

**OCCUPATIONAL LICENSING REQUIREMENTS  
AND  
THE MANICURE INDUSTRY**

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## INTRODUCTION

Nearly a third of the U.S. workforce is required to hold an occupational license (Kleiner and Krueger 2008). This form of government intervention in the labor market is dramatic in its scope; for comparison, just 12.5 percent of U.S. workers belong to unions (Kleiner 2006). Imposed either by law or by a government-sanctioned trade organization, occupational licensing requirements interfere with an otherwise voluntary exchange of service for money. Compared to other countries, jobs in the U.S. are lightly regulated; based on the Organization for Economic Cooperation and Development's most recently available statistics, the U.S. and the U.K. have relatively fewer license requirements for skilled professions, while China, Luxembourg and Turkey have the highest barriers to entry and continued practice in these fields (OECD 2008). Nevertheless, occupational licensing in the U.S. adds an estimated \$116 billion a year to the cost of services, or about 1% of total U.S. consumer spending (Simon 2011). Yet the effects of occupational licensure are rarely examined in economic literature. Through empirical research, I seek to determine whether these barriers to job entry benefit or harm the unlicensed – both customers and would-be practitioners.

Requirements for obtaining a license may include any of several components: a passing grade on a written or oral examination, a period of training ranging from hours to years, classroom instruction, and a fee. Financial dues are the sole commonality among all licenses, from permits needed for playing tennis on public courts to those required for performing brain surgery. The fees associated with licensure exist, at the very least, to cover the administrative costs of state licensing bureaus. As I will discuss, these payments often rise above a minimal overhead in order to restrict job entry or to raise revenues for the collecting organization.

Beyond the explicit aim of ensuring quality, licensure has complex effects on the otherwise voluntary exchanges (of goods and services) that it distorts. Indeed, it does distort—as any manipulation of prices, by definition, affects supply and demand. Hayek (1945) pioneered in formulating the theory of prices as encapsulating the totality of dispersed knowledge of society. A prospective buyer need not know which factors of production went into a particular good and how costly they were, nor how scarce the good itself may be, in order to weigh its value against those of other goods; the market price conveys such information. Prices provide the basis of cost-benefit analysis, which underlies rational human behavior and forms the basis of modern economic analysis (Grossman 1989). Thus, the simple levy of a price on job entry impacts the labor market in ways that deserve exploration.

Researchers can observe and quantify the effects of occupational licensing along several measures. License regulations may impact licensed and unlicensed workers, prices, demand for unlicensed service and other close substitutes, worker supply, and state tax revenues. An occupation may be more lucrative in states where it is closed to unlicensed workers, as compared with the incomes of workers permitted to perform the same services unlicensed in other states. Consumer price may be higher, as a result of reduced worker supply and because licensees pass onto the consumer the cost of obtaining their licenses. Those unable to afford the licensed service may find cheaper substitutes—a phenomenon termed “the Cadillac effect” as, in response to this price premium, low-end customers must find alternatives to purchasing from licensed providers (Young 1986). If licensure raises consumer prices, one can expect the demand for cheaper substitutes to be stronger in states where licensure is less burdensome to workers (i.e. where barriers to entry are weaker). Restricted worker supply is yet another manifestation of occupational licensure’s effectiveness in elevating price; poor workers, particularly those without

access to credit, may be unable to spare the necessary time and money up front to acquire a license at the start of their careers. If permitted, these poorer workers might have offered their services for a lower price. With licensure, however, workers with more initial wealth (or credit) can seek licensure and insulate themselves against poorer competitors. Similarly, less competent workers who lack the ability to meet or rise to the level of licensure are denied entry to the profession – though, in the absence of mandatory licensing, they could render services at a lower level and thus a lower price, perhaps meeting the demand of poorer customers who cannot afford “Cadillac”-level service. Finally, licensure provides a stream of government tax revenue that states may rely on, regardless of whether this serves the interest of economic efficiency as defined by the most desirable product at the lowest price. The mere fact that state governments profit from licensing fees (not to mention currying favor with large, cohesive trade interest groups who may reward these favored politicians with votes) calls into question the notion that licenses protect consumers. The average consumer is savvy enough to make a personal decision about hiring interior decorator or a pet groomer without government endorsement. For medicine and other industries, the downside risk of bad services is more severe; customers may require meaningful quality assurance before choosing among service providers. Yet government restrictions are one-size-fits-all and unresponsive to ever-changing consumer needs. Without state intervention, more efficient and indeed more varied means of quality assurance may emerge in the labor market, just as consumers may choose among an array of products wherever else there is demand in the U.S. economy. In our current system, each state government has a monopoly on deciding which workers are allowed to offer their services, and for how costly a fee paid to the state licensing bureau. For the above-mentioned reasons, I hypothesize that licensing requirements for American workers result in restricted supply and higher consumer price.

