Gius, International Journal of Applied Economics, 13(2), September 2016, 30-45

The Effects of Occupational Licensing on Wages: A State-Level Analysis

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Abstract: The present study examines a wide variety of occupations in order to determine if licensing requirements have any statistically-significant effects on earnings. State-level data for the years 2000-2012 were used in a random effects analysis. Data were obtained from the Occupational Employment Statistics Survey and various Census Bureau reports. Results suggest that licensing increases average state-level wages for three occupations: child care workers, opticians, and veterinary technicians. For all of the other occupations examined, licensing had no statistically-significant effects on average wages. These results contradict some of the results of prior studies in this area.

Keywords: occupational licensing; random effects; wages; employment

JEL Classification: J28, J38, J44

1. Introduction

According to a recent article by Meehan (2015), one in three occupations in the United States requires a state-issued license. This ratio is up significantly from the 1950s. Given that occupational licensing may have impacts on both goods and labor markets, this increase in occupational licensing is noteworthy.

In general, there are two schools of thought regarding the economic effects of occupational licensing. The first contends that licensing protects consumers by reducing uncertainty regarding the quality of service provided by certain occupations. Hence, occupational licensing is a form of consumer protection against shoddy workmanship and is a way to ensure consumer safety. In addition, occupational licensing sets minimum standards for training and education, thus reducing the potential asymmetry of the market. Given the shift to a more service-oriented economy, this positive impact is probably even more relevant than in decades past.

The second school of thought, however, contends that occupational licensing provides a mechanism by which the state can restrict employment in certain labor markets. Some states require the licensing of occupations that have little to do with quality or safety. For example, according to Carpenter, Knepper, Erickson, and Ross (2012), interior designers have the most onerous licensing requirements (an average of 2,190 days of education required) of any occupation that they examined, and it is unclear what safety or quality issue exists regarding the employment of an interior designer. It is important to note, however, that only three states and the District of Columbia require interior designers to obtain a license. Hence, according to this school of thought,

occupational licensing acts as a barrier to entry which reduces the labor supply of a particular occupation, thus reducing labor supply and increasing wages for that occupation.

Before proceeding with a discussion of the previous literature in this area, it is important to note several important features about occupational licensing in the United States. First, the vast majority of occupational licensing is done at the state-level. Some larger cities may impose additional licensing requirements, but these are rather limited. Second, although many states require some type of business license, the present study and prior research focus on individual-level occupational licensing requirements. For example, in some states, individuals must be licensed in order to perform the duties of a travel agent. In other states, however, only the business itself has to be registered or licensed to operate; individuals working for a travel agency do not have to be licensed. The present study focuses on individual occupational licenses. Third, there is a difference between occupational certification and occupational licensure. Certification is not a prerequisite for performing the duties of a particular occupation, but licensure is. States that have certification programs typically allow those individuals who obtain the certification to use the title "certified." Given that certification is not required in order to perform the duties of a particular occupation, most studies, including the present one, differentiate between licensure and certification. Fourth, even in states that have occupational licensing requirements, most of the requirements, such as fees or education, are rather minimal. In fact, fees are much more common than educational or training requirements for most licensed occupations. In most states, only about 20 occupations have educational requirements. In 2012, Wyoming had the fewest number of occupations that had a required educational component (11); Arizona had the most (51). Finally, occupational licensing does not appear to be correlated with state-level politics. Many states that have rather onerous occupational requirements would be considered to be rather politically conservative, such as Arizona and Louisiana.

Regarding prior research in this area, thus far, all studies have found that licensing increases wages. Meehan (2015) looked at state-level data for security guards for the period 1998-2010 and found that experience requirements had a significant and positive but declining effect on average wages. Timmons and Mills (2015) looked at individual-level data for opticians for the years 1940-2012 and found that more stringent licensing requirements increased earnings by 2-3 percent. Thornton and Timmons (2013) looked at individual-level data for massage therapists for the period 2000-2009 and found that licensing increased wages by as much as 16.2 percent. Gittleman and Kleiner (2013) used National Longitudinal Survey of Youth (NLSY) data for 2006-2008 and found that occupational licensing in general increased earnings by 18 percent. Kleiner and Krueger (2013) used survey data from 2008 and found that licensing also increased wages by 18 percent. Another Kleiner and Krueger (2010) study used Gallup survey data from 2006 and found that licensing increased wages by approximately 15 percent. Timmons and Thornton (2010) looked at individual-level data for barbers for the year 2000 and found that licensing increasing barbers' earnings between 11 and 22 percent. Finally, Timmons and Thornton (2007) looked at individual-level data for radiologic technologists and found that licensing increased earnings by 3.3-6.9 percent. Other research in this area include Gittleman, Klee, and Kleiner (2015), Kleiner (2015), Gittleman, Klee, and Kleiner (2014), and Kleiner (2006). As can be ascertained from the preceding discussion, most prior studies used individual-level data and looked at only one occupation. In addition, most of the above mentioned articles used OLS regressions; only three prior studies capitalized on the longitudinal nature of their data and used fixed or random effects.

