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AUGUST 2022

A look at the U.S. labor force through automation and COVID-19

Summary written by: [Alexander Saenz](#)

The first Industrial Revolution was ushered in by the invention of the steam engine in 1698, as machines infiltrated nearly all facets of life in Europe and North America. About a century later, new technologies in manufacturing and production defined the second Industrial Revolution. Digitalization arrived in the mid-1900s with new advancements to society to define the third Industrial Revolution.

In their paper “[Race and jobs at risk of being automated in the age of COVID-19](#)” (The Hamilton Project, Brookings Institution, March 4, 2021), Kristen E. Broady, Darlene Booth-Bell, Jason Coupet, and Moriah Macklin establish that we are currently living in a fourth Industrial Revolution, one centered around automation and artificial intelligence. The authors use prior studies to list the occupations that are most and least susceptible to automation and then relate these findings to the demographic data of occupations. Furthermore, in this study, they examine how the coronavirus disease 2019 (COVID-19) pandemic will affect jobs moving forward and offered potential strategic adjustments.

Broady, Booth-Bell Coupet, and Macklin note that other research, based on the Standard Occupational Classification (SOC) system, used machine learning to determine the future potential of an occupation becoming automated. In this study, the authors match these computerization data to occupations by race from the Current Population Survey (CPS). Although the SOC and CPS do not completely overlap, Broady, Booth-Bell, Coupet, and Macklin apply percentages by race from the larger occupational categories to the subcategories that do not have racial data, to provide estimates of the probability of future automation for occupations.

From these occupations, Broady, Booth-Bell, Coupet, and Macklin find that among a subset of 30 jobs (at least 300,000 workers) with the highest risk of automation, Blacks and Hispanics are overrepresented, whereas Asians are underrepresented. Overall, 23.0 percent of the total U.S. workforce is included in this subset of 30 jobs.

Among a subset of 30 jobs with the lowest risk of automation (about 73,000 workers), however, the authors find that these jobs are made up of a low percentage of Blacks, Hispanics, and Asians. In total, 14.0 percent of the U.S. workforce is concentrated in these 30 occupations. The authors then detail specific jobs, such as transportation and food preparation occupations, that are at risk of automation and are filled by a high proportion of Black and Hispanic workers.

Next, Broady and colleagues describe how the COVID-19 pandemic has expedited automation. They explain that the rise of “telepresence,” which they describe as “a form of automation” or “the experience of being present at a real-world location, remote from one’s own immediate physical environment,” will decrease economic hubs, because being situated in a central location will become less necessary. This shift will favor the large businesses that already have more automation in place.

The authors conclude with a few ways to move forward through this fourth revolution, particularly those that do not leave behind the Black and Hispanic workers. The first is investing in education for the Black workers, for example, through historically Black colleges and universities and minority-serving institutions, innovative programs, and organizations such as the United Negro College Fund. Another possibility is through workplace training for unskilled workers or those who need to be reskilled. Many other countries have “developed programs and incentives to ensure workers are able to update their skills to match the demands of the evolving workforce.”



ARTICLE

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Occupational licensing and interstate migration in the United States

The empirical evidence regarding the effects of state occupational licensing practices on interstate migration in the United States is mixed. This article uses a standardized and established methodology—founded in the tradition of gravity models and common across the social sciences—to evaluate the relationship between occupational licensing and migration flows between states. The analysis focuses on the most general of relationships: the volume of migration from each state to another state as a function of the percentage of workers in licensed occupations. Overall, state licensing rates appear to have no effect on interstate migration flows; as a result, the evidence suggests that federal policy interventions, such as standardizing occupational licensing across the states, are not indicated.

State and local governments both explicitly and implicitly regulate migration in many ways, such as through child custody laws,¹ zoning regulations,² and residency requirements for employment.³ The role of internal borders in restricting migration has been established in both India⁴ and the United States.⁵ Although these border effects are unlikely to be the result of any single policy, the effect of variations in state occupational licensing regimes on interstate migration in the United States has received the most attention. Over 25 percent of workers in the United States are employed in occupations regulated by state laws. These regulations, however, frequently differ from one state to another and in some cases vary dramatically: Michigan requires 3 years of education and training to become a licensed security guard, while other states require only 11 days; the average length of training among low-income licensed occupations varies from a high of 724 days in Hawaii to a low of 113 days in Pennsylvania; and Louisiana is the only state that requires a license to work as a florist. Such variations are presumed to raise the cost of migrating from one state to another enough to reduce interstate migration. Of consequence is whether any associated reduction in interstate migration reduces the efficiency of regional labor and housing markets and, if so, whether policy interventions are necessary.

The empirical evidence on the effects of licensure on migration is mixed.⁶ For example, Johnson and Kleiner estimated cross-sectional models of out-migration among a large sample of licensed occupations (controlling for sources of unobserved heterogeneity) and concluded that interstate variations in licensing requirements reduce migration rates within these occupations by 36 percent relative to members of other occupations.⁷ In contrast, Arbury et al. found that a state's adoption of reciprocity and endorsement policies for teachers increases out-migration by just 0.02 percent.⁸ DePasquale and Stange examined the effects of participating in the Nurse Licensure Compact (NLC), which allows nurses to practice in other NLC states without obtaining a separate license, and found no effect of adopting the NLC on out-migration or commuting to another state.⁹

Several factors may account for these inconsistencies. First, although many interstate variations in licensing are certainly burdensome, the actual costs of many licensing policies—in terms of direct and indirect costs of time and money—may not be high enough to actually reduce migration.¹⁰ Second, many states have developed reciprocity agreements with neighboring states for specific occupations, thereby reducing the cost of moving between those states (or commuting from one state to a neighboring state for work). Third, occupational licensing may not be the only source of border effects. Even if licensing has a negative effect on migration, other policies may have positive effects that offset any licensing effect. Finally, much of the previous research on licensing uses inconsistent and even idiosyncratic methods that ignore accepted practices for modeling migration flows. Taking these concerns into account, we are agnostic as to the actual relationship between licensing and migration.

Our research has two goals. First, we approach the question of state licensure and interstate migration flows using tried and tested methods. We estimate a modern form of what has traditionally been called a gravity model. The advantage of this approach is that it integrates several salient characteristics of migration flows between states—namely, their spatial dimensions and the simultaneous determination of both in- and out-migration between pairs of states. Second, we discuss the meaning of our results for the narrative that occupational licensing inhibits interstate migration and thereby the efficient operation of regional labor and housing markets. This narrative has gained considerable traction, causing states and the federal government to push for either harmonizing or liberalizing state occupational licensing regimes.¹¹ Because the empirical evidence supporting these policies is at best unclear—a finding underscored by our models—the pursuit of new policies may have both unintended and undesired consequences. For example, reducing the role of occupational licensing might lead to reduced consumer health and safety protections and, perhaps indirectly, protections against the erosions in income and job security,¹² especially in times of economic crisis.¹³

Background

The early research on licensing and migration emerged as the state regulation of occupations started to increase in the 1950s.¹⁴ These studies were similar in that they all focused on aggregate occupationally specific U.S. interstate migration rates (i.e., Do workers in one type of occupation move more often than those in another type?). Compared with later research, the earlier studies offered more concrete conclusions. To summarize, these investigations made the following points: First, occupations more likely to be licensed have lower rates of interstate migration. Although these studies generally focus on professional occupations, there is some evidence that the effects also apply to nonprofessional occupations. Second, licensed occupations that have reciprocity agreements with other states have higher interstate migration rates compared with similar licensed occupations that do not have such agreements. This effect, however, may be contingent upon having a critical mass of participating states. Third, occupational differences in interstate migration rates and licensing practices may be endogenous with other occupationally specific spatial labor market processes and practices, such as the role of professional associations in developing spatial information networks. Finally, occupations requiring an investment in either developing a local clientele (e.g., dentists) or investing in localized knowledge necessary for successful practice (e.g., lawyers) have lower interstate migration rates. In turn, such highly localized professions may develop more restrictive licensing regulations to protect their considerable investment in those practices.