## LITERATURE REVIEW

A careful analysis of any government regulation must first assess its reach and determine the reasons for its continued existence. Occupational licensing today affects many more Americans than half a century ago. In the early 1950s, 4.5 percent of the labor force required licenses to practice their trades (Council of State Governments 1952). Since then, licensing has increased six-fold to regulate more occupations than ever, from mortgage brokers to plumbers and dental hygienists. In 2006, 29 percent of US workers required a license issued by some government agency in order to perform their jobs (Kleiner and Krueger 2008).

State governments and licensed practitioners are the primary advocates for licensing. Regulatory fees provide a steady stream of revenue to state governments. At the same time, licenses are an effective tool to suppress the number of workers in profession. Kleiner (2006) compared employment growth in the 1990s in occupations that required licenses in some states and not in others, and found that statewide employment in unlicensed occupations grew about 20 percent more than in states requiring licenses for those jobs. This highlights the dramatic potency of licensing in restricting access to jobs and limiting the supply of workers performing a particular role in states that mandate licensure. A more vivid example of licensure as a tool to suppress competition: The state of Virginia is now considering legislation to limit bear-killing exclusively to hunters with a (proposed) bear-specific hunting license. The proposal's chief advocates are bear hunters seeking to reduce competition from other licensed big-game hunters (Cochran 2009). Here, one can identify with clarity the rent-seeking aspect of licensure: It is a case of bear hunters versus those who hunt a multitude of big game. The former group seeks to enlist government coercion – literally changing state law – to eliminate the threat of competition

posed by the latter group. If successful, bear-focused hunters can enlarge their own market share without surpassing the other hunters in skill, productivity or anything else but naked political maneuvering.

The beneficiaries of licensing are a select few: revenue-seeking public officials and the industry insiders wielding enough clout to sway political decisions. This paper takes it as a given that governments at every level require a stream of funds to remain solvent (much like any household, firm or individual above subsistence level). Unlike private firms, which raise capital through investor confidence and seek their revenue streams by meeting consumer demand, governments cannot create wealth nor generate economic activity; to fund their operations, governments must print money or extract wealth from the private sector either through loans—i.e. selling bonds—or through taxation. Licensure is a tax, and like all taxes it discourages some form of economic activity. It is necessary to distinguish between the various groups impacted by such fees. Some of the costs are borne by consumers, who must pay higher prices as a result of the restricted supply of workers in licensed industries. Also harmed by licensure, though less noticeably, are the industry outsiders: individuals not associated with a powerful lobby, those unpracticed in political rent-seeking, and finally those unable to spare the time and money required to obtain a license. In an effort that earned the city \$8.1 million in 2005, the city of Jacksonville, Florida, stepped up the enforcement of its business license requirements that year. An official in the city's Chamber of Commerce stated that the license fees “may be a way to fund small-business programs to the community, given the fact a large number of those licenses are small businesses.” Absent from this political doublespeak is the recognition that small-business owners suffer the hardship of license fees far more than their older, wealthier counterparts. If the

goal of fee collection were to foster the growth of businesses, a logical alternative would be to refrain from taxing them.

Previous literature has attempted to quantify the added cost of licensing in specific industries and to identify substitution mechanisms on the part of consumers. Barker (2008) finds that regulatory requirements raise the average real estate brokerage commission by an estimated 0.25 percent, costing consumers \$5.4 billion annually, without improving service quality. Research in other industries analyzes data that suggests that licensing's adverse affects on supply or price leads consumers marginally to substitute self-service for the labor of licensed professionals. Carroll and Gaston (1981) identify a negative relationship between the ease of obtaining an electrician license and the per-capita density of electricians; they further show that lower availability of electricians correlates with greater incidence of accidental electrocutions. Meanwhile, more stringent restrictions in the plumbing industry correlate with higher retail sales of plumbing supplies (Carroll and Gaston 1977).

