REGULATING WORK: MEASURING THE SCOPE AND BURDEN OF OCCUPATIONAL LICENSURE AMONG LOW- AND MODERATE-INCOME OCCUPATIONS IN THE UNITED STATES

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Abstract
This study examines the scope and burden of occupational licensing laws in the United States for 102 low- and moderate-income occupations. Findings indicate that the licences studied require of aspiring workers, on average, $US209 in fees, one exam, and about nine months of education and training, plus minimum grade and age levels. Data also indicate striking disparities in requirements within and between occupations and within and between states. These inconsistencies likely reflect not the relative public health and safety risks of occupations, but instead the lobbying prowess of practitioners in securing laws to shut out competition.

JEL codes: D45, J44, L15, L51, L84.

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1. Introduction

In the contemporary labour market, one of the most increasingly pervasive forms of regulation is occupational licensure. This form of regulation limits the practice of a given occupation only to those who acquire a certain amount or type of education, complete specialised training, pass an exam, attain a certain grade level, pay fees, and more. In the 1950s only one in 20 US workers needed a licence to pursue a chosen occupation; today that figure stands at almost one in three (Kleiner and Krueger 2010). The growing list of licensed occupations includes many ideally suited for small business creation and often filled by those of modest means, such as cosmetologists, auctioneers, locksmiths, interior designers, and African-style hairbraiders.

As Potts (2009) and Mester et al. (2009) describe, occupational licensing is typically justified as benefiting the greater society as a 'public good' or a 'public welfare'. Legislative or state protection is given to occupations to guard the greater society against the possibility of rogue operatives, incompetents, quacks, charlatans, and others who might cause 'public harm' through delivery of substandard or even dangerous standards of service. Licensing has been achieved principally through cooptation of government by the political activities of professional associations in individual states (Freidson 1986; Halliday 1987). Government officials typically accept such arguments with little question (Skarbek 2008), as Carpenter (2008) illustrated in a study of the evolution of regulation for interior designers.

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In general, two divergent views on occupational licensing predominate. The first describes licensing primarily as a means for professionals to keep wages high by restricting entry into the profession (Friedman 1962) with little social benefit. Evidence from studies of various occupations indicate licensing indeed reduces the supply of practitioners (Adams, Jackson and Ekelund 2002b; Federman, Harrington and Krynski 2006; Carpenter and Stephenson 2006; Jackson 2006; Jacob and Murray 2006; Kleiner and Todd 2007), resulting in increased wages (Adams, Jackson and Ekelund 2002a; Angrist and Guryan 2008; Kleiner and Kudrle 2000; Timmons and Thornton 2008; White 1978). Moreover, research on a diversity of occupations finds little evidence supporting benefits in the form of increased quality of product, service or producer (Angrist and Guryan 2008; Buddin and Zamarro 2008; Kleiner and Petree 1988; Carpenter 2008; Skarbek 2008; Kleiner and Todd 2007; Kleiner and Kudrle 2000; Paul 1984; Carroll and Gaston 1981).

The second view concedes that occupational licensing may increase the wages of professionals, but argues that licensing serves as a means of solving an asymmetric information problem. Consumers have less information than practitioners, and licensing protects consumers from poor service (Leland 1979; Shapiro 1986). This view is supported by at least some results that find a positive relationship between occupational regulation and quality of service (Johnson and Loucks 1986; Shilling and Sirmans 1988). Moreover, when advocating for new regulations or defending existing ones, industry leaders emphasise benefits to public health, safety and welfare as a justification (Carpenter 2008).

Common in the research on this form of regulation is an occupation-centric approach. That is, studies on the effects of licensure focus on one or two discrete occupations within one or perhaps several states or cities, since licensure occurs predominantly at these levels. Rare are studies that examine multiple occupations across numerous jurisdictions. Consequently, the extent and costs of licensure regulations are not fully known. In fact, the aforementioned figures from Kleiner and Krueger (2010) are among only a handful of studies that attempt to quantify the scope of occupational licensure.

Two of these studies gathered counts of licensed occupations as part of the creation of larger economic and regulatory indices. In the first, McQuillan et al. (2008) collected licensure data for a small sample of occupations across all 50 US states. Fifteen of the occupations were non-health-care related and covered a broad range of the socio-economic spectrum. Another 42 of the occupations came from the health-care sector and ranged from physicians to drug counsellors. In the second study, Ruger and Sorens (2009) counted how many of 800 occupations listed by the US Bureau of Labor Statistics (BLS) were licensed across the states. The report found that 191 occupations were licensed in some but not all states, and 93 occupations were licensed in all states. In a study specifically on occupational licensure, Summers (2007) similarly counted the number of occupations in each state requiring a licence to work. He found that states require licences for 92 occupations, on average. California leads the nation, licensing 177 job categories, almost double the national average.

Although helpful in beginning to explain the breadth of regulation, absent from any of these studies is a measure of regulatory burden. Instead, previous studies have been limited just to counting the number of occupations licensed. Unexamined to date are questions such as: how difficult are licences to earn? What are the requirements for earning a licence? Which occupations are more heavily regulated than others? Which states, on average, impose greater

regulatory burdens through occupational licensure? What implications might arise from how occupations are regulated? To date, no study has attempted to measure in a systematic way regulatory burden associated with occupational licensure and to do so across all 50 US states and the District of Columbia. Therefore, the study presented here represents the first attempt to do so.

This research also differs from prior studies by focusing on low- and moderate-income occupations. Those studied here are occupations recognised by the BLS in which practitioners earn less than the national average income and where the occupation is licensed in at least one state. These occupations are often well-suited for individuals just entering or re-entering the economy. The list also includes occupations ideal for new small-business creation. Thus, this research examines the burdens of occupational licensing on those on the first several rungs of the economic ladder.

2. Methods

2.1. Sample

The sample for this research includes 102 occupations in the US licensed at the state level. Some commonly licensed occupations do not appear in our sample because they are regulated primarily at the city rather than the state level. To create the sample, we started with a complete list of occupations designated as licensed by the US Department of Labor (DOL). This DOL list was cross-tabulated against occupational lists maintained by the BLS. Any occupation in the DOL list that did not appear in the BLS lists was excluded, thus creating a list of 'measured' occupations, meaning occupations for which the BLS gathers some form of data. Lists from the two sources were used because each source provided different essential information: the DOL list indicated occupations that are licensed; the BLS list included occupations that are 'measured'. Finally, the list of 'measured' occupations was rank ordered by income. All occupations that fell above the national average income were excluded, resulting in a final list of low- and middle-income occupations. The final sample is listed in Table 1 and Table 2.

