

CONSUMER PROTECTION IN AN ONLINE WORLD: AN ANALYSIS OF OCCUPATIONAL LICENSING

By Chiara Farronato, Andrey Fradkin, Bradley Larsen, Erik Brynjolfsson

OVERVIEW

We study the effects of occupational licensing on consumer choices and market outcomes in a large, online platform for home services. On this platform, verified information about professional licenses is displayed only for professionals who submitted proof of license, and only after the platform has had a chance to independently verify the license. We use variation in verification times to demonstrate that the platform-verified licensing status of a professional is unimportant for consumer decisions when compared with review ratings and prices. We confirm this result in a nationally representative consumer survey.

We also use variation in the stringency of licensing regulations across states and occupations to measure the effects of this regulation on aggregate market outcomes. Our results show that more stringent licensing regulations are associated with less competition and higher prices, but they are not associated with any improvement in customer satisfaction as measured by review ratings or the propensity to use the platform again.

BACKGROUND ON OCCUPATIONAL LICENSING

Heated debates over the effects of occupational licensing date back hundreds of years, with a long treatise on the subject contained in *The Wealth of Nations* (Smith, 1776) and continuing intensely today.¹ An occupational license is a restriction on who is allowed to legally perform certain types of services unless practitioners meet licensing requirements. These laws apply to a growing share of the U.S. labor force and now affect nearly 30% of all workers. More than 1,100 occupations are licensed in at least one state (Kleiner and Krueger, 2010). These occupations include doctors, electricians, contractors, interior designers, and even hair salon shampoo specialists.

LICENSING LAWS APPLY TO A GROWING SHARE OF THE U.S. LABOR FORCE AND NOW AFFECT NEARLY 30% OF ALL WORKERS.

The stringency of licensing requirements—and the range of specific tasks within a service category requiring or not requiring a license—varies widely from state to state. Nevertheless, there is limited empirical evidence on the effects of licensing restrictions on professionals, consumers, and market equilibrium.

1. See, for example, discussions in *The New York Times* (Cohen 2016), *Wall Street Journal* (Zumbrun 2016), and *Forbes* (Millsap 2017).

IN THIS BRIEF

- Licensing ideally protects consumers from poor service outcomes but has the potential downside of raising prices by restricting competition.
- We demonstrate that consumers care greatly about the price and online rating of professionals, but care little about their licensing status.
- Fewer than 1% of 5,219 respondents surveyed listed licensing in their top three reasons for hiring a professional.
- Most consumers are not very knowledgeable about a professionals' license at the time of their hiring decision. Only 61% were sure that their service provider was licensed, and a majority only found out when they signed their contract.
- We document, in a range of occupations, that states and occupations with more stringent licensing requirements have higher prices, less competition, and no detectable improvements in quality.
- If low-quality service providers can be easily and quickly identified based on online consumer experiences, the cost and benefit trade-off of occupational licensing might tip toward reducing licensing regulation.

Licensing regulation arguably exists to protect consumers from poor service outcomes, guaranteeing at least some minimum standards of quality and safety for consumers. But in practice, these laws may raise consumer prices and increase rents for licensed professionals by restricting competition. Shapiro (1986) demonstrates that the quality benefits of occupational licensing for some consumers may come at costs to other consumers who face higher prices. Occupational licensing requirements have been shown to reduce competition (Kleiner 2006) and harm professionals who are unable to meet licensing standards but whose services are nonetheless desirable to consumers, such as Vietnamese manicurists (Federman et al. 2006), or the recent case of hair braiders in South Dakota (Sibilia 2017).

METHODOLOGY

Our transaction-level data from a large, proprietary, online platform provided an unprecedented opportunity to study

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several features of occupational licensing. The data consists of over one million requests by consumers in hundreds of distinct service categories throughout the United States over eight months. The data allows visibility into most dimensions of the search and exchange process occurring through the platform.

In order to analyze a consumer's propensity to hire a professional near the date on which the professional's uploaded licensing status was verified by the platform, we exploit a unique feature of our data: Professionals choose to upload proof of licensure, but this information is not displayed to consumers until a few days later when the platform verifies the licensure. After verification, a licensing badge appears on the professional's profile. The random time to verification allows us to identify the causal effect of the licensing badge on consumers' choices.