The present study differs from this prior research in several ways. First, this study will examine a number of different occupations in order to determine if licensing has any significant effects on wages; we should observe higher wages in a state that has licensing requirements for a given occupation if the barrier to entry theory holds true. Second, a very large and very recent data set will be used. Third, in order to control for state and year effects, a random effects model will be used to estimate the determinants of wages and employment. Finally, data obtained from the Occupational Employment Statistics Survey will be used in this study. The following section presents the empirical technique and data that will be used in the present study.

2. Empirical Technique and Data

In order to determine if occupational licenses affects wages, a random effects model that controls for both state-level and year effects is used. The following equation is estimated in the present study:

$$Y_{i,t} = \alpha_0 + \alpha_i + \gamma_t + \beta' X + \varepsilon_{i,t} \quad (1)$$

In the above equation, y denotes the wage rate, α_i denotes the state-level effects, γ_t denotes the year effects, and X denotes the vector of explanatory variables which includes the occupational licensing dummy variables.

Regarding the occupational licensing dummy variable, if a state requires a license for the occupation in question, then the licensing dummy variable equals one; otherwise, it equals zero. It is important to note, however, that some states have certification, and not licensure, of certain occupations. As noted previously, the difference between licensure and certification is that licensure is required in order to practice the occupation in question in a given state, while certification is not. In states where there is only certification of an occupation, the licensing dummy variable equals zero. In addition, in some states, the occupation itself is not licensed, but rather the business is. In states such as these, individuals working for a business do not necessarily have to be licensed. For these states, the licensing variable also equals zero.

Regarding expected results, if licensing acts as a barrier to entry, then it is reasonable to assume that states with occupational licensing will have higher wages for the licensed occupation. If, however, licensing is more pertinent for consumer safety and it does act as a barrier to entry, then licensing may not have significant effects on wages for that specific occupation.

In addition to occupational licenses, it is also assumed that wages are dependent upon state demographics and various other state-level socioeconomic factors. One prior study that used state-level data (Meehan, 2015) used the following control variables: per capita income, population, the unemployment rate, and the minimum wage. In the present study, the control variables include per capita real income, percentage of population that is college educated, unemployment rate, population density, percentage of state labor force that is unionized, and a dummy variable denoting whether or not the state is located in the South. The following occupations were examined: bartenders, child care workers, crane operators, massage therapists, opticians, pharmacy technicians, security guards, taxi drivers, teacher's assistants, travel agents, and veterinary

technicians. These occupations were selected because of their diversity in state-level licensing requirements and the availability of data.

Data for all fifty states for the period 2000-2012 were collected. State-level data on wages were obtained from the Occupational Employment Statistics Survey. Information on occupational licensing requirements were obtained from Carpenter, Knepper, Erickson, and Ross (2012) and Summers (2007). If there was a discrepancy between these two secondary sources, the relevant state statute regarding occupational licensing was examined in order to verify the licensure requirements. All other state-level data were obtained from relevant Census Bureau reports. All dollar denominated variables were deflated using the Consumer Price Index (1982-1984 = 100).

3. Results and Conclusions

Results are presented on Tables 1-11. These results suggest that licensing increases wages for child care workers (4.3 percent), opticians (16.6 percent), and veterinary technicians (4.6 percent). Although licensing does not affect all of the occupations examined in the present study, these results were not unexpected. Most licensing fees and training periods are rather modest. Another noteworthy point is that the significance of licensing apparently is not affected by the stringency of the licensing requirement. For example, although the results of the present study suggest that the average wage for child care workers in states with licensing requirements is 4.3 percent higher than the average wage in states without such requirements, the licensing requirements for child care workers in all states are rather modest. Only 12 states have licensing fees, and the highest is $50. Thirty states have some educational requirement, but most require less than ten days of education or training. Only two states have educational requirements greater than 100 days. These are not very onerous requirements (significant barriers to entry), and yet licensing resulted in significantly higher wages. This is in contrast to massage therapists whose licensing fees were much greater (as high as $775) and whose educational requirements were also very rigorous (most licensing states require at least 117 days of training), and yet licensing had no statistically-significant effects on their wages.