2.2. Data

All licensure requirements for each of the 102 occupations were collected from state statutes and administrative codes, state licensing boards, state agencies, professional associations, and/or direct correspondence with a licensing authority. Alternative sources were necessary because specific licensing requirements were created by different bodies, such as legislatures, regulatory agencies and licensing boards.

All requirements were recorded for each occupation. In order to derive the requirements that would be part of the analyses, we identified those that were the most consistent across the occupations. These were fivefold:

- Fees paid to the state
- Education/experience requirements
- Number of examinations

Table 1: Occupations ranked by average burden

Rank	Occupation	Number of licensed states	Average fee ($US)	Average education and experience (days)	Average exams	Minimum grade level	Minimum age
1	Interior designer	4	364	2,190	1	0	0
2	Preschool teacher	49	103	1,728	2	0	2
3	Athletic trainer	46	443	1,460	1	0	3
4	Social and human service assistant	7	200	1,251	1	0	5
5	Heating, ventilating, and air conditioning (HVAC) contractor (general/commercial)	40	250	891	1	0	6
6	Optician	22	184	710	3	10	12
7	Midwife	29	619	700	1	5	7
8	Dietetic technician	3	30	800	1	0	6
9	Veterinary technologist	37	209	710	2	1	5
10	Earth driller	47	177	704	1	1	7
11	Conveyor operator	1	142	730	1	0	0
12	Security alarm installer	34	213	535	1	1	8
13	Barber	50	130	415	2	7	14
14	Sheet metal contractor (general/commercial)	28	292	507	1	0	5
15	Glazier contractor (general/commercial)	30	287	500	1	0	4
16	Mason contractor (general/commercial)	29	287	491	1	0	4
17	Cosmetologist	51	142	372	2	8	13
18	Fire alarm installer	34	230	486	1	1	5
19	Cross-connection survey inspector	4	153	463	1	3	5
20	Pipelayer contractor	29	301	466	1	0	4
21	Iron/steel contractor (general/commercial)	31	329	459	1	0	5
22	Carpenter/cabinet maker contractor (general/commercial)	30	286	450	1	0	4
23	Paving equipment operator contractor	27	332	446	1	0	4
24	Drywall installation contractor (general/commercial)	30	284	426	1	0	4
25	School bus driver	51	96	293	6	0	19
26	Cement finishing contractor (general/commercial)	29	283	415	1	0	4
27	Door repair contractor	35	282	407	1	0	5
28	Painting contractor (general/commercial)	28	285	404	1	0	4
29	Terrazzo contractor (general/commercial)	29	276	403	1	0	4
30	Insulation contractor (general/commercial)	29	277	390	1	0	4
30	Floor sander contractor (general/commercial)	29	277	390	1	0	4
32	HVAC contractor (residential)	5	385	365	1	0	4
33	Tree trimmer	7	174	369	2	0	8
34	Log scaler	2	25	365	2	0	9
35	Psychiatric technician	4	162	247	1	12	5
36	Landscape worker	10	117	334	1	0	0
37	Crane operator	18	195	221	3	0	17
38	Skin care specialist	50	120	149	2	9	14
39	Home entertainment installer	3	101	243	2	0	12
40	Make-up artist	36	116	138	2	9	14
41	Mobile home installer	39	337	245	1	0	6
42	Cement finishing contractor (residential)	9	309	245	1	0	4
43	Terrazzo contractor (residential)	8	309	230	1	0	5
44	Teacher assistant	29	82	152	1	12	2
45	Psychiatric aide	2	0	228	1	6	0
46	Pharmacy technician	12	67	194	0	6	10
47	Coach	24	54	254	0	2	2
48	Cathodic protection tester	16	1,442	99	2	0	1
49	Iron/steel contractor (residential)	11	261	232	1	0	2
50	Massage therapist	39	181	139	1	5	14
51	Pest control applicator	51	90	191	2	0	9
52	Sheet metal contractor (residential)	7	320	209	1	0	3
53	Drywall installation contractor (residential)	9	282	203	1	0	2
54	Bus driver (city/transit)	51	92	86	5	0	19
55	Court clerk	4	13	195	0	3	5
56	Painting contractor (residential)	10	283	184	1	0	4
57	Carpenter/cabinet maker (residential)	10	277	184	1	0	4
58	Insulation contractor (residential)	10	277	184	1	0	4
59	Floor sander contractor (residential)	9	278	164	1	0	4

Table 1 (continued)

Rank	Occupation	Number of licensed states	Average fee ($US)	Average education and experience (days)	Average exams	Minimum grade level	Minimum age
60	Auctioneer	33	307	100	1	3	12
61	Tank tester	14	241	162	1	0	3
62	Sign language interpreter	16	772	2	3	5	6
63	Truck driver	51	83	65	4	0	18
64	Mason contractor (residential)	10	277	147	1	0	4
65	Manicurist	50	91	87	2	6	0
66	Glazier contractor (residential)	9	300	123	1	0	4
67	Emergency medical technician (EMT)	51	85	33	2	4	17
68	Vegetation pesticide handler	51	83	93	2	0	9
69	Locksmith	13	147	92	1	1	10
70	Animal trainer	20	93	105	1	0	10
71	Childcare worker	33	8	37	0	4	16
72	Title examiner	6	269	61	1	0	3
73	Security guard	37	89	38	0	1	16
74	Travel guide	21	191	58	1	0	9
75	Backflow prevention assembly tester	18	133	49	1	2	0
76	Dental assistant	7	50	55	1	2	2
77	Gaming supervisor	23	449	0	0	0	15
78	Bill collector agency	30	471	24	0	1	3
79	Funeral attendant	9	167	2	0	4	6
80	Shampooer	5	67	23	1	0	10
81	Pipelayer non-contractor	1	195	0	0	0	18
82	Taxi driver/chauffeur	12	74	3	1	0	15
83	Bartender	13	24	1	0	0	20
84	Slot key person	21	199	0	0	0	14
85	Gaming cage worker	22	175	0	0	0	14
86	Electrical helper	2	58	1	0	0	17
87	Gaming dealer	24	167	0	0	0	13
88	Animal control officer	17	116	4	1	0	8
89	Fisher	41	403	0	0	0	2
90	Florist	1	225	0	1	0	0
91	Fire sprinkler system tester	1	220	0	1	0	0
92	Weigher	24	42	0	0	0	8
93	Forest worker	1	129	0	1	0	0
94	Travel agent	8	211	0	0	0	2
95	Farm labour contractor	9	162	0	0	0	2
96	Still machine setter	2	43	0	1	0	0
97	Milk sampler	34	18	0	1	0	1
98	Upholsterer	7	116	0	0	0	0
99	Animal breeder	26	92	0	0	0	1
100	Taxidermist	26	67	0	0	0	0
101	Nursery worker	2	55	0	0	0	0
102	Packager	7	54	0	0	0	0
	Means (*without zeros*)	*22*	*221*	*577*	*2*	*11*	*18*

- Minimum grade level (e.g. tenth grade, 12th grade)
- Minimum age

Some requirements, such as surety bonds, character references, or cardiopulmonary resuscitation (CPR) training, were collected but not included in the analyses described below.

