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## Occupational Licensing

Morris M. Kleiner

**T**he study of the regulation of occupations has a long and distinguished tradition in economics.

Occupational regulation was discussed by Adam Smith (1776 [1937]) in the *Wealth of Nations* (Book I, Ch. 10, Part II), where he focuses on the ability of the crafts to lengthen apprenticeship programs and limit the number of apprentices per master, thus ensuring higher earnings for persons in these occupations.

The patrimony of a poor man lies in the strength and dexterity of his hands; and to hinder him from employing this strength and dexterity in what manner he thinks proper without injury to his neighbor, is a plain violation of this most sacred property. It is a manifest encroachment upon the just liberty both of the workman, and of those who might be disposed to employ him. As it hinders the one from working at what he thinks proper, so it hinders the others from employing whom they think proper. To judge whether he is fit to be employed, may surely be trusted to the discretion of the employers whose interest it so much concerns. The affected anxiety of the law-giver lest they should employ an improper person, is evidently as impertinent as it is oppressive. The institution of long apprenticeships can give no security that insufficient workmanship shall not frequently be exposed to public sale.

Smith states that long apprenticeships are no assurance of quality, nor are they useful in inculcating industriousness among workers. Instead, he argues, they serve

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only to “prevent this reduction of price, and consequently of wages and profit, by restraining that free competition which would most certainly occasion it.”

In a 1945 volume published by the National Bureau of Economic Research, which was largely based on Milton Friedman’s dissertation, Friedman and Simon Kuznets suggested that the issue of occupational regulation continued to be of long-standing interest in economics. Friedman and Kuznets (p. 12) related, “In all professions, there has developed in the last few years an aristocratic, or at least a restrictive movement which, in a sense, is reminiscent of the medieval guilds.” In the early 1960s, a volume summarizing the most important research issues in labor economics focused its lead article on the subject of occupational licensing (Lewis, 1962).

But even though occupational licensing has historically been among the most examined institutions in labor economics, this institution has received relatively little recent attention, either from academics or the public policy press. An examination of the *American Economic Review*, *Journal of Political Economy* and the *Quarterly Journal of Economics* found no articles published in these journals on occupational licensing during the past five years.

The neglect of occupational licensing does not seem to have occurred because the practice has dwindled to a negligible amount. Occupational licensing directly affects approximately 18 percent of U.S. workers, which is more than either the minimum wage, which has a direct impact on less than 10 percent of workers (even though it covers most of the workforce), or unionization, whose membership rates are now less than 15 percent of the labor force (Kleiner, 1990; Wheelen, 1999). Moreover, while unions have declined from representing approximately 30 percent of the labor force in the 1950s to less than 15 percent in 1999, the percentage of workers who are covered by either state or local licenses continues to rise as the demand for regulated services grows and more occupations become regulated. However, while unions and the minimum wage have been among the most researched institutions within labor economics during the past decade, the study of occupational licensing has gone into partial eclipse.

Table 1 presents employment for five major occupations in which there is state licensing within the occupation from the 1990 Census. These five occupations alone total nearly 10 million workers. Although not all the persons in these occupations require a license to perform their work, the most difficult and economically rewarding tasks generally require a state license. The Council of State Governments lists more than 800 occupations as licensed in at least one state, ranging from fortune-tellers in Maryland to rainmakers in Arizona (Council of State Governments, 1994).

Anecdotes abound in the popular press about the unintended consequences of occupational licensing. There are examples of persons who gave themselves root canals rather than going to an expensive dentist (Rademacher, 1997),<sup>1</sup> and exam-

<sup>1</sup> I thank Charles Brown for providing this example to me.

*Table 1*  
**Number of Persons in Major Licensed Occupations**

<i>Occupation</i>	<i>Number of Persons Who Worked in the Occupation</i>
Teachers	3,588,317
Nurses	2,269,695
Engineers	1,682,902
Accountants and Auditors	1,565,359
Lawyers and Judges	770,789

*Source:* 1990 Public Use Sample Census Data

ples of licensed painters who would lose their license to paint by doing only one rather than four walls of a room—regardless of the desires of the customer (Daly, 1996). Even among licensed occupations, there are conflicts about who gets to do the work. For example, dentist's organizations have attempted creative political and legal maneuvers to block licensed dental hygienists from opening independent shops without the supervision of a licensed dentist (Rundle, 1987).