A limitation of the earlier studies is that they focused on aggregate occupationally specific interstate migration rates. Such an approach ignores how state-specific characteristics, including state-specific licensing practices, affect both in- and out-migration for a particular state. In two similar papers, Kleiner, Gay, and Greene addressed this issue and estimated the effects of state-specific occupational licensing practices on state-specific in- and out-migration rates.¹⁵ They found that licensing barriers reduce both in-migration and out-migration among a large set of widely licensed occupations. They also compared surveyors, which is an occupation characterized by wide variations in licensing practices, with other professional and technical occupations and found that more restrictive licensing practices in surveying reduces in-migration but has no effect on out-migration. Calculated marginal effects of licensing, for specific occupations, are about 5 percent. More recently, Johnson and Kleiner estimated the effect of bar exam difficulty on interstate migration and found large effects.¹⁶

Recent studies have made important methodological improvements. Three studies use causal methods to estimate how a change in licensing and reciprocity practices affect state-specific out-migration rates among attorneys, nurses, and teachers.¹⁷ The results are either insignificant or uncover only a very small effect for a change in licensing practices on interstate migration. For example, Arbury et al. estimated a difference-in-difference model revealing that a state's adoption of reciprocity and endorsement policies for teachers increases out-of-state migration by only 0.02 percent.¹⁸ Another advance in the research has been to selectively apply some gravity model concepts. Loucks, for example, found that, after controlling for some of the spatial processes indicated by a gravity model, the in-migration of pharmacists is affected by destination-specific licensing practices.¹⁹ Loucks's specification, however, did not consider the effects of origin-specific licensing practices or fully account for the spatial structure of each origin–destination pair.

A study by Mulholland and Young is notable in that it addresses the role of occupational licensing in interstate migration flows within what the authors call a “modified gravity” framework that accounts for spatial structure as well as differences in origin and destination conditions.²⁰ Similar to our study, the Mulholland–Young analysis finds weak effects on interstate migration of occupational licensing in low- to moderate-income professions, among both the full population and those without a college education. However, their log-odds model specification for each origin–destination pair is unconventional and not directly comparable to the traditional Poisson gravity model log-linear flow-count specification or its conditional logit counterpart that can be derived from discrete choice theory.²¹ The Mulholland–Young model also includes intrastate flows that are assigned distances of zero, biasing the estimation of spatial structure effects on migration. One of our goals is to assess the effects of licensing on migration flows between states, excluding intrastate flows and using a conventional specification. As we shall explain, one of the advantages of the specification we used is that it constrains the estimation to reproduce the total flows out of and into each state.

Previous research, then, provides mixed evidence that licensing hinders interstate migration and certainly not enough to raise concerns about licensing's effect on regional labor and housing markets. That said, a weakness of the earlier research is that it uses idiosyncratic methods, which makes it difficult not only to compare results but also to identify which results are more robust than others. Our response is to introduce a standardized and established methodology founded in the tradition of gravity models but also derived from discrete choice theory and commonly used across the social sciences to model flows between regions. Our intuition is that migration from one region to another is determined by the characteristics of the origin, the characteristics of the destination, the distance between the origin and the destination, and the relative spatial arrangement of alternative origins and destinations surrounding both the origin and destination of a migration flow. As a first step toward establishing a more robust body of evidence, our analysis focuses on the most general of relationships—the volume of migration from each state to every other state as a function of the percentage of workers in a licensed occupation.

Empirical strategy

The interstate flow data for our models come from the 2014, 2015, and 2016 IPUMS (originally, the Integrated Public Use Microdata Series) versions of the 1-year American Community Survey (ACS).²² We pool these data because interstate migration is relatively rare—only about 1.5 percent of the U.S. population migrates between state lines each year. By pooling the data, we seek a balance between (1) an increase in sample size (to 3 percent of the U.S. population); (2) a reduction in yearly oscillations in annual data resulting from the small annual number of migrants between small states located far apart; and (3) improved precision in the estimates versus using the 5-year, 5-percent ACS, which would create a large gap between the last few years of observations in the ACS—specifically, 2018 and 2019—and when the focal independent variable is measured (2013).

From these data we generate seven sets of flows to test whether licensing effects matter for subgroups of the population defined by age, labor force participation, and educational attainment level: (1) all movers, (2) people in the labor force ages 25 to 64, (3) people in the labor force ages 25 to 64 with at least a 4-year college degree, (4) people in the labor force ages 25 to 64 without a 4-year college degree, (5) people in the labor force ages 25 to 39, (6) people in the labor force ages 25 to 39 with at least a 4-year college degree, and (7) people in the labor force ages 25 to 39 without a 4-year college degree. We focus on educational attainment and age rather than on other labor force variables such as income and occupation because the data are cross sectional; both income and occupation are only observed after the move and therefore may change as a result of the move. Education level is more stable before and after a move and is highly correlated with income and occupation.²³

We expect that people without a 4-year college degree may be more sensitive to licensing costs than others because their wages are generally lower. We speculate that these effects may be weaker for younger workers because, following human capital logic, they have a longer time horizon to recoup these costs. Our expectations are not especially strong for these group differences, however, and there are reasonable arguments in favor of alternative hypotheses. Many workers with a college degree are also in licensed occupations, and although the wages of these workers are relatively high, the costs associated with satisfying state licensing requirements may influence their destination choice. Younger workers may be more deterred from selecting a destination by licensing restrictions than older workers are because younger workers are less likely to have the resources to cover the costs of new licensing requirements.

We use the following equation to measure the effects of licensing on these flows:

$$M_{ij}^k = \exp(O_i + D_j + \gamma \ln(d_{ij}) + \delta c_{ij} + \lambda(X_j/X_i) + \beta(L_j/L_i))$$

Where M_{ij}^k is the number of people in group k moving between state i and j , ($i \neq j$), O_i is an origin-state fixed effect, D_j is a destination-state fixed effect, d_{ij} is the great circle distance between state population centroids, c_{ij} is a dummy variable equal to 1 if state i and j are contiguous, X_j/X_i are the ratios of destination-to-origin variables that may guide the direction of flows between pairs of states not captured by the fixed effects, and L_j/L_i is the ratio of licensing penetration in the destination state relative to the origin state.²⁴ L_j/L_i implies that licensing in the origin state affects the volume of migration from that state, which is a point not considered in previous research. Higher levels of licensing in the origin state may inhibit out-migration because of the protections associated with licensing and the sunk costs of attaining a license there. We opt for ratio measures of the independent variables because previous research finds they are better suited to capture the likely influence of differences between destination-state and origin-state characteristics on migration choice.²⁵ We restrict the model to include only the lower 48 states and the District of Columbia because of the remote locations of

Alaska and Hawaii in relation to the remaining conterminous states. Including these outlying states would bias any estimate of spatial interstate distance because of the extreme distances between them and the other 48 states, which would result in a poorer fit for the latter.²⁶