2.3. Analysis

The analyses included (*a*) deriving a consistent measure of burden, (*b*) determining the average burden of licensure for each occupation across states, and (*c*) calculating the average burden of

Table 2: Occupations ranked by number and average burden of licensed states combined

Tier 1		Tier 2		Tier 3		Tier 4	
Rank	Occupation	Rank	Occupation	Rank	Occupation	Rank	Occupation
1	Preschool teacher	16	Mobile home installer	45	Animal breeder	87	Shampooer
2	Athletic trainer	17	Security alarm installer	46	Taxidermist	88	Cross-connection survey inspector
3	Earth driller	18	Massage therapist	47	Gaming dealer	89	Psychiatric technician
4	Cosmetologist	19	Fire alarm installer	48	Weigher	90	Court clerk
5	Barber	20	Door repair contractor	49	Gaming supervisor	91	Dietetic technician
6	School bus driver	21	Midwife	50	Gaming cage worker	92	Home entertainment installer
7	HVAC contractor (general/commercial)	22	Make-up artist	51	Travel guide	93	Log scaler
8	Skin care specialist	23	Fisher	52	Slot key person	94	Psychiatric aide
9	Pest control applicator	24	Iron/steel contractor (general/commercial)	53	Animal trainer	95	Electrical helper
10	Bus driver (city/transit)	25	Security guard	54	Crane operator	96	Still machine setter
11	Truck driver	26	Glazier contractor (general/commercial)	55	Backflow prevention assembly tester	97	Nursery worker
12	Emergency medical technician (EMT)	27	Carpenter/cabinet maker contractor (general/commercial)	56	Cathodic protection tester	98	Conveyor operator
13	Vegetation pesticide handler	28	Drywall installation contractor (general/commercial)	57	Sign language interpreter	99	Pipelayer non-contractor
14	Manicurist	29	Mason contractor (general/commercial)	58	Animal control officer	100	Florist
15	Veterinary technologist	30	Pipelayer contractor	59	Tank tester	101	Fire sprinkler system tester
		31	Auctioneer	60	Locksmith	102	Forest worker
		32	Sheet metal contractor (general/commercial)	61	Pharmacy technician		
		33	Cement finishing contractor (general/commercial)	62	Bartender		
		34	Terrazzo contractor (general/commercial)	63	Iron/steel contractor (residential)		
		35	Floor sander contractor (general/commercial)	64	Taxi driver/chauffeur		
		35	Insulation contractor (general/commercial)	65	Landscape worker		
		37	Childcare worker	66	Social and human service assistant		
		38	Painting contractor (general/commercial)	67	Painting contractor(residential)		
		39	Milk sampler	68	Carpenter/cabinet maker (residential)		
		40	Paving equipment operator contractor	69	Insulation contractor (residential)		
		41	Teacher assistant	70	Mason contractor (residential)		
		42	Optician	71	Cement finishing contractor (residential)		
		43	Bill collector agency	72	Drywall installation contractor (residential)		
		44	Coach	73	Floor sander contractor (residential)		
				74	Glazier contractor (residential)		
				75	Funeral attendant		
				76	Terrazzo contractor (residential)		
				77	Farm labour contractor		
				78	Interior designer		
				79	Tree trimmer		
				80	Travel agent		
				81	Sheet metal contractor (residential)		
				82	Dental assistant		
				83	Upholsterer		
				84	Packager		
				85	Title examiner		
				86	HVAC contractor (residential)		

licensure for each state across occupations. Occupations and states were then ranked based on burden. For these analyses, we combined the five aforementioned licensure requirements in a multi-step process. For occupations, the procedure was as follows.

Step 1: Each requirement's sub-requirements were combined. Three of the requirement types – fees, education/experience and exams – had sub-requirements that needed combining. For fees, applicants are often required to pay fees of various types – application fees, processing fees, licensing fees, and so forth. These were summed to create an overall fee. The final metric was dollars. Likewise, discrete exams were summed across exam types, which commonly included written and practical exams. The final metric was number of exams.

Education/experience sub-requirements, some of which are reported in days, some in hours, some in years, and some in degree completion, were converted into a common measurement of days. We defined days as the number of days someone is restricted from fully entering an occupation while earning a licence (for the sake of brevity we do not include the algorithm here, but it is available upon request from the authors). For grade level, the metric was a number representing the minimum grade (i.e. tenth grade = 10, high school completion = 12, etc.), and for age it was years.

Not all states had minimums in all requirements. Thus, in states with a licence but no minimums in a given requirement, a zero value was assigned to the requirement. In states with no licence, the cells in the spreadsheets were empty.

Step 2: The respective requirements were averaged across states for each occupation.

Step 3: Because the different requirement types are measured in different units – dollars, years, days, grades and so forth – requirements were converted into z-scores by averaging across all occupations and using deviations from that average as the basis for the z-scores.

Step 4: Recognising that some requirements are more burdensome than others, we applied weights to the requirements. This acknowledges that education/experience, for example, represents a greater barrier to entering an occupation than fees or age requirements. Specifically, we applied a weight of 20 to the education/experience requirement and 1.5 to the grade-level requirement.

Step 5: The weighted z-scores for each requirement were summed. This score was used for ranking occupations by average regulatory burden.

Step 6: The weighted z-scores were multiplied by the number of states that license. This score was used for ranking occupations based on a combined measure of how widely they are licensed and how burdensome the licences are to earn.

Similarly, for states, the procedure was as follows.

Step 1: The final requirement metrics created in Step 1 for occupations above were averaged across all occupations for each state. This resulted in an average fee, education/experience, exam, grade level, and age requirement for each state.

Step 2: Requirements were converted into z-scores.

Step 3: Requirements were weighted as described above.

Step 4: The weighted z-scores for each requirement were summed. This score was used for ranking states by average regulatory burden.

Step 5: The weighted z-scores were multiplied by the number of licensed occupations. This score was used for ranking states based on a combined score of how widely they license and how burdensome the licences are to earn.