In general, these results suggest that most licensing requirements (fees and training periods) are not very onerous for the occupations examined in the present study. In addition, the results of the present study suggest that licensing requirements are not strongly correlated with higher wages. Finally, it is important to note that this is one of the first studies to look at several different occupations, use state-level data, and control for both state and year effects. Some of the results obtained in prior studies showing the significant and positive impact of licensing requirements on wages may be due to these differences in data and methodologies. In addition, the present study did not use as explanatory variables any measures of the stringency of state-level licensing requirements. The primary reason for this is because those states with no licensing for a particular occupation would obviously have no licensing requirements (fees or training periods) for that occupation. The inclusion of such variables may introduce multicollinearity or specification bias into the regression analysis. Given that some of the results of the present study contradict the results of prior studies in this area, more research on the effects of occupational licensing on labor markets is warranted.

References

Carpenter, D., L. Knepper, A. Erickson, and J. Ross. 2012. *License to Work,* Institute for Justice.

Gittleman, M. and M. Kleiner. 2013. "Wage Effects of Unionization and Occupational Licensing Coverage in the United States," BLS Working Papers, #464.

Gittleman, M., M. Klee, and M. Kleiner. 2015. *Analyzing the Labor Market Outcomes of Occupational Licensing* (No. w20961). National Bureau of Economic Research.

Gittleman, M., M. Klee, and M. Kleiner. 2014. "Analyzing the Labor Market Outcomes of Occupational Licensing." Report 504, Research Department Staff, Federal Reserve Bank of Minneapolis, Minneapolis, MN.

Kleiner, M. 2015. *Reforming Occupational Licensing Policies*. Brookings.

Kleiner, **Morris M.** 2006. Licensing Occupations: Ensuring Quality or Restricting Competition? Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.

Kleiner, M. and A. Krueger. 2013. "Analyzing the Extent and Influence of Occupational Licensing on the Labor Market," *Journal of Labor Economics*, 31, 2, S173-S202.

Kleiner, M. and A. Krueger. 2010. "The Prevalence and Effects of Occupational Licensing," *British Journal of Industrial Relations*, 48, 4, 1-12.

Meehan, B. 2015. "The Impact of Licensing Requirements on Industrial Organization And Labor: Evidence from the U.S. Private Security Market," *International Review of Law and Economics*, 42, 113-121.

Summers, A. 2007. "Occupational Licensing: Ranking the States and Exploring Alternatives," working paper, Reason Foundation.

Thornton, R. and E. Timmons. 2013. "Licensing One of the World's Oldest Professions: Massage," *Journal of Law and Economics*, 56, 2, 371-388.

Timmons, E. and A. Mills. 2015. "Bringing the Effects of Occupational Licensing into Focus: Optician Licensing in the United States," Mercatus Working Paper.

Timmons, E. and R. Thornton. 2010. "The Licensing of Barbers in the USA" *British Journal of Industrial Relations*, 48, 4, 740-757.

Timmons, E. and R. Thornton. 2008. "The Effects of Licensing on the Wages of Radiologic Technologists," *Journal of Labor Research*, 29, 333-346.

Table 1
Random Effects Regression
Bartenders

Variable	Coefficient	Test Statistic
Constant	1.13	22.55***
License	-0.0129	-0.76
Population density	0.000027	0.53
Real per capita median income	-0.00000046	-0.36
Proportion of population with college degree	0.538	3.37***
Unemployment rate	0.966	7.54***
Proportion of labor force that is unionized	1.333	7.47***
State is located in the South	0.014	0.51

$R^2 = 0.438$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 2
Random Effects Regression
Child Care Workers

Variable	Coefficient	Test Statistic
Constant	1.38	43.26***
License	0.043	2.64***
Population density	0.00013	4.16***
Real per capita median income	-0.0000016	-1.93*
Proportion of population with college degree	0.094	0.91
Unemployment rate	0.484	5.74***
Proportion of labor force that is unionized	0.437	3.89***
State is located in the South	-0.0759	-4.39***

