Three Essays on Regulation and Entrepreneurship

by

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DEDICATION

To My Family and Friends

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ABSTRACT

Three Essays on Regulation and Entrepreneurship

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Chair: Francine Lafontaine

This dissertation analyzes how government regulations can affect entrepreneurship and small business performance. The first essay focuses on the effects of occupational licensing regulation, which has increased dramatically in importance over the last several decades and currently affects more than one thousand occupations in the United States. I use confidential U.S. Census Bureau micro-data to study the relationships between occupational licensing and key business outcomes. Among findings that shed light on the effect of occupational licensing on entrepreneurship are that occupational licensing regulation does not affect the equilibrium number of practitioners, but substantially reduces their entry and exit rates and that providers of occupational licensing training, namely, schools, are larger and seem to be more profitable in states with more stringent occupational licensing regulation. In the second essay, I explore (with a coauthor) whether businesses started as franchises survive longer than those launched as independent businesses, and whether there is a relationship between state franchise relationship

regulation aimed at preventing franchisor opportunism and the survival of franchised businesses. We find the difference in one-year survival rate between franchised and independent businesses to be about five percentage points, and this gap to persist across two and three-year survival rates. State franchise relationship laws, however, do not seem to affect the survival of franchised businesses. In the final essay, I analyze (with a coauthor) how personal bankruptcy laws affect entrepreneurship. Lenient bankruptcy laws may encourage entrepreneurship by limiting the possible negative consequences of business failure. We examine this relationship using variation in state bankruptcy homestead exemptions, and analyze the impact of the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 that affected these exemptions. We argue that sole proprietorships are expected to be affected by the differences in homestead exemptions, corporations, because they have limited liability, not to be affected. Consistent with these predictions, entrepreneurs' choice of legal form of organization does not seem to be affected by homestead exemptions, and we find no evidence of any significant effect of the Bankruptcy Abuse Prevention and Consumer Protection Act on entry rates.

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CHAPTER 1

THE EFFECTS OF OCCUPATIONAL LICENSING: EVIDENCE FROM DETAILED BUSINESS-LEVEL DATA

1.1 Introduction

Occupational licensing regulation specifies requirements a practitioner must fulfill to be permitted to perform certain services. Such regulation currently governs, to varying degrees across U.S. states, more than one thousand occupations (Brinegar, 2006), and both the number of occupations and percentage of the workforce covered by such regulations have increased dramatically over the last several decades. At present, nearly thirty percent of the workforce is required to obtain some form of licensing, up from about four percent in the 1950s (Kleiner and Krueger, 2013). These, mostly state level, regulations directly affect both blue- and white-collar workers.[1]

Intended to improve service quality (Shapiro, 1986), limit negative externalities (Kleiner, 2006), and reduce information asymmetries (Arrow, 1963, Akerlof, 1970, Leland, 1979), occupational licensing regulation does not necessarily improve consumer welfare because, unlike voluntary certification, it also increases barriers to entry. Theoretical models of industry dynamics based on Jovanovic (1982), Hopenhayn (1992), and Asplund and Nocke (2006)

[1] For a detailed list, see, for instance, Bianco (1993). The Institute for Justice (Carpenter et al., 2012) recently published state licensing burdens for 102 low- and moderate-income occupations.

associate higher barriers to entry with reduced competition, which can harm consumers. Welfare loss is potentially especially large in industries characterized by frequently repeated purchases, limited potential for externalities, or easy-to-implement voluntary certification.

This essay makes several contributions to the literature. First, the literature on occupational licensing has largely relied on survey data that provide limited information on the number, and entry and exit patterns of, practitioners in a market, and limited the outcomes explored mostly to earnings. I combine two comprehensive U.S. Census Bureau data sets (the Longitudinal Business Database (LBD) and Integrated Longitudinal Business Database (ILBD)), in order to study the effect of occupational licensing on the per capita number, as well as entry and exit rates, of practitioners and thereby shed light on the effect of licensing on the intensity of competition. Second, I study the relationship between the intensity of occupational licensing and providers of the training. This relationship, which is crucial to a better understanding of the political economy of occupational licensing regulations, has been largely unexplored until now. Lastly, I study the effects of occupational licensing in the unique setting of the cosmetology industry, which provides jobs for more than a million practitioners. This industry is characterized by localized markets, relative within-industry homogeneity of occupations, substantial variation in regulation across the U.S. states, and sizable entry costs associated with licensing.

I find no evidence that more intense occupational licensing regulation affects the equilibrium number of practitioners or leads to higher prices for consumers. I do find, however, that such regulation substantially reduces practitioner entry and exit rates. That fewer practitioners seem to test their fit for the occupation may result in lower ability practitioners being able to survive in more intensely regulated markets. Lastly, the evidence suggests that

providers are the clear beneficiary of more licensing, licensing intensity being associated with both larger numbers of instructors and larger producer surplus for training schools.

The essay is organized as follows. In Section 1.2, I briefly review the occupational licensing literature and describe the cosmetology industry. I present a theoretical framework in Section 1.3, describe the data in Section 1.4, and discuss my empirical approach and present results on practitioners in Section 1.5. Results on providers of occupational licensing training are reported in Section 1.6, and political economy and endogeneity considerations discussed in Section 1.7. Concluding remarks are offered in Section 1.8.

1.2 Background

1.2.1 Occupational Licensing

Occupational licensing regulation limits to those who satisfy licensing requirements the number of practitioners in an occupation. Discussion of the effects of such regulation on service providers and consumers dates at least to Adam Smith (1776), who noted how practitioners like cutlers, weavers, and hatters could restrict competition by prescribing in bylaws the length of training and limits on numbers of apprentices.

Most empirical research on the effect of occupational licensing has focused on practitioner earnings. A large literature (e.g., Friedman and Kuznets, 1945, Kleiner and Kudrle, 2000, Tenn, 2001, Angrist and Guryan, 2008, Kleiner and Park, 2010, Pagliero, 2011, Kleiner and Krueger, 2013, and Thornton and Timmons, 2013) suggests that occupational licensing has a positive effect on practitioners' mean earnings. I revisit this issue in the context of cosmetology.

The limited research that has focused on the relationship between occupational licensing and number of practitioners per capita fails to find significant effects (e.g., Thornton and

Weintraub (1979) for barbers, White (1980) for registered nurses, and Thornton and Timmons (2013), who find mixed evidence for massage therapists).[2]

Evidence on the impact of licensing on practitioner entry and exit is even more limited. Using a binary indicator for presence of licensing, Law and Kim (2005), using data for 1880-1930, find licensing requirements too weak to affect the net growth of practitioners in most occupations. Although mentioned by Bresnahan and Reiss (1987) as an example of local regulations that should increase entry costs, occupational licensing regulations are not considered in their empirical analysis. The literature, however, suggests that occupational licensing reduces interstate mobility of licensed professionals (Pashigian, 1979) and depresses the rate of immigration of workers in licensed occupations (Federman et al., 2006, Peterson et al., 2013).

Although impact on quality of service is theoretically central to arguments for occupational licensing regulation, empirical evidence suggests that this relationship is weak at best. Larsen (2012) and Hotz and Xiao (2011) find mild positive effects, but most studies find either no (Kleiner and Kudrle, 2000, Angrist and Guryan, 2008) or negative (Carroll and Gaston, 1981, Kugler and Sauer, 2005) effects. The absence of differences in malpractice insurance rates between licensed and unlicensed states (Kleiner, 2006) is consistent with weak effects of licensing on quality. Data constraints preclude me from providing evidence on this question, but given the findings of the literature, this essay assumes no effect of licensing on quality.

Previous studies of the personal care industries find little effect of an hours of training licensing requirement on practitioner supply (Thornton and Weintraub, 1979), earnings (Kleiner, 2000, Timmons and Thornton, 2010), or vocational class enrollment (Klee, 2010). Only Adams

[2] Evidence on the effect of licensing regulation for nurse practitioners and physician assistants on health care service utilization is also mixed (Stange, 2012).

et al. (2002) provide some evidence suggestive of lower quantities and higher prices of transacted services in states with more stringent requirements.

1.2.2 Cosmetology

The standard industrial classifications, such as Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS), do not distinguish between cosmetologists, hairdressers, hair designers, and hair stylists. These occupations being subject to the same required number of hours of training in most states, I treat them as a single category and refer to them collectively as "cosmetologists."[3]

Its idiosyncrasies make cosmetology an ideal industry in which to study the effects of occupational licensing. First, licensing can impose substantial costs, especially relative to practitioner earnings, on entry to the occupation. In 2010, the average number of required hours of training was 1,599, the median annual wage of a cosmetology employee $22,760.[4] For a conservatively chosen tuition rate of $5/hour, and opportunity costs of time of $7.25/hour (Federal Minimum Wage), the entry costs would be $19,588,[5] in relative terms, 86 percent of the median practitioner's annual wage. Using a more realistic tuition rate of $10/hour, the costs amount to 121 percent of the median practitioner's annual wage.

[3] The six-digit NAICS industrial code for cosmetologists is 812112. In 2010, there were 667,277 cosmetology nonemployer businesses (Nonemployer Statistics, U.S. Census Bureau), defined as businesses with no paid employees, and 75,355 cosmetology employer establishments with 442,149 employees (County Business Patterns, U.S. Census Bureau). Barbers constitute a separate industrial category with a separate occupational licensing regulation. The barbering industry, in terms of number of practitioners, is only about one ninth the size of the cosmetology industry.

[4] Occupational Employment Statistics from the Bureau of Labor Statistics (BLS).

[5] Interviews with industry insiders and extensive Internet search suggest that five dollars per training hour is on the conservative end of the spectrum. More prestigious schools, such as the Aveda Institute, often charge more than ten dollars per training hour, and tuition in the Empire Education Group, the largest cosmetology school operator in North America, ranges between nine and twelve dollars per training hour.

Second, licensing requirements vary considerably across states.[6] Of the several dimensions of licensing requirements (e.g., presence of a practical licensing exam, differences in state reciprocity provisions, and required years of general education), I consider number of hours of training required to be the most important source of differences in costs of regulation for prospective practitioners. Cosmetology training requirements differ by as many as 1,100 hours across states (standard deviation of 254). Factoring in tuition at $10/hour and opportunity costs, this difference corresponds to as much as $18,975, or 83 percent of a median practitioner's annual wage.

Third, the non-tradable character of the services and limited willingness of consumers to travel to have their hair cut or styled renders cosmetology markets local. This study thus benefits from a high number of localized markets, which I equate with counties.[7] Whereas some papers take as their definitions of local markets small isolated town and cities (e.g., Bresnahan and Reiss, 1991) and others Component Economic Areas (e.g., Syverson, 2004), lower travel distances for consumers of personal services together with the availability of a wide set of control variables make a county-based definition of markets most suitable.

Finally, because in many industries establishments employ workers from many distinct occupations, industry-based business data often cannot be used to study regulation of a specific occupation. But in the cosmetology industry, firms employ mainly cosmetologists. Table 1.1 lists the main occupations in the cosmetology industry. If supervisors are considered cosmetology practitioners, more than eighty percent of individuals working in the cosmetology industry are, in

[6] Mention of U.S. states is understood to include the District of Columbia (D.C.).
[7] I use states as the relevant market definition in the analyses of occupational licensing training because of the greater distance students are willing to travel to get trained relative to the distance consumers are willing to travel to get their hair cut or styled.

fact, cosmetologists.[8] Cosmetologists can thus be tracked fairly accurately in U.S. Census Bureau business data, especially if the fraction of non-cosmetologists within the cosmetology industrial category is stable across states. The high fraction of cosmetologists within the cosmetology industrial category enables me to explore the relationship between intensity of occupational licensing and such key business outcomes as the number of practitioners in a market, their entry and exit rates, and the revenue gap between entrants and incumbents, and thereby shed light on competition, industry dynamics, and possible selection due to occupational licensing regulation.

The Economic Census of 2007 provides information on various business characteristics of the industry. Nonemployer practitioners, for instance, defined by the U.S. Census Bureau as businesses with no paid employees generated 38 percent of total cosmetology revenues of $32.2 billion in 2007.[9] In terms of legal form of organization, 98 percent of nonemployer businesses are proprietorships. With respect to employer establishments, 59 percent are corporations, 30 percent proprietorships, and 11 percent partnerships. Hair care services are responsible for 78 percent, merchandise sales for about six percent, skin-care services for five percent, and nail services for four percent of the revenues of cosmetology employer establishments. Massage and hair removal services and office space rentals account for the remaining seven percent.

[8] Scali-Sheahan (2008) notes that data on numbers of licensed practitioners traditionally compiled by professional organizations are no longer being collected. The comprehensive U.S. Census Bureau business data enable me to circumvent this problem.

[9] I use the Bureau of Labor Statistics' Consumer Price Index (CPI-U) to convert all variables denominated in current dollars to constant 2010 base, denoted in the tables by (2010 $).

1.3 Theoretical Framework

Because occupational licensing regulation increases the costs of entry, it should have a negative effect on the equilibrium number of practitioners in an industry. In states with more stringent regulation, the quantity of services provided is expected to be lower and price of services higher.