3. Results

The presentation of results begins by focusing first on occupations and then on states.

3.1. Occupations

The list of occupations included here is diverse. Some serve the needs of children, such as childcare workers, preschool teachers and teacher assistants. Others come from the health care sector, like dental assistants, opticians, psychiatric workers and dietetic technicians. The service sector is well represented with occupations including barbers, bartenders, cosmetologists, massage therapists, manicurists and skin-care specialists, as are the building trades and the transportation sector. Some of these occupations are commonly recognised as licensed, such as barbers and contractors, while others may not be as well-known as licensed – home entertainment installers, florists, interpreters for the deaf, interior designers and upholsterers. Some occupations, such as milk sampler, conveyor operator, still machine setter, and various forms of tester, may be altogether unfamiliar.

Notably, about half of the occupations on the list offer the possibility of new business creation. While those in a number of these occupations necessarily work for others, such as bus drivers, emergency medical technicians, and various kinds of assistants, in at least 54 of the occupations studied practitioners can start their own businesses. Occupations with opportunities for entrepreneurship include the cosmetology trades, construction trades, massage therapists, mobile home installers, taxi drivers and chauffeurs, animal breeders and trainers, and tree trimmers.

Indeed, about one-third of the 102 occupations are construction trades, such as masons, glaziers, painters, and cement finishers, and in these trades only those who act as contractors and have their own business need a licence. For instance, painters who work for contractors are not licensed, but in many states painting contractors are licensed. Note also that contractor licences usually vary according to whether the work is performed in a residential or a commercial setting. Since the licence requirements are different, we treated these as distinct occupations. For residential work, a residential licence is required. These are generally easier to obtain and are required in fewer states. For commercial work, either a commercial licence specific to the specialty (such as painting or cement finishing) or a general contractor's licence is required.

3.2. Breadth of licensure

As per Table 1, seven of the 102 occupations studied are licensed in all 50 states and the District of Columbia: pest control applicator, vegetation pesticide handler, cosmetologist, emergency medical technician (EMT), truck driver, school bus driver and city bus driver. Another eight occupations are licensed in 40 to 50 states. Thus, the vast majority of these occupations are licensed in fewer than 40 states, and five are licensed in only one state each: florist, forest worker, fire sprinkler system tester, conveyor operator, and non-contractor pipelayer. On average, the occupations on this list are licensed in about 22 states.

3.3. Burdens of licensure

Table 1 provides the average requirements for all 102 occupations in the states that license them. Note that because these are averages, minimum grade level and age may appear odd. No

state has a minimum age of three; more typical is 16, 18, or 21, but states with no requirements (but still with licensure) were assigned zeros in the data. Interior designer tops the list as the most difficult occupation to enter in the states where it is licensed.

As Table 1 shows, another three occupations require, on average, more than three years of experience in addition to fees ranging from $103 to $443, one to two exams, and imposes minimum age requirements. Twenty-nine occupations require one to three years of education and training, while another 32 require three months to one year. In 79 of the occupations, at least one exam is required. Recall that when states regulate occupations but have no minimum thresholds for particular requirements (such as fees or education), a zero was entered into the respective cells in the datasheet. Under this coding scheme, the occupational licences studied here require, on average, paying more than $209, passing one exam, and completing more than 275 days, or about nine months, of training and experience. However, when zeroes are removed, the licensure requirements are about $221 in fees, 577 days in education and experience, two exams, and minimums of 11th grade and 18 years of age (as shown in the final row of Table 1).

3.4. Breadth and burden combined

Table 2 combines measures of the burden and breadth of licensure for lower-income workers. To appreciate the difference between the rankings in Table 1 and Table 2, note that interior designer has the most burdensome entry requirements (Table 1), but ranks as the 78th most widely and onerously licensed occupation (Table 2). That is because it is licensed in only four states (with DC counted). By contrast, EMT has the 67th most burdensome entry requirements but, because it is licensed in all states, it ranks as the 12th most widely and onerously licensed occupation.

To more closely examine the combined ranking of occupations, we divided the list into tiers, as shown in Table 2, based on standard deviations. Tier 1 includes occupations with scores greater than positive one standard deviation (i.e. more widely and onerously licensed than most others), Tier 2 includes occupations with scores between the mean and positive one standard deviation, and so forth. The 15 occupations in Tier 1 are all licensed in more than two-thirds of states and include those who style hair, drive buses and trucks, control pests and weeds, and clean and style fingernails. In fact, almost every cosmetology-related field falls into Tier 1. These occupations are licensed in all or almost all states and face fairly difficult entry requirements. To enter the 15 occupations in Tier 1 costs, on average, $142 in fees, 464 days, and two exams.

Twenty-nine occupations fall into Tier 2, and it takes an average of $254 in fees, ten months of education and training, and one exam to break into them. They are licensed in an average of 31 states. Tier 2 includes most of the construction trades, as well as mobile home installers, massage therapists, make-up artists, security guards, auctioneers, teacher assistants and opticians.

Tier 3 includes 42 occupations, several of which are onerously but not widely licensed. Social services assistant, for example, has the fourth most burdensome entry requirements, but, because it is licensed in only seven states, the occupation is in Tier 3. Interior design, the most burdensome occupation to enter, likewise falls in Tier 3. Several other occupations in Tier 3 impose above-average requirements, but are not widely licensed, such as landscape worker, tree trimmer, and heating, ventilating, and air conditioning (HVAC) contractor (residential).

The 16 occupations in Tier 4 are the least onerously and widely licensed, and yet, as with Tier 3, several of them face substantial barriers in the states where they are licensed, including home entertainment installer, log scaler, cross-connection survey inspector, dietetic technician, psychiatric aide and conveyor operator. These occupations fall into Tier 4 largely because they are licensed in so few states – an average of two for the tier.

The number of states that license an occupation plays a large role in where it falls among the tiers. This highlights a key issue with occupational licensing – mobility. Those who seek to work in Tier 1 or Tier 2 occupations often already face steep burdens imposed by one state, but if they choose to move to another state they likely face a second dose of burdens should their new state not grant licensure reciprocity. Evidence from studies on this additional type of burden indicate the effects are real – licensure requirements significantly reduce migration between states, as individuals licensed for an occupation in a given state choose not to relocate rather than undertake the burdensome licensure process a second time (Kleiner, Gay and Greene 1982a,b).

3.5. States

As Table 3 shows, Louisiana licenses 70 of the 102 occupations studied – more than any other state. It is followed closely by Arizona (64), California (62) and Oregon (59). Wyoming, with a mere 24, licenses the fewest among those studied, followed by Vermont and Kentucky, which each license 27. On average, states license 43 of the occupations studied.