The economic distortion associated with licensing has at its roots a phenomenon inherent in democratic political systems. The voting and lobbying process leads to concentrated gains and dispersed losses. Licensed workers and state officials stand to gain enormously from licensing fees and restrictions; these select few have a strong incentive to preserve and strengthen license regulations. Customers and industry outsiders, though far greater in number, possess as individuals a far weaker interest in dismantling such regulations. Friedman (1962) points out that "those of us who use barbers at all, get barbered infrequently and spend only a minor fraction of our income in barber shops. Our interest is casual. Hardly any of us are willing to devote time going to the legislature in order to testify against the iniquity of restricting the practice of barbering."

Central to the argument in favor of licensing is the claim that it protects consumers from asymmetric information that suppliers of products and labor enjoy at the expense of consumers. Sellers typically know more about their product than buyers, so they may overstate its value by charging more – or delivering less – than the buyer would insist on, if s/he were fully informed. This information asymmetry is worsened in situations where the buyer and seller infrequently transact, the product or service is rarely exchanged, or the buyer has little regard for personal reputation in the marketplace. Thus, as the argument goes, an occupational license forces sellers to meet a minimum standard of reliability and gives buyers some assurance that the product or service will meet expectations.

Yet when consumers have no do-it-yourself alternatives, more restrictive licensing can simply mean higher consumer prices. This limits overall consumption, as consumer purchasing power is finite. Kleiner and Kudrle (2000) find that greater dentist licensing requirements lead to higher prices for some dental services, but without better patient outcomes. Other research (Stangler 2012) finds no difference in the volume of consumer complaints filed in states with or without restrictive licensing requirements for particular occupations.

Skarbek (2008) counters the notion of information asymmetry (insofar as it may bolster the cause of occupational licensure) by examining the effect of a temporary *suspension* of roofing contractor license requirements in Florida in the aftermath of Hurricane Frances. In September 2004, the hurricane ripped through Florida, several neighboring states, and the Bahamas, causing \$12 billion in destruction and taking 49 lives. In Florida alone, the damage totaled nearly \$9 billion (Beven 2004). In the wake of such a disaster, consumers of relief aid – construction, medical care, food and clothing – find themselves armed with even less information as usual, as they have little time to seek out and compare among multiple options

before making purchases. Further, in such situations, prices typically rise due to shortages, preventing careful cost comparisons and charting of past values. Yet, despite this heightened information asymmetry, the governor of Florida chose to lessen rather than increase licensing requirements for roof repair and construction in the wake of Hurricane Frances. The language of the Florida governor's executive order 04-188 explicitly states the rationale for its issuance: "This Order provides relief for Hurricane Frances victims by creating a larger pool of licensed individuals to choose from" (Department of Business and Professional Regulation 2004). In an unprecedented move, this government order extended temporary licenses to in-state contractors not previously licensed to work on roofs, as well as out-of-state roofers. In the months that followed, there was a small uptick in customer complaints levied against roofers in Florida, which was dwarfed by the increase in roofer revenue. Using roofer revenue as a proxy for roofing repair and construction, it appears that complaints increased disproportionately less than Florida roofing activity in the wake of Hurricane Frances. Skarbek (2008) adduces the difference in these rates as evidence that the lowering of roofing restrictions in Florida did not wreak havoc on the quality of roofing.

It is difficult to determine what portion of the increase in Florida roofing revenue was due to price gouging or to the higher prices of labor and raw materials as a result of post-disaster scarcity. Thus, a better choice of data for analysis in Skarbek's paper may have been roofer *profit*, as distinct from roofer *revenue*. Yet the fact remains that loosening requirements for in- and out-of-state roofers brought into the disaster area much-needed reconstruction aid in the wake of an unprecedented disaster. Indeed, in a government action that seemed to endorse executive order 04-188, the temporary loosening of license requirements was repeated in 2005 by Florida's governor in the wake of Hurricane Katrina. In response to Katrina, the governor of

Louisiana also lowered licensing requirements on roofers as well as medical workers, movers, and schools (Skarbek 2008). The fact that worker supply restrictions are lowered in a time of crisis indicates that state governments acknowledge the power of licensure to restrict supply – a power that can be detrimental not just to emergency relief efforts, but to everyday citizens’ activities when they have the luxury of choosing calmly among goods and service providers.