To provide intuition for the expected effect of sunk entry costs on equilibrium industry dynamics, that is, on entry and exit rates, I briefly describe a model by Backus (2012) that builds on Hopenhayn (1992) and Asplund and Nocke (2006).

Businesses in the model are assumed to be infinitesimally small and the number of *ex ante* identical potential entrants unlimited. Entrants pay the sunk costs of entry S to become active and learn their ability θ_t, which positively affects current period profitability π_t and, over time, evolves according to a Markov process based on a cumulative distribution function $F(\theta_{t+1}|\theta_t)$. Every period, each incumbent decides, based on ability θ_t and intensity of competition C_t in the market, whether to remain or exit the industry. Intensity of competition is captured by the distribution of types of active businesses. The payoff from exiting is normalized to zero.

The value function of an active business can be written recursively as,

$$V_t(\theta_t, C_t) = \pi_t(\theta_t, C_t) + max\left\{0, \beta \int V_{t+1}(\theta_{t+1}, C_{t+1}) dF(\theta_{t+1}|\theta_t)\right\}$$

where β is a discount factor. If entry is positive in equilibrium, the *ex ante* expected value of entering for an entrant of ability θ_E facing level of competition C^* has to be equal to the sunk costs of entry,

$$\int \beta V_{t+1}(\theta_{t+1}, C^*) dF(\theta_{t+1}|\theta_E) = S_t.$$

The exit strategy is summarized by a threshold rule that requires practitioners with ability equal to the exit threshold to be indifferent between remaining and exiting,

$$\int V_{t+1}(\theta_{t+1}, C^*) dF(\theta_{t+1}|\theta^*) = 0.$$

Intensity of competition is determined by the distribution of entrant types, and of incumbent types from the previous period,

$$C_{t+1}(\theta_{t+1}) = \gamma^* F(\theta_{t+1}|\theta_E) + \int_{\theta^*}^{1} F(\theta_{t+1}|\theta_t)\, dC(\theta_t).$$

A stationary competitive equilibrium of this game yields an equilibrium entry γ^*, ability threshold θ^* below which incumbent businesses exit, as well as equilibrium intensity of competition C^*.

The model implies that higher sunk costs of entry result in lower entry and exit rates.[10] The proof, done by Backus (2012), is conducted in two steps. First, it can be shown that higher sunk costs of entry imply a lower exit threshold. Second, entry and exit rates increase in the exit threshold. Higher sunk costs of entry thus imply lower equilibrium entry and exit rates.

1.4 Data

1.4.1 Licensing Regulation

Licensing requirements for cosmetologists have been around for decades, the first U.S. state to enact such regulation being Georgia, in 1914. By 1950, cosmetologists faced licensing requirements in 45 states (Council of State Governments, 1952). Hours of training required have been remarkably stable within states since at least the early 1980s. The median state hours requirement has been constant since that time as well, at 1,500 hours.

[10] Entry rate equals exit rate in equilibrium.

Because I am interested in long-run equilibrium outcomes, sunk costs of obtaining a license being irrelevant in the short run, my analyses focus on states with a stable hours requirement. I therefore consider only states in the contiguous United States with no documented change in the cosmetology training hours requirement from 1981 to 2010[11] and no multiple licensing categories within cosmetology.[12] The hours of training required in all U.S. states in 2010, and the 32 states that satisfy the aforementioned restrictions, are listed in Appendix 1.A (and depicted as well in a map in Figure 1.1).[13] The latter states accounted for 72.1 percent of the U.S. population in 2010.

Occupational licensing regulation is binding for all practitioners. Some states automatically license practitioners from other states with similar licensing requirements; other states require practitioners to take a new state licensing exam. Substituting years of practice for part of the hours requirement, in states in which it is permitted, enables some migrating practitioners, especially those migrating from low to high hours training requirement states, to take the licensing exam in a new state without having to return to a training school.[14]

Because building a clientele base is important in this industry, moving between states to avoid stricter licensing regulation is unlikely to be common. Working unlicensed, because it is usually a misdemeanor punishable by a fine and possibly imprisonment, is also unlikely.

[11] These years are determined by the availability of occupational licensing regulation data.

[12] Because they have multiple licensing categories with differing hours requirements, I exclude Colorado, Georgia, Idaho, Nevada, Ohio, and Wyoming. Colorado, for instance, requires cosmetologists to have 1,800 hours of training, hairstylists 1,200 hours of training.

[13] For robustness, I consider an extended set of states that had neither any change in the hours regulation in the 1993-2010 period nor multiple licensing categories (except for Georgia, in which cosmetology and hair stylist categories differ by only 175 hours). The 44 states are depicted in Figure 1.2. The results are consistent with the results from the baseline set of 32 states.

[14] In Michigan, for instance, the conversion rate is six months of experience for every hundred hours of training a cosmetologist lacks. Thus, an individual newly licensed in New York (1,000 hour requirement) who wants to move to Michigan (1,500 hour requirement) must either make up the difference in hours by returning to a cosmetology school or have practiced in New York for at least 30 months ((1,500 hrs. - 1,000 hrs.)/100 × 6 months).

Because they provide services to the public, cosmetologists would find it difficult to work clandestinely without the authorities or competitors noticing.[15]

Although the barrier occupational licensing poses to entry, because it is likely to decrease competition, might benefit practitioners by enabling them to earn more, this benefit may be offset by the costly upfront investment required to acquire a license. Schools that provide training, however, are likely benefit from occupational licensing because individuals who want to become licensed must be trained in an approved school. Schools benefit from higher regulation if demand for training services is inelastic with respect to the hours requirement, and profit as well from student tuition and revenues earned by students practicing during training. Currently licensed cosmetologists would likely be worse off were licensing to be relaxed as competition would likely increase.

Information on licensing requirements is from several sources. Information on cosmetology licensing requirements for 2010 is from the *2010 Endorsement Report* of the National-Interstate Council of State Boards of Cosmetology as well as my own compilations based on searches of individual state statutes, e-mail exchanges, and telephone interviews with representatives of state regulation boards and cosmetology schools. Morris Kleiner provided historical cosmetology regulation data dating back to 1981.[16] Information on cosmetology regulation in 1993 is from Bianco (1993). The mean of mandated training hours over the 32 states in my sample is 1,567 hours. In the regressions, I measure the training hours requirement in hundreds of hours.

[15] In states like Texas and California, detection of unlicensed practitioners by authorities is facilitated by the availability of an online complaint form that can be filed anonymously.
[16] These data are used in Kleiner (2006).

1.4.2 Dependent Variables - Practitioners

My empirical analyses rely on multiple sources of data.[17] The equilibrium number of practitioners per capita and their entry and exit rates are constructed from two confidential U.S. Census Bureau databases, the Longitudinal Business Database (LBD) and Integrated Longitudinal Business Database (ILBD). The LBD and ILBD provide not only more detailed information on businesses than publicly available data like the County Business Patterns and Nonemployer Statistics, but also linkages of employer establishments and nonemployer businesses over time that enable me to create county-year level measures of practitioner entry and exit.

The ILBD contains annual information on geographic location and annual revenues for all private sector nonemployer businesses in the United States.[18] Defined as businesses with no paid employees, nonemployer businesses accounted for 57 percent of cosmetology practitioners. I use the ILBD for 1994-2010, which is the longest uninterrupted interval currently available. The LBD provides annual information on location and employment for all private sector employer establishments in the United States[19] As well as analyzing the effect of licensing only on nonemployer practitioners, I also combine the ILBD and LBD to provide evidence on all cosmetology practitioners.

I assume a single practitioner to be involved in each nonemployer business, and employer establishments to have one practicing owner (partnerships, two practicing owners) and

[17] Appendix 1.B lists all dependent variables, the level at which they vary, and the data source.
[18] The ILBD, described in some detail by Davis et al. (2007), draws on information from individual and corporate tax returns and various business surveys conducted by the U.S. Census Bureau.
[19] Information on the construction of the LBD can be found in Jarmin and Miranda (2002).

exclusively practitioner employees.[20] The number of practitioners per capita is defined as the number of practitioners in a county divided by the county's population. Table 1.2 shows there to be, on average, 245 cosmetology practitioners per hundred thousand people, 178 of which are nonemployers. I focus only on the 32 states with stable licensing requirements, as discussed in Section 1.4.1. To simplify disclosure of results from the Census Bureau, I also consider only counties that had at least one cosmetology practitioner each year during the 1995-2009 period. This restriction is binding for less than two percent of counties. My sample for the county-level analyses consists of 2,055 observations (counties) per year.

As the equilibrium number of provided services is affected not only by the number of practitioners, but also by how much those practitioners work, I use the U.S. Census Bureau's publicly available American Community Survey (ACS) to investigate whether occupation licensing affects practitioners' weekly work hours (neither the ILBD nor LBD contain information on weekly hours of work).[21] Table 1.3, which provides descriptive statistics for the individual level data from the ACS, shows cosmetology practitioners to be, on average, 41 years of age, work, on average, 33.6 hours per week, and be mostly women. Constrained by the level of detail in the ACS data, the hours of work analyses are done only at the state-year level.

Entry and exit rates, defined at the county-year level, are based on information in the ILBD and LBD. For nonemployers, entrants are practitioners whose businesses are operating in the current period but were not in the market in the previous period. Entry rates are calculated as the ratio of year *t* number of entrants to year *t-1* number of practitioners. I create in a similar

[20] To limit the influence of measurement error and outliers, I consider only establishments in which the number of employees does not exceed the 99.99th percentile number of employees and adjusted average annual revenues are between $1,000 and $150,000 (2010 $).

[21] I use surveys for 2000-2011, currently the longest available span. As the ACS's question on usual weekly hours worked is asked for the year preceding the survey, my analyses span 1999-2010.

manner a county-year count of exiters. These are practitioners whose businesses are operating in the current period but are not in the market the following period. Exit rates are calculated as the ratio of year *t* number of exiters to year *t* number of practitioners. Table 1.2 shows nonemployer entry rates to have a mean of 26.6 percent and nonemployer exit rates a mean of 23.7 percent. As expected for an industry in long-run equilibrium and predicted by the model in Section 1.3, the entry rates are statistically no different from the exit rates.

For robustness, I create entry and exit rates for all, nonemployer and employer, practitioners. Entry and exit of the employer establishments is analogous to the nonemployer universe, differing only in terms of weighting by the number of practitioners in an establishment. Expansions and contractions of continuing establishments require some additional assumptions, as I do not have unique identifiers for individual practitioners within a business establishment. Expansion of an employer establishment is assumed to be covered by new practitioners, contractions due to practitioners exiting the profession. Continuing employer establishments that remain at the same employment size are assumed to retain the same practitioners, although, in fact, entering practitioners could have exactly offset exiting practitioners. Because of the additional assumptions needed because of the LBD data limitations, I use the combined nonemployer and employer measures only for robustness checks, and focus my analyses primarily on nonemployer entry and exit rates.

The entry rates I obtain are likely to be somewhat greater than measures based on new licensees. For example, the entry rate for Texas, which has been publishing data on numbers of new licensees, is about eighteen percent. I find higher rates because not all entrants are newly licensed practitioners. Exit rates are also likely to be greater than measures based on practitioners' terminal exits from a profession. Higher entry and exit rates do not pose a problem

for my entry and exit analyses as long as differences between the business-based measures I use and practitioner-based measures are not correlated with the intensity of occupational licensing.

Although the information from the LBD and ILBD enables me to measure my main variables of interest, number of practitioners per capita and practitioner entry and exit rates, occupational licensing regulation, as noted earlier, is also expected to affect practitioner earnings and consumer prices. From the ILBD, I obtain gross revenues of nonemployer practitioners from which I calculate median nonemployer practitioner revenues for each county and year. This variable and all other variables denominated in current dollars are converted to a constant 2010 base using the Bureau of Labor Statistics' Consumer Price Index (CPI-U). The mean of median nonemployer practitioner revenues is $15,993. This value being smaller than the median annual full-time wage of $22,760 reported by the Occupational Employment Statistics for 2010, it would appear that many practitioners are either not able to capture enough clientele or are working part time.

For consumer prices, I generate state-year level average prices for women's cut and shampoo blow-dry from Cost of Living Index (COLI) data derived from a survey of establishments in urban areas and published by the Council for Community and Economic Research (C2ER). Table 1.4 shows the mean price of women's cut and shampoo blow-dry to be $30.4, with a standard deviation of $5.5.

To provide insight into selection of practitioners caused by occupational licensing, I use the ILBD to define a gap in nonemployer entrants' revenues as the median annual revenues of an incumbent minus the median annual revenues of an entrant within the same market. As expected,

the median entrant has, on average, smaller revenues than the median incumbent, the average gap, as can be seen in Table 1.2, being $4,334.

1.4.3 Dependent Variables - Providers of Occupational Training

The Economic Census for 2007 identifies 1,727 cosmetology and barber schools with 15,999 employees and revenues of more than $1.3 billion. Eighty-three percent of these schools' revenues were generated by occupational training, seven percent by personal care services, and the remaining ten percent by merchandise sales, office space rentals, and other activities.