We estimate this model as a Poisson regression, which is equivalent to a doubly constrained gravity model in which the origin-state and destination-state fixed effects constrain the predicted outflows and inflows to and from each state to equal the observed outflows and inflows. The model thus has the attractive quality of reproducing the observed net flows between all pairs of states. Additionally, Poisson regression with origin-state fixed effects yields coefficient estimates equivalent to those obtained from a conditional logit model, which links Poisson estimates to the theoretical foundation for the conditional logit in the random utility model and individual utility maximization.²⁷

Overdispersion is frequently an issue with Poisson models because the variance of the dependent variable is greater than its mean, producing underestimated standard errors. Quasi-Poisson estimation, which yields the same coefficient estimates with increased standard errors, corrects this problem. An alternative, a negative binomial estimation, has a less restrictive variance assumption than Poisson but does not have the doubly constrained property. Moreover, a negative binomial model gives greater weight to small counts in the estimation of the coefficients.²⁸ In our case, this would mean that flows between smaller states would be given greater weight than those between larger states, which is an unattractive feature because the larger states account for the majority of interstate migration.

We include a measure of distance to account for the costs of moving, including spatial job search, the actual costs of moving, and the increased cost of moving to locations far from family, friends, and community. Logging distance in the Poisson specification transforms its effect on spatial interaction to a power function, which is typical for a gravity model. We add a contiguity dummy variable to account for the different processes governing short-distance flows across state lines.²⁹ People who live in counties next to a state line can move to another state and still be within the same labor market and the same metropolitan areas.

The fixed effects capture the influence of factors generating flows from, and attracting flows to, different states. Flows between pairs of states, however, may respond to the relative difference in the values of key variables. For instance, migrants are more likely to leave states with high unemployment rates for states with lower unemployment rates, and these effects will be captured by the origin-state and destination-state dummy variables. The size of a particular flow between two states, however, may also depend on their relative difference in unemployment rates—states with low unemployment rates, for example, may be especially attractive for migrants leaving states with high

unemployment rates. Because other researchers have found such variables to successfully predict U.S. interstate migration,³⁰ we use origin–destination ratios, X_j/X_i , to assess this and other possibilities.

We deploy three such variables. (See table 1 for descriptive statistics.) Two of these capture origin–destination differences in labor market conditions: the 2013 unemployment rate from the U.S. Bureau of Labor Statistics,³¹ and 2013 real family income, defined here as the median state family income divided by median state housing costs, with both measures calculated from the American Community Survey microdata downloaded from IPUMS.³² We use this adjusted measure of family income to account for real income returns to moving. Housing prices have risen much faster than wages in the United States, especially in high-income areas, and this has reduced the returns to migration, especially for low-skilled workers.³³ The third ratio measures state amenities calculated by the U.S. Department of Agriculture in 1999 for counties; we convert the state amenities to state scores by using population-weighted averages of standardized county amenity scores.³⁴ Higher scores mean high amenity ratings. The components of the amenity score include measures of climate and physical geography characteristics, including topography and water features that most people find desirable. We include amenities because some migration research shows they are drivers of U.S. destination choice, although their importance relative to economic considerations for those in the labor force is a matter of considerable debate.³⁵ To ensure exogeneity, we use unemployment rates and real family income for 2013.

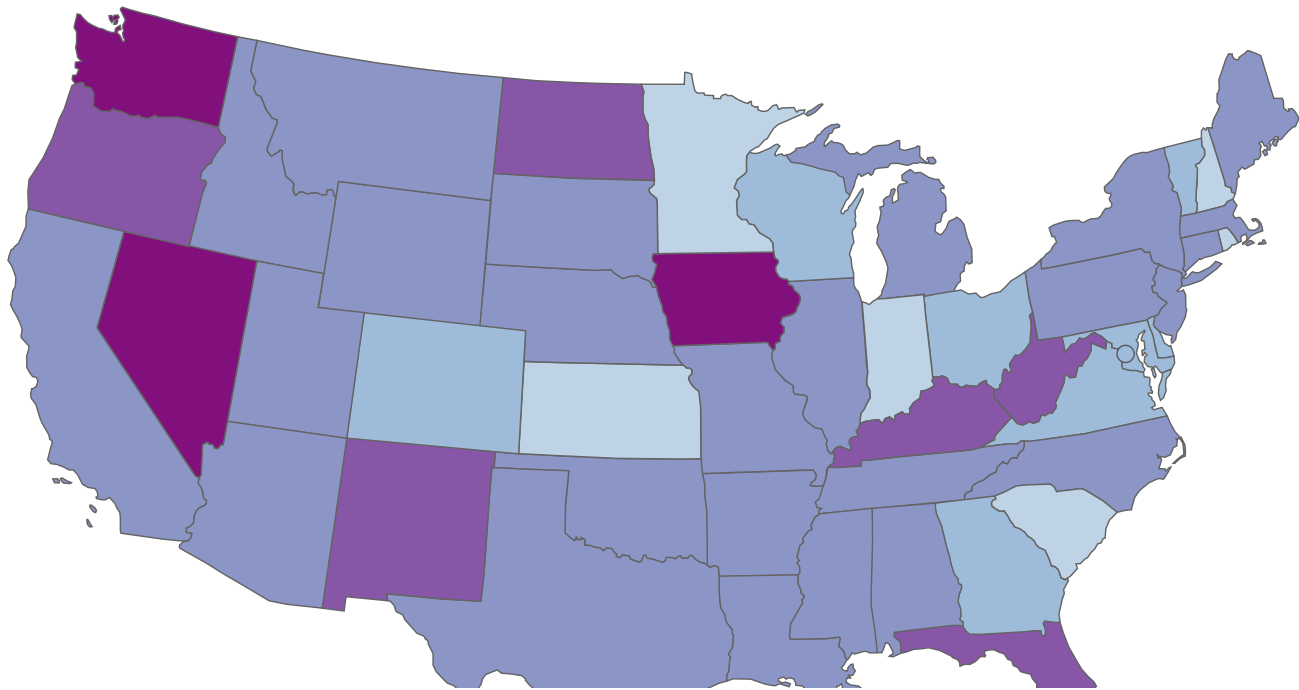
Table 1. Descriptive statistics

Item	Mean	Standard deviation	Minimum	Maximum
Natural logarithm of distance between state <i>i</i> and state <i>j</i> (in miles)	6.724	0.723	2.982	7.887
Contiguity between state and <i>i</i> and state <i>j</i> (yes = 1; no = 0)	0.093	0.290	0.000	1.000
Unemployment ratio (unemployment rate in state <i>i</i> / unemployment rate in state <i>j</i>)	1.070	0.410	0.302	3.310
Real income ratio (real income in state <i>i</i> / real income in state <i>j</i>)	1.023	0.221	0.524	1.909
Amenity ratio (amenity index in state <i>i</i> / amenity index in state <i>j</i>)	1.312	1.105	0.084	11.876
Licensing ratio (percentage licensed in state <i>i</i> / percentage licensed in state <i>j</i>)	1.050	0.333	0.372	2.686

Source: U.S. Census Bureau, American Community Survey; U.S. Bureau of Labor Statistics (unemployment rate); 2013 Harris poll of 9,850 individuals.

The focal explanatory variable is based on a measure of the percentage of all workers employed in a licensed occupation, by state. These percentages are calculated from a 2013 Harris poll of 9,850 individuals that yielded samples representative of state populations and included questions about whether workers required licenses to work in their occupation.³⁶ Chart 1 maps these licensing rates, and the map shows no obvious pattern.