In this paper, I present the central arguments and unresolved issues involving the costs and benefits of occupational licensing. Occupational licensing is defined as a process where entry into an occupation requires the permission of the government, and the state requires some demonstration of a minimum degree of competency. The state usually creates a nongovernmental licensing board with political appointees, public members and members of the occupation to oversee the regulated occupations. Generally, members of the occupation dominate the licensing boards. The agency must usually be self-supporting by collecting fees and registration charges from persons in the licensed occupations. Usually, members of the occupation provide technical support to the licensing agency.

It is useful to contrast occupational licensing with certification. A certification permits any person to perform the relevant tasks, but the government agency administers an examination and certifies those who have passed and the level of skill or knowledge (Rottenberg, 1980). Consumers of the product or service can then choose whether to hire a certified worker or not. In the case of occupational licensing, it is illegal for anyone without a license to perform the task. For example, travel agents and mechanics are generally certified, but not licensed.

The main benefits that are suggested for occupational licensing involve improving quality for those persons receiving the service. Occupational licensure creates a greater incentive for individuals to invest in more occupation-specific human capital because they will be more able to recoup the full returns to their investment if they need not face low-quality substitutes for their services (Akerlof, 1970; Shapiro, 1986). Under these conditions, some sectors of the market divided by income or quality for the services may benefit more than others, which is what

Shapiro calls a “separating equilibrium.” The existence of licenses may minimize consumer uncertainty over the quality of the licensed service and increase the overall demand for the service (Arrow, 1971). Moreover, it is argued that in some cases, a poor quality service is not just a matter between employer and employee. A doctor who makes a bad diagnosis may cause a widespread epidemic. A boiler-maker who installs a furnace incorrectly may cause a building to catch fire, injuring or killing many persons. In this sense, requiring a practitioner to be trained at a minimum level recognizes a form of regulation which may produce positive social payoffs.

Skeptics of occupational licensing point out that the empirical evidence on the increase in quality, greater level of training, or avoidance of catastrophes is often thin or nonexistent. They argue that if a signal of quality is important, certification is a better way of accomplishing the goal than occupational licensing. Moreover, the skeptics argue that any remaining beneficial effects of occupational licensing are more than offset by the monopoly effects of restriction of supply of practitioners.

## **Supply-side Effects of Occupational Licensing**

### **How Licensing Constricts Labor Supply**

The most generally held view on the economics of occupational licensing is that it restricts the supply of labor to the occupation and thereby drives up the price of labor as well as of services rendered (Rottenberg, 1980). State-regulated occupations can use political institutions such as state legislatures or city councils to control initial entry and in-migration, and thereby restrict supply and raise the wages of the licensed practitioner. There is presumed to be a once-and-for-all income gain that accrues to current members of the occupation who are grandparented in, because they do not have to meet the newly established standard (Perloff, 1980). Individuals who attempt to enter the occupation in the future will need to balance the economic rents of the field’s increased monopoly power against the greater difficulty of meeting the entrance requirements.

Once an occupation is regulated, members of that occupation in a geographic or political jurisdiction can implement tougher statutes or examination pass rates and may gain relative to those who have easier requirements by further restricting the supply of labor and obtaining economic rents for incumbents (Kleiner, 1990). Restrictions would include lowering the pass rate on the licensing exam, imposing both higher general and specific education requirements, and implementing tougher residency requirements that limit new arrivals in the area from qualifying for a license. Indeed, individuals who have finished schooling in the occupation may decide not to go to a particular political jurisdiction where the pass rate is low because both the economic and shame costs may be high (Kandel and Lazear,

1992). Of course, the individuals who take a test in Mississippi may have different qualifications and abilities than someone in California. Consequently, any analysis of pass rate effects need to be tempered with some controls for the academic quality of the test-takers both across states and over time. One additional effect of licensing is for individuals who are not allowed to practice at all in an occupation as a consequence of regulation. They may then enter a nonlicensed occupation, shifting the supply curve outward and driving down wages in these nonregulated occupations.

The costs of failing a licensing exam, for example, in dentistry is the estimated present value cost of failing the exam, which was \$54,000 in 1997 dollars when reduced earnings growth, lost experience, and nominal earnings growth differences are accounted for over time (Kleiner and Kudrle, 2000). Long residency requirements or the necessity of retaking parts of the new sections of the original licensing exam further impede geographic mobility across states or local jurisdictions (Kleiner, Gay and Greene, 1982). Florida, Arizona and California have traditionally had longer continuous residency requirements for many regulated occupations, presumably to keep persons from states with more inclement weather from moving to the state and working in the occupation during the winter months (Shimberg, Esser and Kruger, 1973). Other states focus on unique parts of an occupation, such as the “gold foil” method of filling teeth in California, that are only examined within their state’s licensing exam.

