

**Occupational licensure and entrepreneurs:  
The case of tax preparers in the U.S.\***

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*Abstract:*

We examine the relationship between entrepreneurship and occupational licensure using data on the universe of over 700,000 tax preparers in the U.S. While extant research focuses on the downsides of occupational licensure for entrepreneurs, we argue that licensure may allow entrepreneurs to signal quality and may enhance their legitimacy. States with licensure have higher average rates of entrepreneurship—approximated by tax practice ownership—and, in high-income ZIP codes, more demand for paid preparer services. In our analysis of the introduction of a federal license in tax preparation in 2013, voluntary early adoption of the announced license among entrepreneurs predicts lower exit rates. Entrepreneurs are less likely to adopt the license early than non-entrepreneurs, unless they lack substitute state-level credentials. Our results thus suggest that licensure represents a trade-off for entrepreneurs between the costs of compliance and the benefits of signaling quality and legitimacy.

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Entrepreneurship accounts for a significant share of jobs created in today's economy (Haltiwanger, Jarmin, and Miranda 2012). The decision individuals make to work for themselves, rather than for others, may be an important means of career attainment (Sørensen and Sharkey 2014; Kacperczyk and Marx 2016), and because entrepreneurship is highly intertwined with the labor market process (Kacperczyk 2012; Burton, Sørensen, and Dobrev 2016), structural features of the labor market affect success and survival of entrepreneurial ventures. Evidence accumulates that constraints imposed on the labor market by the legal and regulatory environments can have a profound impact on entrepreneurial activity. For example, entry, growth, and survival of entrepreneurial businesses are affected by non-compete agreements (e.g., Rauch 2016; Starr, Balasubramanian, and Sakakibara 2017) and unemployment insurance (Hombert et al. 2014).

Despite the growing interest, we still know relatively little about the relationship between entrepreneurship and some of the key phenomena related to the regulation of labor markets. Specifically, scant attention has been devoted to the relationship between entrepreneurship and occupational licensure—a prominent feature of contemporary labor market that affects up to a third of all U.S. workers (Bureau of Labor Statistics 2018; Kleiner and Krueger 2013). As a labor market phenomenon, occupational licensure has received increasingly critical attention from researchers, who argue that the levels of licensure may be excessive and that such regulation might be detrimental to worker mobility (Kleiner and Kudrle 2000; Weeden 2002). Recently, this argument has been extended to entrepreneurship, with researchers and policy makers arguing that occupational licensure hinders new and small businesses. For instance, a comprehensive report by the U.S. Treasury states that “licensure may place special burdens on [...] entrepreneurs” (The White House 2015, 41). Similarly, Slivinsky (2015, 2) states that

“occupational licensure is stifling entrepreneurship in America,” and the Kauffman Foundation (2015, 1) argues that barriers such as occupational licensure “can slow or even block entrepreneurs.”

The view that licensure depresses entrepreneurship has important consequences. For example, despite estimates that the lack of licensure requirements for tax preparers in the U.S. leads to “fraud, abuse, and error relating to the earned income tax credit alone [that] costs the taxpaying public about \$13 billion annually” (Kavanaugh 2014, 8; U.S. GAO 2006), the Internal Revenue Service (IRS) recently suffered a legal defeat in its attempt to institute federal licensing requirements for tax preparers (IRS 2014). The IRS was forced to abandon its Registered Tax Return Preparer (RTRP) licensure program two years after starting it, with plaintiffs arguing, in part, that licensure “impose[s] a barrier to entry to the tax preparation market, [causing] small and independent tax preparation businesses [to] exit the market” (Institute for Justice 2012). And yet, as we estimate below, in 2013—a year after the RTRP program was provisionally introduced by the IRS—the rate of practice ownership was about 10 percent *higher* in states where tax preparers were already required to obtain a license, compared to states without licensure. If practice ownership approximates entrepreneurship in tax preparation, how can we explain this higher rate of entrepreneurial activity in light of the arguments against licensure?

In this study, we provide evidence to suggest that aspects of occupational licensure may foster, rather than inhibit, entrepreneurial activity by helping individual entrepreneurs signal quality of their goods and services to the market and boosting an occupation’s collective legitimacy. Although both aspects follow from the stated objective function of licensure—to ensure a minimum standard of quality—they have received little attention, with most discussions of licensure focusing instead on the barrier-to-entry aspect of this regulation. We offer cross-

sectional evidence suggesting that the demand for an occupation's services and the entrepreneurial activity by practitioners may be higher in markets with licensure than those without. More important, we show the first evidence that a license may be valuable to individual practitioners and practice owners because of its quality-signaling and legitimizing aspects.

Although considered theoretically, the value of the signaling and legitimizing aspects of licensure for entrepreneurs have not been studied empirically. Because occupational licensure is mandatory for all practitioners in a market, measuring the underlying demand among practitioners for licensure is inherently challenging. Here, we use the gradual introduction of a federal license in tax preparation, which allowed for voluntary early adoption of the license before it were to become mandatory, to provide evidence of individual-level demand for licensure among practitioners, including entrepreneurs, that is related to its value as a signaling device. Our results suggest that licensure may help those who attain it to signal their quality and skills and boost the legitimacy of the occupation, increasing survival chances of small tax practices. At the same time, licensure is likely costlier to entrepreneurs than to non-entrepreneurs, presumably because the former face more acute resource constraints than the latter (Stinchcombe 1965). Accordingly, in markets where entrepreneurs already have a state-level equivalent of the federal license, they are less likely to be among the voluntary early adopters of the federal license than non-entrepreneurs. Conversely, in markets where they lack a substitute signal, entrepreneurs have a higher demand for licensure. Licensure therefore presents a trade-off to entrepreneurs, by offering a way to signal quality and legitimacy, while simultaneously increasing the costs of practice.

## **Prior research on occupational licensure**

Occupational licensure is a substantial and growing labor market phenomenon in the United States. Kleiner and Krueger (2013) estimate that 29 percent of all U.S. workers are subject to occupational licensure requirements and that such requirements are associated with about 18 percent higher wages. They conclude that licensure has thus surpassed labor union membership as a force contributing to intra-occupational wage inequality (Kleiner and Krueger 2013, S177). The view of entrepreneurship as a labor market phenomenon (Burton, Sørensen, and Dobrev 2016) suggests that a feature of the labor market as prominent as licensure is likely consequential for entrepreneurs; and, indeed, policymakers and commentators have devoted increasing attention to the topic in recent years (The White House 2015; Slivinski 2015). Yet, perhaps because licensure research has traditionally focused on the downsides of compliance, associating licensure with monopoly and closure (see e.g., Svorny 2000 for a review), substantively similar arguments have been extended to entrepreneurship. The arguments propose a negative relationship between licensure and entrepreneurship, suggesting that the cost of licensure present a barrier for entrepreneurs, negatively affecting the rates of entrepreneurial activity. By contrast, we propose that a more careful consideration of licensure benefits may yield a better understanding of its role in the context of entrepreneurship.

Researchers rely on various definitions of licensure, but most mention two key features that are at the center of our argument: licensure reduces uncertainty about the quality of practitioners' services and it results in exclusive rights to provide a service. The first feature is a key part of economic theories of licensure (Leland 1979; Shapiro 1986). These theories suggest that licensure mitigates asymmetric information in markets—a problem especially severe in markets for credence goods, such as professional services (Darby and Karni 1973). If less

competent service providers are blocked from entering the occupation, service quality increases and the risk of unknowingly selecting a low-quality service provider decreases (Akerlof 1970).