Chart 1. Percentage of jobs that require licensing, by state, 2014–16

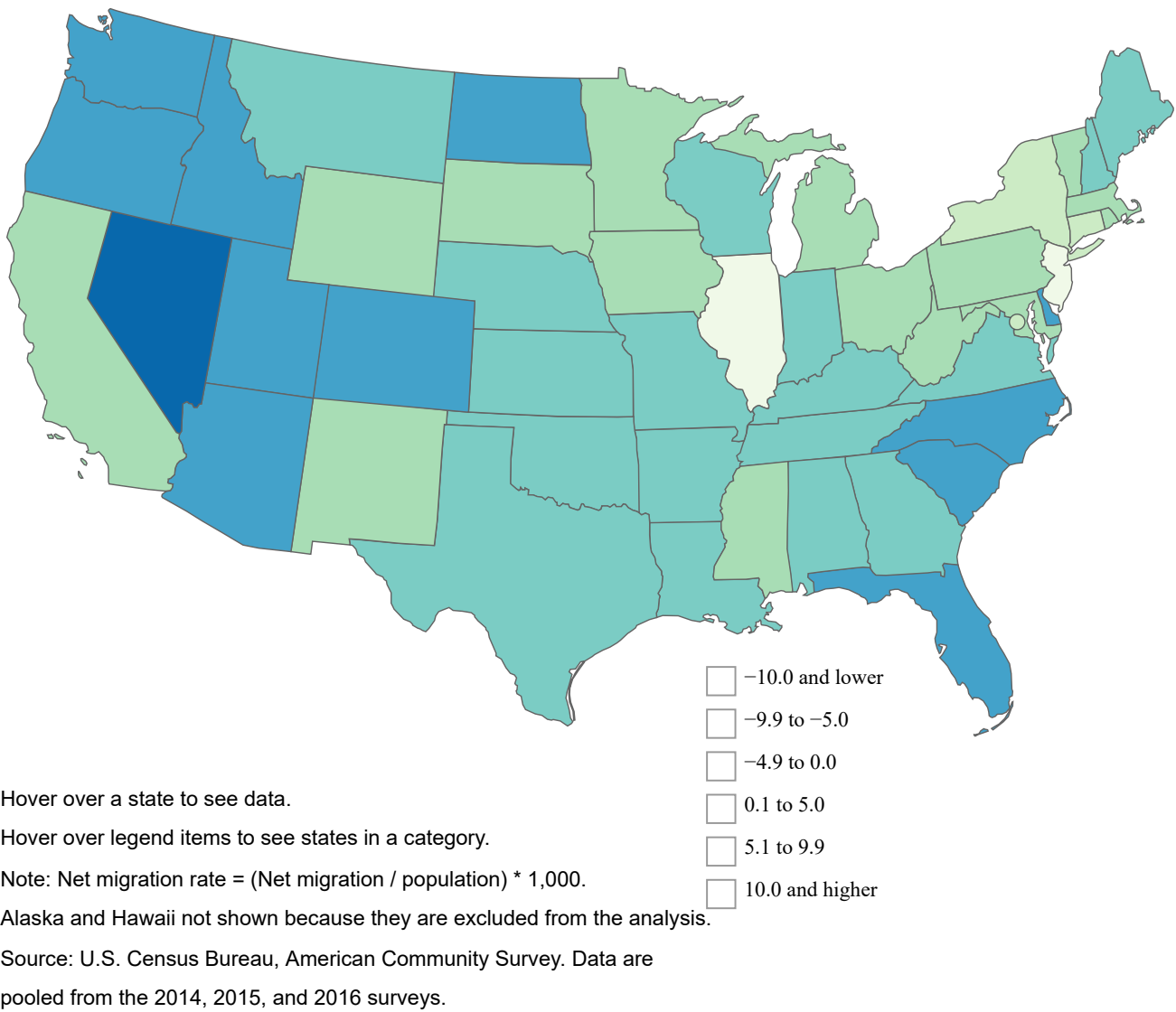




[View Chart Data](#)

In addition, some states that have above-average regulation of their labor markets actually have very low rates of licensing, such as Minnesota, while states that are generally thought to have less regulated labor markets have relatively high rates of licensing, such as Kentucky and Florida.³⁷ These state-to-state variations in licensing do not appear to correlate with the most basic measure of interstate migration—net migration. (See chart 2.) Nevada is one of the most highly licensed states and yet has high rates of net in-migration. Kansas and South Carolina have relatively low licensing rates but very different net-migration rates: 1.3 and 8.5, respectively. Migration between states, of course, is shaped by a variety of forces, but it is nonetheless telling that there is frequently a disconnect between licensing and overall migration patterns.

Chart 2. Net migration rate, by state, 2014–16 (all migrants per 1,000 population)



[View Chart Data](#)

Results

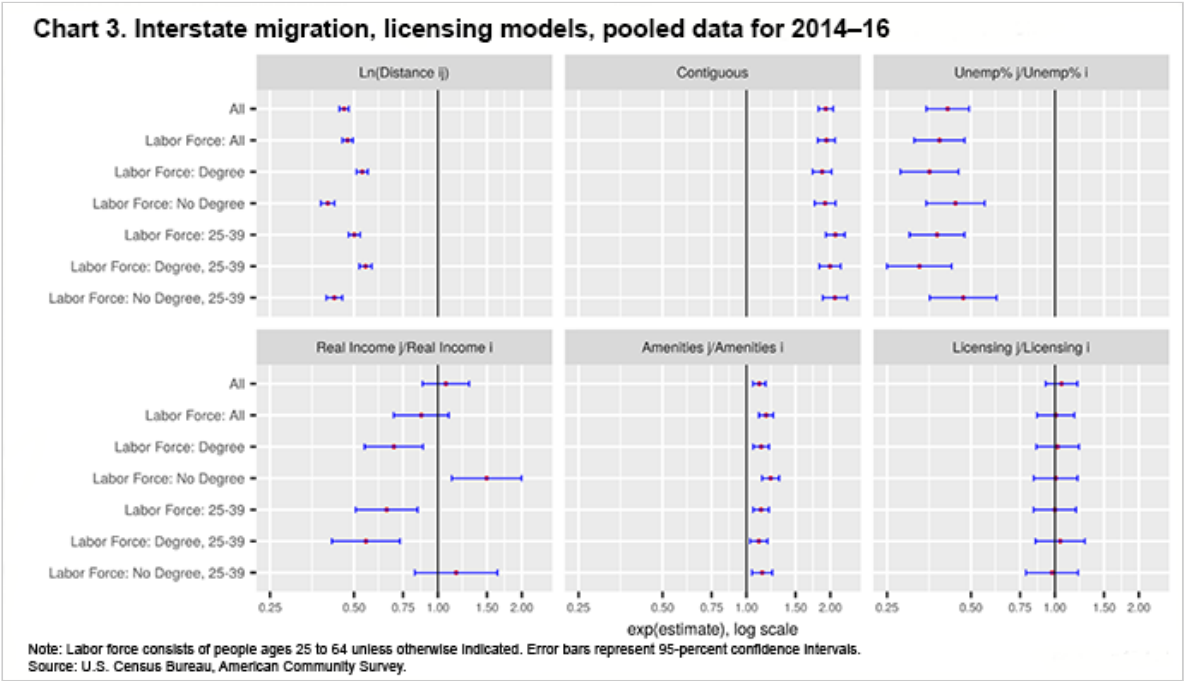
Table 2 shows the results of the Poisson regression models using the licensing ratio, excluding the origin-state and destination-state fixed-effects parameters. The coefficients are exponentiated to yield marginal multiplicative effects with appropriately adjusted standard errors and confidence limits. In this form, coefficients are assessed as significantly different from 1, a null multiplicative effect. For the estimation, all ratio variables were normalized to a mean of 0 and a standard deviation of 1 to ease interpretation. Thus, a one-standard-deviation increase in the unemployment ratio—that is, an increase of 0.410 in the absolute value of that ratio (see table 1)—reduces the flow of all migrants between *i* and *j* by a factor of 0.399 (see table 2), a decline of almost 60 percent.