The restrictions of supply involved in occupational licensing have led to charges that licensing results in discrimination against historically disadvantaged minority groups (Williams, 1982). A disproportionate impact on minority groups might occur either because minorities have a disproportionately difficult time in passing the licensing examinations, or because minorities are underrepresented among the incumbents within occupations who are protected by licensing. However, the limited evidence shows little effect of licensing on restricting African-Americans from the traditionally regulated occupations (Freeman, 1980).

### **Parallels to Unions**

When an occupation becomes regulated, there are some similarities to union limitations on entry at the firm level (Freeman and Medoff, 1984). Where management agrees to a union shop provision as part of a collective bargaining agreement, generally only members of the union can be employed at that workplace doing certain tasks. This presumably increases the economic leverage of the union, and also may contribute to the more than 20 percent wage premium received by union members (Lewis, 1986). However, recent evidence on the union effects shortly following an organizing drive shows that unions have a modest effect on wages in newly organized establishments, and the same gradual increase in earnings also may be true of persons in licensed occupations (Freeman and Kleiner, 1990). No analysis of this issue has been undertaken for licensed occupations.

One major difference between occupational licensing and unions is that licensing may be a more secure job classification. It is rare either for an occupation to become deregulated by a government agency, or for the regulatory powers of a licensing board to be stripped by the legislature, or for the licensing board to ask to be terminated. One rare example: the occupational licensing of watchmakers was eliminated in Minnesota when the number of persons in the occupation in the state dropped to less than 100. In contrast, unions can be and are decertified as representatives of employees in National Labor Relations Board elections. Annually, hundreds of decertification elections are conducted in the private sector, and unions lose more than half of these elections (Fossum, 1999).

### **Evidence on Wage Premiums and Employment**

Table 2 presents some illustrative evidence on the effects of occupational licensing on wage premiums and employment. The table shows total earnings, hourly earnings, and employment growth of persons in four occupations that are licensed across the United States, each compared with some unlicensed occupations that are listed in the Census as in the same job family category, which means that they include similar education and job requirements. The universally licensed occupations are dentists, lawyers, barbers, and cosmetologists.<sup>2</sup> To work in these occupations, *all* persons must have a license. This is in contrast to jobs like teachers or accountants, where most persons in the occupation are regulated by type of job performed within the occupation, but not all. The four licensed occupations in Table 2 reflect occupations for which there is considerable variation among the states in the statutes and pass rates governing entrance into the jobs.

Column one of Table 2 shows the average annual total earnings in the occupation from the 1990 Public Use Sample from the Census Bureau (the 5 percent sample), including only persons who worked more than 20 hours for pay per week in the given occupations. Columns one and two show the annual earnings and the hourly earnings of persons in these occupations. Column three shows the log average hourly earnings of licensed relative to the listed nonlicensed occupations. Of course, wages in these occupational categories may differ because of differences in human capital characteristics.

I also present a residual wage gap analysis of what these persons would have earned if they had been in a nonregulated occupation in column three. To do this, a human capital model using multivariate techniques that included earnings as a function of age, age-squared, education, race, gender, and whether the person was

<sup>2</sup> The four licensed occupations in Table 2 are included as part of a project to examine the labor market effects of licensing in the United States and major European Union countries (Kleiner, 2000). Additional comparisons of these four occupations with others in the same Census category, not shown here, produced results similar to the ones presented in Table 2.

*Table 2*  
**Earnings and Employment Change in Selected Licensed and Nonlicensed Occupations**

<i>Occupation</i>	<i>Total Earnings</i>	<i>Earnings per Hour</i>	<i>Log difference in per Hour</i>		<i>% Change in Employment</i>
			<i>Log of Actual Difference</i>	<i>Difference due to Licensing</i>	
<b>Dentists</b>	\$82,976	\$38.87			20
Chemists, except Biochemists	\$38,532	\$17.61	0.72	0.29	28
Biological and Life Scientists	\$32,373	\$14.91	0.91	0.45	28
<b>Lawyers</b>	\$76,513	\$28.51			40
Personnel, Training and Labor Relations Specialists	\$31,029	\$14.12	0.73	0.20	25
Economists	\$45,424	\$19.72	0.94	0.02	38
<b>Barbers</b>	\$18,667	\$ 7.73			-22
Bartenders	\$12,960	\$ 7.51	0.16	-0.01	01
Welfare Service Aides	\$14,653	\$ 8.13	0.04	-0.12	-21
<b>Hairdressers and   Cosmetologists</b>	\$13,473	\$ 7.29			33
Bartenders	\$12,960	\$ 7.51	-0.05	0.07	01
Health Aides, except Nursing	\$14,448	\$ 7.95	-0.12	-0.08	-22