In an empirical study detailed below, I analyze the effect of licensing requirements across states with varying licensure requirements within a service industry.

## METHODOLOGY

*Sample Selection.* I seek to evaluate the effects of licensing in a narrowly defined industry with no educational or physical requirements for entry. As a test case, I focus on a specific low-skilled service job within the beauty industry. Manicurists represent a convenient test case for three reasons: First, licensing requirements for nail technicians vary dramatically among U.S. states. Second, the fundamental uniformity of service and practitioner quality in this industry eliminates the statistician's task of controlling for these hard-to-measure variables. Thus, the statistical purity of my research distinguishes it from previous licensing studies, which had to screen out or control for the positive effects of licensing (arguably, quality control and the assurance of competence on the part of licensed, knowledgeable workers). Third, manicurists may perform their services to customer satisfaction with no formal education and only minimal English language comprehension; indeed, there exists a large pool of immigrant and native workers who would readily enter this field, absent licensing requirements.

*Analytical Approach and Data.* My model uses manicure industry data for 39 states, taken from the 2009 Bureau of Labor Statistics (BLS) State Occupational Employment and Wage Estimates. I use state-level data on the number of employed manicurists, their median and mean hourly wage, and their mean annual wage. The remaining U.S. states were excluded because their BLS data was incomplete. Widely disparate labor market conditions resulted from the 2007-2009 recession, depending on the U.S. state. To account for systemic economic booms and corrections that may depress or elevate wages without reflecting meaningfully on the manicure industry itself, I control for these macro fluctuations using 2009 state-level

unemployment data from the BLS. The Federal Cost of Living Index also provided a means of comparing state-by-state wage data, since a dollar of income in one state may be worth less relative to the cost of living than dollar earned elsewhere.

One segment of the data, in particular, is subject to its compiler's discretion: the assessment and numerical ranking of each state's barriers to entry in the manicurist occupation. Based on information available from state boards of cosmetology, I construct a scale of regulatory severity with which to assign numerical values to each state's license requirements. Length (in hours) of mandatory instruction receives particular weight; less emphasis goes to the rules surrounding reciprocity among states, i.e. the regulatory treatment of a licensed manicurist who migrates to a state in which he or she is unlicensed. The latter scenario I regard as too rare to affect the outcome of this research.

The primary barriers to employment as a manicurist are those imposed by state governments and supported by industry insiders. The nature of manicurist work is fairly straightforward and necessitates little formal training or innate skill—that is, the learning curve is flat, as suggested by the omnipresence of do-it-yourself manicure kits available for sale at drugstores and other retailers. Thus, we may regard job entry in this field as one restricted *only* by government fiat. Political influences that generate this legislation may relate to a multitude of economic and demographic circumstances that vary by state. Whether the volume of unskilled immigrant populations affects the stringency of licensing requirements in particular regions will be an interesting area to explore. I leave time-series studies and public policy solutions to these distortions to future research.

## DATA

The independent variable is the annual manicurist wage in 2009, averaged at the state level. Due to the limited availability of nail industry data for 11 U.S. states, just 39 of 50 states are represented in the sample. The annual manicurist wage is expected to be higher in states with greater barriers to entry into this occupation. In my analysis, a higher manicurist wage reflects inflated compensation without a commensurate increase in the quality of service. Without explicitly introducing quality of service into the model as a variable, I can nevertheless control for quality based on the assumption that the quality of manicure services is roughly uniform. Thus, a higher wage reflects not a quality premium but rather the suppression of market competition as a result of barriers to entry in the form of occupational licensing requirements.

There are five dependent variables measured as state-level characteristics: the average wage of personal care and service workers, the cost of living standardized to 100 based on the nationwide average, the number of instruction hours required for licensure, and two dummy variables: home nail salons are permitted (yes/no) and mobile nail salons are permitted (yes/no).