Item	Statistical measure	Population	Labor force	Labor force with at least a 4-year college degree	Labor force without a 4-year college degree	Labor force ages 25 to 39	Labor force ages 25 to 39 with at least a 4-year college degree	Labor force ages 25 to 39 without a 4-year college degree
Null deviance		14,156,051.1	5,113,054.8	2,657,120.9	2,797,241.6	3,182,559.7	1,870,095.9	1,586,568.8
Deviance		1,208,968.8	523,527.1	301,578.4	387,847.3	384,368.0	250,994.5	278,612.2

[1] $p < 0.001$.
[2] $p < 0.01$.

Note: Origin-state and destination-state fixed effects not shown. Exponentiated coefficients in bold. Labor force consists of people ages 25 to 64 unless otherwise indicated.
Source: U.S. Census Bureau, American Community Survey.

Chart 3 shows the coefficients and their confidence intervals to make it easier to compare the different effects across samples. As expected, migration declines with increasing distance and increases with contiguity. Distance is less of a barrier to migration for people with higher levels of human capital and for younger workers. The ratio control variables we used generally produced the expected results: High values of the unemployment rate ratio reduce migration flows between states, while high values of the amenity ratio boost flows. Th unemployment ratio effect is generally similar in magnitude across groups: about a 60-percent decline in the flow for a one-standard-deviation increase in the ratio. Amenity ratios boost migration flows by 10 to 22 percent for a one-standard-deviation increase in the ratio, having the strongest effect for workers without a college degree. The real-income effects align with recent research showing a divergence in the United States between high-skilled workers and low-skilled workers, both in economic terms and in migration patterns.³⁸ Workers without a college degree favor states where the real-income return to migration is positive. An increase in this ratio of one standard deviation increases their migration between i and j by almost 50 percent. Workers with a college degree often move to states where that return is lower than in their origin state, possibly because these states are more likely to offer jobs in growth industries or with better prospects for career mobility and income growth.



[View Chart Data](#)

The primary variable of interest, the ratio of licensing in the destination state to licensing in the origin state, has no effect on the flows of migrants from origins to destinations. Chart 3 shows that the parameter estimates for licensing across all seven models are close to a value of 1 (the baseline) with very large standard errors. The results are clear: We find that aggregate licensing rates do not affect the flow of people from one state to another. It is important to emphasize that these estimates are net of origin-state and destination-state fixed effects, which arguably address sources of unobserved heterogeneity, such as the occupational makeup of the labor force.

Discussion

Using robust standardized migration modeling procedures, this analysis finds no effect on interstate migration rates resulting from interstate variations in occupational licensing regimes. How do we explain this? First, we note that the early literature shows a link between licensing and migration, but the relationship becomes more tenuous in later studies. Although some of the change in estimates over time may be due to methodological improvements, it is also plausible that occupational licensing practices have become more uniform (or at least less burdensome). Indeed, many large professional occupations, such as nurses, teachers, and lawyers, have moved in this direction in recent years.³⁹ Second, attaining a license in a potential destination may not be difficult, especially compared with other, more important, factors shaping migration, such as the direct costs of moving a household, job opportunities, cost of living, family ties, and amenities. We conclude that licensing has essentially no effect because it is not that important of a factor compared with other spatial and locational determinants of migration flows accounted for in our gravity model.

These results contrast with a common and influential view that licensing hinders interstate migration, which negatively affects the efficiency of labor and housing markets, and that governments should therefore adjust these policies. We caution against such interventions being made on the basis of the presumed link between licensing and migration. Specifically, we are concerned about the likely unintended consequences, especially because many occupations are already engaged in rationalizing licensing regimes across states. We are also concerned that the present study may contribute to what we perceive as an overemphasis on licensing as the primary regulatory barrier to interstate migration. As stated in the introduction, state and local governments both explicitly and implicitly regulate migration in many ways, such as through child custody laws, zoning regulations, and residency requirements for employment.⁴⁰ The role of internal borders in restricting migration has been established in both India and the United States.⁴¹ We are hopeful that by presenting evidence against any link between licensing and migration that interest can shift beyond this one policy impact to look at the broader role of states in regulating migration.

SUGGESTED CITATION:

Thomas J. Cooke, Mark Ellis, and Richard Wright, "Occupational licensing and interstate migration in the United States," *Monthly Labor Review*, U.S. Bureau of Labor Statistics, August 2022, <https://doi.org/10.21916/mlr.2022.22>