*Source:* Integrated Public Use Microdata Series: Version 2.0, Minneapolis: Historical Census Projects  
*Note:* Excludes Postsecondary Educators

a U.S. citizen is estimated. Age-squared is included to account for the fact that earnings decline in a nonlinear manner over time. Citizenship also is included since it has historically been used as a criterion for entering regulated occupations.<sup>3</sup>

<sup>3</sup> I estimate the effects of the usual human capital variables for both nonregulated and regulated occupations as follows:

$$W_L = \alpha_L + \sum \beta_{jL} X_{jL}$$

$$W_{NL} = \alpha_{NL} + \sum \beta_{jNL} X_{jNL}$$

where *W* is earnings and *X* is a vector including all observable human capital factors and the subscripts *NL* signify nonregulated occupations and *L* signifies a regulated occupation. Using the standard algebra of the decomposition analysis the equation becomes

$$\bar{W}_L - \bar{W}_{NL} = [\beta_{jL}(\bar{X}_{jL} - \bar{X}_{jNL})] + [(\alpha_L - \alpha_{NL}) + \sum(\beta_{jL} - \beta_{jNL})\bar{X}_{jNL}]$$

where the bar values are the mean values of the estimated values in equations one and two. Filer, Hamermesh and Rees (1996, pp. 548-50) offer a textbook treatment of the decomposition analysis.



The wage difference is broken down into two parts. The first part is attributed to human capital factors; essentially, this part of the calculation asks how much of the difference in wages across licensed and unlicensed occupations can be explained by differences in the average level of human capital across the two sorts of occupations. The part that cannot be explained in this way is taken to be the consequence of regulation. In column four I present the difference in licensing using the residual wage gap analysis model.

The results in column three suggest that earnings are higher for the licensed occupations that require more education and training relative to their comparison jobs. For cosmetologists and barbers, which are low wage and low education occupations, the impact of regulation appears to be small, which is consistent with earlier studies (Thornton and Weintraub, 1979). For dentists, on the other hand, the impacts for hourly wages are more than 30 percent higher. These estimates are similar to ones found for the effects of licensing in regulated versus unregulated occupations in Canada, which averaged around 27 percent (Muzando and Pazdaerka, 1980). For lawyers, the other occupation in the table that requires a baccalaureate degree, the effects of licensing are positive, but around 10 percent, which is considerably lower than the value found for dentistry.

Unlike unionization, where lower wage employees appear to gain as a consequence of organizing, licensing effects appear to be larger for higher wage workers, at least within this limited set of occupations. Consequently, licensing may increase wage inequality by first keeping out persons from entering higher wage occupations, and then by raising wages for persons in these already high income occupations. Moreover, more highly educated and influential occupations may be more powerful in state or local jurisdictions and be able to control supply more effectively. Since occupational licensing appears to increase earnings, on average, for persons in high income occupations relative to persons in lower income ones, this state and local policy may serve to exacerbate income dispersion in the United States.

The empirical results in column four do rest on several assumptions. First, they rely on a relatively small sample of licensed and unlicensed occupations. Although the examples are chosen to be representative, and the use of other licensed and unlicensed industries does not change the picture notably, the effect of licensing clearly varies a large amount across occupations. Second, the assumption that this residual difference is attributable to licensing requires that there not be too much spillover from the licensed to the nonlicensed occupations, which is likely the case for the occupations presented. Finally, there is always a danger in regressions using human capital characteristics that individuals who have greater unobservable ability characteristics may choose to enter a licensed occupation where the economic returns are greater, rather than occupations that require similar aptitude, but are unregulated. Given the large queue of persons wishing to enter these regulated occupations, part of the returns to licensed occupations may be the higher quality labor market abilities of persons in regulated occupations, which consumers in turn

see as raising the quality of service in these areas. Future analysis needs to be focused on disentangling these issues on regulation in the labor market.