Empirical studies that investigate this relationship between licensure and quality generally fail to establish robust effects (Kugler and Sauer 2005; Kleiner and Kudrle 2000) or find that improvements in quality in high-income markets tend to be offset by a decline in low-income markets (Hotz and Xiao 2011; Larsen 2013; see Shapiro 1986 for a theoretical model). Such findings are consistent with the suspicion of rent-seeking behind occupations' efforts to secure licensure (Weeden 2002; Friedman 1962). Accordingly, most studies focus on the monopoly aspects of licensure and underscore the tendency of this regulation to restrict competition and promote social closure. For instance, Kleiner and Krueger (2010, 667) define occupational licensure as “the toughest form of regulation... [that makes] working in an occupation for compensation without first meeting government standards illegal.” Similarly, Weeden (2002, 62) defines licensure broadly as a set of requirements that “[restrict] access to an occupation to candidates who have met a predefined set of criteria, [which] may include ... educational credentials... minimum age, citizenship, residency, local experience, and moral turpitude requirements.” This predominant focus on closure risks dismissing the importance of licensure benefits, including its quality-signaling and legitimizing properties.

We first turn to the quality-signaling benefits. Such benefits may exist because market participants can rarely afford to thoroughly assess the quality of goods and services, and often have to make decisions faced with high information asymmetries. This limitation is especially severe in markets for credence goods, where even a long history of transactions with a provider may not reveal the provider's objective quality (Darby and Karni 1973). Signaling theory posits that, when uncertainty is high, markets are concerned with reducing information asymmetry

between two parties (Spence 1973; Milgrom and Roberts 1986) and that costly signals mitigate such asymmetries. For example, Spence (1973) argued that academic credentials function to convey a signal about the relative, objective quality of any given worker and others have subsequently argued that market participants rely not only (if at all) on direct knowledge of quality, but infer it using indirect information (Belenzon, Chatterji, and Daley 2017; Galperin et al. 2018). Because signals are costlier for less productive (poorly trained or poorly motivated) practitioners than for more productive (well-trained and highly motivated) ones, signals can separate the two types of workers in the market (Spence, 1973). Less productive practitioners eventually exit the market, while more productive ones stay—an outcome that likely increases the overall quality of practitioners.

Second, licensure might also function to legitimize the entire occupation. Research in the sociology of occupations suggests that licensure mitigates the “lemons” problem not necessarily because consumers receive objective information about quality, but by engendering a belief that practitioners of a particular occupation are the most appropriate—i.e., legitimate—market actors for solving a category of problems (Abbott 1988). Such occupational authority implies that other solutions to a problem—e.g., turning to a competing occupation, or solving the problem oneself—are illegitimate. For example, medicine’s strong occupational authority implies the appropriateness of going to a physician when having symptoms resembling appendicitis, rather than going to a homeopath (whose occupational authority for such problems is weak) or using home remedies. The choice of the medical profession as a provider may occur in the face of a wide variation in the quality of the physician’s solution and despite the lack of detailed information on the quality of the alternatives. Hence, licensure may affect demand for services by informing a consumer’s choice of the appropriate *category* of providers.

Together, the two perspectives emphasize that licensure has signaling and legitimizing properties that may offer significant potential benefits to practitioners not only in consumer markets, but also in labor markets. Some research on low-wage labor markets, for example, suggests that licensure requirements are associated with better labor market outcomes for groups of workers who have difficulty signaling their qualifications otherwise. For instance, in a study of women and minority representation in a dozen U.S. occupations between 1880 and 1950, Law and Marks (2009) find that licensure increases the representation, arguing that “if uncertainty about worker quality gives rise to statistical discrimination ... then licensing regulation that serves as an imprimatur of quality can increase the presence of minority workers in regulated occupations” (Law and Marks 2009, 352). Similarly, Redbird (2017, 619) suggests that a license can be seen as a “state-endorsed signal of quality, a device that helps bypass ... questions of employability.”

In sum, despite the dominant treatment of licensure as a phenomenon that increases the costs of practice and creates monopoly rents, the fact that it arises from and could be a solution to the problem of information asymmetry in markets points to the potential value it may bring to practitioners beyond monopoly rents. From this perspective, licensure presents a trade-off to individual practitioners. On the one hand, it increases the cost of entering and remaining in a trade; on the other, it increases the ability to signal quality and legitimacy of their practice.

### **Entrepreneurship, legitimacy and quality signaling**

Considering the signaling and legitimation benefits modifies our understanding of the relationship between licensure and entrepreneurship. A core tenet of entrepreneurship research is that founding and operating a venture is associated with exceptionally high levels of uncertainty (e.g., Burton, Sørensen, and Beckman 2002; Stuart and Ding 2006). Given the high chances of



failure for young firms (Audretsch 2007), the ability to signal quality and thus reduce the uncertainty is critical for securing resources.

Numerous studies have documented a link between the presence of quality signals and the subsequent success of a venture. For example, Burton and coauthors (2002) find that entrepreneurs from “entrepreneurially-prominent” employers realize benefits from this association, such as access to funding. Similarly, Pollock and coauthors (2010) find that ventures of entrepreneurs with a history of employment at a high-status firm secured higher IPO valuations. Accordingly, entrepreneurs invest in a variety of signals, such as engaging in corporate social responsibility initiatives to strategically signal legitimacy (York and Lenox 2014). Even the presence of the founder’s name in the name of the venture may be a valuable signal of entrepreneur’s commitment and competency (Belenzon, Chatterji, and Daley 2017). Collectively, these studies suggest that credible quality and legitimacy signals are crucial for securing access to resources.

It follows that licensure might be valuable for entrepreneurs for at least two reasons. First, consistent with the signaling theory (Spence 1973; Milgrom and Roberts 1986), a license may function as a quality signal, reducing information asymmetry between entrepreneurs and the market. Because consumers will anticipate that the quality of goods and services provided by a licensed entrepreneur is higher, the demand for a startup’s offerings might increase, enabling entrepreneurs to sell higher volumes or to charge higher prices. Hence, by signaling their skill more directly, entrepreneurs will be able to secure entrepreneurial resources (e.g., funding) more easily, and to build larger market for their product.

Second, to the extent that licensure enhances legitimacy of the focal occupation, it might further bestow legitimization benefits on all entrepreneurs in the trade. For instance, in the context

of tax preparation, a license can signal to consumers that the quality of the services is higher and that tax preparers are more legitimate than the providers of substitute services—e.g., providers of tax software. Using a tax preparer's services thus may be a more appropriate solution to the problem of tax compliance than completing tax forms on one's own or with the use of the software. More generally, enhanced legitimacy will increase demand for a venture's service, by raising customers' valuation of a particular good or service and increasing consumer demand relative to substitutes. The ability to charge higher prices or sell higher volumes will likely enhance entrepreneur's profits, ultimately increasing the chances of survival of the business.

Hence, conditional on practitioners absorbing its costs, we expect licensure to be associated with a higher rate of entrepreneurship and the demand for practitioners' services, as licensed practitioners can signal their quality to consumers more effectively.

***Proposition 1:** Licensure will be associated with higher rates of entrepreneurship, and greater demand for services in markets where signaling benefits outweigh the costs of compliance.*

***Proposition 2:** Licensure will be associated with higher entrepreneurial survival, to the extent that it enhances an entrepreneur's ability to signal quality to the market.*

Given the legitimation and quality signaling benefits of licensure in the entrepreneurial context, entrepreneurs will likely place high value on it, in anticipation of greater demand, higher profitability, and ultimately, longer survival. Despite the substantial benefits, however, there may be diminishing returns to accumulating signaling credentials, such as a license. Importantly, because entrepreneurial ventures often face acute resource constraints (Aldrich and Fiol 1994), demand for costly signaling credentials will only be high when alternative quality signals are not available. That is, to the extent that entrepreneurs possess substitute signals of quality and legitimacy, obtaining a license will increase costs of operation without bringing the additional signaling value. For example, if various levels of licensure (e.g., state and federal) act as

substitutes in a local market, obtaining a federal license while holding an equivalent state license may not be as beneficial in that market, compared to obtaining the federal license while practicing in a state without licensure requirements. Assuming scarcity of resources usually associated with running one's own small business, we should then expect entrepreneurs to have lower demand for licensure than non-entrepreneurs *unless* they lack a substitute signal of quality.