- ¹ See Thomas J. Cooke, Clara H. Mulder, and Michael Thomas, "Union dissolution and migration," *Demographic Research*, vol. 34, no. 26 (April 2016), pp. 741–60, especially p. 746, <https://www.demographic-research.org/volumes/vol34/26/34-26.pdf>.
- ² See David Schleicher, "Stuck! The law and economics of residential stagnation," *Yale Law Journal*, vol. 127, no. 1 (October 2017), pp. 78–154, <https://www.yalelawjournal.org/article/stuck-the-law-and-economics-of-residential-stagnation>.
- ³ See Mark Ellis, Richard Wright, and Matthew Townley, "State-scale immigration enforcement and Latino interstate migration in the United States," *Annals of the American Association of Geographers*, vol. 106, no. 4 (March 2016), pp. 891–908, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7526940/pdf/nihms-1590893.pdf>.
- ⁴ See Zovanga L. Kone, Maggie Liu, Aaditya Mattoo, Caglar Ozden and Siddharth Sharma, "Internal borders and migration in India," *Journal of Economic Geography*, vol. 18, no. 4 (July 2018), pp. 729–59, <https://doi.org/10.1093/jeg/lbx045>.
- ⁵ See Youngjin Song, "Internal migration in the United States 1960–2000: the role of the state border" (working paper, University of California at Los Angeles, Los Angeles, CA, May 2018), https://www.dropbox.com/s/a9xnt6anvoil6yd/jmp_yjsong.pdf.
- ⁶ See, for example, Kone et al., "Internal borders and migration in India" and Song, "Internal Migration in the United States 1960–2000."
- ⁷ Janna E. Johnson and Morris M. Kleiner, "Is occupational licensing a barrier to interstate migration?," *American Economic Journal: Economic Policy*, vol. 12, no. 3 (August 2020), pp. 347–73, <https://pubs.aeaweb.org/doi/pdfplus/10.1257/pol.20170704>. For an earlier version of this article, see Johnson and Kleiner, "Is occupational licensing a barrier to interstate migration?," Working Paper 24107 (Washington, DC: National Bureau of Economic Research, December 2017), <https://doi.org/10.3386/w24107>.
- ⁸ Chelsea Arbury, Gerardo Bonilla, Thomas Durfee, Megan Johnson, and Robin Lehniger, "The ABCs of regulation: the effects of occupational licensing and migration among teachers," Public Policy: Professional Papers (Hubert H. Humphrey School of Public Affairs, University of Minnesota Twin Cities, Minneapolis and Saint Paul, MN, January 2015), <https://hdl.handle.net/11299/170743>.
- ⁹ Christina DePasquale and Kevin Stange, "Labor supply effects of occupational regulation: evidence from the Nurse Licensure Compact," Working Paper 22344 (Cambridge, MA: National Bureau of Economic Research, June 2016), <http://www.nber.org/papers/w22344>.
- ¹⁰ See Dick M. Carpenter II, Lisa Knepper, Angela C. Erickson and John K. Ross, *License to Work: A National Study of Burdens from Occupational Licensing* (Arlington, VA: Institute for Justice, May 2012), <https://ij.org/wp-content/uploads/2015/04/licensetowork1.pdf>.
- ¹¹ See U.S. Department of the Treasury Office of Economic Policy, Council of Economic Advisers, and U.S. Department of Labor, *Occupational Licensing: A Framework for Policymakers* (Washington, DC: The White House, July 2015), https://obamawhitehouse.archives.gov/sites/default/files/docs/licensing_report_final_nonembargo.pdf; and Morris M. Kleiner, "Reforming occupational licensing policies," Discussion Paper 2015-01 (Washington, DC: The Hamilton Project, Brookings Institution, January 2015), https://www.hamiltonproject.org/papers/reforming_occupational_licensing_policies.
- ¹² See Jack Ladinsky, "The geographic mobility of professional and technical manpower," *The Journal of Human Resources*, vol. 2, no. 4 (Autumn 1967), pp. 475–94, <https://doi.org/10.2307/144767>; and Ladinsky, "Occupational determinants of geographic mobility among professional workers," *American Sociological Review*, vol. 32, no. 2 (April 1967), pp. 253–64, <https://doi.org/10.2307/2091815>.
- ¹³ See Allan D. Vestal, "Freedom of movement," *Iowa Law Review*, vol. 41, no. 1 (Fall 1955), pp. 6–49.
- ¹⁴ See, for example, Ladinsky, "The geographic mobility of professional and technical manpower"; Ladinsky, "Occupational determinants of geographic mobility among professional workers"; Arlene S. Holen, "Effects of professional licensing arrangements on interstate labor mobility and resource allocation," *Journal of Political Economy*, vol. 73, no. 5 (October 1965), pp. 492–98, <https://doi.org/10.1086/259073>; Morris M. Kleiner, "Interstate occupational migration: an analysis of data from 1965–70," *Monthly Labor Review*, vol. 100, no. 4 (April 1977), pp. 64–67, <https://www.jstor.org/stable/41840476>; B. Peter Pashigian, "Occupational licensing and the interstate mobility of professionals," *Journal of Law and Economics*, vol. 22, no. 1 (April 1979), pp. 1–25, <http://dx.doi.org/10.1086/466931>; Leila J. Pratt, "Occupational licensing and interstate mobility," *Business Economics*, vol. 15, no. 3 (May 1980), pp. 78–80, <https://www.jstor.org/stable/23482545>; and Steven Tenn, "The relative importance of the husband's and wife's characteristics in family migration, 1960–2000," *Journal of Population Economics*, vol. 23, no. 4 (October 2010), pp. 1319–37, <https://www.jstor.org/stable/40925862>.
- ¹⁵ See Morris M. Kleiner, Robert S. Gay, and Karen Greene, "Barriers to labor migration: the case of occupational licensing," *Industrial Relations: A Journal of Economy and Society*, vol. 21, no. 3 (September 1982), pp. 383–91, <https://doi.org/10.1111/j.1468-232X.1982.tb00245.x>; and Kleiner, Gay, and Greene, "Licensing, migration, and earnings: some empirical insights," *Review of Policy Research*, vol. 1, no. 3 (February 1982), pp. 510–22, <https://doi.org/10.1111/j.1541-1338.1982.tb00456.x>.
- ¹⁶ See Johnson and Kleiner, "Is occupational licensing a barrier to interstate migration?"
- ¹⁷ See Johnson and Kleiner, "Is occupational licensing a barrier to interstate migration?"; Arbury et al., "The ABCs of regulation"; and DePasquale and Stange, "Labor supply effects of occupational regulation."
- ¹⁸ Arbury et al., "The ABCs of regulation."
- ¹⁹ See Christine Loucks, "The effects of occupational licensing on interstate labor migration: a case study of pharmacists" (Ph.D. diss., Washington State University, 1983).
- ²⁰ See Sean E. Mulholland and Andrew T. Young, "Occupational licensing and interstate migration," *Cato Journal*, vol. 36, no. 1 (Winter 2016), pp. 17–31, <https://www.cato.org/sites/cato.org/files/serials/files/cato-journal/2016/2/cato-journal-v36n1-2.pdf>.
- ²¹ For more information on discrete choice theory and related topics, see Alex Anas, "Discrete choice theory, information theory and the multinomial logit and gravity models," *Transportation Research Part B: Methodological*, vol. 17, no. 1 (February 1983), pp. 13–23, [https://doi.org/10.1016/0191-2615\(83\)90023-1](https://doi.org/10.1016/0191-2615(83)90023-1); Mike Baxter, "Similarities in methods of estimating spatial interaction models," *Geographical Analysis*, vol. 14, no. 3 (July 1982), pp. 267–72, <https://doi.org/10.1111/j.1538-4632.1982.tb00076.x>; Daniel McFadden, "Conditional logit analysis of qualitative choice behavior," in Paul Zarembka, ed., *Frontiers in Econometrics*, (New York: Academic Press, 1974), pp. 105–42, <https://eml.berkeley.edu/reprints/mcfadden/zarembka.pdf>.
- ²² For more information on IPUMS (originally, the Integrated Public Use Microdata Series) and the American Community Survey data, see Steven Ruggles, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, and Matthew Sobek, IPUMS USA: Version 10.0 [dataset] (Minneapolis, MN: IPUMS, 2020), <https://doi.org/10.18128/D010.V10.0>.
- ²³ See Mulholland and Young, "Occupational licensing and interstate migration."

²⁴ Mulholland and Young, “Occupational licensing and interstate migration.”

²⁵ See, for example, Paul S. Davies, Michael J. Greenwood, and Haizheng Li, “A conditional logit approach to U.S. state-to-state migration,” *Journal of Regional Science*, vol. 41, no. 2 (May 2001), pp. 337–60, <https://doi.org/10.1111/0022-4146.00220>.

²⁶ See Jerald R. Herting, David B. Grusky and Stephen E. Van Rompaey, “The social geography of interstate mobility and persistence,” *American Sociological Review*, vol. 62, no. 2 (April 1997), pp. 267–87, <https://doi.org/10.2307/2657304>; Brian J. Cushing, “Accounting for spatial relationships in models of interstate population migration,” *The Annals of Regional Science*, vol. 20, no. 2 (July 1986), pp. 66–73, <https://doi.org/10.1007/BF01287242>; Peter Mueser, “The spatial structure of migration: an analysis of flows between states in the U.S.A. over three decades,” *Regional Studies*, vol. 23, no. 3 (1989), pp. 185–200, <https://doi.org/10.1080/00343408912331345412>; and Michael Tiefelsdorf, “Misspecifications in interaction model distance decay relations: a spatial structure effect,” *Journal of Geographical Systems*, vol. 5, no. 1, (May 2003), pp. 25–50, <http://dx.doi.org/10.1007/s101090300102>.