Column five of Table 2 shows the change in employment for the licensed and nonlicensed occupations between 1980 and 1990. Dentistry, which is heavily regulated by licensing boards at the state level, had lower growth rates than its comparison nonlicensed professions. Other licensed occupations, such as lawyers, had faster employment growth than the nonregulated ones with which they were compared in the table. However, these basic employment change results do not control for changes in the demand for the service or how licensing may have changed it. Overall, the licensed occupations appear to have had somewhat faster growth rates than ones with similar educational requirements, although there are wide variations in growth rates in this sample.

## **Quality and Demand-Side Effects of Occupational Regulation**

Most of the empirical work on the regulation of occupations has emphasized the barriers to entry, while relatively little empirical work has looked at issues involving the quality of output or the demand-side response to these quality effects.

In thinking about how occupational licensure can affect quality, it is useful to think through the situation one step at a time.<sup>4</sup> Licensing sets initial requirements for entering an occupation. These include residency requirements, letters from current practitioners regarding good moral character, citizenship, general education and specific training levels, and scores on specific tests. States and local governments can also change pass rates to mirror relative supply and demand conditions for the service. For example, when there is perceived to be an oversupply in the occupation, the regulatory board can raise the test scores required to pass the exam (Maurizi, 1974; Kleiner, 1990).

The consequence of these regulatory practices is a reduction in the flow of new persons into the occupation, which can have several effects on quality. The average quality of service provided increases as less competent providers of the service are prevented from entering the occupation, which should tend to raise quality. Moreover, persons in regulated jobs may think that they can capture any additional occupation-specific returns to their training, and this may increase the overall competency of the persons in the occupation. However, prices and wages will rise as a result of restricting the number of practitioners, which should tend to reduce quality received by consumers.<sup>5</sup>

<sup>4</sup> The explanation in the next few paragraphs draws on Kleiner and Kudrle (2000).

<sup>5</sup> As with any production relationship, other factors such as capital or technology may also contribute to the overall quality of service outputs. But since there is no particular reason to believe that these other factors have a larger effect on the quality of licensed services vs. unlicensed services, or vice versa, they are not discussed here.

Because of these countervailing forces of price and restricting supply of lower skilled applicants, the level of service quality as a consequence of regulation is uncertain. It is impossible on theoretical grounds to determine whether more intense regulation will increase or decrease the quality of the service provided.

The ambiguity of the effect of occupational licensing on quality carries over into ambiguity about the effect of licensing on the quantity of the service demanded. Clearly, the higher price should discourage consumption of the service. However, if there is higher (or less variable) quality, this may lead to an increased demand for the service.

Collecting empirical evidence on these issues of quality and demand is difficult. Typically, direct estimates of the quality of a service—say, the quality of a dental visit—are not available. For some licensed occupations, like cosmetologists and barbers in Table 2, it is not even altogether clear how one would measure quality, although there have been some attempts to do so. Perhaps measures of outputs can be developed through metrics like surveys of customer satisfaction, complaints to state licensing boards, or through rates of liability insurance?

An alternative approach is to compare results across states, looking at those which have tighter or looser occupational licensing, or no licensing at all. In a study of dental licensing, Kleiner and Kudrle (2000) examined the records of 464 new Air Force recruits from different states for which there were individual records over their lifetime, and found little statistical support for the role of tougher licensing measured either through characteristics of state licensing statutes or pass rates on dental health (Kleiner and Kudrle, 2000). Further investigation on the role of licensing on malpractice insurance rates, or complaints to state licensing boards also found few effects of tougher regulations. However, Kleiner and Kudrle did find a positive impact of licensing on the prices of certain dental services as well as on the hourly earnings of dentists. Although this study was not the first to attempt to obtain “productivity effects of licensing” (for an earlier example, see Carroll and Gaston, 1981), it did examine outcomes and the characteristics of the person served in a more comprehensive way using actual outcomes with lifetime data on individuals receiving the service.

## **An Agenda for Future Research**

Occupational licensing is becoming an increasingly dominant factor in the regulation of services in the United States. The numbers of occupations that require licenses is growing. The number of workers who require licenses to work in their present occupation is increasing. In general, the requirements for entry into occupations with licensing are increasing, and geographic mobility declines for individuals who have an occupational license in only one or a limited number of jurisdictions. However, the amount of analysis of state and local regulation of occupations seems to be declining.

In part, the lack of recent analysis of occupational licensing may be because the topic lies at the intersection of labor economics, law, and industrial organization, and thus does not fit easily within the subfields of the economics profession as they have evolved. Moreover, occupational licensing is often thought to be a state or local issue, rather than a national one, and it probably attracts less attention for that reason as well.