For each state, Table 3 shows the average burdens imposed across all occupations licensed in that state. The average state requires $203 in fees, 307 days (i.e. more than ten months) in education and experience, one exam, and grade and age minimums. Table 3 also ranks states from most to least. Hawaii tops the list as the most burdensome state, with Arkansas not far away. Nevada, Florida and Arizona round out the top five most burdensome states. In all, 14 states require more than a year of education and experience on average for the occupations they license. Pennsylvania is the least burdensome state, while four states – Nebraska, Montana, Wisconsin and North Dakota – follow closely with similar burdens.

Taking into account the extent of licensing in the states, Table 4 ranks states according to a combined measure of burden and number of occupations licensed. States that appear high on this list are those that license a large number of occupations and impose burdensome requirements. By this measure, Arizona ranks at the top, with California a close second.

Like the combined occupational rankings, Table 4 breaks the combined state rankings into tiers based on standard deviations. Eight states – Arizona, California, Oregon, Nevada, Arkansas, Hawaii, Florida and Louisiana – make up Tier 1. The exam, age, and grade requirements are quite similar across state tiers, but this is not so for fees, education, and experience and number of occupations licensed. Tier 1 fees and education and experience requirements substantially outpace those in the other tiers (see Table 5). In fact, someone seeking to work in a Tier 1 state would have to pay almost twice the amount in fees and wait more than eight months longer to enter his or her chosen occupation than someone in a Tier 2 state. And Tier 1 states license a greater number of occupations – six more than Tier 2, 17 more than Tier 3, and 27 more than Tier 4. Seven of the top ten most burdensome states, listed in Table 3, remained in the top ten in Table 4: Arizona, Arkansas, California, Florida, Hawaii, Nevada and Oregon. These states already imposed comparably heavy licensure burdens on

Table 3: States ranked by burden of licensing requirements

Rank	State	Number of low-income occupations licensed	Average fee ($)	Average education and experience (days)	Average exams	Minimum grade level	Minimum age
1	Hawaii	43	367	724	2	1	13
2	Arkansas	52	212	689	1	3	6
3	Nevada	55	505	601	2	2	7
4	Florida	45	274	603	1	2	15
5	Arizona	64	455	599	2	2	5
6	Oregon	59	267	568	1	1	13
7	California	62	300	549	1	2	12
8	Virginia	46	153	462	1	1	11
9	Vermont	27	174	402	2	3	8
10	Maryland	42	198	446	1	1	7
11	Oklahoma	29	116	416	2	2	9
12	New Mexico	52	158	413	1	2	8
13	Utah	46	269	417	2	0	4
14	South Carolina	51	166	402	1	1	7
15	Kentucky	27	230	336	2	4	8
16	Ohio	31	137	341	1	3	9
17	Texas	34	304	326	2	2	10
18	Georgia	33	167	324	2	3	8
19	New York	33	145	283	2	2	11
20	New Jersey	48	179	292	1	3	6
21	Michigan	42	198	256	1	3	14
22	South Dakota	28	166	271	2	2	9
23	Washington, DC	41	240	311	1	1	6
24	Minnesota	36	164	290	2	2	5
25	Massachusetts	37	181	293	1	1	6
26	Indiana	28	147	251	1	2	12
27	West Virginia	49	132	247	2	2	7
28	New Hampshire	34	209	230	2	2	8
29	North Carolina	48	180	250	1	1	7
30	Maine	39	206	226	1	2	6
31	Illinois	40	249	203	1	3	10
32	Wyoming	24	173	196	2	3	9
33	Colorado	28	195	227	1	1	10
34	Tennessee	53	218	222	1	1	7
35	Missouri	31	100	220	1	1	10
36	Idaho	47	122	240	1	1	5
37	Rhode Island	49	164	211	1	1	12
38	Alabama	47	319	182	2	2	5
39	Connecticut	54	173	230	1	1	4
40	Alaska	44	373	179	1	1	6
41	Washington	54	152	199	1	1	7
42	Delaware	49	94	195	1	1	6
43	Louisiana	71	214	163	1	2	6
44	Kansas	34	88	166	1	2	5
45	Mississippi	55	198	155	2	2	5
46	Iowa	54	141	181	1	1	6
47	North Dakota	40	107	132	1	2	13
48	Wisconsin	47	209	145	1	1	8
49	Montana	44	131	133	1	3	7
50	Nebraska	45	140	147	1	2	6
51	Pennsylvania	44	176	113	1	1	7

Table 4: States ranked by number and burden of licensing requirements combined

Tier 1		Tier 2		Tier 3		Tier 4	
Rank	State	Rank	State	Rank	State	Rank	State
1	Arizona	9	New Mexico	23	Idaho	46	Kansas
2	California	10	South Carolina	24	Alabama	47	Missouri
3	Oregon	11	Virginia	25	Delaware	48	South Dakota
4	Nevada	12	Utah	26	Michigan	49	Indiana
5	Arkansas	13	Tennessee	27	Washington, DC	50	Colorado
6	Hawaii	14	Maryland	28	Wisconsin	51	Wyoming
7	Florida	15	Connecticut	29	Alaska		
8	Louisiana	16	New Jersey	30	Illinois		
		17	West Virginia	31	Nebraska		
		18	Mississippi	32	Texas		
		19	Washington	33	Maine		
		20	Iowa	34	Massachusetts		
		21	North Carolina	35	Montana		
		22	Rhode Island	36	Minnesota		
				37	Georgia		
				38	Pennsylvania		
				39	Ohio		
				40	New York		
				41	Oklahoma		
				42	North Dakota		
				43	New Hampshire		
				44	Vermont		
				45	Kentucky		

their citizens; taking into account the number of occupations licensed merely changed their relative positions among the top ten most burdensome states.

A handful of states license relatively few occupations but do so comparably onerously. They show up ranked high in Table 3 but substantially lower in Table 4. Examples include Vermont (ninth most burdensome but 44th combined), Oklahoma (11th most burdensome but 41st combined), Kentucky (15th most burdensome but 45th combined), Ohio (16th most burdensome but 39th combined), Texas (17th most burdensome but 32nd combined), Georgia (18th most burdensome but 37th combined), and New York (19th most burdensome but 40th combined). Conversely, some states impose relatively light burdens, but license a large number of occupations, such as Mississippi (55 occupations, 45th most burdensome), Iowa (54 occupations, 46th most burdensome), Washington (54 occupations, 41st most burdensome), Connecticut (54 occupations, 39th most burdensome), and Tennessee (53 occupations, 34th most burdensome).