²⁷ See Mike Baxter, “A note on the estimation of a nonlinear migration model using GLIM,” *Geographical Analysis*, vol. 16, no. 3 (July 1984), pp. 282–86, <https://doi.org/10.1111/j.1538-4632.1984.tb00816.x>.

²⁸ See Jay M. Ver Hoef and Peter L. Boveng, “Quasi-Poisson vs. negative binomial regression: how should we model overdispersed count data?,” *Ecology*, vol. 88, no. 11 (November 2007), pp. 2766–72, <https://doi.org/10.1890/07-0043.1>.

²⁹ For more on this approach, see Pasquale A. Pellegrini and A. Stewart Fotheringham, “Intermetropolitan migration and hierarchical destination choice: a disaggregate analysis from the U.S. public use microdata samples,” *Environment and Planning A: Economy and Space*, vol. 31, no. 6 (June 1999), pp. 1093–1118, <https://doi.org/10.1068/a311093>.

³⁰ See, for example, Paul S. Davies, Michael J. Greenwood, and Haizheng Li, “A conditional logit approach to U.S. state-to-state migration,” *Journal of Regional Science*, vol. 41, no. 2 (May 2001), pp. 337–60, <https://doi.org/10.1111/0022-4146.00220>.

³¹ See “States and selected areas: employment status of the civilian noninstitutional population, 1976 to 2021 annual averages” (U.S. Bureau of Labor Statistics, last modified March 14, 2022), <https://www.bls.gov/lau/staadata.txt>.

³² See Ruggles, et al., IPUMS USA: Version 10.0.

³³ See Peter Ganong and Daniel Shoag, “Why has regional income convergence in the U.S. declined?,” *Journal of Urban Economics*, vol. 102 (November 2017), pp. 76–90, <https://doi.org/10.1016/j.jue.2017.07.002>.

³⁴ See “Natural amenities scale (including the 6 components) for U.S. counties,” dataset (U.S. Department of Agriculture, Economic Research Service, last updated September 30, 1999), <https://www.ers.usda.gov/data-products/natural-amenities-scale/>.

³⁵ See, for example, Michael J. Greenwood and Gary L. Hunt, “Jobs versus amenities in the analysis of metropolitan migration,” *Journal of Urban Economics*, vol. 25, no. 1 (January 1989), pp. 1–16, [https://doi.org/10.1016/0094-1190\(89\)90040-5](https://doi.org/10.1016/0094-1190(89)90040-5); Paul D. Gottlieb and George Joseph, “College-to-work migration of technology graduates and holders of doctorates within the United States,” *Journal of Regional Science*, vol. 46, no. 4 (October 2006), pp. 627–59, <https://doi.org/10.1111/j.1467-9787.2006.00471.x>; Jordan Rappaport, “Moving to nice weather,” *Regional Science and Urban Economics*, vol. 37, no. 3 (May 2007), pp. 375–98, <https://doi.org/10.1016/j.regsciurbeco.2006.11.004>; Allen J. Scott, “Jobs or amenities? Destination choices of migrant engineers in the U.S.A.,” *Papers in Regional Science*, vol. 89, no. 1 (March 2010), pp. 43–63, <http://dx.doi.org/10.1111/j.1435-5957.2009.00263.x>; Richard Wright and Mark Ellis, “Where science, technology, engineering, and mathematics (STEM) graduates move: human capital, employment patterns, and interstate migration in the United States,” *Population, Space and Place*, vol. 25, no. 4 (May 2019), e2224, <https://doi.org/10.1002/psp.2224>; and Philip E. Graves and Peter D. Linneman, “Household migration: theoretical and empirical results,” *Journal of Urban Economics*, vol. 6, no. 3 (July 1979), pp. 383–406, [https://doi.org/10.1016/0094-1190\(79\)90038-X](https://doi.org/10.1016/0094-1190(79)90038-X).

³⁶ See Kleiner, “Reforming occupational licensing policies”; and Kleiner and Evgeny Vorotnikov, “Analyzing occupational licensing among the states,” *Journal of Regulatory Economics*, vol. 52, no. 2 (October 2017), pp. 132–58, <https://doi.org/10.1007/s11149-017-9333-y>.

³⁷ See Oxfam, *Best and Worst States to Work in America: 2019 Best States to Work Index* (Boston, MA: Oxfam America, 2019), https://webassets.oxfamamerica.org/media/documents/BSWI_2019_Report_Final.pdf.

³⁸ See Ganong and Shoag, “Why has regional income convergence in the U.S. declined?”; and Enrico Moretti, *The New Geography of Jobs* (Boston, MA: Houghton Mifflin Harcourt, 2012).

³⁹ For more information on this trend, see Iris Hentze and Zach Herman, “State efforts to improve occupational licensing mobility,” *LegisBrief*, vol. 28 (National Conference of State Legislatures, March 2021), <https://www.ncsl.org/research/labor-and-employment/state-efforts-to-improve-occupational-licensing-mobility.aspx>; Jennifer S. Lewis, Anne M. Klingen, and Kenneth M. Heard, III, “Realigning professional licensure within the 21st century” (presentation handout from the annual conference of the National Association of State Administrators and Supervisors of Private Schools, April 24–27, 2022), <https://nasasps.org/wp-content/uploads/NASASPS2022-HeardLewisKlingen-Realigning-Professional-Licensure.pdf>; and Council of State Governments, *Occupational Licensure: Interstate Compacts in Action* (National Center for Interstate Compacts, the Council of State Governments, June 2019), https://licensing.csg.org/wp-content/uploads/2020/04/OL_Compacts_InAction_Update_APR_2020-3.pdf.

⁴⁰ See Cooke, Mulder, and Thomas, “Union dissolution and migration”; Schleicher, “Stuck! The law and economics of residential stagnation”; and Ellis, Wright, and Townley, “State-scale immigration enforcement and Latino interstate migration in the United States.”

⁴¹ See Kone et al., “Internal borders and migration in India” and Song, “Internal migration in the United States 1960–2000.”



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AUGUST 2022

Antitrust enforcement and labor monopsony in the United States

How Antitrust Failed Workers. By Eric A. Posner. New York, NY: Oxford University Press, 2021, 207 pp., \$29.95 hardcover.

Antitrust enforcement in the United States began in the late 19th century with the [Sherman Antitrust Act of 1890](#), which prevented firms from engaging in anticompetitive market practices by prohibiting them from monopolizing markets and colluding to fix prices or reduce competition. Later, in an effort to supplement the Sherman Act and the Federal Trade Commission Act of 1914, Congress passed the [Clayton Antitrust Act of 1914](#), expanding antitrust enforcement. Although antitrust laws apply to both product and labor markets, antitrust enforcement has mostly targeted product markets. Neglecting antitrust enforcement in labor markets has allowed firms to engage in practices that, by reducing competition for labor, diminish the market power of workers seeking employment. In *How Antitrust Failed Workers*, author and legal scholar Eric A. Posner examines antitrust law’s inability to protect workers from anticompetitive labor market practices, providing a thorough overview of labor monopsony and antitrust law as it applies to labor markets. Using recent data and research from various economic and legal scholars, Posner argues that antitrust, employment, and labor laws should undergo several reforms that would help increase labor market competition.