The relevant market for schools being geographically larger than that for cosmetology services, and number of schools in a typical county being small, I analyze providers of occupational training at the state level. Although the NAICS industrial classification does not distinguish between cosmetology and barber schools (NAICS 611511), cosmetology schools accounted for more than 94 percent of cosmetology and barber school establishments in December 2011 according to the U.S. Department of Education Database of Accredited Postsecondary Institutions and Programs. Thus, I restrict the current analyses to the set of 32 states used in the cosmetology practitioner analyses, and consider cosmetology hours requirements to be the relevant measure of required training.

Using the LBD database and Census population data, I calculate Instructors per Capita, defined as the number of instructors in a given state divided by the state's population. All employees as well as owners of school establishments are assumed to be instructors. I assume each establishment to have one owner (partnerships, two owners). Table 1.5 shows there to be 4.8 cosmetology instructors per 100,000 people. Number of School Establishments, also measured at the state-year level, is, on average, 33 per state. School Establishment Size, being

the median number of instructors per establishment in the state-year, is, on average, 8.9. Instructors' Median Wage, calculated from the LBD's annual payroll and number of employees per establishment, is $23,774. Average Revenues per School Establishment is calculated from the publicly available version of the Economic Census of 2002 (EC 2002). These data include total annual training school revenues at the state level, which I divide by the number of the school establishments in the state that year. The mean is $579,054. Average Gross Margin per School Establishment is defined as annual state training school revenues minus total payroll divided by the number of school establishments in the state that year. The mean is $383,801. Although fairly large, this margin is not equal to the economic rent, as school establishments also have to cover office rent, cost of energy and materials, and the opportunity costs of the owner.

1.4.4 Market Characteristics

Throughout my analyses, I control for a number of market-level characteristics. Campbell and Hopenhayn (2005) and Asplund and Nocke (2006) show that intensity of competition and industry turnover should increase with market size. I therefore include in all regressions yearly population levels and demographics (age, gender, and race composition) obtained from the County Population Estimates of the U.S. Census Bureau from 1995 to 2009.[22] Table 1.2 shows the average county population to be about one hundred thousand people. County data on annual personal income per capita, which is assumed to positively affect demand for cosmetology services, are from the Regional Economic Accounts of the Bureau of Economic Analysis. Mean personal income per capita is $30,278. County geographic area, which may affect consumer commuting distance and thus intensity of competition, and high school educational attainment

[22] In specifications that analyze the impact of licensing on the number of practitioners per capita, population is used only to create the dependent variable, not as a control variable. Because I include number of practitioners per capita in the regression as a dependent variable only after logarithmic transformation, the elasticity of population with respect to the number of practitioners is restricted to one.

data, which may affect the supply of practitioners, are from the U.S. Census Bureau State and County QuickFacts.[23] County-level data on annual unemployment rates, which may influence both demand for services and supply of practitioners, are from the Local Area Unemployment Statistics of the Bureau of Labor Statistics (BLS). The unemployment rate averages 5.6 percent. In all the state-level analyses including analyses of number of hours worked, price of service, and providers of occupational training the market characteristics are included at the state level.

To control for possible unobserved factors that may affect economic outcomes in densely populated areas and are not fully captured by population and personal income variables (e.g., higher office rent), I include in the county-level analyses a binary indicator for central counties of metropolitan statistical areas obtained from U.S. Census Bureau Metropolitan and Micropolitan Statistical Areas data. To account for the possibility that states with more stringent occupational licensing regulation may have also adopted other business regulations that might affect my analyses, I include the *Small Business Survival Index* (SBSI) for the year 2000 produced by the Small Business & Entrepreneurship Council (Keating, 2000) and designed to reflect major state-level costs imposed on businesses; the greater the index, the greater the costs. In the sample, the index ranges from 24.9 (South Dakota) to 68.2 (D.C.).

1.5 Econometric Specifications and Results

The theoretical framework in Section 1.3 provides several predictions about the effects of occupational licensing regulation that I investigate in this section. I first test whether occupational licensing negatively affects number of practitioners per capita and quantity of services provided by examining the number of practitioners per capita and hours of work per

[23] Educational attainment data from the U.S. Census Bureau State and County QuickFacts are cross-sectional; Census derives them from the American Community Surveys from 2007-2011.

practitioner. I next test whether prices are higher in markets with more stringent occupational licensing and, using nonemployer revenue data, also estimate whether practitioner revenues are higher in such markets. I then examine the effects of occupational licensing on entry and exit rates, which, based on the model of long-run industry dynamics described in Section 1.3, should be lower in markets with more stringent requirements. To provide insight into selection due to occupational licensing, I test whether entrants do better, relative to incumbents, in more regulated markets. I expect the gap in revenues between entrants who test their fit for the occupation and incumbents to be larger in markets with low occupational licensing requirements.[24]

To study the effects of occupational licensing, I rely on variation in the intensity of licensing training requirements across states. As the effect of licensing intensity cannot be identified together with state fixed effects, to mitigate concerns about omitted variable bias, my specifications include an extensive list of variables that might be both correlated with the intensity of occupational licensing regulation and affect the outcomes of interest. The specifications also include year and Census division fixed effects to account for such unobserved factors as differences in tastes across divisions and time.[25]

1.5.1 Number of Practitioners per Capita and Usual Hours of Work

Based on the theoretical framework in Section 1.3, regulation is expected to have a negative effect on number of practitioners per capita. I therefore estimate the following equation,

$$Y_{cst} = \alpha R_s + \beta X_{cst} + \eta_t \times \delta_d + \varepsilon_{cst}$$

[24] Based on the model in Section 1.3, the ability threshold θ^* for surviving in the market with lower sunk costs is higher.

[25] The U.S. Census Bureau defines nine divisions, namely, New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific.

where the *c* subscript indexes counties, the *s* subscript states, *d* subscript geographical divisions within the United States, and the *t* subscript years.[26] My analyses cover 2,055 counties in 32 states over 15 years. In this specification, Y_{cst} is the log of per capita number of practitioners. The natural logarithm is used to limit the impact of outliers. For the same reason, I perform a logarithmic transformation for two control variables, personal income per capita and geographic area. The main independent variable of interest is Regulation (R_s), measured in hundreds of hours of training required.

The vector of control variables (X_{cst}) includes the county-year log of per capita personal income, unemployment rate, and county demographics, specifically, the gender, race, and age compositions of the population. It also contains county-level geographic area, high school education, a state-level indicator for the general business environment (SBSI index), and a binary variable for whether the observation comes from a central county of a metropolitan statistical area. To account for common unobserved factors within years and U.S. Census Bureau divisions, I include year fixed effects interacted with division fixed effects, denoted by $\eta_t \times \delta_d$. Because the outcomes of interest may be correlated across counties within a state as well as over time, standard errors are clustered at the state level.

The results in Table 1.6 imply no effect of intensity of licensing training on number of practitioners per capita. In the specification with year-division fixed effects (column 2), the effect of an extra one hundred hours of training requirement on number of practitioners per capita is -0.3 percent and not statistically different from zero. This finding is surprising because occupational licensing is expected to reduce the number of practitioners. At the conventional

[26] To simplify disclosure review of the results by the U.S. Census Bureau, all regression analyses are provided for 1995-2009. Year 1994 data were used to define entry rates for the year 1995 and year 2010 data to define exit rates in 2009.

statistical significance level, however, the confidence interval allows me to detect only an effect larger than one percent. Thus, a reduction, if there is one, must be relatively small. Considering only nonemployer practitioners (column 4) yields the same conclusion.

Because the total number of hours cosmetology practitioners provide is affected by not only the number of practitioners, but also the number of hours they work, I employ the ACS data that contain information on cosmetologists' usual weekly hours. To analyze whether practitioners work fewer hours in states with more intense occupational licensing regulation, I estimate the following equation,

$$Y_{ist} = \alpha R_s + \beta X_{ist} + \eta_t + \delta_d + \varepsilon_{ist}$$

where the *i* subscript indexes individual practitioners, the *s* subscript states, the *d* subscript geographical divisions within the United States, and the *t* subscript years. The regression is a pooled ordinary least squares (OLS). The results in Table 1.7 suggest that cosmetologists do not work more hours in more intensely regulated states. In the specification with year-division fixed effects (column 2), the effect of an extra one hundred hours of training requirement on the usual weekly hours of work is 0.1 percent and not statistically different from zero. The standard errors are, however, large, and at the conventional statistical significance level allow me to detect only an effect larger than 6.7 percent.

In the aggregate, the results for number of practitioners and their usual hours of work suggest, quite surprisingly, no significant effect of occupational licensing on the equilibrium quantity of services provided.

1.5.2 Consumer Prices and Practitioner Earnings

Occupational licensing may affect prices by increasing practitioner skill and thus improving the quality of services rendered, or by reducing competition, enabling existing providers to charge more. I do not find any effect of licensing regulation on consumer prices, as shown in Table 1.8. In the specification with year-division fixed effects (column 2), the effect of an extra one hundred hours of training requirement on the price of a women's cut and shampoo blow-dry is close to zero. The standard errors are, however, somewhat large, and allow me to detect, at the conventional statistical significance level, only an effect greater than 1.5 percent. The finding of no significant results on prices, although surprising, taken together with the foregoing finding of no effect on per capita number of practitioners, suggests that consumers may not experience negative consequences, in terms of higher prices or fewer providers, of more stringent occupational licensing.

To increase confidence in my findings on prices and hours of work, I examine the effect of licensing on median practitioner annual revenues. As I do not find effects of occupational licensing on prices of cosmetology services or cosmetology practitioners' usual hours of work, I do not expect to find any effect of occupational licensing on annual revenues. Table 1.9 shows that, in the specification with year-division fixed effects (column 2), the effect of an extra one hundred hours of training requirement on median practitioner revenues is small and only marginally statistically significant. Annual revenues of the median practitioner in the county are thus surely not higher in more regulated markets.

1.5.3 Industry Dynamics - Entry and Exit Rates

The model described in Section 1.3 assumes equilibrium entry and exit rates to be equal in a long-run equilibrium, and implies that they should be negatively related to the sunk costs of

entry. I test this prediction with a specification similar to those in Section 1.5.1. In the entry rate specification, however, I use control variables lagged by one year, as it may be last year's market conditions that drive potential practitioners' decisions to start occupational licensing training. I estimate the following equation,

$$Y_{cst} = \alpha R_s + \beta X_{cs(t-1)} + \eta_t \times \delta_d + \varepsilon_{cst}$$

where, again, the *c* subscript indexes counties, the *s* subscript states, the *d* subscript geographical divisions within the United States, and the *t* subscript years. Controlling for year times division fixed effects in Table 1.10, column 2, produces entry rates smaller by half a percentage point per hundred hours of licensing requirement. This is a substantial effect, given a mean entry rate of 24.9 percent. The effect is slightly stronger when only nonemployer practitioners, for whom the constructed entry (and exit) measures have less measurement error, are considered, as discussed in Section 1.4. Entry rate results are robust to considering current period control variables. As expected based on the model, and as can be seen in columns 2 and 4 in the second half of the table, the effect on exit rates is similar in magnitude to the effect on entry rates. The findings on entry and exit rates are consistent with the predictions of the long-run industry dynamics model, which implies entry and exit rates lower in markets with more stringent requirements.

Overall, the evidence suggests that the effect of regulation on prices and revenues is small at best. Entrants in highly regulated markets might, however, through more training, be able to earn higher revenues than those in less regulated markets without affecting median revenues in the market.

In a last set of analyses of practitioners, I consider a specification similar to those in Section 1.5.1, in which the dependent variable is, however, the revenue gap between the median

entrant and median incumbent nonemployer practitioner in a market. The results, reported in Table 1.11, suggest that entrants' revenues are greater relative to those of incumbents in states with a higher hours requirement. The gap is $182 in annual revenues per hundred hours' difference in licensing requirement. Entering practitioners might thus still be able to recoup at least part of the cost of a higher occupational licensing requirement by being able to earn more from the start. The results are robust to considering a gap normalized by median nonemployer revenues in the market that year.

1.6 Providers of Occupational Training

Turning to the link between the intensity of occupational licensing and outcomes for training providers, I estimate the relationship between regulation and number of instructors per capita, number of training school establishments, and median school establishment size. I use a specification similar to that used in the per capita number of practitioners' regressions and rely again on cross-state variation in the hours requirements. Observations, however, are at the state-year instead of county-year level, as the relevant market for schools is geographically larger than that for cosmetology services and the number of schools in a typical county small.

The results, reported in Table 1.12, show states with more intense training requirements to have more instructors per capita. This is not surprising, given the above documented lack of a negative effect of regulation on per capita number of practitioners. If number of instructors is proportional to average required number of training hours in the sample, specifically 1,567 hours, an increase of one hundred hours in the licensing requirement corresponds to 6.4 percent increase (100*100%/1,567) in the number of instructors needed. The actual estimate with division fixed effects is 5.1 percent, which is somewhat smaller and could be explained by my finding of lower entry rates in markets with more stringent occupational licensing. As can be

seen in the last column of Table 1.12, however, instructors in more regulated states are not better paid. The estimated coefficient is close to zero. The training requirement also does not affect number of school establishments, as can be seen in column 2 of Table 1.13. The standard errors are, however, somewhat large, and would enable me to detect an effect of at least 3.8 percent per hundred hours. The median size of the school establishment, in terms of number of instructors, is larger in more intensely regulated states by about 6.3 percent, as shown in column 4 of the table.