Table 5: Average state requirements by tier

Tier	Fee ($)	Education/experience (days)	Exams	Grade	Age	Occupations
Tier 1	323	542	1	2	9	56
Tier 2	176	289	1	1	7	50
Tier 3	192	236	1	2	8	39
Tier 4	141	221	2	2	9	29

4. Discussion

This study sought to describe the scope and burden of an increasingly pervasive form of economic regulation on small-business entrepreneurship – occupational licensing. The requirements of 102 low- and moderate-income occupations in the United States show that aspirants are required, on average, to spend about nine months in training, spend more than $200 in fees, and pass at least one exam, in addition to complying with age and grade minimums. When we take into account both how widely states license (i.e. the number of occupations they license) and how onerous those licensure laws are for aspiring workers, Arizona tops the list as the most widely and onerously licensed. Wyoming ranks as the least regulated. The average state requires $203 in fees, 307 days (i.e. more than ten months) in education and experience, one exam, and grade and age minimums.

While these averages are helpful in understanding the scope and burden of occupational licensure, the rather wide disparities within or between regulations or states is also one of the more striking findings in this study. Indeed, one of the most significant implications from such disparities is what they illustrate about the purported need for licensure. If, as licensure proponents often claim, a licence is required to protect public health and safety, one would expect more consistency. For example, auctioneers are licensed in 33 states, interpreters for the deaf are licensed in 16, and only five states require licences for shampooers. It is highly unlikely that conditions in those five states are any different from the other 46 (with DC counted) that do not license shampooers.

What makes this type of discrepancy even more notable is the burden attached to occupations licensed in only a few states, like opticians or interior designers. Twenty-nine states allow opticians to work without a licence, while the licensed states impose significant requirements. Yet state agencies that have examined the need for licensing opticians recommend against the creation of a licence or for the elimination of an existing one (Davenport 2001; Haskell 1995; Office of the State Auditor 1990). Similarly, only three states and the District of Columbia license interior designers, but that occupation is the most difficult to enter in those states. It seems implausible that interior design poses a health and safety risk in these four jurisdictions that is absent everywhere else (or that there is risk severe enough to warrant requiring would-be designers to complete six years of education and training). In fact, multiple state commissions that have studied the issue have concluded that there is simply no need to license interior designers and have recommended against proposed licensing schemes accordingly (Cooke 2000; Nettles 1991; Roper 1989; Washington State Department of Licensing 2005).

Similar discrepancies are evident when examining the number of occupations licensed in the states. All of the 102 occupations studied are licensed somewhere. Louisiana, Arizona and California license more than 60 of the 102 occupations in this report, while Oklahoma, Colorado, Indiana, South Dakota, Kentucky, Vermont and Wyoming license fewer than 30. The average state licenses 43. Apparently many states are satisfied to leave their citizens free to pursue occupations that other states license.

A third type of discrepancy is present when examining requirements within an occupation across states. It is common to find wide inconsistencies in what states require for the same occupation. For example, 39 occupations have differences of more than 1,000 days between the minimum and the maximum number of days required for education and experience

across the states, and another 23 occupations have differences of more than 700 days among the states.

Finally, when one compares one occupation to another, discrepancies between requirements can be striking. For example, EMTs literally hold lives in their hands, yet 66 other occupations have greater average licensure burdens than EMTs. They include interior designers, log scalers, barbers and cosmetologists, landscape workers, manicurists, and a host of contractor designations. By way of perspective, the average cosmetologist spends 372 days in training; the average EMT a mere 33. Even the average locksmith must complete almost three times the amount of training as the average EMT.

The contexts within states are likely not so radically different as to warrant all of these types of disparities. Instead, these discrepancies appear to lend credence to the first predominant view referenced above – occupational licences often stem from the economic interests of those already practising the occupations rather than a rational need demonstrated by clear evidence of threat to public health and safety. Adam Smith observed that trades conspire to reduce the availability of skilled craftsmen in order to raise wages (Smith 1776, I. x(2). 26; V. i(3). Art 1. 27), and modern public choice theory (Becker 1983; Buchanan and Tullock 1962) and social science research (Abbott 1988; Abel 1979; Bo 2006; Carpenter 2008; Kleiner 2006a,b; Timmermans 2008) suggests the same is often true today.

Even courts of law have questioned the efficacy of licensure. On 21 July 2011, a federal court in Louisiana – recognised as a Tier 1 state in Table 4 – struck down a requirement that casket sellers be licensed as funeral directors. The court recognised that the state had 'no rational basis' for imposing the burden of a funeral director's licence – which includes apprenticing at a licensed funeral home, mastering irrelevant skills and passing a funeral industry test – on those who merely sell empty boxes (i.e. coffins). As the court declared, 'The licensing scheme is not rationally related to public health and safety concerns . . . [I]t is detrimental to the welfare of the consumers and does not protect the health and safety of the public' (*St. Joseph Abbey v. Castille* 2011, pp. 18–19). Instead, the court found, 'The provisions simply protect a well-organized industry that seeks to maintain a strict hold on this business' (p. 18).

In conclusion, although the data in this study demonstrate some of the opportunity costs associated with licensure in a sample of low- and moderate-income occupations, they underestimate the full measure of regulatory burden of licensure. We included only 'measured' occupations regulated at the state level, not those licensed by cities, counties or the federal government. The study also understates regulatory burden by taking a conservative approach to documenting licence requirements. When states offer multiple levels of licensure, we measured the easiest-to-obtain or entry-level requirements that allowed for the broadest scope of work. Those wishing to advance in such a field would need to meet additional requirements. Moreover, depending on the nature of the work and the setting in which it is performed, some occupations may be subject to additional or alternative licensing regimes not captured here. For example, the licensing requirements reported for social and human service assistants are those of social work assistants and social work associates. Some workers in this field, however, may need a psychology associate licence or a similar licence in another related field. Future research could use these underestimates as a guide for further inquiry.

On a more technical note, future research on the relative burdens represented by licensure requirements would also be beneficial. Recall that the requirements included in the scale used

in this study were combined through weighted z-scores. The decision to apply weights was based on prior qualitative research (Carpenter 2011) and observation of the comments and behaviours of aspiring workers concerning licensure requirements (Adams 2012) that act as disincentives to obtain a licence. Specifically, formal education and training requirements are consistently referenced as the greatest barrier to licensure, where fees and age requirements, for example, are comparatively infrequently discussed. For this reason we weighted education and training requirements as more onerous.