The online platform operates in all 50 states and offers consumers access to professional service providers in a variety of categories, such as interior design, home renovation, and painting. The platform allows customers to submit a project request. Several professionals are then allowed to submit quotes, consisting of a price and textual details of the service. The quoted price is not binding, and the actual payment takes place off the platform.

The online marketplace is distinct from other websites, such as Yelp (Luca 2016), that primarily provide a directory of businesses and professionals with crowd-sourced reviews. It also differs from platforms matching consumers to professional freelancers providing digital services, such as Freelancer and Upwork (Pallais 2014), since projects on this platform are nearly all physical tasks. Finally, it differs from platforms such as Instacart or Amazon Mechanical Turk, which match consumers to service providers for tasks that require less professional training and more physical tasks. (Cullen and Farronato, 2015; Chen and Horton 2016).

The platform in our study works as follows: Interested professionals can join the platform and create a profile containing information about themselves and their services. They can also submit proof of a license to be verified by the platform. It typically takes the platform about a week to verify the license, although there is substantial variation across professionals.

Consumers request quotes for a particular type of service by describing their needs using pre-specified fields as well as some open-ended fields. Platform professionals in the appropriate occupation are then notified of the job request

and may place bids for the contract. A limited number of professionals are allowed to bid, and bids are passed on to the consumer on a first-come, first-priority basis. The providers pay a fee to submit bids. As bids are submitted, the consumer can look up information about each of the bidders, and then may select a provider from among those bidders.

OUR TRANSACTION-LEVEL DATA FROM A LARGE, PROPRIETARY, ONLINE PLATFORM PROVIDED AN UNPRECEDENTED OPPORTUNITY TO STUDY SEVERAL FEATURES OF OCCUPATIONAL LICENSING.

The information available to the consumer about each of the professionals submitting quotes varies. It may contain photos or detailed descriptions of the kind of work the professional has performed in the past. To some extent, the amount and type of information available depends on what the professional decides to share on the platform.

Importantly for our study, the consumer can see any licensing information reported by the bidder. This information is prominently visible with a licensing badge if it has been verified by the platform. The consumer can also see any reviews of the professional's past work, along with a one- to five-star average rating, the number of previous reviews, and the number of times the professional has been hired through this platform.

The median bid comes from a professional with four reviews, a rating of 4.9 stars, and a fixed price of \$199. Seven percent of bids result in a recorded hire, and hired bids are made by professionals with more reviews, higher ratings, lower prices, and similar licensing-related variables as the typical bid. The platform relies on either customers or professionals to voluntarily mark a job as hired. This means that not all hires resulting from the platform will be recorded and that some hires may not be accurately logged.

Studying these relationships more closely, we find that consumers respond to online reputation characteristics of professionals, and not to indicators of licensure. We find that there is a jump of 2.8 percentage points in hiring rates around the time of the first review, and a smooth decline in prices around the focal date. The change in prices is more gradual, and thus unlikely to explain the discrete increase in hiring rates. We also examine whether, around the time of their license verification or first review, professionals themselves change their behavior in terms of prices or types of requests on which they bid; we mostly find no evidence of

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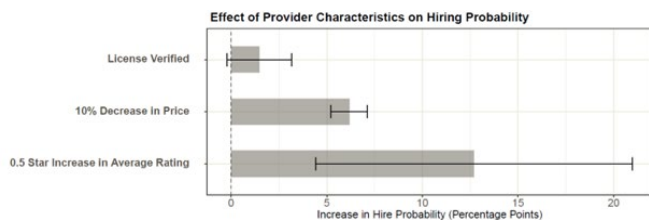
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changes in the composition of bids that professionals submit before and after license verification.

We are able to directly compare the value customers place on each characteristic. The below figure demonstrates the relative importance of each of the characteristics. We find that a 10% decrease in price and a .5 star increase in average rating have a much larger effect on higher probabilities than a verified license.