$R^2 = 0.582$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 3
Random Effects Regression
Crane Operators

Variable	Coefficient	Test Statistic
Constant	1.817	18.91***
License	0.0408	1.32
Population density	-0.000056	-0.85
Real per capita median income	0.0000093	2.28**
Proportion of population with college degree	0.625	1.83*
Unemployment rate	1.282	3.22***
Proportion of labor force that is unionized	0.987	3.33***
State is located in the South	-0.0855	-2.44**

$R^2 = 0.276$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 4
Random Effects Regression
Massage Therapists

Variable	Coefficient	Test Statistic
Constant	1.697	14.28***
License	-0.0354	-1.18
Population density	-0.000063	-0.77
Real per capita median income	-0.0000036	-0.77
Proportion of population with college degree	1.672	4.00***
Unemployment rate	-0.673	-1.45
Proportion of labor force that is unionized	1.24	3.37***
State is located in the South	0.0046	0.10

$R^2 = 0.239$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 5
Random Effects Regression
Opticians

Variable	Coefficient	Test Statistic
Constant	1.61	19.51***
License	0.1665	6.66***
Population density	0.00014	2.44**
Real per capita median income	-0.0000057	-1.59
Proportion of population with college degree	1.327	4.52***
Unemployment rate	-0.565	-1.63
Proportion of labor force that is unionized	0.796	3.19***
State is located in the South	-0.00375	-0.12

$R^2 = 0.179$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 6
Random Effects Regression
Pharmacy Technicians

Variable	Coefficient	Test Statistic
Constant	1.36	17.85***
License	0.022	0.99
Population density	-0.00014	-2.84***
Real per capita median income	0.0000118	3.41***
Proportion of population with college degree	0.49	1.80*
Unemployment rate	1.168	3.48***
Proportion of labor force that is unionized	0.541	2.38**
State is located in the South	-0.056	-2.08**

$R^2 = 0.19$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 7
Random Effects Regression
Security Guards

Variable	Coefficient	Test Statistic
Constant	1.23	13.11***
License	-0.00439	-0.18
Population density	-0.00013	-2.34**
Real per capita median income	0.000018	3.68***
Proportion of population with college degree	0.266	0.78
Unemployment rate	1.29	2.65***
Proportion of labor force that is unionized	0.189	0.68
State is located in the South	-0.0556	-1.76*

$R^2 = 0.084$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 8
Random Effects Regression
Taxi Drivers

Variable	Coefficient	Test Statistic
Constant	1.31	16.80***
License	-0.017	-0.52
Population density	0.000066	1.32
Real per capita median income	-0.0000008	-0.22
Proportion of population with college degree	0.81	2.95***
Unemployment rate	0.0075	0.02
Proportion of labor force that is unionized	0.803	3.58***
State is located in the South	-0.002	-0.08

$R^2 = 0.179$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 9
Random Effects Regression
Teacher's Assistants

Variable	Coefficient	Test Statistic
Constant	1.52	34.70***
License	-0.0816	-1.42
Population density	0.00015	2.76***
Real per capita median income	0.000004	4.27***
Proportion of population with college degree	-0.028	-0.21
Unemployment rate	0.815	8.42***
Proportion of labor force that is unionized	0.418	2.72***
State is located in the South	-0.145	-4.67***

$R^2 = 0.593$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 10
Random Effects Regression
Travel Agents

Variable	Coefficient	Test Statistic
Constant	1.647	20.98***
License	0.005	0.14
Population density	-0.0000032	-0.06
Real per capita median income	0.0000089	2.58***
Proportion of population with college degree	0.41	1.47
Unemployment rate	0.28	0.83
Proportion of labor force that is unionized	0.141	0.59
State is located in the South	0.0076	0.27

$R^2 = 0.075$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%

Table 11
Random Effects Regression
Veterinary Technicians

Variable	Coefficient	Test Statistic
Constant	1.52	22.46***
License	0.046	2.24**
Population density	0.00002	0.47
Real per capita median income	-0.000001	-0.30
Proportion of population with college degree	1.19	4.97***
Unemployment rate	0.359	1.09
Proportion of labor force that is unionized	0.249	1.29
State is located in the South	-0.0688	-2.99***

$R^2 = 0.174$
Year and state dummies are not shown.
*5%< p-value < 10%; ** 1%< p-value < 5%; *** p-value<1%