Table 1 shows that the average state-level mean annual wage for a nail technician in 2009 is \$22,761, with a fairly narrow spread. The standard deviation is \$2,587. This distribution closely mirrors the data for personal care and service workers as a whole; Table 2 shows that the mean annual wage for personal care and service workers in 2009 is \$24,068 with a standard deviation of \$2,491.

**Table 1. Nail Technician Industry by U.S. State<sup>1</sup>**

<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>St. Dev.</b>	<b>Min.</b>	<b>Max.</b>
Annual wage <sup>2</sup>	39	22,761	2,587.06	16,040	32,090
School hours required	39	378	186.41	0	1,000
Home salons permitted <sup>3</sup>	39	0.92	0.27	0	1
Mobile salons permitted <sup>3</sup>	39	0.67	0.48	0	1

<sup>1</sup>Eleven U.S. states were omitted from the research sample due to insufficient data collection by the Federal Bureau of Labor Statistics. The US Commonwealth of Puerto Rico was included, as it is in all BLS data.

<sup>2</sup>Before taxes, measured in US dollars.

<sup>3</sup>Dummy variable with yes=1 and no=0.

*Source:* Wage data were obtained from the State Occupational Employment and Wage Estimates, U.S. Federal Bureau of Labor Statistics, May 2009. Nail technician industry data were collected from state boards of cosmetology and obtained via <http://ginawallace.com>.

**Table 2. Key Economic Data by U.S. State**

<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>St. Dev.</b>	<b>Min.</b>	<b>Max.</b>
Annual wage of personal care and service workers	39	24,068	2,490.86	18,590	29,810
Cost of living <sup>1</sup>	39	102.79	12.98	88.90	135.10

<sup>1</sup>Normalized to 100, based on all fifty U.S. states.

*Source:* Wage data and the cost of living index were collected from the State Occupational Employment and Wage Estimates, U.S. Federal Bureau of Labor Statistics, May 2009.

Table 1 shows that the mean annual state-level wage (i.e. computed by comparing state averages) of nail technicians is \$22,761 with a standard deviation of 2,587. This parallels the mean annual state-level wage for personal care and service overall, shown in Table 2 as \$24,068 with a standard deviation of 2,491. Oregon's nail technicians are the highest paid, with a mean annual wage of \$32,090, while Puerto Rico represents the minimum with \$16,040.

The regulatory data in Table 1 represents licensing restrictions, collected from state boards of cosmetology. On average, 378 hours of instructional credit hours are required to obtain a nail technician license, although the range is from 0 in Connecticut to 1,000 in Puerto Rico. Home and mobile nail salons are permitted in most states (92% and 67%, respectively).

Cost of living as shown in Table 2 is normalized to 100. The average in the 39 states under analysis is 102.79 with a standard deviation of 12.98 and a range of 88.90 to 135.10. Thus, the selected states represent a wide range of living standards with a mean close to the nationwide average.

The mean nail technician's wage is positively associated with the mean wage of personal care and service workers in a given state. For this reason, I control for the prevailing wage climate in each state to screen out the effects of higher wages in general on one particular industry. The cost of living, which is conceptually related to a higher-wage climate, is also included in the model. Table 3 shows that the cost of living index has a somewhat weaker positive correlation with mean nail technician wage.

**Table 3. Correlation Matrix**

	NailWage	WageAll	CostLiving	CreditHours	Home	Mobile
NailWage	1					
WageAll	0.3101	1				
CostLiving	0.061686	0.588625	1			
CreditHours	-0.21776	-0.48118	-0.2084204	1		
Home	0.123304	0.213082	-0.2428252	-0.3222249	1	
Mobile	0.109268	0.143501	0.0284518	-0.099523	1.03E-16	1

A rule of thumb for interpreting correlations involves a cutoff of  $\pm 0.7$ . A correlation with an absolute value at or above 0.7 may be interpreted as strong. Below an absolute value of 0.3, there is little or no association between the two variables under examination. Thus, none of the relationships shown in Table 3 are indicative of correlations between variables. The correlation between a state's cost of living and its mean wage for personal care and service workers approaches positive strength, which makes sense given the expected effect of the cost of living on wages. Yet the relationship between nail technician wage and cost of living is much weaker, though still positive. There are three surprises here: the signs of the correlations between nail worker wage and each of the variables representing licensure restrictions. The amount of instructional credit hours required in a particular state has a weak negative correlation with the nail technician wage in that state, meaning that more credit hours required (a more stringent licensure restriction) is associated with a *lower* manicurist wage. The permissibility of home and mobile salons each have a slight positive correlation with manicurist wage. For all three