***Proposition 3:*** *The demand for licensure among entrepreneurs will be lower when substitute signaling devices are available and higher when such substitute signals are not available.*

### **Empirical Context**

We now turn to the empirical examination of the relationship between occupational licensure and entrepreneurship. In what follows, we use data on one U.S. industry, income tax preparation, to assess whether our theory about the trade-off between the costs of compliance and the benefits of signaling is consistent with the patterns we identify. The tax preparation industry comes close to a credence goods setting, in which licensure could protect the public from low-quality services. Consumers often cannot assess whether their tax preparer exercised due diligence to ensure the accuracy of the tax return or took advantage of all available opportunities to reduce tax liability by claiming deductions and credits. Even gross mistakes made by a tax preparer may not be evident unless a consumer is audited by the IRS, and full audits are relatively rare, representing less than one percent of tax returns (IRS 2017). Licensure could ensure that all tax preparers have at least a minimal level of competence and thus reduce the risk of errors (U.S. GAO 2006). Therefore, licensure might be effective as a quality-signaling and legitimizing credential that increases the demand for tax practitioners' services.

The tax preparation industry is a suitable empirical context for investigating the relationship between occupational licensure and entrepreneurship for several reasons. First,

starting a tax preparation practice requires a relatively low capital investment, which increases the relative importance of regulatory barriers like licensure for entrepreneurial activity. Second, most tax preparation tasks—especially those pertaining to the federal tax code—as well as the knowledge and skills that they require are standardized across states with and without licensure requirements, which allows for meaningful inter-state comparisons. Specifically, it is possible to compare industry dynamics in four states (California, Maryland, New York and Oregon) that require tax preparers to obtain a license to practice and therefore presumably offer higher-quality service, to those in the remaining states, where tax practitioners are not required to have an occupational license or credentials (Galperin 2017). We use this beneficial feature of the context to study within-occupation differences in entrepreneurship and demand for the occupation’s services, comparing thousands of local tax preparation markets located in states with and without state licensure requirements.

Another beneficial feature of our context is that the U.S. tax preparation industry recently underwent a regulatory change—an attempt to introduce a federal-level license for all practitioners—that was implemented in a way that created an opportunity to measure the otherwise difficult to observe differences in demand for licensure among practitioners. Specifically, in 2011, the IRS announced the Registered Tax Return Preparer (RTRP) program with the goal of instituting a minimal competency requirement in the industry to curb low-quality tax returns that result from the ignorance of preparers working without proper training and knowledge (U.S. GAO 2006). Obtaining the RTRP credential required passing a 2½ hour test of tax code knowledge, paying a fee of \$116, and attending annual continuing education courses—requirements similar to those imposed by the four licensure states, as detailed below. The RTRP credential requirement was phased in gradually by the IRS between 2012 and 2014, allowing for

voluntary early adoption of the credential until the end of 2013; the license were to become mandatory thereafter. Even though the RTRP program was successfully challenged in courts in 2014 and subsequently canceled, our analysis focuses on 2013, when, as our interviews suggest, tax preparers expected the licensing credential to become mandatory (discussed below).

The provisional introduction of this license created an opportunity for voluntary early adoption by practitioners, which allows us to measure relative demand for licensure among preparers, including entrepreneurs. The variation in the benefits related to obtaining a license between licensure and non-licensure states allows to identify the demand for RTRP among practitioners, including entrepreneurs, that is related to its signaling value. While the costs of obtaining the RTRP are exactly the same for tax practitioners in all states, the benefit of an additional legitimacy signal should be lower to those practitioners who already have a similar state-level signal. We use this logic to test our theoretical propositions.

### **Data and sample**

Our data come from Preparer Tax Identification Number (PTIN) holder listings received from the IRS through a series of Freedom of Information Act requests. The listings include all active PTIN holders in the U.S. and abroad (over 700,000 individuals annually) and represent virtually all active paid tax preparers. The IRS requires PTIN holders to renew their PTIN every year, so the listings include only actively practicing preparers in any given year. We obtained the PTIN listings for years 2013 and 2014 and used the data to establish general descriptive facts relating licensure to the rates of entrepreneurship and the demand for tax preparation services. The 2013 listing additionally identifies early adopters of the Registered Tax Return Preparer license (RTRP) among practitioners and entrepreneurs in licensure and non-licensure states, which allows to compare the demand for the credential across state licensure regimes.

Comparing records across 2013 and 2014 allowed us to assess the likelihood that a practitioner exits the industry by 2014.

The fields available in the PTIN listings included preparer's name, name of their tax preparation practice ("doing business as"), business address, email, telephone number, and website, as well as the preparer's professional credentials, if any. All of the data in these fields are self-reported by the preparers applying for their PTIN. We augmented these data in several ways. First, using commercial marketing databases, we identified the approximate age of each preparer, using preparer's name, city and state. We then used a combination of age and preparer's first name to code preparer's gender. We coded gender in two steps, first using the Social Security Administration's baby names database, then using proprietary name-gender databases. In addition to the individual-level data, we used ZIP-code-level data for the 2011 tax filing season from the IRS Statistics of Income datasets to identify (lagged) local tax preparation market and industry characteristics: the number of tax returns filed in the ZIP code, the average reported income, and the number of returns filed through paid preparers. Finally, we used a list of Electronic Return Originators (EROs) from 2015, provided by the IRS through a Freedom of Information Act request, to identify establishments that are registered to file tax returns electronically via the agency's Modernized E-File system.<sup>1</sup> Usually, larger and more established

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<sup>1</sup> See <https://www.irs.gov/e-file-providers/modernized-e-file-overview> for a description of EROs. We matched individual PTIN holders to ERO establishments using various combinations of preparer name, business name, geo-coded address, phone number, and email address fields available in both datasets. While we could not access the ERO list for 2013, which would ideally match our data, the ERO listings are additive—i.e., all establishments that were operating in 2013, but have since been closed, remain on the list. This allowed us to identify the establishments that operated in 2013, unless they have relocated to a different ZIP code between 2013 and 2015. We have no definitive way to check how many establishments may have moved in this way, but expect this number to be relatively small as there is a great deal of specificity to state and local tax codes. Our phone interviews suggest that their work tends to rely on dense local client networks. Our calculations using 2001-2016 pooled data from the American Community Survey support this assumption: 98.7% of self-employed and 96.1% of wage-earning tax preparers live in the same state as they did the previous year. This level of immobility is consistent with what we see in similar occupations commonly pursued through self-

practices obtain their own ERO number and thus get on the list. Accordingly, approximately 61 percent of tax preparers in 2013 were associated with ERO establishments, with most other preparers working as sole practitioners. We use these data to code practice ownership status—our proxy for entrepreneurship—as we describe below.

