dakota	1/1/2004
Rhode Island	7/1/2008
South Carolina	2/1/2006
South Dakota	1/1/2001
Tennessee	7/1/2003
Texas	1/1/2000
Utah	1/1/2000
Virginia	1/1/2005
Wisconsin	1/1/2000

Source: National Council of StateBoards of Nursing

Table A2: Covariate Index

	In Labor Force		Employed	
	(1)	(2)	(3)	(4)
Fitted values	-0.010	0.022	-0.025	-0.037
	(0.035)	(0.059)	(0.023)	(0.037)
Adjusted R^2	0.0001	0.0003	0.0001	0.0000

Standard errors in parentheses. Models 1 & 3 include all military spouses in nursing. Models 2 & 4 are restricted to recently relocated military spouses in nursing. Fitted values for respective labor market outcome are used to predict NLC status. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A3: Linear Probability Model, Simple Specifications, N=717

	In the Labor Force			Employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional Mean	0.741			0.669		
Panel A						
Treated Move	0.0761	0.0488	0.0488	0.128+	0.119*	0.119+
	(0.0606)	(0.0708)	(0.0996)	(0.0675)	(0.0576)	(0.0671)
Demographic Controls		X	X		X	X
Location Effects	X	X	X	X	X	X
Year Effects	X	X	X	X	X	X
Adjusted R^2	0.054	0.183	0.183	0.083	0.170	0.170
Panel B						
Treated Move	0.207*	0.176*	0.176+	0.300***	0.280***	0.280***
	(0.0849)	(0.0778)	(0.102)	(0.0905)	(0.0630)	(0.0617)
Demographic Controls		X	X		X	X
Location Effects	X	X	X	X	X	X
Year Effects	X	X	X	X	X	X
Adjusted R^2	0.040	0.174	0.173	0.064	0.155	0.155

Individual controls include age, age^2, female, nonwhite, less than high school, high school graduate, some college, master's degree, professional degree, and veteran. White and college graduate are the reference categories. Family variables are number of own children, number of children under 5, and active duty service member's wages, logged. In Panel A, location effects include only the 51 potential destination statesand the state ratio of nurses per capita; Panel B location effects is expanded to also encompass originationstate. Estimates calculated using survey weights. N= 717 relocated nurse military spouses. Standard errors in parentheses: models 1 & 4 are robust, 2 & 5 are clustered by origin state, and 3 & 6 use two-way clustering on origin and destination states. $+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001$

Table A4: Logistic Regression Results, N=717

	In the Labor Force			Employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional Mean	0.741			0.669		
Treated Move	3.847**	3.847*	4.341*	4.899***	4.899***	5.557***
	(0.495)	(0.648)	(0.605)	(0.462)	(0.437)	(0.402)
Demographic Controls			X			X
Location Effects	X	X	X	X	X	X
Year Effects	X	X	X	X	X	X

Odds ratios reported. Individual controls include age, age^2, female, nonwhite, less than high school, high school graduate, some college, master's degree, professional degree, and veteran. White and college graduate are the reference categories. Family variables are number of own children, number of children under 5, and active duty service member's wages, logged. Location effects encompass origination state, destination state, and the state ratio of nurses per capita. Estimates calculated using survey weights.N=717 relocated nurse military spouses. Standard errors in parentheses: models 1 & 4 are robust, allothers clustered by origin state. $+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001$

Table A5: Restricted Samples Panel C: Couples without Children, N=266

	In the Labor Force			Employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional Mean	0.895			0.812		
Treated Move	0.171	0.166+	0.166	0.214	0.229	0.229+
	(0.122)	(0.0833)	(0.103)	(0.168)	(0.142)	(0.132)
Demographic Controls		X	X		X	X
Location Effects	X	X	X	X	X	X
Year Effects	X	X	X	X	X	X
Adjusted R^2	0.302	0.301	0.256	0.221	0.195	0.128

Individual controls include age, age2, female, nonwhite, less than high school, high school graduate, some college, master's degree, professional degree, and veteran. White and college graduate are the reference categories. Family variables are number of own children, number of children un-der 5, and active duty service member's wages, logged. Location effects encompass origination state, destination state both with separate indicators for compact states pre- and post-entry, andthe state ratio of nurses per capita. Estimates calculated using survey weights. N=266 relocatednurse military spouses without children. Standard errors in parentheses: models 1 & 4 are robust,2 & 5 are clustered by origin state, and 3 & 6 use two-way clustering on origin and destinationstates. $+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001$

Table A6: Robust Linear Probability Model, Expanded, N=717

	In the Labor Force			Employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional Mean	0.741			0.669		
Treated Move	0.236*	0.195**	0.195+	0.325**	0.291***	0.291***
	(0.0956)	(0.0663)	(0.104)	(0.101)	(0.0671)	(0.0693)
Age		0.0346	0.0346		0.0472*	0.0472*
		(0.0227)	(0.0227)		(0.0204)	(0.0198)
Age^2		-0.000560+	-0.000560+		-0.000737*	-0.000737*
		(0.000322)	(0.000327)		(0.000301)	(0.000309)
Female		-0.158+	-0.158		-0.107	-0.107
		(0.0854)	(0.136)		(0.130)	(0.174)
Non-white		0.0824*	0.0824+		-0.0202	-0.0202
		(0.0379)	(0.0480)		(0.0563)	(0.0705)
LTHS		-0.506**	-0.506**		-0.519**	-0.519**
		(0.176)	(0.158)		(0.162)	(0.158)
High School		0.0668	0.0668		0.0219	0.0219
		(0.131)	(0.128)		(0.129)	(0.129)
Some College		0.0148	0.0148		0.00536	0.00536
		(0.0507)	(0.0406)		(0.0484)	(0.0378)
Master's Degree		0.112	0.112		0.145*	0.145*
		(0.0669)	(0.0687)		(0.0658)	(0.0614)
Professional		0.111	0.111		0.166	0.166
Degree or PhD		(0.152)	(0.148)		(0.181)	(0.167)
Veteran		0.0822	0.0822		0.0397	0.0397
		(0.0662)	(0.0629)		(0.0751)	(0.0670)
US Citizen		0.0463	0.0463		-0.0252	-0.0252
		(0.125)	(0.0957)		(0.119)	(0.0987)
# of Children		-0.0183	-0.0183		-0.00104	-0.00104
		(0.0195)	(0.0217)		(0.0176)	(0.0262)
# of Children < age 5		-0.204***	-0.204***		-0.210***	-0.210***
		(0.0354)	(0.0387)		(0.0359)	(0.0404)
ln Spouse's Wage		-0.0306	-0.0306		-0.0136	-0.0136
		(0.0415)	(0.0480)		(0.0434)	(0.0514)
Constant	1.052*	1.345+		1.189**	1.069	
	(0.410)	(0.690)		(0.458)	(0.924)	
Location Effects	X	X	X	X	X	X
Year Effects	X	X	X	X	X	X
Adjusted R^2	0.106	0.233	0.229	0.117	0.204	0.185

Individual controls include age, age2, female, nonwhite, less than high school, high school graduate, some college, master's degree, professional degree, and veteran. White and college graduate are the reference categories. Family variables are number of own children, number of children under 5, and active duty service member's wages, logged. Location effects encompass origination state, destination state both with separate indicators for compact states pre-and post-entry, and the state ratio of nurses per capita. Estimates calculated using survey weights. N= 717 relocated nurse military spouses. Standard errors in parentheses: models 1 & 4 are robust, 2 & 5 are clustered by origin state,and 3 & 6 use two-way clustering on origin and destination states. $+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001$

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