Future research could test empirically whether this assumption holds true. Moreover, if the assumption is valid, additional research could seek to establish relative weights associated with the respective burdens. The weighting scheme used in this study was based on observation of relative costs of requirements (i.e. fees compared with tuition costs) and interviews and discussions with aspiring workers. With the data set constructed for this study, future research could establish these weights empirically. In general form, for example, the number of workers in occupations or some similar outcome could be regressed on the licensure requirements to discern appropriate weights. Because of the importance the weights play in the determination of state and occupational rankings, this would likely result in differences in the rankings reported here. For example, when all requirements in this study's data are equally weighted, four occupations fall out of the top ten: preschool teacher, earth driller, HVAC contractor and pest control applicator (see Table 6). Moreover, of the six that remain, the orders change somewhat, where school bus driver moves from sixth most broadly and onerously regulated to first, and athletic trainer falls from second to seventh, for instance. The effect is similar for states, although less pronounced. As the bottom panel of Table 6 illustrates using the top eight states (i.e. Tier 1), one state falls out of the top eight – Louisiana is replaced by Michigan – and the order changes slightly, whereby Arizona goes from first to third, and Florida goes from seventh to fourth, for example. It is nonetheless

Table 6: Weighted and unweighted occupation and state ranks

Weighted rank	Occupation	Unweighted rank	Occupation
1	Preschool teacher	1	School bus driver
2	Athletic trainer	2	Cosmetologist
3	Earth driller	3	Bus driver (city/transit)
4	Cosmetologist	4	Barber
5	Barber	5	Skin care specialist
6	School bus driver	6	Truck driver
7	HVAC contractor (general/commercial)	7	Athletic trainer
8	Skin care specialist	8	Midwife
9	Pest control applicator	9	Optician
10	Bus driver (city/transit)	10	Make-up artist
	State		
1	Arizona	1	Nevada
2	California	2	Hawaii
3	Oregon	3	Arizona
4	Nevada	4	Florida
5	Arkansas	5	California
6	Hawaii	6	Oregon
7	Florida	7	Arkansas
8	Louisiana	8	Michigan

important to note that this article's other primary findings will remain unchanged, specifically the average burdens to obtain a licence and the vast discrepancies in the requirements. These findings came from the raw data directly and remain unaffected by any alternative weighting schemes.

Of course, which weights to use is not the only element affecting how states or occupations rank in their licensure burdens. Ruger and Sorens (2013), for example, built a licensing scale composed of a measure of occupational licensing extent, the sum total of education and experience requirements for all included occupations, a weighted average of each state's licensure prevalence for 64 coded occupations (where each occupation's weight is its proportion of the total employment in those 64 occupations), and a measure of regulations that limit the practice of nurses and nurse practitioners, physician assistants and dental hygienists. In this way, Ruger and Sorens examined some constructs similar to those in our study, such as the extent of licensing and education and experience requirements, but their study differed in the number and types of occupations in the scale, its weighting scheme, and its inclusion of occupations not necessarily limited to low- and moderate-income sectors.

Yet their ranking of states, which was the purpose of their study, was surprisingly similar to the rankings in ours. Although the order differed slightly, seven states appeared among the eight most burdensome states for licensing in both ours and Ruger and Sorens's lists – Oregon, Louisiana, Arizona, Florida, Arkansas, California and Nevada. Similarly, of the six states ranked as least burdensome in our study, three were so named in Ruger and Sorens – Missouri, Colorado and Wyoming. This suggests that, even if some details differ based on the precise measures of licensing, the general effects of the requirements appear robust.

Future research could shed further light on the robustness of these effects across states by using a sample of occupations distributed widely across the economic spectrum or prestige scale (Kriesberg 1962; Mackinnon and Langford 1994; Nakao and Treas 1994). Indeed, given the ubiquity of occupational licensing today and the comparatively sparse literature on this topic, more research is most certainly warranted.

References

Abbott, A. (1988) *The System of Professions*. Chicago, IL: University of Chicago Press.

Abel, R. L. (1979) 'The Rise of Professionalism', *British Journal of Law and Society* 6(1), 82–98.

Adams, A. F., J. D. Jackson and R. B. Ekelund (2002a) 'Occupational Licensing in a Competitive Labor Market: The Case of Cosmetology', *Journal of Labor Research* 23(2), 261–78.

Adams, A. F., J. D. Jackson and R. B. Ekelund (2002b) 'Occupational Licensing of a Credence Good: The Regulation of Midwifery', *Southern Economic Journal* 69(3), 659–75.

Adams, B. (2012) 'African Hair Braider Gets Win in Federal Court', *Salt Lake Tribune*, 10 August. Available at http://www.sltrib.com/sltrib/news/54668494-78/hair-clayton-braiding-cosmetology.html.csp (accessed 12 November 2014).

Angrist, J. D. and J. Guryan (2008) 'Does Teacher Testing Raise Teacher Quality? Evidence from State Certification Requirements', *Economics of Education Review* 27, 483–503.

Becker, G. (1983) 'A Theory of Competition Among Pressure Groups for Political Influence', *Quarterly Journal of Economics* 98, 371–400.

Bo, E. D. (2006) 'Regulatory Capture: A Review', *Oxford Review of Economic Policy* 22(2), 203–25.

Buchanan, J. M. and G. Tullock (1962) *The Calculus of Consent: Logical Foundations of Constitutional Democracy*. Ann Arbor, MI: University of Michigan Press.