In Table 1.14, I report results on the relationship between the hours training requirement and schools' revenues and gross margins, which imply that average revenues of school establishments are greater in states with more stringent licensing. Although these regressions are limited to a single year and the sample is relatively small, the estimates are large and statistically significant.[27] Gross margins earned by these schools (i.e., revenues minus payroll) are also substantially larger in more stringently regulated states. When I include division fixed effects to control for tastes and other unobserved division-level differences, the effect is about twenty percent per hundred hours of training requirement, as can be seen in the last column of Table 1.14. Given the large magnitude of this coefficient, schools, even when their larger size (Table 1.13, last column) is taken into consideration, seem to do better in more regulated states. Together, these findings suggest that the benefits of occupational licensing accrue mostly to owners of schools.

1.7 Political Economy and Endogeneity

Angel (1970) cites as two of the main reasons for growth in licensing public demand for increased protection and pressure by members of occupational groups on state legislators.

[27] The sample is small because, I currently have to rely only on publicly available aggregate information from the Economic Census of 2002, which provides information for only a subset of states.

Stigler (1971), discussing the political economy aspects of these types of regulations, suggests that occupations in states with greater occupational size relative to the total labor force become subject to licensing requirements earlier. The capture theory of occupational licensing is supported by Pagliero (2011). Other research concludes that the political economy aspects of occupational licensing regulation affect both the timing and intensity of regulation (Wheelan, 1998, Tenn, 2001, Law and Kim, 2005).

One implication of the political economy view of these regulations is that reverse causality might be a concern when estimating the effects of occupational licensing. That is, occupational licensing regulation may be more stringent in states with a greater number of practitioners per capita because of their political power and desire to limit the number of future entrants.

To shed light on this question, I regress the current intensity of regulation in states with stable licensing requirements on number of practitioners per capita and fraction of urban population in the Census years 1900, 1910, 1920, and 1930. Because the historical Census did not separate the two, I include as practitioners both barbers and hairdressers. My finding that states with more practitioners per capita adopted more stringent hours requirements is shown in Specification A in Table 1.15. When I include division fixed effects (Specification B), however, the coefficients become smaller and statistically not significant. I also find that states with a higher number of cosmetology practitioners per capita adopt licensing regulation for the occupation sooner (Specification A, Appendix 1.C).[28] As above, with division fixed effects the coefficients become smaller and statistically not significant (Specification B, Appendix 1.C). Altogether, the results confirm the importance of including division fixed effects in analyses of

[28] Law and Kim (2005) find the same pattern using a hazard model.

the effects of licensing regulations. However, as my analyses focus on recent years in states with stable hours requirements, the causes of behind regulation intensity, unless they persist over very long horizons, should be irrelevant.

A second concern is that reliance on cross-state variation might admit the possibility of omitted variable bias if some other market-level factors not controlled for in the empirical analyses are both correlated with the regulation and affect the outcomes. Because I am unable to completely rule out such a possibility, I include an extensive list of variables that might be correlated with the intensity of the occupational licensing regulation and affect the outcomes of interest, such as market-level population, per capita mean personal income, demographic characteristics (age, gender, and race composition), fraction of the population with at least a high school diploma, unemployment rate, geographic area, and SBSI index (which is designed to reflect major state-level costs imposed on businesses). To further mitigate this concern, I include year, or year interacted with division fixed effects.

A third concern is the focus only on states with stable licensing environments, which might possibly differ from states not included along a dimension other than, but correlated with, cosmetology licensing regulation. Descriptive statistics comparing states with low, medium, and high hours of regulation intensity with states that recently changed their regulation and were thus excluded are reported in Appendix 1.D. There is no apparent pattern suggesting that states excluded would differ from those included in the analyses. Regression results reported in Appendix 1.E show the excluded states not to be significantly different from the states included in the analyses along any of the considered dimensions including per capita number of cosmetology practitioners, prices of cosmetology services, personal income per capita, demographic composition, geographic area, or SBSI index. This increases my confidence that

the set of excluded states is not significantly different from the states considered in my analyses. Including division fixed effects, as described above, further mitigates this concern.

1.8 Conclusion

This essay provides empirical evidence of the effects of occupational licensing on business activity, price of services, industry dynamics, selection, and providers of licensing training in the context of cosmetology. I find that states with more intense licensing requirements have neither fewer practitioners per capita nor higher prices for services. They do, however, have significantly lower entry and exit rates. The evidence is suggestive of fewer practitioners testing their fit for the occupation in states with more intense regulation, allowing even lower ability practitioners to survive in the market. I also find states with more stringent licensing requirements to have more occupational training instructors, a larger median size of training facilities, and larger school revenues and gross profits. Instructors, however, do not earn more in such states. These findings suggest that the benefits of occupational licensing accrue mostly to owners of training schools.

Table 1.1 – Occupations in the Cosmetology Industry

Occupation	**Cosmetology Industry** (NAICS 812112)
Hairdressers, Hairstylists, and Cosmetologists (%)	77.2
Miscellaneous Personal Appearance Workers (%)	6.8
Supervisors (%)	6.0
Receptionists (%)	4.7
Barbers (%)	0.7
Other (%)	4.6
Number of Observations	90,269

Source: IPUMS-ACS,[29] 2001-2011

[29] The IPUMS ACS data are available courtesy of Ruggles et al. (2010).

Table 1.2 – Descriptive Statistics for Practitioners' Regressions (ILBD & LBD)

	Cosmetology	
Variables	**Mean**	**SD**
Practitioners/100,000 people	245.18	79.91
Nonemployer Practitioners/100,000 people	177.72	69.54
Median Annual Revenues (2010 $)	15,993	4,981
Entry Rate (%)	24.87	15.99
Exit Rate (%)	22.55	10.13
Nonemployer Entry Rate (%)	26.59	17.23
Nonemployer Exit Rate (%)	23.67	10.86
Gap in Nonemployer Entrants' Revenues* (2010 $)	4,334	8,283
Hours Requirement (in 100s)	15.92	2.71
Population	100,087	337,417
Population: Mean Personal Income (2010 $)	30,278	7,476
Population: Males (%)	49.57	1.88
Population: Caucasians (%)	88.01	15.16
Population: African Americans (%)	8.67	13.89
Population: Other Race (%)	3.32	6.86
Population: Age 14 and Younger (%)	20.35	2.80
Population: Age 15-64 (%)	64.28	3.51
Population: Age 65 and Older (%)	15.37	4.10
Population: At Least High School Diploma (%)	83.36	7.22
Population: Unemployed (%)	5.64	2.60
Geographic Area (Square Miles)	832	913
Indicator for MSA Central County	0.1698	0.3755
SBSI	40.22	6.96
Number of States	32	
Number of Counties	2,055	
Number of Observations	30,825	
Period	1995-2009	

Notes: The observations are at the county-year level (2,055 counties times 15 years). * Gap in Nonemployer Entrants' Revenues is defined as median annual revenues of an incumbent minus median annual revenues of an entrant. Hours Requirement varies only across states. At Least High School Diploma and Geographic Area variables vary only across counties. The SBSI index, which varies only across states, is designed to take into account major state-level costs imposed on businesses; the greater the value, the greater the costs. In the sample, the index ranges from 24.9 (South Dakota) to 68.2 (D.C.).

Table 1.3 – Descriptive Statistics for Usual Hours of Work (ACS)

Variables	Mean	SD
Weekly Hours Worked	33.61	11.78
Employee: Age	41.30	13.75
Employee: Age Squared	1894.40	1209.94
Employee: Male (%)	8.26	27.53
Employee: Caucasian (%)	80.38	39.71
Employee: African American (%)	8.50	27.89
Employee: Asian Race (%)	4.80	21.38
Employee: Other Race (%)	6.31	24.32
Employee: Hispanic (%)	12.16	32.68
Employee: Less than 12 Grades (%)	6.06	23.85
Employee: High School (%)	59.82	59.82
Employee: Some College (%)	29.03	45.39
Employee: College (%)	5.09	21.99
Employee: Single (%)	22.53	41.78
Employee: Married (%)	56.19	49.62
Employee: Not Single or Married (%)	21.28	40.93
Employee: At Least One Child (%)	46.49	49.88
Employee: Naturalized Citizen (%)	10.14	30.19
Employee: Not a Citizen (%)	6.10	23.93
Hours Requirement (in 100s)	14.53	2.55
Population	14,675,684	11,058,579
Population: Mean Personal Income (2010 $)	39,929	5,556
Population: Males (%)	49.06	0.53
Population: Caucasians (%)	79.41	7.62
Population: African Americans (%)	13.19	7.62
Population: Other Race (%)	7.40	4.93
Population: 14 and Younger (%)	20.31	1.70
Population: Age 15-64 (%)	66.88	1.06
Population: 65 and Older (%)	12.81	1.94
Population: At Least High School Diploma (%)	79.70	3.58
Population: Unemployed (%)	6.21	2.28
Geographic Area (Square Miles)	162,861	144,135
SBSI	41.31	7.26
Number of States	32	
Number of Observations	46,425	
Period	1999-2010	

Notes: The observations are at the state-year level. The sample contains only cosmetologists, based on the Standard Occupational Classification (SOC), at least eighteen years old, with usual weekly hours of work greater than zero and not exceeding eighty, and personal income between $1,000 and $150,000 (2010 $). Hours Requirement, At Least High School Diploma, Geographic Area, and the SBSI variables vary only across states.

Table 1.4 – Descriptive Statistics for Prices of Cosmetology Services (COLI)

	Cosmetology	
Variables	**Mean**	**SD**
Price (2010 $)	30.42	5.51
Hours Requirement (in 100s)	15.74	2.92
Population	6,705,233	7,532,375
Population: Mean Personal Income (2010 $)	36,702	7,044
Population: Males (%)	48.94	0.66
Population: Caucasians (%)	81.21	12.69
Population: African Americans (%)	13.83	12.88
Population: Other Race (%)	4.96	3.49
Population: Age 14 and Younger (%)	20.62	1.92
Population: Age 15-64 (%)	66.37	1.56
Population: Age 65 and Older (%)	13.02	1.70
Population: At Least High School Diploma (%)	80.72	4.43
Population: Unemployed (%)	5.08	1.60
Geographic Area (Square Miles)	114,619	103,931
SBSI	42.21	8.21
Number of States	32	
Number of Observations	454	
Period	1995-2009	

Notes: Price refers to the price for women's cut and shampoo blow-dry. Observations are at the state-year level. As price data are missing for some state-years, the number of observations is smaller than 480 (32 states times 15 years). Hours Requirement, At Least High School Diploma, Geographic Area, and the SBSI variables vary only across states.

Table 1.5 – Descriptive Statistics for Analyses of Providers of Occupational Training (LBD)

Providers of Occupational Training		
Variables	**Mean**	**SD**
Instructors/100,000 people	4.79	2.63
Instructors' Median Wage (2010 $)	23,774	4,715
Number of School Establishments	32.61	31.97
School Establishment Size (Instructors)	8.91	3.11
Hours Requirement (in 100s)	15.67	2.86
Population	6,464,328	7,416,688
Population: Mean Personal Income (2010 $)	36,754	6,949
Population: Males (%)	48.92	0.65
Population: Caucasians (%)	81.83	12.69
Population: African Americans (%)	13.31	12.76
Population: Other Race (%)	4.86	3.43
Population: Age 14 and Younger (%)	20.56	1.89
Population: Age 15-64 (%)	66.37	1.54
Population: Age 65 and Older (%)	13.06	1.68
Population: At Least High School Diploma (%)	80.86	4.42
Population: Unemployed (%)	5.05	1.57
Geographic Area (Square Miles)	110,128	102,983
SBSI	42.55	8.31
Number of States	32	
Number of Observations	480	
Period	1995-2009	

Notes: The observations are at the state-year level (32 states times 15 years). Hours Requirement, At Least High School Diploma, Geographic Area, and the SBSI variables vary only across states. The At Least High School Diploma variable is from the Decennial Census of 2000.

Table 1.6 – OLS Regression Results: Number of Practitioners per Capita

	Log(Practitioners/Capita)		Log(Nonemp. Pract./Capita)	
Hours Requirement (in 100s)	**0.002**	**-0.003**	**0.013**	**-0.006**
	(0.006)	(0.005)	(0.011)	(0.010)
Control Variables	Yes	Yes	Yes	Yes
Fixed Effects – Year	Yes	No	Yes	No
Fixed Effects – Year × Division	No	Yes	No	Yes
Number of Observations	30,825	30,825	30,825	30,825
Period	1995-2009	1995-2009	1995-2009	1995-2009

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Observations are at the county-year level. All regressions include the following set of control variables: log of per capita mean personal income, log of geographic area, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, fraction of population with at least a high school diploma, unemployment rate, SBSI index, and an indicator for central counties of the Metropolitan Statistical Area.