variables representing licensure restrictions, the correlation is even stronger – in the same direction – between these variables and the mean wage for personal care and service workers. Thus, more nail technician licensure restrictions are associated with a lower state mean wage for personal care and service workers. This relationship exists for each licensure restriction independent of the others. The cost of living in a state has a correlation of 0.59 with the state’s mean wage of personal care and service workers. Though it does not approach a generally acknowledged level of significance (0.7), it is the strongest relationship in the correlation table.

## RESULTS

**Table 4. Linear Regression of Full Model**

*Dependent variable: mean state-level nail technician wage*

	<b>Coeff.</b>	<b>St. Error</b>	<b>T-stat</b>	<b>P-value</b>	<b>Lower 95%</b>	<b>Upper 95%</b>
Intercept	17523.18	5663.912	3.093873	0.004006	5999.864	29046.49
WageAll	0.396884	0.251913	1.575562	0.124666	-0.11561	0.909379
CostLiving	-37.4218	45.59128	-0.82081	0.417644	-130.178	55.33433
CreditHours	-1.06884	2.669165	-0.40044	0.691412	-6.49936	4.361612
Home	-273.266	1863.041	-0.14668	0.884279	-4063.65	3517.12
Mobile	282.2799	896.4262	0.314895	0.754824	-1541.51	2106.073

$$R^2 = 0.1259$$

$$\text{Adjusted } R^2 = -0.0066$$

$$\text{Root MSE} = 2595.5$$

Table 4 shows the results of a linear regression of five independent variables on mean state-level nail technician wage, the dependent variable. There are 39 observations in the sample. The R-squared is 0.13, meaning that 13% of the variation in state mean manicurist wage can be explained by the state mean wage of personal care and service workers, the state-level cost of living, the number of credit hours required for licensure, and the two dummy variables representing the permissibility of home and mobile nail salons. Based on the p-values, not one of these independent variables approaches a level of statistical significance at the 95% confidence level.

**Table 5. Linear Regression Excluding State-Level Mean Wage of Personal Care and Service Workers**

*Dependent variable: mean state-level nail technician wage*

	<b>Coeff.</b>	<b>St. Error</b>	<b>T-stat</b>	<b>P-value</b>	<b>Lower 95%</b>	<b>Upper 95%</b>
Intercept	21830.16	5067.554	4.31	0.000	11531.66	32128.67
CostLiving	8.212307	35.96828	0.23	0.821	-64.8840	81.30864
CreditHours	-2.43453	2.578949	-0.94	0.352	-7.67558	2.806523
Home	735.8395	1787.222	0.41	0.683	-2896.23	4367.911
Mobile	491.0022	5067.554	0.54	0.591	-1349.61	2331.616

$$R^2 = 0.0601$$

$$\text{Adjusted } R^2 = -0.05051$$

$$\text{Root MSE} = 2651.5$$

**Table 6. Linear Regression Excluding State-Level Cost of Living**

*Dependent variable: mean state-level nail technician wage*

	<b>Coeff.</b>	<b>St. Error</b>	<b>T-stat</b>	<b>P-value</b>	<b>Lower 95%</b>	<b>Upper 95%</b>
Intercept	16122.35	5374.7	3.00	0.005	5199.65	27045.06
WageAll	0.26553	0.1936	1.37	0.179	-0.12791	0.658972
CreditHours	-1.02326	2.655752	-0.39	0.702	-6.42041	4.373871
Home	431.9284	1645.166	0.26	0.794	-2911.45	3775.307
Mobile	353.4341	887.9336	0.40	0.693	-1451.06	2157.932

$$R^2 = 0.1080$$

$$\text{Adjusted } R^2 = 0.0031$$

$$\text{Root MSE} = 2583.1$$

The relatively high correlation between state-level cost of living and state-level mean wage of personal care and service workers inspires a redo of the regression excluding either of these input variables. Yet the R-squared actually becomes smaller as a result. Table 5 and 6 above show the results of linear regressions that exclude respectively a) state-level mean wage of personal care and service workers and b) state-level cost of living. The first of these revised regressions has an R-squared of 0.06; the second has an R-squared of 0.11. Thus, excluding either of these somewhat correlated independent variables actually lowers the strength of the model's relationship.