Buddin, R. and G. Zamarro (2008) 'Teacher Qualifications and Student Achievement in Urban Elementary Schools', *Journal of Urban Economics* 66, 103–15.
Carpenter, C. G. and E. F. Stephenson. (2006) 'The 150–Hour Rule as a Barrier to Entering Public Accountancy', *Journal of Labor Research* 27(1), 115–26.
Carpenter, D. M. (2008) 'Regulation through Titling Laws: A Case Study of Occupational Regulation', *Regulation and Governance* 2(3), 340–59.
Carpenter, D. M. (2011) 'The Power of One Entrepreneur: A Case Study of the Effects of Entrepreneurship', *Southern Journal of Entrepreneurship* 4(1), 19–35.
Carroll, S. L. and R. J. Gaston (1981) 'Occupational Restrictions and the Quality of Service Received: Some Evidence', *Southern Economic Journal* 47(4), 959–76.
Cooke, M. M. (2000) *Interior Designers*. Denver, CO: Office of Policy and Research, Colorado Department of Regulatory Agencies.
Davenport, D. K. (2001) *Performance Audit: Arizona Board of Dispensing Opticians*. Phoenix, AZ: Office of the Auditor General.
Federman, M. N., D. E. Harrington and K. J. Krynski (2006) 'The Impact of State Licensing Regulations on Low–Skilled Immigrants: The Case of Vietnamese Manicurists', *American Economic Review* 96(2), 237–41.
Freidson, E. (1986) *Professional Powers*. Chicago, IL: University of Chicago Press.
Friedman, M. (1962) *Capitalism and Freedom*. Chicago, IL: University of Chicago Press.
Halliday, T. C. (1987) *Beyond Monopoly*. Chicago, IL: University of Chicago Press.
Haskell, E. (1995) *Optical and Contact Lens Dispensers: 1995 Sunrise Review*. Denver, CO: Colorado Department of Regulatory Agencies.
Jackson, R. E. (2006) 'Post-Graduate Educational Requirements and Entry into the CPA Profession', *Journal of Labor Research* 27(1), 101–14.
Jacob, J. and D. Murray (2006) 'Supply-Side Effects of the 150-Hour Educational Requirement to CPA Licensure', *Journal of Regulatory Economics* 30(2), 159–78.
Johnson, L. L. and C. Loucks (1986) 'The Effects of State Licensing Regulations on the Real Estate Brokerage Industry', *Real Estate Economics* 14(4), 567–82.
Kleiner, M. M. (2006a) 'A License for Protection', *Regulation* 29(3), 17–21.
Kleiner, M. M. (2006b) *Licensing Occupations: Ensuring Quality or Restricting Competition*. Kalamazoo, MI: Upjohn Institute.
Kleiner, M. M., R. S. Gay and K. Greene (1982a) 'Barriers to Labor Migration: The Case of Occupational Licensing', *Industrial Relations* 21(3), 383–91.
Kleiner, M. M., R. S. Gay and K. Greene (1982b) 'Licensing, Migration, and Earnings: Some Empirical Insights', *Policy Studies Review* 1(3), 102–11.
Kleiner, M. M. and A. B. Krueger (2010) 'The Prevalence and Effects of Occupational Licensing', *British Journal of Industrial Relations* 48(4), 676–87.
Kleiner, M. M. and R. T. Kudrle (2000) 'Does Regulation Affect Economic Outcomes: The Case of Dentistry', *Journal of Law and Economics* 43(2), 547–82.
Kleiner, M. M. and D. L. Petree (1988) 'Unionizing and Licensing of Public School Teachers: Impact on Wages and Educational Output', in R. B. Freeman and C. Ichniowski (eds), *When Public Sector Workers Unionize*. Chicago, IL: University of Chicago Press.
Kleiner, M. M. and R. M. Todd (2007) Mortgage Broker Regulations that Matter: Analyzing Earnings, Employment, and Outcomes for Consumers. NBER Working Paper No. 13684. Cambridge, MA: National Bureau of Economic Research.
Kriesberg, L. (1962) 'The Bases of Occupational Prestige: The Case of Dentists', *American Sociological Review* 27(2), 238–44.
Leland, H. E. (1979) 'Quacks, Lemons, and Licensing: A Theory of Minimum Quality Standards', *Journal of Political Economy* 87(6), 1328–46.
Mackinnon, N. J. and T. Langford (1994) 'The Meaning of Occupational Prestige Scores: A Social Psychological Analysis and Interpretation', *Sociological Quarterly* 35, 215–45.
McQuillan, L. J., M. T. Maloney, E. Daniels and B. M. Eastwood (2008) *U.S. Economic Freedom Index: 2008 Report*. San Francisco, CA: Pacific Research Institute.

Mester, J. L., A. M. Trepanier, C. E. Harper, L. S. Rozek, B. M. Yashar and W. R. Uhlmann (2009) 'Perceptions of Licensure: A Survey of Michigan Genetic Counselors', *Journal of Genetic Counseling* 18, 357–65.
Nakao, K. and J. Treas (1994) 'Updating Occupational Prestige and Socioeconomic Scores: How the New Measures Measure Up', *Sociological Methodology* 24, 1–72.
Nettles, E. L. (1991) *Review of Occupational Registration and Licensing for Interior Designers*. Columbia, SC: State Reorganization Commission.
Office of the State Auditor (1990) Sunset Evaluation Update: Dispensing Opticians. A Report to the Governor and the Legislature of the State of Hawaii. Report No. 90-13. Available at http://www.state.hi.us/auditor/Overviews/1990/90-13.htm (accessed 23 August 2012).
Paul, C. (1984) 'Physician Licensure Legislation and the Quality of Medical Care', *Atlantic Economic Journal* 12(4), 18–30.
Potts, J. (2009) 'Open Occupations – Why Work Should Be Free', *Economic Affairs* 29(1), 71–6.
Roper, W. H. (1989) *Review of Senate Bill 305 which Proposes to License Interior Designers in Georgia*. Atlanta, GA: Georgia Occupational Regulation Review Council.
Ruger, W. P. and J. Sorens (2009) *Freedom in the 50 States: An Index of Personal and Economic Freedom*. Arlington, VA: Mercatus Center.
Ruger, W. P. and J. Sorens (2013) *Freedom in the 50 States: An Index of Personal and Economic Freedom*. Arlington, VA: Mercatus Center.
Shapiro, C. (1986) 'Investment, Moral Hazard, and Occupational Licensing', *Review of Economic Studies* 53(5), 843–62.
Shilling, J. D. and C. F. Sirmans (1988) 'The Effects of Occupational Licensing in Complaints against Real Estate Agents', *Journal of Real Estate Research* 3(2), 1–9.
Skarbek, D. (2008) 'Occupational Licensing and Asymmetric Information: Post-Hurricane Evidence from Florida', *Cato Journal* 28(1), 73–82.
Smith, A. (1776) *An Inquiry into the Nature and Causes of the Wealth of Nations*.
Summers, A. (2007) *Occupational Licensing: Ranking the States and Exploring Alternatives*. Los Angeles, CA: Reason Foundation.
Timmermans, S. (2008) 'Professions and Their Work: Do Market Shelters Protect Professional Interests?', *Work and Occupations* 35(2), 164–88.
Timmons, E. J. and R. J. Thornton (2008) 'The Effects of Licensing on the Wages of Radiologic Technologists', *Journal of Labor Research* 29, 333–46.
Washington State Department of Licensing (2005) *Sunrise Review of Interior Designers. Report to House Committee on Commerce and Labor*. Olympia, WA: Department of Licensing.
White, W. (1978) 'The Impact of Occupational Licensure of Clinical Laboratory Personnel', *Journal of Human Resources* 13, 91–102.

Case cited

St. Joseph Abbey v. Castille, 835 F. Supp. 2d 149 (E.D. La. July 21, 2011).