But perhaps the largest barrier standing in the way of analysis of occupational licensing is that there is no well-organized national data set waiting to be exploited. No national or state data exists to assess the wage or consumer price effects of occupational licensing. Although the Bureau of Labor Statistics surveys workers on their union status, and also asks whether they are displaced through the Current Population Survey, no information is collected about whether individuals are certified or licensed as a condition of employment. Although the occupational associations, such as the American Bar Association and the American Dental Association, collect wage and salary data, and the number of new entrants and pass rates by state through the early 1980s, the state pass rate information is no longer tabulated or released to the public. Moreover, state licensing boards often are reluctant to provide this information to researchers. Consequently, estimates about the potential costs and benefits of licensing are difficult to obtain.

Economists interested in the area of occupational licensing will need to find ways to pull together their own data and approaches.

One approach, for example, might explore why states or countries have different occupational licensing requirements. Why does Massachusetts currently license almost three times as many occupations as Rhode Island (Wheelan, 1999)? Is occupational licensing endogenous to the industrial, occupational, demographic or political composition of a state? Recent empirical work in political economy suggests that political influence and funding of licensing initiatives by the professions are the most important factors influencing whether an occupation becomes regulated by the states (Graddy, 1991; Wheelan, 1999).

This question of what determines the existence and extent of occupational licensing is a question that might be tackled in an international context as well. Some occupations that are universally licensed in the United States, like cosmetologists, have varying levels of licensing or certification in many other advanced economies. For example, there is limited national licensing of hairdressers in many European Union (EU) nations. Generally, within western Europe, the EU requires that persons licensed in one nation must be granted a "right of establishment" to work in all other nations (Cairns, 1997), with some conditions. For example, dentists and other "science-based" occupations can practice their professions immediately. However, accountants and lawyers must work in their new country for up to three years with a licensed practitioner or take the host country's licensing exam (Seche, 1988). Occupational licensing is one area where there are fewer regulations affecting the labor market in Europe than in the United States. Moreover, given the language and cultural barriers in EU nations, it is doubtful if much international

mobility will take place within traditionally licensed occupations in the near future in spite of more relaxed licensing barriers (Krueger, 2000). Nonetheless, there has been little theoretical or empirical work on the economic causes or consequences of occupational licensing in the European Union (Faure, Finsinger, Siegers and Van den Bergh, 1993).

A second approach to occupational licensing would use fieldwork to find ways to quantify differences in the quality of certain services across states, and compare the quality with the degree of occupational licensing.<sup>6</sup>

A third approach might seek to find ways to examine the actual skill levels of certain occupations across states. Although regulated occupations routinely require license-holders to attend continuing education seminars, examinations on the contents are rarely given to the persons that attend, and denial of permission to work in the occupations once an individual passes the initial licensing exam is highly unusual. To my knowledge, there have been no empirical studies to document whether there are greater occupation-specific investments in licensed occupations relative to nonregulated ones.

A fourth approach might attempt to address the question of whether states with stricter occupational licensing have fewer injuries or illnesses or accidents related in that area. Again, to my knowledge this question has not been addressed empirically. Potential sources of information on damage caused by incompetent practitioners at the state level may come from data on malpractice insurance rates, although these will reflect both the extent of negligence and the propensity for litigiousness in a state. Major complaints to governmental licensing boards about regulated practitioners also may signal the presence of incompetent persons in the occupation. In general, the effect of occupational licensing on reducing major complaints or insurance rates have not been carefully documented.

Finally, in thinking about the policy implications of empirical research in this area, it is important always to keep in mind the policy option of certification. This potential substitute for licensing allows consumers or employers to choose whether they are willing to pay a higher wage for someone with greater state-documented skills relative to someone with fewer job characteristics. It is plausible to believe that certification would have lesser effects on the prices charged or the wages of an occupation, because it would not restrict supply as tightly, and also that it would have lesser effects on quality. Thus, it offers an intermediate choice between the extremes of no state role in qualifications at all and the absolute requirement of having a license before working at certain occupations.

<sup>6</sup> The effects of restrictions on occupations are potentially large. In one study, only tangentially related to occupational licensing, Bond, Kwoka, Phelan and Whitten (1980) compared the prices of the same set of eyeglasses in cities that had restrictions on advertising for licensed optometrists and ones without advertising restrictions (with appropriate covariate controls). The estimates from the field study found that glasses were 33 percent less expensive in the nonregulated cities. The authors conclude that regulation does have major effects on the price and quantity of regulated services, with no difference on their impacts on the quality of either the eyeglasses or the service rendered to the patient.

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