### **Sample restrictions**

For all of our analyses we focus on the cross-section of PTIN holders from 2013, with the only exception of the analysis of exit rates, which also uses data from 2014. To decrease the heterogeneity of market and other environmental conditions, we only include preparers who reported practicing in the lower 48 U.S. states and the District of Columbia. We thus start with the sample of 707,846 individuals and restrict the sample in several ways, to reduce unobserved heterogeneity and ensure common data support in our analyses. First, to increase the likelihood that local market conditions for tax preparation services are comparable across states with and without licensure, we use Coarsened Exact Matching (Iacus et al. 2012) on ZIP code market size (measured as the number of tax returns filed in 2011) and income (average Adjusted Gross Income in ZIP code, top-coded by the IRS at \$100,000). This approach excludes 99 ZIP codes associated with 2,031 preparers (0.03 percent of our sample) as not matched. Since ZIP codes are typically more socioeconomically homogeneous than larger geographic units of analysis, matching on the ZIP-code level ensures that we compare tax preparers to peers operating in demographically and economically similar markets. Second, we drop from our sample ZIP codes with an unusually high (> 99th percentile) number of tax preparers per capita, as they likely include idiosyncratic establishments, such as customer support centers for tax software

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employment. For example, 98.1% of self-employed and 96.1% of wage-earning financial advisors work in the same state as they did a year ago.

providers. Since we focus on in-person tax preparation services market, such ZIP codes could bias our estimates. Our sample is also restricted by missing data. For individual-level analyses, 131,869 individuals (19 percent of the sample) have missing age or gender data in the databases. These restrictions and limitations reduced our final estimation sample to 573,946 individuals in 23,785 ZIP codes. We address the robustness of our results to the potential missing data problem in the appendix.

### **Measures of RTRP adoption, entrepreneurial status, and exit from occupation**

We identify as entrepreneurs in our sample all practitioner-owners among tax preparers—i.e., those who report being a partner, an owner, a principal, or a sole proprietor of a tax preparation practice. Specifically, we use two criteria, either one of which classifies a preparer as an entrepreneur: (i) a preparer appears in the contact list of the associated ERO establishment and is described as owner, partner, or sole proprietor, or (ii) a preparer reports doing business under her or his full name or with a business name that includes the preparer's last name. These non-mutually-exclusive criteria identified 46 percent of practitioners in 2013 as entrepreneurs (13.5 percent according to the first criterion and 32.8 percent according to the second one). Such definition of entrepreneurship, while expansive, is appropriate for studying entrepreneurs in the tax preparation industry, where most practices are small. For example, in our sample, there were 361,094 unique addresses associated with 707,846 preparers in 2013, for the mean of about two preparers per establishment (the median number of preparers per establishment is one). Moreover, such a definition is consistent with the policy arguments that motivate this study; opponents to licensure claim that the RTRP program depresses the entrepreneurial activity of small business owners and sole proprietors (The White House 2015; Slivinski 2015).



To assess the signaling benefits of the RTRP, we calculate one-year exit rates by locating tax preparers on the 2013 PTIN list in the 2014 PTIN listing. Since the IRS does not provide a unique individual identifier with the PTIN listings, we used various combinations of e-mail address, preparer's name, business name, phone number, and business address to locate them across the two cross-sections. Of the 705,815 records in the 2013 matched sample (before restricting it for missing values for gender and age), 202,362 (28.6 percent of the sample) were not found in 2014. We coded tax preparers that disappear from the PTIN listing by 2014 as having left tax preparation practice.

### **Estimation approach**

We evaluate our theoretical arguments in two steps. First, to assess whether the broad patterns in our data are consistent with the license-as-barrier perspective, we use the 2013 cross section of the tax preparation industry to test our Proposition 1, measuring, on the ZIP-code level, the relationship between licensure requirements, entrepreneurship rates, and the demand for tax preparation services in equilibrium. Second, we test our Propositions 2 and 3 that license may boost survival and be valuable to entrepreneurs as a signaling device. To test Proposition 2, we conduct individual-level analysis of entrepreneurial exit from industry conditional on voluntary early adoption of the RTRP license. To test Proposition 3, we estimate the propensity of early adoption of the license by entrepreneurs when compared to non-entrepreneurs. In both steps, a key identifying difference between preparers is whether or not they practice in a state that has licensure requirements in place for tax preparation work.

#### *State licensure requirements*

We use the variation in licensure requirements across states to identify preparers that have (or do not have) a legitimizing device that is equivalent to the RTRP license. We thus make

assumptions that the RTRP is a substitute for state licenses as a legitimacy signal, and that state licenses are sufficiently similar to each other. Table 1 compares the requirements and costs of obtaining the RTRP and each of the state licenses. The comparison suggests that the RTRP may provide a similar signal of legitimacy to that provided by the state licenses, since licensed practitioners in all of these jurisdictions are called “registered preparers” and the effective costs of obtaining the licenses are comparable. One exception in the cost comparison is New York, which in 2013 had, effectively, no costs or requirements outside of the \$100 annual registration fee. We address this exception in the following way: we separate New York from the rest of the licensure states in analyses where the costs of obtaining a license are important—i.e., in the ZIP-code-level estimations below. We combine New York with the three other licensure states in the individual-level analyses of survival and voluntary early adoption of the RTRP, since our goal is to discern the effects of *not* having a substitute signal of legitimacy. Since consumers are unlikely to be informed about the detailed costs of any of these credentials (Galperin 2017), tax preparers in New York likely derive legitimizing benefits from the state registration that are similar to the benefits provided by the other three state licenses.

[ Table 1 about here ]

### *ZIP-code-level models*

We first assess the proportion of entrepreneurs and the aggregate demand for tax preparers’ services across ZIP codes in states with and without licensure requirement. Because we compare outcomes on a ZIP-code level across states, we control for both ZIP-code and state-level characteristics that may have a significant effect on local markets for tax preparation. The most important of such characteristics is the income profile of the ZIP code. Low income neighborhoods may have higher demand for preparer services because receiving the Earned

Income Tax Credit (EITC)—the single largest vehicle for government subsidies to low income households (Sykes et al. 2014; Galperin and Weaver 2014)—requires filing a tax return. Low-income households may have difficulty preparing even a simple tax return without expert help. High-income households may have higher demand for preparers' services because the complexity of the tax return increases with income and taking advantage of all available credits and exemptions to reduce tax liability requires more expertise. This is consistent with models of markets for professional services that predict higher demand in higher-income markets (Shapiro 1986). Because the demand for tax preparation services may be higher in low-income and high-income ZIP codes compared to medium-income ZIP codes, we include a quadratic term for the income variable and interact it with licensure, since the position and the shape of the relationship could both be affected (Aiken and West 1991).

To account for the difference in the cost of obtaining the state license between New York and the other three licensure states, we use a separate indicator for New York. Our ZIP-code-level regressions with state random effects are therefore based on the following general form.

$$Y_{zs} = \beta_0 + \beta_1 License_s + \beta_2 AGI_z + \beta_3 AGI_z^2 + \beta_4 (License_s \times AGI_z) + \beta_5 (License_s \times AGI_z^2) + \beta_6 NY_s + \beta_7 (NY_s \times AGI_z) + \beta_8 (NY_s \times AGI_z^2) + \beta_9 \mathbf{Z}_z + \beta_{10} \mathbf{X}_s + \varepsilon_{zs} \quad (1)$$

In this equation,  $Y$  represents entrepreneurship rate (the count of practice owners, controlling for the number of practitioners in the ZIP code) or the aggregate demand for tax preparation services (the log of the number of tax returns that were filed with a paid preparer, controlling for the log number of tax returns filed and the number of tax preparers in the ZIP code). *License* is an indicator for California, Maryland, or Oregon; *NY* is an indicator for New York state; and *AGI* is the mean Adjusted Gross Income in a ZIP code (top-coded at \$100,000 by the IRS). A vector of ZIP-code-level controls  $\mathbf{Z}$  includes indicators for whether large national tax preparation chains (H&R Block, Jackson Hewitt, and Liberty Tax) operate in the ZIP code, the (log) number of tax

returns filed in the ZIP code in 2011, and the (log) number of tax preparers in the ZIP code, which turn  $Y$  into a relative rate of entrepreneurship and a relative demand for preparers' services, respectively. A vector of state-level controls  $\mathbf{X}$  includes potentially important factors that could influence demand for tax preparers' services: an indicator for state income tax, an indicator for state-supplemented Earned Income Tax Credit, and an index of overall state tax complexity in 2014, adapted from the Tax Foundation reports.<sup>2</sup> Finally,  $\varepsilon$  is the error term.