Table 1.7 – OLS Regression Results: Weekly Hours Worked

	Log(Weekly Hours Worked)	
Hours Requirement (in 100s)	**0.007**	**0.001**
	(0.005)	(0.034)
Control Variables	Yes	Yes
Fixed Effects – Year	Yes	No
Fixed Effects – Year × Division	No	Yes
Number of Observations	46,425	46,425
Period	1999-2010	1999-2010

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. All regressions contain employee-level variables shown in Table 1.3 that control for age, gender, race, ethnicity, education, marital status, presence of children, and citizenship. The regressions also include the following state-level controls: log of population, log of per capita mean personal income, log of geographic area, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, fraction of population with at least a high school diploma, unemployment rate, and SBSI index.

Table 1.8 – OLS Regression Results: Prices of Cosmetology Services

	Log(Price)	
Hours Requirement (in 100s)	**-0.005**	**0.0005**
	(0.006)	(0.0078)
Control Variables	Yes	Yes
Fixed Effects – Year	Yes	No
Fixed Effects – Year × Division	No	Yes
Number of Observations	454	454
Period	1995-2009	1995-2009

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Price is the price for women's cut and shampoo blow-dry and is from the Cost of Living Index (COLI) data published by the Council for Community and Economic Research (C2ER). Observations are at the state-year level. As price data are missing for some state-years, the number of observations is smaller than 480 (32 states times 15 years). All regressions include the following set of control variables: log of population, log of per capita mean personal income, log of geographic area, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, fraction of population with at least a high school diploma, unemployment rate, and SBSI index.

Table 1.9 – OLS Regression Results: Median Annual Revenues

	Log(Median Annual Revenues)	
Hours Requirement (in 100s)	**0.009***	**-0.010***
	(0.005)	(0.005)
Control Variables	Yes	Yes
Fixed Effects – Year	Yes	No
Fixed Effects – Year × Division	No	Yes
Number of Observations	30,825	30,825
Period	1995-2009	1995-2009

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Observations are at the county-year level. The dependent variable is a logarithm of median annual revenues of nonemployer practitioners in a market in a given year. All regressions include the following set of control variables: log of per capita mean personal income, log of geographic area, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, fraction of population with at least a high school diploma, unemployment rate, SBSI index, and an indicator for central counties of the Metropolitan Statistical Area.

Table 1.10 – OLS Regression Results: Entry and Exit Rates

	Entry Rate (%)		Nonemployers' Entry Rate (%)	
Hours Requirement (in 100s)	**-0.141**	**-0.500*** **	**-0.154**	**-0.636*** **
	(0.159)	(0.122)	(0.218)	(0.193)
Control Variables	Yes	Yes	Yes	Yes
Fixed Effects – Year	Yes	No	Yes	No
Fixed Effects – Year × Division	No	Yes	No	Yes
Number of Observations	30,825	30,825	30,825	30,825
Period	1995-2009	1995-2009	1995-2009	1995-2009
	Exit Rate (%)		**Nonemployers' Exit Rate (%)**	
Hours Requirement (in 100s)	**-0.129**	**-0.408*** **	**-0.259**	**-0.522*** **
	(0.123)	(0.084)	(0.176)	(0.133)
Control Variables	Yes	Yes	Yes	Yes
Fixed Effects – Year	Yes	No	Yes	No
Fixed Effects – Year × Division	No	Yes	No	Yes
Number of Observations	30,825	30,825	30,825	30,825
Period	1995-2009	1995-2009	1995-2009	1995-2009

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Observations are at the county-year level. All regressions also include the log of lagged population, log of lagged per capita mean personal income, log of geographic area, lagged fraction of males, lagged fraction of African Americans, lagged fraction of population other than African American or Caucasian, lagged fraction of population age 14 and younger, lagged fraction of population age 65 and older, fraction of population with at a least high school diploma, unemployment rate, SBSI index, and an indicator for central counties of the Metropolitan Statistical Area.

Table 1.11 – OLS Regression Results: Gap in Entrants' Revenues†

	Gap in Entrants' Revenues	
Hours Requirement (in 100s)	**23.9**	**-181.9*****
	(62.9)	(44.0)
Control Variables	Yes	Yes
Fixed Effects – Year	No	No
Fixed Effects – Year × Division	No	Yes
Number of Observations	30,825	30,825
Period	1995-2009	1995-2009

Notes: † Gap in Entrants' Revenues is defined as median annual revenues of a nonemployer incumbent minus median annual revenues of a nonemployer entrant. Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Observations are at the county-year level. All regressions include the following set of control variables: log of population, log of per capita mean personal income, log of geographic area, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, fraction of population with at least a high school diploma, unemployment rate, SBSI index, and an indicator for central counties of the Metropolitan Statistical Area.

Table 1.12 – OLS Regression Results: Instructors

	Log(Instructors/Capita)		Log(Instructors' Median Wage)	
Hours Requirement (in 100s)	**0.064*** **	**0.051*** **	**0.0009**	**-0.004**
	(0.012)	(0.017)	(0.0068)	(0.006)
Control Variables	Yes	Yes	Yes	Yes
Fixed Effects – Year	Yes	Yes	Yes	Yes
Fixed Effects – Division	No	Yes	No	Yes
Number of Observations	480	480	480	480
Period	1995-2009	1995-2009	1995-2009	1995-2009

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Observations are at the state-year level. All regressions include year fixed effects and the following set of control variables: log of per capita mean personal income, log of geographic area, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, fraction of population with at least a high school diploma, unemployment rate, and SBSI index. Instructors' Median Wage regressions also include log of population.

Table 1.13 – OLS Regression Results: Schools

	Log(Number of School Establishments)		Log(School Establishment Size)	
Hours Requirement (in 100s)	**0.006**	**-0.014**	**0.049*** **	**0.063*** **
	(0.022)	(0.019)	(0.015)	(0.021)
Control Variables	Yes	Yes	Yes	Yes
Fixed Effects – Year	Yes	Yes	Yes	Yes
Fixed Effects – Division	No	Yes	No	Yes
Number of Observations	480	480	480	480
Period	1995-2009	1995-2009	1995-2009	1995-2009

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Observations are at the state-year level. All regressions include year fixed effects and the following set of control variables: log of population, log of per capita mean personal income, log of geographic area, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, fraction of population with at a least high school diploma, unemployment rate, and SBSI index. School Establishment Size is defined as the state-year median size of a school establishment in terms of number of instructors.

Table 1.14 – OLS Regression Results: School Revenues and Margins

	Log(Avg. Revenues of School Establishments)		Log(Avg. Gross Margin of School Est.)	
Hours Requirement (in 100s)	**0.092*** **	**0.207*** **	**0.101*** **	**0.203*** **
	(0.032)	(0.064)	(0.028)	(0.066)
Fixed Effects – Division	No	Yes	No	Yes
Number of Observations	25	25	25	25

Notes: Robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Regression data are from states with stable required hours of training for cosmetologists for which the U.S. Census Bureau provides publicly available information based on the Economic Census of 2002, namely: Arkansas, California, D.C., Florida, Illinois, Indiana, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, South Dakota, Texas, Utah, and West Virginia. Subject to data constraints, Average Gross Margin of School Establishment is defined as annual state training school revenues minus state annual payroll divided by the number of school establishments in the state. All regressions include the following set of state-level control variables: log of per capita mean personal income, log of population, log of geographic area, and SBSI index. With the full set of control variables, the coefficients are of similar magnitude, although in specifications with division fixed effect, due to lack of degree of freedom, the coefficients are no longer statistically significant.

Table 1.15 – OLS Regression Results: Explaining the Intensity of Occupational Licensing Regulation

	Hours Requirement for Cosmetologists			
Specification A	**(1)**	**(2)**	**(3)**	**(4)**
Log(Practitioners per Capita)	**324.11*** **	**423.45*** **	**296.94**	**480.38** **
	(114.26)	(136.97)	(263.07)	(189.92)
Urbanization (%)	**-10.76*** **	**-10.89*** **	**-8.42** **	**-10.97*** **
	(3.28)	(2.92)	(3.16)	(2.66)
Fixed Effects – Division	No	No	No	No
Number of Observations	32	32	32	32
Census Data from Year	1900	1910	1920	1930
Specification B	**(1)**	**(2)**	**(3)**	**(4)**
Log(Practitioners per Capita)	**122.27**	**140.78**	**-149.98**	**-12.32**
	(129.23)	(178.03)	(298.13)	(231.34)
Urbanization (%)	**-3.93**	**-4.17**	**-0.55**	**-2.78**
	(3.95)	(4.13)	(4.29)	(3.64)
Fixed Effects – Division	Yes	Yes	Yes	Yes
Number of Observations	32	32	32	32
Census Data from Year	1900	1910	1920	1930

Notes: Robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. The observations are states with stable licensing requirements per Section 1.4.1. Because the Census did not separate the two in the relevant periods, I include as practitioners both barbers and hairdressers.

Figure 1.1 – Cosmetology Training Hours Requirements (2010)

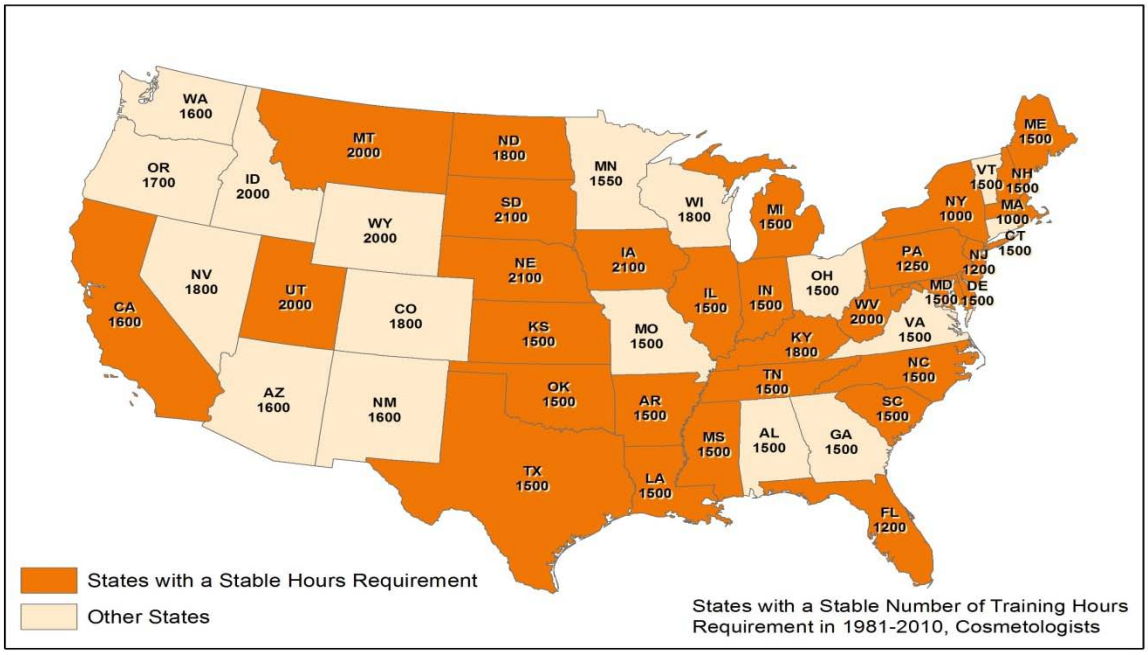
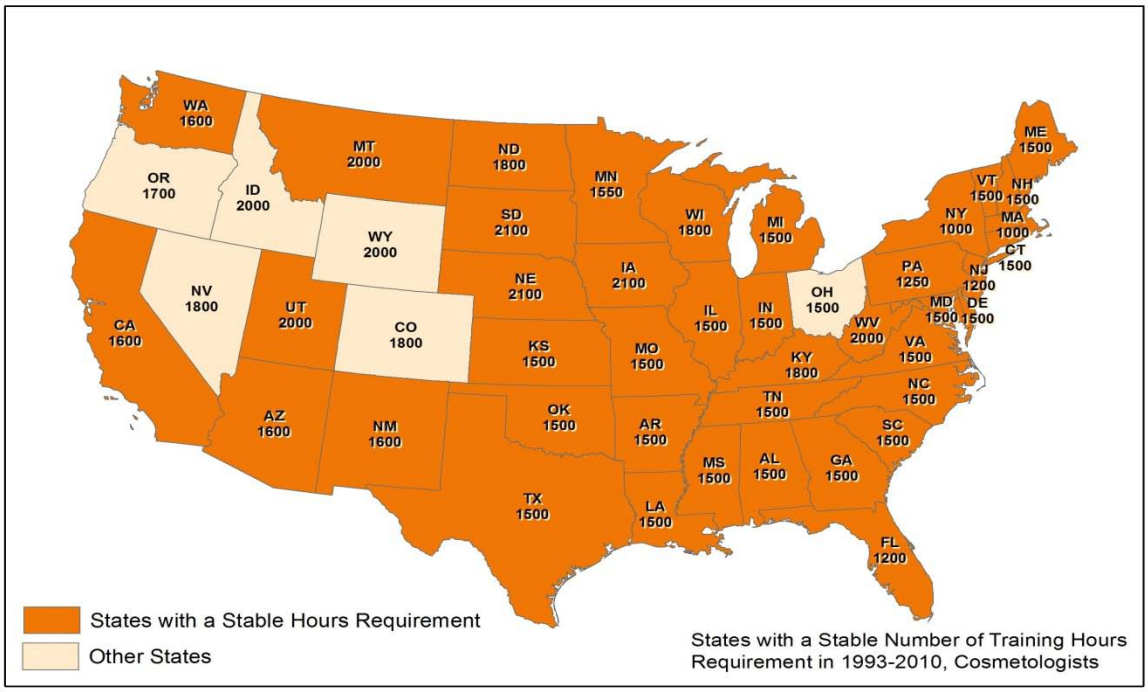


Figure 1.2 – Robustness Checks: Extended Set of States (2010)



Notes: As robustness checks, I use an extended set of 44 states (including Alaska with 1,650 hours, not depicted) that did not have a change in hours regulation in the 1993-2010 period and do not have multiple licensing categories (except for Georgia, in which cosmetology and hair stylist categories differ by only 175 hours).