We then analyze consumer choices in a regression framework where we correlate consumers' choices as an indicator of whether the professional has a verified licensing status. In our regression framework, we find similar results to our event studies: Consumers appear to value professionals' reputation and prices but not their licensing status.



SURVEY DATA

To augment the data analysis and to dive deeper into how consumers think about licensing when making choices, we also conducted an original survey using a nationally representative panel of 12,760 individuals, 41% of whom purchased a home improvement service within the past year. Many consumers found their service providers online, validating the importance of studying consumer choices in online platforms.

Respondents typically list prices and reviews when they are asked about the factors that influenced their decision to hire a particular professional. In contrast, fewer than 1% of these respondents, mentioned licensing status among the top three reasons for why they hired a given service professional. This provides further evidence that consumers may care more about prices and online reputation than licensing status. Only 61% of consumers were sure that their service provider was licensed, and of those, a majority only found out definitively when they signed their contract. This sequence of events suggests that most consumers are not particularly knowledgeable about professionals' licensing at the time of their hiring decision. The results—that consumers appear to pay little attention to

licensing—do not necessarily imply a null effect of licensing laws on equilibrium service quality or prices, but it does raise questions about their effectiveness.

MARKET EQUILIBRIUM

In the final part of the paper we exploit variation in licensing requirements across occupations and states to evaluate the effects on licensing stringency on supply, demand, equilibrium prices, and satisfaction metrics. For this exercise we take advantage of the fact that professionals such as plumbers are regulated differently across U.S. states, with certain states requiring more education and training than other states for a license. We also take advantage of the fact that within a state, certain occupations have more stringent requirements than other occupations.

To illustrate the effects we estimate, consider a one standard-deviation increase in regulation stringency from the average occupation. The average occupation, pest control applicators in Oregon, are required to be at least 18 years old, pay \$206 in licensing fees, and pass two exams. Plumbers in Rhode Island are one-standard deviation away from the average. They have to be at least 22 years old, pay \$737, pass two exams, attend five hours of class instruction, and have five years of experience.

We find that such an increase in licensing requirements leads to no changes in aggregate demand, but to a reduction in supply. In practice, this means 2.2% fewer bids for each project, a 3.9% increase in price quotes, and a 3.2% increase in transacted prices. More stringent licensing is also not associated with higher customer satisfaction, as measured by ratings or customer returns.

Unlike most of the previous literature which focuses on the employment and wage consequences of licensing, our study focuses on consumer response to seeing a signal indicating that a professional is licensed across a variety of professions.

The advantage of studying how occupational licensing affects market outcomes in our context is twofold: First, the platform facilitates matching across a wide range of service categories and U.S. states. To our knowledge, this level of breadth is unique in the literature on occupational licensing.

Second, since the platform tracks requests, quotes, and to some extent hiring decisions and consumer evaluation of service quality, we can measure the effect of occupational licensing regulation on multiple stages of the consumer-professional exchange funnel: search, hiring, and ex-post satisfaction.

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We find that more stringent licensing laws are associated with less competition (fewer professionals bidding) and higher prices, and that they have no detectable effect on two proxies of customer satisfaction: a customer's online rating of the service provider, and their propensity to use the platform again. An important caveat is that our data may not provide a full picture of the effect of licensing on quality. Our customer satisfaction metrics—online ratings and return to the platform—are unlikely to take into account factors that are unobservable to the consumer during the transaction but that may impact consumer safety in the long-run, or that may cause externalities on other individuals. We may also lack statistical power to detect extremely rare, but costly mistakes made by service professionals.

CONCLUSION

Our work points to the importance of digital technologies for the design of regulation. Online platforms allow many occasional providers to offer their services with little scrutiny of their licensing status. At the same time, online markets make it easy to rate providers through online reviews and to provide other immediate forms of feedback to the platform. Friedman (1962) and Shapiro (1986) argued that a well-functioning feedback system can be an effective substitute for licensing by reducing the need for upfront screening or quality certification. The advent of online reputation mechanisms may be providing just such a system (Cowen and Tabarrok 2015; Farronato and Zervas 2019).

If low-quality service providers can be easily and quickly identified by consumers' past experiences, the cost and benefit trade-off of occupational licensing might tip toward reducing licensing regulation.

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