### *Individual-level models*

More central to our theorizing is examining the trade-off faced by entrepreneurs between the costs of obtaining a license and its legitimacy-signaling effects. Toward that goal, we conduct individual-level analysis to first measure the association between obtaining a license and subsequent survival of a business and then assess the demand for licensure among entrepreneurs, conditional on having access to a substitute signaling device.

We first examine whether the adoption of RTRP may be associated with lower propensity among entrepreneurs to exit the industry by 2014. In this step, our sample includes only entrepreneurs in both licensure and non-licensure states. A key identifying assumption here is that state licenses may be a reasonable substitute for the RTRP to signal quality and legitimacy. We therefore treat all states *without* licensure as markets where RTRP is more valuable as a signal and estimate logit regressions of the following form.

$$P(Exit_{izs} = 1) = \beta_0 + \beta_1 Adopt_i + \beta_2 (Adopt_i \times NoLicense_s) + \beta_3 \mathbf{X}_i + \beta_4 \delta_z + \varepsilon_{izs} \quad (2)$$

The binary outcome *Exit* equals 1 if an individual entrepreneur practicing in 2013 is not found in the list practitioners for 2014. The key predictor is the interaction of being the early adopter of

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<sup>2</sup> To make the index more intuitive, we invert it, by subtracting it from 10, so that higher values signify higher complexity. The description of the index can be found at <https://taxfoundation.org/2017-state-business-tax-climate-index/>

RTPR ( $Adopt = 1$ ) and practicing in a no-licensure state ( $NoLicense = 1$ ). Since we are interested in individual-level differences here,  $\delta$  is a set of ZIP code fixed effects, which allows us to flexibly control for local market and industry differences. In addition, vector  $\mathbf{X}$  consists of potentially-important individual-level controls: an indicator of not having major professional educational credentials (0 if a preparer holds a CPA, a JD, or is an Enrolled Agent, and 1 otherwise); an indicator for working in an ERO establishment; age in years and age squared; and an indicator for gender (1 = Male, 0 = Female).

Next, we identify the trade-off between the costs and benefits of licensure, by estimating the propensity of entrepreneurs to voluntarily adopt the RTPR license in 2013, compared to non-entrepreneurs, conditional on having or not having a substitute signal in the form of a state license. We therefore estimate logit models of the following form.

$$P(Adopt_{izs} = 1) = \beta_0 + \beta_1 Entrepreneur_i + \beta_2(Entrepreneur_i \times NoLicense_s) + \beta_3 \mathbf{X}_i + \beta_4 \delta_z + \varepsilon_{izs} \quad (3)$$

The outcome  $Adopt$  is 1 if a preparer adopts RTPR voluntarily in 2013 and is zero otherwise. The coefficient for the interaction term  $\beta_2$  is the main coefficient of interest, representing the marginal difference in the likelihood of early RTPR adoption for entrepreneurs ( $Entrepreneur = 1$ ) by those who have no substitute signal of a state license ( $NoLicense = 1$ ). Similar to the equation (2), we include ZIP code fixed effects, and the same set of individual-level controls.

## Results

### ZIP-code-level analysis of ownership rate, entry, and exit

To establish industry-wide patterns related to licensure, we first compare the rates of ownership and the use of paid preparer services at the ZIP code level across states with varying licensure requirements. Models 1 and 2 in Table 3 show the results of regressing the count of entrepreneurs in a ZIP code on licensure; Figure 1 shows predicted values of interest, based on

model 2. Because we include the (logged) number of tax preparers in a ZIP code as a covariate, we estimate the model on ZIP codes that have at least one tax preparer.<sup>3</sup> Coefficients in Model 1 indicate an approximately 10 percent higher rate of entrepreneurship in states with licensure (significant at  $p < 0.001$ ), and about 9 percent higher rate of entrepreneurs in New York (although not significant at  $p < 0.7$ ), on average, compared to states without licensure. This finding is consistent with the view of licensure as a device providing legitimizing benefits and is in stark contrast to the arguments implying licensure depresses entrepreneurship.

In Model 2, we account for the heterogenous effect by income. Note that the coefficient for licensure in that model is not interpretable on its own, as it corresponds to entrepreneurship rates in ZIP codes with zero income, which do not exist in our data. Therefore, it can only be interpreted in conjunction with the interaction terms. To help the interpretation, we plot predicted values in figure 1. It suggests that the rate of entrepreneurship is somewhat higher in licensure states and New York, compared to non-licensure states, for low- and middle-income ZIP codes and is lower in high-income ZIP codes. However, the largely overlapping confidence intervals suggest that these differences may not be estimated precisely enough in our sample.

[ Tables 2 & 3 about here ]

[ Figures 1 & 2 about here ]

Next, we assess the relationship between the demand for tax preparation services and licensure. Regression results are shown in models 3 and 4 of table 3. While, on average, there is no significant relationship between licensure and the use of paid preparers in the licensure states, the demand differs by income. The interaction with income suggests that in higher income ZIP

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<sup>3</sup> We also used two alternative approaches to estimating these models, by including all ZIP codes, and by only including ZIP codes with at least two tax preparers. The results are consistent with those presented here.

codes, the demand for preparers is higher, although only in New York the predicted differences with non-licensure states appear to be significant (see Figure 3).

To summarize, the cross-sectional evidence presented here suggests that licensure states have significantly *higher* practice ownership rates on average, and the demand for paid preparer services is higher in higher-income ZIP codes in New York, where preparers face the lowest cost of compliance with licensure requirements. The higher demand could result from (although is not definitively indicative of) a combination of greater legitimacy for licensed practitioners and lower costs, which could result from more competition in a crowded market (see appendix for the analysis of practitioner supply by licensure). These interpretations are necessarily speculative, but nonetheless contrast with the view of licensure as an unambiguous deterrent to entrepreneurial activity.

### **Results of individual-level analysis of the demand for RTRP license**

To study the trade-off between the legitimacy and cost aspects of licensure more directly, we first estimate the effect of early adoption of the RTRP on the likelihood of remaining in the industry one year after the adoption, and then estimate the demand for the RTRP credential among entrepreneurs. In contrast with the ZIP-code-level analysis, here we attempt to tease out individual-level differences among entrepreneurs who have or lack substitute signals and between entrepreneurs and non-entrepreneurs. We control for the variation across local markets for tax preparation with ZIP code fixed effects. Our key explanatory variable here is the *lack* of a substitute legitimacy signal in a form of a state license, so it equals 1 for a preparer who is practicing outside of the four licensure states and is 0 otherwise. Descriptive statistics for the sample used in our estimations are summarized in table 4.