Appendix 1.A – Cosmetology Training Hours Requirements in 2010

State	Cosmetology Hours	State	Cosmetology Hours
Alabama[2]	1,500	**Montana[1,2]**	**2,000**
Alaska[2]	1,650	**Nebraska[1,2]**	**2,100**
Arizona[2]	1,600	Nevada	1,800*
Arkansas[1,2]	**1,500**	**New Hampshire[1,2]**	**1,500**
California[1,2]	**1,600**	**New Jersey[1,2]**	**1,200**
Colorado	1,800*	New Mexico[2]	1,600
Connecticut[2]	1,500	**New York[1,2]**	**1,000**
Delaware[1,2]	**1,500**	**North Carolina[1,2]**	**1,500**
D.C. [1,2]	**1,500**	**North Dakota[1,2]**	**1,800**
Florida[1,2]	**1,200**	Ohio	1,500*
Georgia[2]	1,500*	**Oklahoma[1,2]**	**1,500**
Hawaii	1,800*	Oregon	1,700
Idaho	2,000*	**Pennsylvania[1,2]**	**1,250**
Illinois[1,2]	**1,500**	**Rhode Island[1,2]**	**1,500**
Indiana[1,2]	**1,500**	**South Carolina[1,2]**	**1,500**
Iowa[1,2]	**2,100**	**South Dakota[1,2]**	**2,100**
Kansas[1,2]	**1,500**	**Tennessee[1,2]**	**1,500**
Kentucky[1,2]	**1,800**	**Texas[1,2]**	**1,500**
Louisiana[1,2]	**1,500**	**Utah[1,2]**	**2,000**
Maine[1,2]	**1,500**	Vermont[2]	1,500
Maryland[1,2]	**1,500**	Virginia[2]	1,500
Massachusetts[1,2]	**1,000**	Washington[2]	1,600
Michigan[1,2]	**1,500**	**West Virginia[1,2]**	**2,000**
Minnesota[2]	1,550	Wisconsin[2]	1,800
Mississippi[1,2]	**1,500**	Wyoming	2,000*
Missouri[2]	1,500	***Mean***	***1,599***

[1] Indicates the 32 states in the contiguous United States with no documented change in the cosmetology training hours requirement from 1981 to 2010 and no multiple cosmetology categories. The states are depicted in Figure 1.1.
[2] Indicates the 44 states with no documented change in the cosmetology training hours requirement from 1993 to 2010 and no multiple cosmetology categories. The states are depicted in Figure 1.2.
* Indicates cases with an alternative category of cosmetology professional that has a somewhat different title and different training hours requirement (for instance, Cosmetologists and Hair Designers in Ohio, with requirements of 1,500 and 1,200 hours, respectively).
Source: Cosmetology requirements are based on 2010 Endorsement Report of the National-Interstate Council of State Boards of Cosmetology and my own compilations. Thanks to Morris Kleiner, I also have cosmetology regulation data for several years since 1981. Additionally, I used cosmetology regulations in Bianco (1993).

Appendix 1.B – List of Dependent Variables and Sources

Dependent Variable	Variation	Data Source
Practitioners		
Practitioners per Capita	County-Year	ILBD & LBD, Census
Nonemployer Practitioners per Capita	County-Year	ILBD, Census
Weekly Hours Worked	Individual	ACS
Price	State-Year	COLI
Median Annual Revenues	County-Year	ILBD
Entry Rate	County-Year	ILBD & LBD
Exit Rate	County-Year	ILBD & LBD
Nonemployer Entry Rate	County-Year	ILBD
Nonemployer Exit Rate	County-Year	ILBD
Gap in Entrants' Revenues	County-Year	ILBD
Providers of Occupational Training		
Instructors per Capita	State-Year	LBD, Census
Instructors' Median Wage	State-Year	LBD
Number of School Establishments	State-Year	LBD
School Establishment Size	State-Year	LBD
Avg. Revenues per School Establishment	State	EC 2002
Avg. Gross Margin per School Establishment	State	EC 2002

Notes: ILBD stands for Integrated Longitudinal Business Database (a confidential data set from the U.S. Census Bureau), LBD for Longitudinal Business Database (a confidential data set from the U.S. Census Bureau), Census for population data (a publicly available data set from the U.S. Census Bureau), ACS for the American Community Survey (a publicly available data set from the U.S. Census Bureau), COLI for the Cost of Living Index (a proprietary data set from the Council for Community and Economic Research), and EC 2002 for the Economic Census of 2002 (a publicly available version of the data from the U.S. Census Bureau).

Appendix 1.C – OLS Regression Results: Explaining the Year of Adoption of Occupational Licensing Regulation

	Cosmetology: Year of Adoption			
Specification A	**(1)**	**(2)**	**(3)**	**(4)**
Log(Practitioners per Capita)	**-7.72****	**-9.40****	**-7.96**	**-10.60****
	(3.17)	(3.92)	(5.02)	(4.85)
Urbanization (%)	**0.12**	**0.10**	**0.04**	**0.07**
	(0.08)	(0.06)	(0.06)	(0.06)
Fixed Effects – Division	No	No	No	No
Number of Observations	30	30	30	30
Census Data from Year	1900	1910	1920	1930
Specification B	**(1)**	**(2)**	**(3)**	**(4)**
Log(Practitioners per Capita)	**-0.15**	**1.89**	**4.68**	**5.87**
	(4.00)	(6.09)	(6.04)	(8.71)
Urbanization (%)	**-0.10**	**-0.13**	**-0.14**	**-0.16**
	(0.09)	(0.10)	(0.09)	(0.10)
Fixed Effects – Division	Yes	Yes	Yes	Yes
Number of Observations	30	30	30	30
Census Data from Year	1900	1910	1920	1930

Notes: Robust standard errors are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. The observations are states with stable licensing requirements per Section 1.4.1 and known year of adoption of occupational licensing. Because the Census did not separate the two in the relevant periods, I include as practitioners both barbers and hairdressers.

Appendix 1.D – Descriptive Statistics of States

Cosmetologists	Regulation Intensity			Excluded
	Low	Medium	High	
Hours Requirement	1,130	1,505	1,988	/
Population Personal Income per Capita (2010 $)	44,528	38,244	34,172	38,745
SBSI*	42.95	42.53	42.32	42.49
Price (2010 $)	34.26	32.92	26.35	31.29
Practitioners/100,000 people**	349.71	339.76	317.00	313.93
Weekly Hours Worked***	34.27	34.66	34.29	34.33
Age***	40.11	39.62	38.27	39.08
Number of States	5	19	8	19

Notes: Low hours requirement states are those with fewer than 1,500 hundred hours required, medium hours requirement states those with 1,500 hundred to less than 1,800 hours required, and high hours requirement states those with 1,800 hours or greater required. "Excluded" denotes states excluded from the analyses, mostly because of changes in their hours requirement over the 1981-2010 period. * The SBSI index, which varies only across states, is designed to take into account major state-level costs imposed on businesses; the greater the value, the greater the costs. In the sample, the index ranges from 24.9 (South Dakota) to 68.2 (D.C.). ** Calculated from the County Business Patterns and Nonemployer Statistics for 1999-2010. *** Averaged over cosmetologists in the ACS data.

Appendix 1.E – OLS Regression Results: Excluded States

	Indicator for Excluded States
	Cosmetology
Log(Practitioners per Capita)	-0.411
	(0.293)
Log(Price) (2010 $)	-0.046
	(0.458)
Log(Mean Personal Income) (2010 $)	-0.311
	(0.823)
Log (Population)	0.473
	(0.345)
Population: Males (Fraction)	8.782
	(26.254)
Population: African Americans (Fraction)	-0.121
	(0.805)
Population: Other Race (Fraction)	0.369
	(0.762)
Population: Age 14 and Younger (Fraction)	-9.722
	(7.331)
Population: Age 65 and Older (Fraction)	-9.633
	(5.978)
Population: At Least High School Diploma (Fraction)	3.576
	(2.192)
Population: Unemployed (Fraction)	0.170
	(1.702)
Geographic Area (Square Miles)	0.022
	(0.121)
SBSI	0.001
	(0.009)
Number of Observations	638
Period	1998-2010

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. The dependent variable is an indicator denoting 19 states that were excluded from the analyses, mostly because of changes in their licensing regulation. The demographic variables describe a state population. Price information not having been collected for some years in some states, the number of observations is smaller than 663 (13 years times 50 states and D.C.).

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CHAPTER 2

SURVIVAL PROSPECTS OF FRANCHISED AND INDEPENDENTLY OWNED BUSINESSES: A NEW LOOK[†]

2.1 Introduction

The International Franchise Association (IFA), numerous individual franchisors, and the trade press have for decades maintained that the failure rate of individual franchised businesses is far below the high rates of failure of independent firms generally. The IFA's position is reflected in the following excerpt from its critique of the CNBC Documentary, "Behind the Counter: The Untold Story of Franchising."

> According to the U.S Small Business Administration, seven out of 10 new employer firms survive only 2 years, half at least 5 years, a third at least 10 years, and a quarter stay in business 15 years or more. […] According to previous research conducted by the IFA Educational Foundation, more than 90 percent of franchisees renew their agreements at the end of their contracts. On an annualized basis, approximately 5-6 percent of the franchisees that come up for renewal are terminated (not renewed), and approximately 2-3 percent are transferred to another owner (this may be due to a retirement, a death of the previous owner, or a multitude of other factors that have nothing to do with whether or not the business was "successful").

[†] This essay represents joint work with Francine Lafontaine of the University of Michigan.

The tone of the IFA's message, and statistics emphasized within it, suggest that franchises are much less risky than independent businesses. But when failure rates of franchised businesses overall, not just the subset of failure attributable to terminations and non-renewals in franchised chains, are compared with those of independent businesses, the evidence is mixed. Bates (1995a, b), for example, documented that 38 percent of franchised, versus 32 percent of non-franchised, small businesses started in 1986-1987 were no longer operating in late 1991. In other words, the failure rate of franchised businesses is greater, and that of independent businesses much lower, than suggested by industry insiders.

In theory, starting a business as a franchise should be less risky than launching an independent business because franchisees benefit from franchisors' reputation and know-how and may realize cost savings from more efficient supply chains and bulk purchasing. That franchised establishments have become a ubiquitous part of modern day life suggests that business owners value these benefits.[30] Independent business owners, however, do not have to pay franchising fees including royalties on revenues, and retain complete autonomy, allowing them to adapt as needed to changing market conditions. This latter capacity suggests a potential for superior performance by non-franchised businesses.

This essay revisits the question of franchise versus independent business performance measured in terms of survival rates. We also explore whether state franchise relationship regulations aimed at preventing franchisor opportunism increase the survival of franchised businesses. Our analyses exploit newly available U.S. Census Bureau data from the Survey of

[30] Franchise information collected from more than 4.3 million establishments by the U.S. Census Bureau in the Economic Census Franchise Statistics for 2007 document that franchise establishments represented 10.5 percent of employer establishments and employed 7.9 million people. The majority of establishments in franchise chains (77.4 percent) were franchisee-owned. For an industry breakdown of these data see, for instance, Kosová and Lafontaine (2012).

Business Owners (SBO) that includes a question about whether or not a business is franchised. The SBO was started in 2002 and is currently available also for the year 2007. We use the comprehensive Longitudinal Business Database (LBD) of the U.S. Census Bureau to determine survival status for the first few years in business. To limit differences in survival rates documented for repeat business owners (see, notably, Bates, 1998 for franchise business owners and Kalnins and Lafontaine, 2013 for business owners generally), we focus on single-establishment businesses, whether franchised or independent. We find that in simple mean comparisons, the one-year survival rate is about six percentage points higher for franchised than for independent businesses. The difference in the two-year survival rate is even greater at nine to ten percentage points. Controlling for the many factors that may lead an individual to pursue a franchise rather than open an independent business reduces the difference in survival rate slightly, to about five percentage points for the one-year survival rate. Although this gap persists for the two-year and three-year survival rates, we do not find, conditional on having survived one year, any survival advantage for franchised businesses. Franchised businesses from the 2002 cohort that survived to 2003, for instance, have no survival advantage over the set of independent businesses that also survived to that point. Its absence after the first year suggests that the conditional survival advantage of franchised businesses is not a function of franchisers' selection of higher ability applicants relative to market selection in the case of independent businesses. We would expect franchisor selection of higher ability individuals to be reflected in a survival advantage for franchised businesses that persists beyond their initial years. That it does not leads us to suspect that the higher survival rate in the initial years is perhaps best explained by franchisor provided know-how.