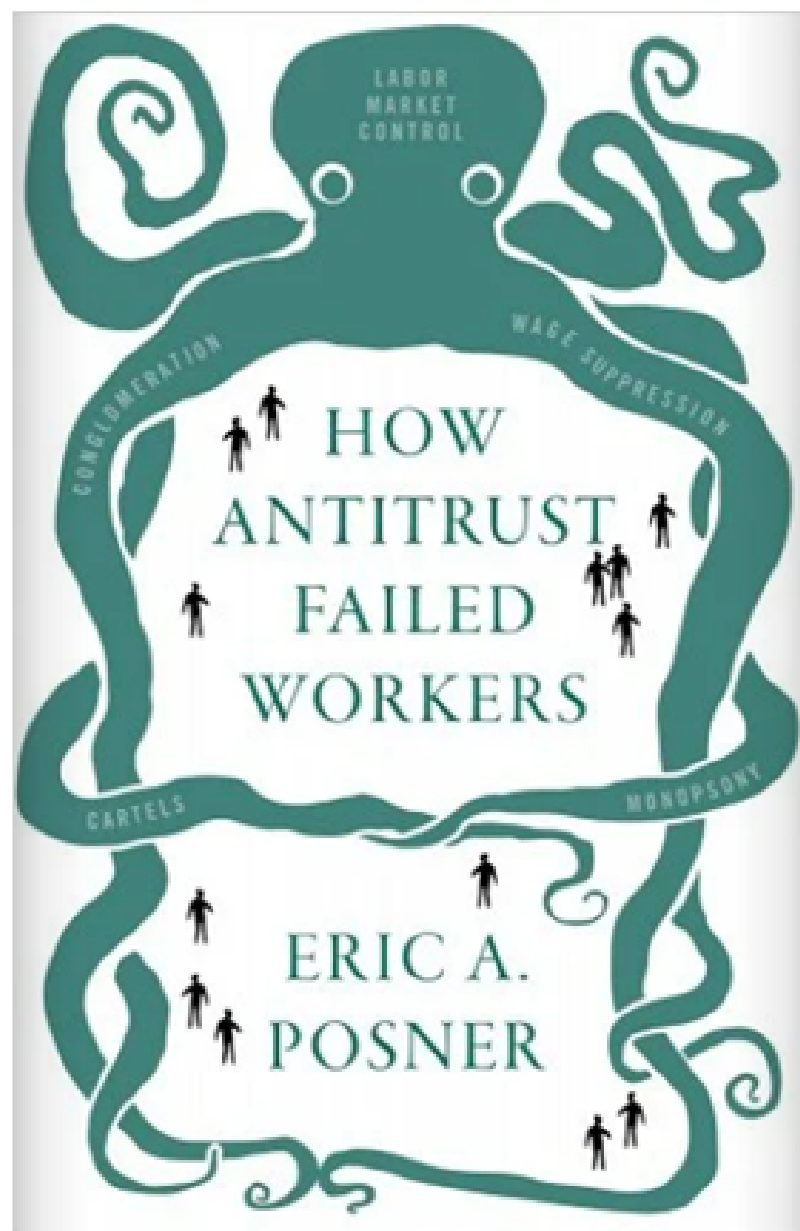
In chapter 1, the author explains the term “monopsony,” which refers to a market condition in which one buyer is the majority purchaser of goods and services. While the term can apply to any market, it is most often used in reference to labor markets. The effects of monopsony power on a labor market are comparable to the effects of monopoly power on a product market. For example, a monopsonist can set wages below a competitive wage value in a labor market just as a monopolist can set prices above a competitive price value in a product market. Posner identifies three sources of labor monopsony power: market concentration (a few employers dominating a specific job market), job differentiation (dissimilarity between jobs at different firms within the same market), and search frictions (the difficulty and cost of seeking employment). In chapter 2, Posner examines why antitrust laws have historically been applied much less frequently to labor markets than to product markets. He provides many potential reasons for this gap, elaborating on them in later chapters. He argues that while certain labor market practices and interventions (such as unionization and minimum-wage laws) can help curb monopsony power, nothing has sufficiently made up for the antitrust litigation gap.

Chapters 3 through 6 address specific features of antitrust law, detailing how they contribute to the litigation gap. Chapter 3 discusses section 1 of the Sherman Act, focusing on restrictions on collusion between firms. According to Posner, section-1 cases claiming wage fixing in labor markets are adjudicated at a rate 10 times lower than the corresponding rate for cases alleging price fixing in product markets. The author explains this difference with the higher difficulty of identifying collusion in labor markets than in product markets, contrasting the confidentiality of employee compensation with the availability of price data. He goes on to describe how conscious parallelism (i.e., firms tacitly changing their behavior or prices to match those of competitors) complicates wage-fixing cases and how no-poaching agreements (i.e., agreements among competing firms not to compete for one another’s employees) harm workers. He remarks that section-1 cases challenging no-poaching agreements are often more successful than wage-fixing cases. In chapter 6, Posner turns to aspects of section 1 that relate to noncompete agreements, which are contracts between employers and employees that prohibit the latter from competing with the former for a specific period after the end of an employment relationship. Noncompete agreements are difficult to challenge under section 1 because, unlike no-poaching agreements, they are concluded between employers and employees rather than between firms. When noncompete agreements are established within a labor market, such as that of the tech industry, they can generate significant anticompetitive outcomes. Posner argues that noncompete agreements are disputable under section 1, noting that they can still have positive market and social effects that should be considered when adjudicating cases.

Chapter 4 turns to section 2 of the Sherman Act, applying it to labor monopsony. Section 2 restricts monopolies, but so far it has not been used successfully in litigating monopsony claims. Posner attributes this failure to litigators’ inability to define labor markets and prove how defendants are engaging in anticompetitive behaviors. He proposes that section 2 be reformed to define labor markets for courts and to provide examples of anticompetitive actions that plaintiffs can use as bases for their claims. In chapter 5, Posner turns his attention to section 7 of the Clayton Act, which puts restrictions on mergers. Section 7 and current merger guidelines do not mention the consequences of mergers on labor markets. Posner states that the merger reviews of the Federal Trade Commission and the U.S. Department of Justice consider the potential positive and negative effects of mergers on consumers, but he argues that these regulatory reviews should also consider the mergers’ effects on workers.

In chapter 7, Posner reiterates that antitrust laws can limit monopsony and market concentrations, but he notes that these laws do not address the issues caused by search frictions or job differentiation. In his view, checking monopsony power will require further actions under labor and employment laws, which are detailed in chapter 8. Examples of reforms mentioned in the book include minimum-wage increases, employee benefit mandates, job standardization, and support for unions. Chapter 9 focuses on reforms related to worker classification and protections for independent contractors. Because independent contractors receive fewer legal protections than other employees (since, technically, contractors work outside the firm), Posner suggests that (1) worker classification should be based on market conditions and (2) antitrust laws should be applied to contractors by considering labor market competitiveness.

Overall, Posner argues that antitrust laws must be reformed to address monopsony power and low competition in labor markets. Furthermore, he suggests that reformed antitrust laws would be insufficient to adequately increase competition in labor markets, which would necessitate additional reforms to labor and employment laws. Efforts to focus antitrust enforcement on labor markets are gaining support among policymakers, with a recent (July 9, 2021) executive order pushing for increased enforcement and ordering a report on the negative effects of low labor market competition. Although its impact on antitrust reform is still uncertain, *How Antitrust Failed Workers* is a remarkable introduction to the intersection of antitrust law and labor markets.



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