## ANALYSIS

The results of this statistical analysis fail to support the relationship predicted by theory. Several explanations exist that may vindicate the theory's hypothesis while allowing for such results; these explanations range from the tax-evasive nature of the manicure profession to the quality of the model itself. Alternatively, the hypothesis may simply be erroneous; it may indeed be the case that, in the manicurist profession, state licensing requirements have no effect on state mean manicurist wage.

In defense of the original hypothesis, aspects of either the model or the object of study may have led to misleading statistical results. First, the sample size is too small for robust quantitative results. Out of necessity, only 39 states were studied; the remainder had incomplete data available in the U.S. Bureau of Labor Statistics. Complete results for these states were available only for a particular year (the most recent one). Second, nail technicians work in a service industry in which clients pay and tip primarily in cash. The lack of a paper trail encourages tax evasion, which may render the data useless or bias its values in ways that align with income tax rates in various states – an independent variable not included in this model.

If the dataset is faulty, the likely culprit is mean state nail technician wage. The other variables in this model are more accurately reported than workers' self-reports, and they are uncorrelated with one another. Running the linear regression without one of the two independent state-level variables that are somewhat correlated – cost of living and mean wage of personal care and service workers – fails to yield statistically significant results. In a more basic analysis of the data, the correlation matrix fails to show theoretically predicted relationships between

several key variables (those representing stringency of licensure requirements) and the response variable. Moreover, statewide cost of living correlates almost ten times as strongly with the state mean wage of personal care and service workers as it does with the state mean wage of nail technicians. This discrepancy suggests that the state mean wage of manicurists in this dataset is far less reliable a statistic than the state mean wage of other service-industry workers analyzed in the model. The low skill requirements and approximate uniformity of service characteristic of the manicure industry make it appear well-suited to research on regulatory dynamics and their effect on wages. Yet the predominance of cash-for-service payments potentially distorts the data in ways that make clear answers elusive when quantitative research is attempted on this topic.

Toward the aim of testing a hypothesis about occupational licensing and its effect on supply and demand, there exist several alternative approaches to measurement. None of these methodologies could be employed in testing the hypothesis on manicurists, unfortunately, for reasons that deserve mention here. One commonly used method of determining the success of regulatory slackening in the area of occupational licensing, or of comparing the effects of regulatory restrictions that vary across licensing jurisdictions, is to assess the volume of formal complaints lodged against practitioners of the occupation under analysis. Skarbek (2008) and Stangler (2012) carry out such studies using complaint counts in their work. Yet complaint counts would be far less useful as a proxy for manicurist performance, given the low stakes – low consumer price and low consumer expectation – when compared with, say, a home renovation or a surgical operation. We would not, therefore, expect the volume of complaints to capture the extent to which manicurists under-deliver to customers; customers would lack motivation to report such petty infractions, given the small amount of time and money spent receiving manicures.

Another channel for measuring the effects of occupational licensing as they vary across jurisdictions involves the *substitutes* for those services provided by the licensed occupation. If regulatory barriers to entry restrict the supply of licensees and drive up the costs of their services, do we observe consumer flight to substitutes, i.e. cheaper alternatives such as over-the-counter and do-it-yourself options? In the case of manicurists, a convenient substitute is the retail nail polish sold widely in convenience stores and on the Internet. Yet an analysis of retail nail polish sales would be difficult to carry out. Unlike BLS statistics on the wages of manicurists and of workers in related occupations, quantitative data on retail nail polish sales exist only to the extent that a private researcher is willing to collect the data, store by store, using a small random sample. A painstaking data collection process was infeasible for the purpose of this study. Furthermore, the results might not necessarily be useful in terms of yielding meaningful data. Sales revenue of retail nail polish might be higher in one state than another for a multitude of reasons unrelated to manicurist wage and supply. Age or racial demographics, for example, might drive the consumption of retail nail polish as distinct from the services of a manicurist. We would have to control for these characteristics not just at the state level but at the local level in the immediate vicinity of each retail store location in the sample.