The essay is organized as follows. In Section 2.2, we briefly review the relevant literature and describe state franchising regulations. Details pertaining to the data are provided in Section 2.3. We present our empirical approach in Section 2.4, and our results in Section 2.5. Concluding remarks are offered in Section 2.6.

2.2 Literature

Bates's (1995a, b) finding that survival prospects are better for independent than for franchised businesses runs counter to commonly held beliefs. Although his study used the best data available at the time—the Characteristics of Business Owners (CBO) dataset from 1987, predecessor of the Survey of Business Owners (SBO) used in this study—the small sample size and persistent claims that franchising is much safer than independent business ownership suggest that the question warrants renewed consideration.

The decision to open a franchised rather than an independent business being non random, one must find a way to control for "selection into franchising" in order to ascertain whether franchising has any direct effect on survival (see, for example, Kosová, Lafontaine, and Perrigot, 2013 on the issue of comparing other outcomes of interest between franchised and non-franchised businesses). Evidence that selection into franchising is not random is variously provided by Williams (1998), Kaufmann (1999), and Mazzeo (2004). Williams (1998) shows such characteristics of business owners as education, managerial experience, and experience as a salaried worker to increase the likelihood of an entrepreneur entering into a franchise relationship. Kaufmann (1999) finds evidence that entrepreneurs are more likely to open franchise businesses in sectors of business activity with which they are unfamiliar, and independent businesses in sectors with which they are familiar. Mazzeo (2004), analyzing the motel industry, finds heterogeneity in the underlying economic environment to affect the

likelihood of affiliation. Motels located near interstate highway exits and in markets with greater volumes of traffic and higher uncertainty, for example, are more likely to be franchised. Our findings on the probability of starting franchise relative to independent businesses are in line with this literature.

Klick, Kobayashi, and Ribstein's (2009) study of state franchise relationship laws find their impact on franchise activity to be negligible when parties are allowed to contract around the laws. The empirical evidence does not support the notion that franchise terminations are a manifestation of franchisor opportunism (Blair and Lafontaine, 2005).

2.3 Data

Whether a business is franchised or independent is identified in the Survey of Business Owners (SBO), a confidential U.S. Census Bureau survey first conducted in 2002. The Census's attempt to obtain information on more than 2.2 million businesses (and their owners) yielded a response rate of 75 percent for the SBO 2002 and 62 percent for the SBO 2007.[31] The SBO universe includes all nonfarm businesses with annual receipts of at least $1,000 that filed Internal Revenue Service tax forms as individual proprietorships, partnerships, or corporations. The survey is conducted every five years, together with the Economic Census. At the time of this study, data collected in this survey were available only for the years 2002 and 2007 (data collected in the 2012 survey having not yet been released). The SBO collects information on the characteristics of both businesses (e.g., industrial sector of operation, legal form of organization, and franchise status) and business owners (e.g., gender, race, age, and education). These variables enable us not only to examine the effect of owner characteristics on survival directly,

[31] The Characteristics of Business Owners (CBO) database used by Bates (1995a, b, 1998) and Williams (1998) was the precursor of the SBO. The CBO sample was much smaller, however.

but, more important, to control for differences between owners of franchised and independent businesses. Because many of the characteristics that predict business survival likely influence as well the decision to buy a franchise or start an independent business, were we not to control for them in our survival analyses our coefficient of interest, on the effect of franchising, would likely be biased upwards. This could lead us to conclude that survival is positively affected by franchising when it is actually caused by differences in the characteristics of the business owners. We return to this issue in the econometric specification section.

Another confidential U.S. Census Bureau dataset, the Longitudinal Business Database (LBD), provides annual information on all private sector employer establishments in the United States. A subset of all business establishments, employer establishments include only businesses with a payroll.[32] Although most businesses in the United States do not have employees, we focus on employer businesses because most economic activity occurs through them. Merging the LBD with the SBO based on unique business establishment identifiers (the match was quite high at 98.2 percent for 2002, and 98.8 percent for 2007) enables us to measure the survival of employer businesses surveyed in the SBO.

To avoid the systematic survivorship bias that characterizes firms founded earlier (to appear in the surveys, firms have to have survived up to the survey year), we focus on single-establishment businesses started in the years to which the SBO relates, that is, 2002 and 2007. This restriction gives us 158,600 businesses in the 2002, and 96,700 businesses in the 2007, wave.[33] As the proportion of franchise relative to independent businesses that survive for any period of time may (as data below suggest) be different, conclusions based on subsets of businesses that have survived up to a certain point could introduce a bias in our analyses.

[32] Information on construction of the LBD can be found in Jarmin and Miranda (2002).
[33] To satisfy U.S. Census Bureau disclosure procedures, all counts are rounded to hundreds.

Moreover, we consider only privately owned businesses in which the main owner had at least a fifty percent stake. This restriction ensures that a business owner, whose characteristics we control for, has a significant influence on the business and its success. Being interested in for-profit businesses, we also eliminate nonprofit establishments and those owned by an estate, a trust, or members of a club. Finally, our goal being to assess the success of franchised relative to independent businesses, we focus on sectors of activity in which franchising is a relevant option. We therefore limit our analyses to businesses that operate in industries with a non-negligible franchising presence. Defining this subset as industries in four-digit North American Industry Classification System (NAICS) sectors in which at least three percent of businesses in our cleaned SBO sample are franchised yields 106 and 82 such industries for the 2002 and 2007 samples, respectively. These sectors account for 92.7 percent of franchised companies in the 2002, and 91.5 percent in the 2007, sample. Our findings are robust to using different cutoffs. The data and sample are further described in Appendix 2.A. The list of industries can be found in Appendix 2.B. Our final sample for the SBO 2002 and 2007 waves consists of 11,582 and 4,351 observations, respectively. Consistent with the 10.5 percent of businesses identified as franchised in the 2007 Economic Census, we find in the final sample for the 2002 wave 11.9 percent, and in the final sample for the 2007 wave 11.6 percent, of businesses to be franchised.

We create for each business a series of binary variables that indicate whether it was still operating *t* years after it was started. We run separate regressions for each survival duration up to three years after business startup. It is important to note that the LBD records a business sold to another owner as an exit and entry of a new business. Because small business owners who sell their businesses often receive, according to the trade press, far less than predicted future cash flows would warrant, business sales may well represent a type of failure, in which case our data

correctly capture the event of interest. If one believes that business sales should not be counted as business failures, how this would affect our results depends on whether the buying and selling of franchises relative to independent businesses exhibits systematic differences. Assuming for both types of businesses a similar pattern for this dimension, our descriptive statistics would underestimate to a similar degree the true survival rates of both types of businesses. Thus, the difference in survival rates between the two types of businesses would be correctly estimated, and the coefficient on our franchise indicator variable in regression analyses would be unbiased. If we expect franchises to be more likely than independent businesses to be bought and sold, if for no other reason than that the former are less likely than the latter to be substantially changed upon transfer of ownership, then the difference in survival rates, and coefficient on franchise status in our regressions, would be biased downwards.

With this caveat, Table 2.1 reports descriptive statistics for all variables broken down by franchise status and SBO wave. Our main dependent variables, rates of business survival, are higher for franchised startups. The one-year survival rate for the 2002 cohort is 97.4 percent for franchised, and 90.9 percent for independently owned, businesses, the two-year survival rate, 89.1 and 80.0 percent, respectively. The three-year survival advantage of franchises over independent businesses is even greater, at more than 11 percentage points. This pattern generally holds as well for the 2007 cohort, although all survival rates are smaller, likely reflecting the fact that businesses started in 2007 were soon faced with a major economic downturn.

Interesting demographic differences among owners include fewer female franchisees in both cohorts, fewer young (less than 34 years old) franchisees in the 2002 cohort, and higher levels of formal education among franchisees generally, individuals with bachelor's and postgraduate degrees constituting 48.8 percent of franchised, and only 36.2 percent of

independent, business owners in 2002 (this difference is even greater for 2007). This latter pattern is in line with findings reported in Williams (1998). Franchised businesses are also more likely to be organized as corporations or partnerships and less likely to be operated from home, to be somewhat larger in terms of initial employment size, and to be more likely to use bank loans as a source of financing. We find no systematic differences in the characteristics of the counties in which the businesses are established.

We consider in our analyses the impact of state franchise laws. Disclosure, registration, and relationship are three categories of laws governing franchising at the state level. The requirements of state disclosure laws being similar to the mandates of the Federal Trade Commission's Franchise Rule, and registration laws being unlikely to have a significant effect, we focus on the impact of the relationship laws that were put in place to allay franchisor opportunism. States with franchise relationship laws include Arkansas, California, Connecticut, Delaware, Hawaii, Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, New Jersey, Tennessee, Virginia, Washington, and Wisconsin (also see Appendix 2.C).[34] We test for a relation between the presence of franchise relationship laws and the survival of franchised businesses.

2.4 Econometric Specification

In Section 2.3, we discussed demographic differences between franchisees and independent business owners based on Table 2.1. To shed light on the differences in a regression framework, we estimate the probability of starting a business as a franchise instead of as an independent business using the following equation,

[34] Because franchisors in those two states can terminate franchise agreements without good cause, we do not consider Mississippi and Missouri to have franchise relationship laws, although technically they do.

$$Franchised_{ijkcs} = X_{ijkcs}\alpha + \eta_{jk} + \delta_s + \varepsilon_{ijkcs}$$

where the subscript *i* identifies a business started in an SBO survey year (either 2002 or 2007), *j* indexes the business's sector (4-digit NAICS), *k* indicates startup size category (0, 1-5, 6-20, or 21-100 employees), and *c* indexes the county and *s* the state in which the business is located. The dependent variable *Franchised* is a binary variable equal to one if the business is a franchise, and zero otherwise. The *X* vector includes owner-, business-, and market-level variables. Specifically, we include indicators for business owner age, gender, race, and education, and whether the business is operated primarily from home. As Mazzeo (2004) finds heterogeneity in the economic environment to be correlated with the decision to affiliate (become a franchisee) or operate independently, we also include in our regressions several market-level (in this case county) characteristics, such as mean county personal income per capita and demographics, for the year in which the business was started. Lastly, to account for various common but unobserved constant factors within U.S. states and within sectors in businesses of similar initial employment, we include state fixed effects and industry fixed effects (4-digit NAICS) interacted with startup size. The fixed effects are denoted in our regression equation by δ_s and η_{jk}. The explanatory variables are elaborated in Appendix 2.A.

When analyzing survival, the dependent variable is an indicator for whether the business is still in operation *t* years later. We estimate the following equation,

$$Y_{ijkcst} = \alpha Franchised_{ijkcs} + \beta R_s Franchised_{ijkcs} + X_{ijkcs}\gamma + \eta_{jk} + \delta_s + \varepsilon_{ijkcst}$$

where, again, the subscript *i* identifies a business started in an SBO survey year (either 2002 or 2007), *j* indexes its sector (4-digit NAICS), *k* indicates startup size category (0, 1-5, 6-20, or 21-100 employees), and *c* indexes the county and *s* the state in which the business is located.

The main explanatory variable of interest is *Franchised* status, which indicates whether the business is operated as a franchise. To estimate the effect of state franchising laws, we include an interaction between franchised status and an indicator *R* for states with franchise relationship laws. The estimation exploits within-state variation between franchised and independent businesses, assuming only the former to be affected by state franchise relationship laws.

The *X* vector again includes owner-, business-, and county-level control variables, specifically, indicators for business owners' age, gender, race, and education as well as an indicator variables for the average number of hours worked in the business. These variables capture possible differences in performance among entrepreneurs of varying demographic characteristics, levels of education, and effort levels, some of which might also affect their decision to become a franchisee. For example, we find, as does Williams (1998), that more formally educated individuals are more likely to start a franchise than an independent business. Given this, and assuming that an owner's human capital, often measured in terms of education level, affects business survival, a regression of business survival on a franchising indicator variable that did not include education among the regressors would yield upward-biased estimates of the effect of franchising. This is because the coefficient of the franchise indicator variable would capture not only the effect of franchising, but also the survival advantage that would accrue to greater human capital being applied to the business. Put differently, the absence of human capital (education) in a regression in which it should be included would yield a positive correlation between the error term (which would include the effect of the omitted variable, human capital) and the franchise indicator variable, thereby violating a central

assumption of the regression model and leading to (omitted variable) bias in the coefficient of interest.

For similar reasons, we include indicator variables for legal form of organization, source of capital used to start the business, and whether the business is operated primarily from home, and is family owned (the latter coded based on a question that asks whether the majority of the business is owned by members of the same family). We control for the size of the business at startup by including the initial year employment level. We include in our regressions several market-level (in this case county) characteristics, such as mean county personal income per capita and demographics, in the year in which the business was started. As above, to account for various common but unobserved factors within U.S. states and within sectors in businesses of similar initial employment, all regressions also include state fixed effects and industry fixed effects (4-digit NAICS) interacted with startup size.