[ Tables 4 & 5 about here ]

First, we estimate whether voluntary adoption of the RTRP license is associated with a significantly lower likelihood of exit by entrepreneurs from the industry within one year. Focusing on just the sample of entrepreneurs in 2013, table 5 reports results of regressing the event of exit from industry by 2014 on voluntary early adoption of RTRP and the additional effects related to state licensure. The coefficients (presented as logit odds-ratios) in model 1 suggest that voluntary adopters of the federal license are about seven times less likely to exit the industry on average (odds-ratio of 0.137, significant at  $p < 0.001$ ). On its own, this effect does not necessarily point to any legitimizing benefits of the license that help entrepreneurs to survive, as it likely also reflects self-selection into licensure based on factors correlated with survival and business success, such as high levels of human capital and commitment to the occupation. However, model 2 sheds more light on the question of licensure benefits: it shows that early RTRP adopters have about 30 percent lower odds of exiting when they do not have a substitute state license, compared to the entrepreneurs in licensure states (odds-ratio 0.773,  $p < 0.05$ ).

To assess whether the potential signaling benefits increase the underlying demand for licensure among entrepreneurs, we regress the event of early voluntary RTRP adoption by an individual tax preparer on her entrepreneurship status and the availability of a state license where she practices. Table 6 summarizes the results. Before examining the main coefficients of interest, it is worth noting that the lack of strong professional credentials like Certified Public Accountant (CPA), Enrolled Agent (EA), or Juris Doctor (JD) is a strong predictor of early voluntary RTRP adoption among all tax preparers—those without such credentials are 58 times more likely to voluntarily adopt RTRP. This is consistent with the view of RTRP as a signaling device.

The main coefficient of interest in model 1 suggest no significant difference in early RTRP adoption between entrepreneurs and non-entrepreneurs, on average. However, when we account



for whether a substitute quality signal is available to entrepreneurs in the form of a state license (model 2), we find two opposing effects: entrepreneurs with a state license have about eight percent lower odds to be voluntary early adopters of RTRP (odds-ratio 0.92,  $p < 0.1$ ), but not having a state license is associated with significantly higher odds of voluntary RTRP adoption for entrepreneurs (odds-ratio 1.174,  $p < 0.01$ ). This result is consistent with the cost-benefit trade-off posed by licensure as a costly barrier and a quality signaling and legitimizing device.

[ Table 6 about here ]

In sum, the analysis of individual-level data on early adoption of the federal license points to the importance of the signaling aspect of licensure. The results suggest that license may, both, carry a cost of compliance that is more burdensome for entrepreneurs than for non-entrepreneurs, and bring benefits of legitimacy and quality signaling, which offset the cost burden.

### **Qualitative illustrations**

These quantitative results are consistent with our theorizing of occupational licensure as presenting a trade-off to entrepreneurs (and practitioners in general) and revisit a widely-held view that licensure has an unequivocally negative influence on entrepreneurship. However, this reduced-form analysis is limited in its ability to improve our understanding of the underlying mechanisms. To investigate the plausibility of our interpretation of the results in the context of the tax preparation industry, we contacted a stratified random sample of 235 preparers (split equally between those who adopted RTRP early and those who did not) via email and conducted telephone interviews with 21 respondents (response rate 9%), of which 15 were early RTRP adopters. These semi-structured, open-ended interviews were conducted in the second half of 2015, lasted 45-60 minutes each, and were retrospective in nature. During the interviews, we asked about respondents' work history in tax preparation, reasons for joining the industry,

reasons for adopting the RTRP, and the role of credentialing in their work. Our respondents shared diverse and nuanced views on the RTRP initiative and its significance for the tax preparation industry as a whole, as well as for individual strategies of growing practices and signaling quality to prospective clients. Together with our quantitative results, these qualitative findings offer a more robust support for our propositions and suggest that our assumptions about the industry dynamics and the role of licensure are plausible.

First, many preparers we interviewed emphasized the signaling and legitimizing benefits (rather than adoption costs) associated with the license program. Preparers expressed a view that licensure can benefit the collective standing of tax preparers as an occupational group, by stripping incompetent practitioners of the ability to practice, and by making tax preparation a more respectable trade. A preparer in California—one of the four states that require tax preparers to be licensed—responded to a question about potential benefits of the state-required license:

I wish that the entire country did that. I think that, well, the mistakes and the [poor] education of a lot of the tax preparers that aren't required to be registered... they do not know what they're doing and they make some horrendous mistakes. I think that everybody should be registered in some way, shape, or form.

Our respondents also recognized the signaling and legitimizing benefits of licensure adoption to individual practitioners. Most agreed that the RTRP program, had it not been cancelled, could weed out low-quality practitioners and contribute to their legitimacy as practitioners. One respondent who recently started his own practice noted:

I think [a license like RTRP] gives people the confidence that I have something to hang my hat on. The competition says "We've been here for 40 years" and looks at you and says "How long have you been around?" And you can say "I have a credential." I mean, I've passed that test.

Preparers thus saw RTRP's potential to signal competence. Another preparer noted:

When [the RTRP] came out, I thought it would be a very good selling point. I thought it would be a very good way to show people... that I had the knowledge level that I needed to service their needs, and things of that sort. That was the main reason why I [took] that test.

Similarly, a solo practitioner explained:

[When you have a credential like RTRP,] people think that you would have a little bit more knowledge and background information than if you didn't [have the credential].

Another preparer explained why he puts the RTRP initials next to his name when advertising in a local church bulletin:

Someone would think that, "Oh, Tom from our church, he's trying to do a little business on the side. I know that he worked for a company for 30 years. He's trying to extend himself here. Oh, look, he's got a credential here. He learned something about the business that he's passing on to other people."

Although many of our respondents emphasized the legitimacy benefits of licensure, some preparers also recognized a trade-off between the value of higher legitimacy of practitioners and the higher costs of doing business associated with licensure. For example, one small-practice owner, while considering whether licensure is beneficial for the industry, stated:

It can be both ways. It all depends on the tax preparers and the small firms because most firms don't make high incomes. So, it would be difficult to maintain a license if it's a little bit too expensive to have. [And] we would [then] lose all of the good tax preparers that are out there. But in defense of [the license, having it] could be good because then the clients will be assured that this person is educated and has been up to date on the [tax code] changes.

Preparers also recognized the potential of licensure for raising fees and profits for incumbents:

If the IRS were to re-institute [the licensing requirement] and start getting the incompetent people out of the [industry], my business would increase, and I could probably increase my fees significantly.

Another preparer raised concerns about license not being sufficiently transparent to consumers. For instance, when asked to consider the relative importance of RTRP for his practice, this preparer noted:

I have the [RTRP] certificate on the wall. I told my clients that I was one of the first few in the country to get that. And maybe they thought it was good that I did that. [But] maybe they thought about it for five minutes and said [to themselves] “Okay. I like John because he does a good job. Not because he took the exam and got the certificate or whatever.” So, I don’t know.

Along similar lines, others noted the importance of educating clients about the significance of a credential like the RTRP:

Interviewer: Do you think that most of your clients are savvy and aware of what the certifications in tax preparation are?

Respondent: “I don’t think so. I don’t think they are, unless we tell them. But it can be a useful marketing tool, because [if you are licensed or certified,] you can use that to say that you are, and that can give you an advantage over other people.”

Preparers in established practices reported that most of their new clients come through direct customer referrals and word-of-mouth (although a few respondents also mentioned advertising in local newspapers or on local radio stations). But even in established practices, prospective and new clients occasionally inquire about preparers’ credentials. As one preparer put it, “I always get a handful of new [clients] during the year that call, and they’ll ask about all my credentialing and what my experience is.” Therefore, while RTRP adoption by the preparers we interviewed may not have been an essential part of their practices, the preparers considered the license as something that their clients would value.

Finally, our treatment of the RTRP credential as a license appears to be reasonable, since preparers perceived the RTRP rollout as an introduction of a credential that was soon to become mandatory—that is, they saw it as an impending license. As one of the early adopters explained:

It looked like [RTRP] was something that was here to stay. I certainly didn't want to have my occupation taken away from me.