Although the methodology for data collection and analysis varies by research focus, the general arguments against occupational licensure are compelling. Empirical comparisons across different licensing jurisdictions have found no difference in the level of formal consumer complaints between those with higher and lower restrictions (Stangler 2012). Temporal studies within a particular licensing jurisdiction or state bear this out, as well (Skarbek 2008). Based on past research, we can therefore make the claim that occupational licensing –in at least some job fields – does not improve quality. But does it actually do harm? From the perspectives of

licensees, would-be licensees, consumers, and would-be consumers, the arguments against occupational licensing are variously outlined below.

Occupational licensure, by its definition, hinders worker mobility between states. License boards are state-wide agencies, often without reciprocity among other states. In 2010, 27 percent of Americans in the U.S. were residing outside of the state where they were born (Census Bureau 2011a). Americans who moved at least 500 miles did so for employment related reasons nearly half the time (Census Bureau 2011b). Yet the lack of license portability means that licensees who have invested time and money in obtaining an occupational license in one state must forfeit the credential when leaving the state, or at the very least expend time and money toward recertification. By impairing worker mobility, licenses hurt practitioners as well as the would-be consumers in states that would otherwise benefit from their services. As in Florida and Louisiana in the wake of recent hurricanes, state governments presiding over natural disasters must ease licensing restrictions in order to facilitate the necessary influx of relief workers (Skarbek 2008).

Licensing requirements burden practitioners not only with state-level credentialing that may become useless in the event of worker mobility, but also with the demands of outdated or simply irrelevant skill acquisition. The bar exams faces by all would-be lawyers in the U.S. vary from state to state and test aspiring jurists on information that, to a large extent, has little to do with the practice of law. Exam preparation necessitates month of preparation and costly bar exam prep courses—the costs of which are, of course, passed on to consumers of legal services in the form of high lawyers' fees (Kauffman Foundation 2012).

Although occupational licensure colors the U.S. economic landscape to a significant degree, several promising opportunities exist for cost reduction and the easing of labor market frictions. The emergence of paralegals in the legal industry, as well as physicians' assistants, nurse practitioners, and medical techs alongside doctors, and teachers' aides in classrooms, indicates the growing presence of non- or lesser-licensed workers in fields whose most highly visible practitioners are required to be heavily credentialed. Campbell (2005) delineates the ways in which lawyers can strategically delegate work to paralegals reduce firm costs and raise profits. A mid-level paralegal generates almost as much revenue as a first-year associate, but at a lower cost in terms of salary and fringe benefits. According to Campbell, the return on investment (ROI) of the paralegal is 35.8%, while the associate's ROI is 22.2%. This indicates a profit margin more than 50% greater on a mid-level paralegal than a first-year associate.

Meanwhile, a study of patients in the neurosciences intensive care unit at University of Virginia Health System found that patients managed by nurse practitioners – skilled nurses who can fill in for a resident or a hospitalist to provide a limited scope of care – had lower rates of urinary tract infections, skin lesions, and pneumonia. Their average length of stay was 27 percent shorter than patients not managed by nurse practitioners. The total one-year cost savings to the health system represented almost \$2.5 million dollars, due to the reduction in intensive care unit stays (Larkin 2003). The average cost of a nurse practitioner visit, nationwide, was 20% less than a comparable physician office visit in 2009, yet nurse practitioners have been shown to meet patient satisfaction and achieve equivalent or superior patient health outcomes (Eibner et al. 2009). The strategic substitution of nurse practitioners and other lower-cost personnel can thus save money even as it produces higher-quality results.

In 2011, the Minnesota legislature unanimously passed a bill stating that “no government shall require an occupational license, certification, registration, or other occupational regulation that imposes a substantial burden on the person unless the government demonstrates that it has a compelling interest in protecting against present and recognizable harm to the public health and safety, and the regulation is the least restrictive means to furthering that compelling interest” (Kleiner 2011). Precise quantification of the costs and benefits of licensing remains an elusive goal for researchers, given the varied nature of occupations and the unpredictability of demand – for instance, in the wake of natural disasters – as well as the potential harm to consumers previously reliant upon the seal of approval conferred by state licensing boards. Yet the potential for cost savings, efficiency brought on by greater worker mobility, and lower barriers to entry into professions make the easing of license restrictions a worthy goal.

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