In sum, most preparers saw the RTRP positively (even if cautiously so), recognizing the potential of such a license to benefit their collective standing as an occupation, and their individual legitimacy as practitioners. While only some voluntarily adopted the impending license early, most recognized the utility of licensure for increasing the general legitimacy of the trade and for the recruitment of new clients.

## **Discussion**

What is the relationship between entrepreneurship and labor-market regulation? We shed light on this question by considering the case of occupational licensure in tax preparation. While recent policy arguments suggest that licensure is detrimental to entrepreneurship and makes operating a small business unnecessarily costly, our analysis suggests that such a view of licensure may be too parochial. Our results indicate that the proportion of entrepreneurs among tax preparers is higher in licensure states on average, and that licensure brings value to entrepreneurs who lack substitute signals of quality and legitimacy. Our key finding, based on individual-level analysis, is that not only were such entrepreneurs more likely to voluntarily adopt RTRP licensure in tax preparation, but they were also more likely to last at least one year in the industry post-adoption. Licensure, therefore should not be seen as uniformly detrimental to entrepreneurship. Instead, occupational licensure involves a trade-off between increasing the cost of practice and improving practitioners' ability to signal quality.

To the extent that mandatory, state-sanctioned nature of licensure increases its value as a legitimizing device and improve the collective standing of an occupation, our results suggest revisiting the longstanding argument that voluntary certification is a better solution for information asymmetry problem (Friedman 1962). For example, in our case, the registration in

New York is both mandatory (while a certification would not be) and not based on any qualification (as a certification presumed to be). Although an established view would imply that such a form of licensure is unlikely to yield any benefits, our results suggest that even the simple fact of registration and a small barrier to entry in the form of a fee might produce signaling and legitimizing effects. In markets for credence goods, legitimacy is not equivalent to objective quality; nor should we assume that a true cost of a signal directly determines legitimacy, simply because such costs may not be directly observable by consumers (Galperin 2017).

Our findings also make an important contribution to the entrepreneurship literature, where researchers are increasingly interested in understanding how regulation affects entrepreneurial entry and success of a new venture (Rauch 2016; Starr, Balasubramanian, and Sakakibara 2017). Whereas researchers have mostly focused on the hindering effects of labor-market regulation for entrepreneurship, we highlight its enabling effects. We offer evidence that, in industries where quality is difficult to assess (e.g., markets with credence goods), licensure might foster rather than hinder entrepreneurial entry, especially when other quality signals are missing. Because entrepreneurship is associated with high uncertainty, whereby entrepreneurs face the challenge of convincing relevant audiences, such as investors, consumers, or future employees about the validity of their claims (Belenzon, Chatterji, and Daley 2017; Kacperczyk and Younkin 2017), the signaling aspects of licensure might be valuable. More generally, our research highlights the potential benefits of labor-market regulation for entrepreneurial activity when the benefits of signaling outweigh the costs of regulatory compliance—as might be the case in instances when substitute quality signals are missing.

Our analysis is limited in many important respects, which suggests fruitful avenues for future research. Because most licensure regimes are mandatory, the generalizability of our

findings is an important question for further study. The voluntary adoption of a credential is typically associated with certification, which tends to highlight differences between individual high- and low-quality practitioners, rather than collective benefits of legitimacy, emanating from higher standing with the state of a licensed occupation. Identifying market conditions in which certification or licensure are most beneficial appears to be a fruitful research direction.

Our study also focuses at entrepreneurship in the equilibrium of a cross-section. But as much of the literature suggests, entrepreneurship comprises dynamic processes of founding, growth, and exit. To what extent are the effects we observe driven by new entrants, incumbents who switch into entrepreneurship, or incumbent entrepreneurs vying for the market share? A related question pertains to the direction of the effect: while legitimacy and quality signaling aspects of licensure may help entrepreneurs survive competition, these aspects may also induce entry into entrepreneurship.

Similarly, future research may investigate whether the utility of occupational licensure is contingent on the growth potential of a new venture. In the tax preparation industry, many new businesses involve self-employment and prioritize stability over growth. Because other quality markers (e.g., patents, trademarks or copyrights) are often unavailable or of little use for such businesses, the adoption of occupational licensure may play a particularly important role in signaling quality to relevant audiences. Conversely, when new ventures are focused on growth outcomes and other quality signals can easily be observed, occupational licensure may play a less significant role. Hence, our findings may be particularly applicable to smaller and younger firms in industries where other quality signals are rarely available. Finally, future research should investigate the utility of licensure for entrepreneurs across a range of industries in order to identify whether and how the mechanisms we establish here generalize to other settings.

## Conclusion

As policymakers and regulators increasingly recognize that the economic growth of countries, cities, and regions depends on entrepreneurial activity, devising policies that foster entrepreneurial entry and growth becomes a primary goal. While researchers debate the costs that regulation imposes on entrepreneurs, the enabling role of regulation in entrepreneurship has been largely overlooked. Our analysis of the role of occupational licensure in entrepreneurship provides evidence consistent with such enabling role and points to a trade-off between the cost and the benefit of licensing—entrepreneurs voluntarily pursue early adoption of a license only when substitute signals of quality are not easily available. Conversely, entrepreneurs are less likely to benefit from a license than non-entrepreneurs when they already have an alternative way to signal quality.

Our findings build upon a growing line of research on the relationship between entrepreneurship and labor market processes (Litwin and Phan 2013; Sørensen and Sharkey 2014; Kacperczyk and Marx 2016). To the extent this paper provides evidence for the competing effects of occupational licensure on entrepreneurship, sensible policy prescriptions require an understanding of the conditions that influence the trade-off between the regulatory cost and the signaling benefits of licensure. Furthermore, the nature of this trade-off may change over time, as occupations evolve. Predicting such a dynamically changing set of market conditions requires simultaneous consideration of individual-level career choices and constraints, as well as the effect of the occupation's overall legitimacy on demand for its services.

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Figures

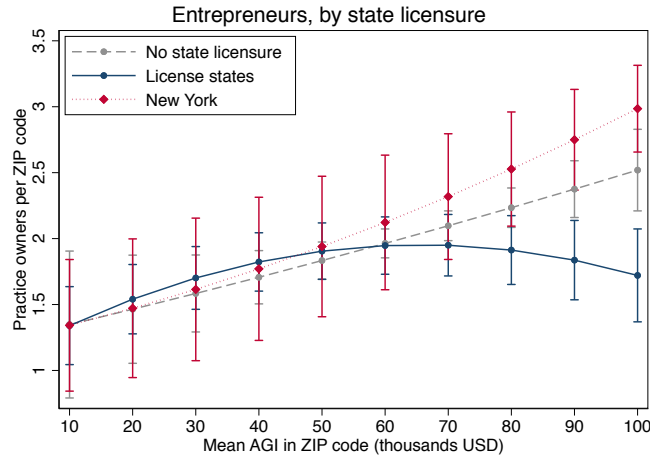


Figure 1. Predicted values, based on regression results in table 3, model 2.

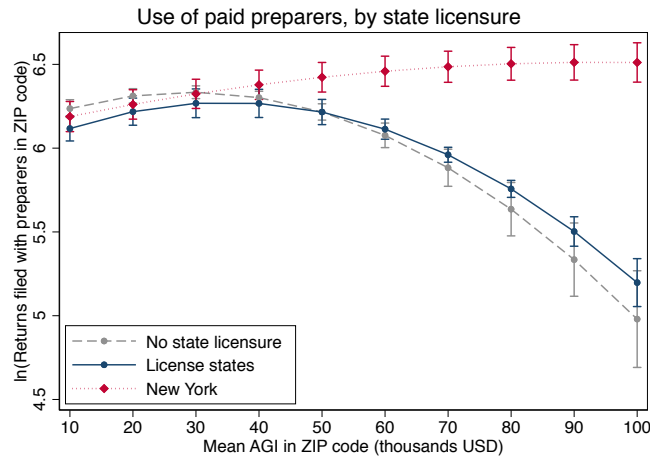


Figure 2. Predicted values, based on regression results in table 3, model 4.

## Tables

**Table 1.** Comparison of the RTRP requirements to state licensure requirements for tax preparation in 2013

	RTRP	California	Oregon	Maryland	New York
Credential	Registered Tax Return Preparer	Registered Tax Preparer	Registered Tax Preparer (or Tax Consultant)	Registered Tax Preparer	Registered Tax Preparer
License fee	none	\$33 annually	\$80 annually	\$50 annually	\$100 annually
Required training	none	60 hours	80 hours	none	none
Exam – intensity	120 questions	none	163 questions	130 questions	none
– duration	2.5 hours	-	4 hours	3 hours	-
– fee	\$116	-	\$60 - \$110	\$65	-
Continuing education – hours	15 hours	20 hours	30 hours	16 hours	none*
– cost	\$35 +	\$80 - \$110	\$60 +	\$200 - \$400	-
Bond requirement	none	\$5,000 bond	none	none	none

*Data sources:* Authors' compilation based on information from the IRS and state regulators for tax preparation practice in Oregon, Maryland, California, and New York. We cross-validated our compilations with those described in various reports on state-level licensure of tax preparers (e.g., <https://www.idfpr.com/forms/pdfs/illinoistaxreturnpreparationtaskforcereport2015.pdf>).

\* New York did not have a continuing education requirement in 2013, but started requiring it after 2014.

**Table 2.** Summary statistics for ZIP code analysis.

	<i>N</i>	Mean	SD	Min	Max
Number of tax preparers in ZIP code	36,940	19	43	0	1,579
ln(Number of tax preparers in ZIP code)	36,940	1.5	1.6	0	7.4
Count of entrepreneurs (practice owners)	23,785	14	21	0	321
ln(Number of returns in ZIP code filed with a paid preparer)	36,940	6.3	1.8	0	10
ln(Number of tax returns in ZIP code)	36,940	6.9	1.8	2.5	11
H&R Block establishment in ZIP code	36,940	.22	.41	0	1
Liberty Tax Services establishment in ZIP code	36,940	.086	.28	0	1
Jackson Hewitt establishment in ZIP code	36,940	.13	.33	0	1
State has income tax	36,940	.86	.35	0	1
State has supplemental EITC	36,940	.45	.5	0	1
Mean Adjusted Gross Income (AGI) in ZIP code (in \$1,000s)*	36,940	31	14	0	79

*Data sources:* 2012 (2011 Tax Year) IRS ZIP code statistics of income; 2013 IRS PTIN holders listing

*Note:* \*AGI for any given ZIP code is top-coded at \$100,000 by the IRS

**Table 3.** Regressions of the rate of entrepreneurship and use of paid preparers in ZIP code on state licensure and ZIP code AGI

	Poisson regressions of the rate of entrepreneurship (number of practice owners)		Linear regressions of the use of paid preparers (log number of tax returns filed with a paid preparer)	
	(1)	(2)	(3)	(4)
License states	1.097*** [0.031]	0.873 [0.188]	-0.053 [0.044]	-0.141** [0.049]
License states # AGI		1.015* [0.008]		0.002 [0.003]
License states # AGI <sup>2</sup>		1.000*** [0.000]		0.000 [0.000]
New York	1.085 [0.185]	0.990 [0.153]	0.067 [0.055]	0.000 [0.063]
New York # AGI		1.000 [0.012]		-0.007*** [0.002]
New York # AGI <sup>2</sup>		1.000 [0.000]		0.000*** [0.000]
AGI	1.015 [0.009]	1.011 [0.010]	0.015*** [0.001]	0.016*** [0.002]
AGI <sup>2</sup>	1.000 [0.000]	1.000 [0.000]	-0.000*** [0.000]	-0.000*** [0.000]
Observations	23,785	23,785	36,940	36,940
State random or fixed effects	RE	RE	RE	RE
Num. of clusters	49	49	49	49
Log-likelihood	-55041	-54979	0.97	0.97

Note: Poisson Incident Rate Ratios shown for models 1 and 2; OLS coefficients shown for models 3 and 4. Robust standard errors in brackets are clustered at state level. States with tax preparer licensure are CA, MD and OR. Registration only: NY. Controls not shown include: log number of tax returns in ZIP code, log number of tax preparers in ZIP code, indicators for at least one establishment of H&R Block, Liberty Tax Service and Jackson Hewitt in ZIP code, state income tax indicator, state EITC indicator, and the index of state tax complexity. Hausman test of coefficient equality between the random effects models 2 and 4 and equivalent fixed effects models cannot reject the Ho of no systematic difference ( $P > Chi-square$  at 0.82 for models 2, and  $P > Chi-square$  at 0.59 for model 4).

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table 4.** Summary statistics for individual-level analysis

	N	Mean	SD	Min	Max
Early RTRP adopter	502,510	.085	.28	0	1
Exits industry by 2014	232,981	.23	.42	0	1
No state license requirement	502,510	.78	.41	0	1
Entrepreneur	502,510	.46	.5	0	1
Age	502,510	52	14	20	100
Male	502,510	.49	.5	0	1
Linked to an ERO establishment	502,510	.62	.49	0	1
No CPA, JD, or EA	502,510	.61	.49	0	1

Data sources: 2013 and 2014 IRS PTIN holders listing; 2013 IRS Electronic Return Originators listing

**Table 5.** Predicted probability of exit in 2014 among entrepreneurs, by state licensure

	(1)	(2)
Early RTRP adopter	0.137*** [0.008]	0.167*** [0.016]
Early RTRP adopter # No state license		0.773* [0.084]
No CPA, JD, or EA	2.780*** [0.059]	2.780*** [0.059]
Linked to ERO est.	0.159*** [0.005]	0.159*** [0.005]
Age	0.912*** [0.003]	0.912*** [0.003]
Age <sup>2</sup>	1.001*** [0.000]	1.001*** [0.000]
Male	1.000 [0.017]	1.000 [0.016]
Observations	256,542	256,542
ZIP code fixed effects	Yes	Yes
Num. of ZIP code groups	12,866	12,866
Num. of state clusters	49	49
Log-likelihood	-93,190	-93,186

Note: Logit odds ratios shown. Robust standard errors in brackets are clustered at state level.

States with tax preparer licensure are CA, MD, NY and OR.

+ p<0.1, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Table 6.** Predicted probability of RTRP license adoption, by state licensure

	(1)	(2)
Entrepreneur	1.044 [0.029]	0.920+ [0.047]
Entrepreneur # No state license		1.174** [0.071]
No CPA, JD, or EA	57.551*** [6.056]	57.606*** [6.083]
Linked to ERO est.	2.488*** [0.067]	2.494*** [0.068]
Age	1.119*** [0.010]	1.119*** [0.010]
Age <sup>2</sup>	0.999*** [0.000]	0.999*** [0.000]
Male	1.030 [0.019]	1.029 [0.019]
Observations	502,510	502,510
ZIP code fixed effects	Yes	Yes
Num. of ZIP code groups	10,834	10,834
Num. of state clusters	49	49
Log-likelihood	-95,417	-95,403

Note: Logit odds ratios shown. Robust standard errors in brackets are clustered at state level.

States with tax preparer licensure are CA, MD, NY and OR.

+ p<0.1, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001