We estimate the probability of survival separately for each SBO wave and each survival period (one, two, and three year survival) under a linear probability model. We also report conditional survival results, that is, the probability that a business survives for another year given that it has already survived for one or two years. Reported standard errors are robust to heteroskedasticity.

2.5 Results

As can be seen in Table 2.2, gender and race do not predict franchise status, but age and education do. Entrepreneurs aged 35 to 64 are more likely to become franchisees, the effect being stronger with age within this range. The probability also increases with formal education, individuals with bachelor's or postgraduate degrees being around ten percentage points more likely to become franchisees relative to independent business owners. We also find franchises to

be less likely to be operated from home. The results do not show any pattern of systematic differences in the characteristics of the counties in which the businesses are established.

The first three columns of Table 2.3 report coefficients for one-, two-, and three-year survival for businesses started in 2002. We find franchised businesses to have a 5.1 percentage point higher one-year survival rate than independent businesses. For the two- and three-year survival rates, the difference is somewhat greater at 5.9 and 7.2 percentage points, respectively. In columns 4 to 6, we report results for the cohort of businesses started in 2007, for which the survival advantage is similar at 4.9, 5.7, and 5.1 percentage points for one-, two-, and three-year survival, respectively. These differences in survival rates between the two modes of business startup are substantial relative to the means, given an initial one-year survival rate for businesses in our sample of 91.7 percent for the 2002, and 89.6 percent for the 2007, cohort (see Table 2.1), but somewhat lower than those reported in our descriptive statistics. This confirms the importance of controlling for factors that might affect the decision to become a franchisee in estimating the effect of franchising on survival. That state franchise relationship laws do not seem to have any effect on franchised businesses' survival can be seen from row 2 in Table 2.3. Coefficients for the franchise relationship laws for the 2007 wave could not be disclosed due to U.S. Census Bureau restrictions, but qualitatively are not statistically different from zero.

The results in Table 2.3 also show the businesses of African American owners to have lower, and those of Asian owners higher, probabilities of survival. Owner age is positively related to a business's duration, and we find few significant effects of education, but striking negative effects of low effort. This being a decision variable for the business owner, it might be that owners put less effort into businesses that are not promising. In any case, the correlation between effort and survival is revealing. Similarly, we find in both cohorts businesses organized

as corporations (the omitted category) to have substantially greater survival rates than those organized as proprietorships or partnerships. This, too, might be capturing business owners' level of dedication to their ventures. Finally, businesses financed at least partly via bank or government guaranteed loans have greater, and those financed via credit card lower, survival probabilities. This is not a surprising finding given the screening process involved in obtaining bank or government financing.

Table 2.4 summarizes the results of the conditional survival regressions in which we examine the effect of franchising and other business and owner characteristics on the probability that a business will survive another year given that it has already survived one (columns 1 and 3 for the 2002 and 2007 cohorts, respectively) or two (columns 2 and 4) years. The results in this table do not show any pattern of systematic differences in one year survival between franchised businesses and independently owned businesses that survived one or two years. Nor to state franchise relationship laws affect the conditional survival of franchised businesses.

Between the likelihood that the higher survival rate of franchised businesses is driven by transfer of franchisors' know-how or capacity to recruit higher ability individuals, we believe know-how to be the more likely driver. Because high ability franchisees should enjoy persistently higher rates of survival than independent owners, but after surviving the first year franchised businesses' rate of survival is no higher than that of independent businesses, we suspect know-how transfer to be particularly important in explaining the difference in survival between franchised and independent businesses.

The results in Table 2.4 also show the lower survival probability of businesses of African American owners, and survival advantage of businesses of Asian owners, to persist even after conditioning on surviving for one, or for the 2007 cohort two, years. That the effects of owner

effort in the survey year also persist even after conditioning on both one and two year survival suggests that the initial-year effort might reveal something about owners' attitudes towards work that helps their businesses survive later on. The greater survival of businesses organized as corporations (omitted category) relative to sole proprietorships and partnerships, and survival advantage of being financed by a bank loan or government guaranteed loan, are present as well after conditioning on one or two year survival. Being financed, at least in part, by credit card, on the other hand, lowers the conditional survival probability in both waves. Thus, unlike franchise status, which improves survival only in the first year and is not present conditionally, many of these factors have a recurrent effect on survival.

2.6 Conclusion

This essay provides evidence on relative survival rates of businesses started as franchises and independent businesses. We also explore whether state franchise relationship regulations aimed at preventing franchisor opportunism have positively affected the survival of franchised businesses. We find franchising to be a safer way to start a business, and the survival of franchised businesses not to be affected by franchise relationship laws.

Some of the difference in survival rates in simple means reflects differences in the types of individuals who choose to start business of one form or the other. Controlling for such differences, which we showed to be essential in order to correctly identify the effect of franchising on survival, we find the difference in one-year survival to be five percentage points, a sizable effect given the mean one-year survival rate of 91.7 percent for all the businesses in our data. Franchised businesses are six to seven percentage points more likely than independent businesses to survive to three years, relative to an overall mean three-year survival rate of around

70 percent. These results are independent of whether we examine the sample of businesses started in 2002 or 2007.

Our conditional survival results show franchises, independent of cohort, that survive for one year to do no better than independent businesses that survive the same length of time. We further conclude that the higher survival of franchises in the initial year is more likely driven by franchisor provided know-how than by franchisors' initial selection of higher ability individuals.[35]

Our results also indicate such owner characteristics as age and race affect the survival probabilities of new businesses. We find owner effort and choice of organizational form, factors likely chosen based on owners' assessment of the value of their businesses, to be related to survival as well. Lastly, firms started with more formal sources of capital (banks and government backed loans as opposed to credit cards) survive longer, on average.

Our findings concerning the survival advantage of franchised businesses do not support claims of the magnitude of this advantage, in part, because many such statements underestimate the probability of survival of new independent businesses. Our results also differ from those of Bates (1995a, b) in that we do find franchising to be somewhat the safer of the two forms. We plan to incorporate to an even greater degree in future analyses consideration of the decision to franchise and how it relates to survival probabilities.

[35] Of course, by the time a business has survived for one year the business concept and ability of the independent entrepreneur have also been selected by the market. In that sense, one could interpret the franchisor selection process to be equivalent in the first year to that provided by the market.

Table 2.1 – Descriptive Statistics

Means	Businesses Started in 2002			Businesses Started in 2007		
Dependent Variables	**All**	**Franch.**	**Indep.**	**All**	**Franch.**	**Indep.**
One Year Survival (%)	91.71	97.38	90.88	89.60	94.85	88.89
Two Year Survival (%)	81.25	89.14	80.08	77.23	85.86	76.06
Three Year Survival (%)	71.48	81.20	70.05	67.83	74.86	66.88
Owner-Level Variables	**All**	**Franch.**	**Indep.**	**All**	**Franch.**	**Indep.**
Male (%)	67.34	70.35	66.89	64.66	72.00	63.66
Female (%)	32.66	29.65	33.11	35.34	28.00	36.34
Caucasian (%)	84.26	81.57	84.65	82.18	84.16	81.91
African American (%)	2.09	2.89	1.97	2.72	2.82	2.70
Asian (%)	12.36	13.83	12.14	14.13	12.49	14.36
Other Race (%)	1.30	1.71	1.24	0.97	0.53	1.03
Age: Younger than 25 (%)	2.48	1.53	2.63	2.08	1.03	2.22
Age: 25-34 (%)	20.42	17.70	20.83	19.97	20.34	19.91
Age: 35-44 (%)	35.04	37.29	34.70	29.86	31.69	34.64
Age: 45-54 (%)	28.48	28.74	28.44	32.34	30.90	29.72
Age: 55-64 (%)	11.18	12.97	10.92	12.52	14.69	12.23
Age: 65 and Older (%)	2.39	1.77	2.48	3.23	1.35	3.48
Less than High School (%)	4.02	2.83	4.20	4.15	1.23	4.55
High School (%)	23.17	15.55	24.29	20.25	16.39	20.77
Technical or Vocational School (%)	7.08	3.09	7.67	5.82	2.55	6.26
Some College (%)	21.04	21.63	20.95	18.03	15.74	18.34
Associate Degree (%)	6.85	8.08	6.67	7.29	4.34	7.69
Bachelor's Degree (%)	26.95	33.80	25.94	31.21	43.70	29.52
Postgraduate Degree (%)	10.89	15.02	10.28	13.25	16.05	12.87
Weekly Work: Less than 20 H. (%)	14.13	16.69	13.75	13.70	20.17	12.83
Weekly Work: 20-39 Hours (%)	11.86	14.01	11.54	13.68	17.14	13.22
Weekly Work: 40 Hours (%)	11.39	8.05	11.88	14.99	8.81	15.81
Weekly Work: 41-59 Hours (%)	30.72	28.31	31.08	29.21	27.55	29.44
Weekly Work: 60 H. or More (%)	31.91	32.94	31.75	28.42	26.33	28.70
Business-Level Variables	**All**	**Franch.**	**Indep.**	**All**	**Franch.**	**Indep.**
Franchise (%)	12.86	100.00	0.00	11.93	100.00	0.00
Sole Proprietorship (%)	25.24	18.22	26.28	19.07	11.99	20.03
Partnership (%)	17.01	19.26	16.68	22.20	26.74	21.59
Corporation (%)	57.74	62.52	57.04	58.73	61.27	58.38
Operated from Home (%)	20.49	8.63	22.24	22.46	9.25	24.25
Family Owned (%)	37.77	46.06	36.54	33.81	51.22	31.45
Initial Year Employment	0.99	1.67	0.90	1.04	1.77	0.94
Observations	11,582	1,377	10,205	4,351	505	3,846

(Continued on the next page)

Table 2.1 – Descriptive Statistics (continued)

Means	Businesses Started in 2002			Businesses Started in 2007		
Business-Level Variables (cont.)	**All**	**Franch.**	**Indep.**	**All**	**Franch.**	**Indep.**
Financing – Savings (%)	70.38	67.07	70.87	72.06	71.47	72.14
Financing – Bank Loan (%)	24.56	40.24	22.24	20.42	33.52	18.64
Financing – Personal Assets (%)	21.35	24.04	20.96	14.16	17.07	13.76
Financing – Credit Card (%)	18.86	14.81	19.46	20.01	17.31	20.37
Financing – Government Loan (%)	3.60	5.32	3.35	1.72	3.94	1.42
Fin. – Govern. guaranteed Loan (%)	4.53	9.91	3.74	3.10	7.70	2.48
Financing – Outside Investor (%)	5.70	4.61	5.87	N/A	N/A	N/A
Financing – None Needed (%)	6.50	1.65	7.21	4.96	0.30	5.60
Financing – Home Equity Loan (%)	N/A	N/A	N/A	17.64	28.43	16.18
Fin. – Loan from Family/Friends (%)	N/A	N/A	N/A	6.43	7.23	6.32
Financing – Venture Capital (%)	N/A	N/A	N/A	0.30	0.97	0.21
Financing – Grants (%)	N/A	N/A	N/A	0.21	0.00	0.24
Fin. – Other Sources of Cap. (%)	N/A	N/A	N/A	3.76	4.32	3.68
Financing – Do Not Know (%)	N/A	N/A	N/A	2.21	1.53	2.30
Market-Level Var. (Counties)	**All**	**Franch.**	**Indep.**	**All**	**Franch.**	**Indep.**
Population*	928,768	906,924	931,993	1,009,438	850,651	1,030,956
Personal Income* (Current $)	32,291	32,483	32,263	40,986	40,786	41,013
Males (%)	49.19	49.16	49.19	49.17	49.09	49.18
Females (%)	50.81	50.84	50.81	50.83	50.91	50.82
Caucasian (%)	82.45	82.49	82.45	80.34	80.06	80.38
African Americans (%)	11.10	11.27	11.07	11.88	12.64	11.78
Other Race (%)	6.45	6.24	6.48	7.78	7.30	7.85
Age: 14 and Younger (%)	20.79	21.10	20.74	20.04	20.41	19.99
Age: 15-64 (%)	66.68	66.59	66.70	67.40	67.38	67.40
Age: 65 and Older (%)	12.53	12.30	12.56	12.56	12.21	12.61
At Least High School Degree (%)	86.31	86.58	86.27	86.30	86.79	86.24
Unemployed (%)	5.70	5.70	5.70	4.51	4.42	4.52
Geographic Area* (Square Miles)	1,316	1,336	1,313	1,406	1,272	1,425
MSA Central County (%)	69.52	73.23	68.98	72.11	75.78	71.61
MSA Outlying County (%)	7.79	7.54	7.82	7.82	9.16	7.64
Observations	11,582	1,377	10,205	4,351	505	3,846

Notes: * Population, personal income per capita, and geographic area are entered into the regressions in logs. *Source:* U.S. Census Bureau SBO 2002, SBO 2007, and LBD, weighted means. Variables unavailable in one of the SBO surveys are denoted by N/A. For more information on the variables, see Appendix 2.A.

Table 2.2 – Linear Probability Estimates for Starting a Business as a Franchise

	Businesses Started in 2002		Businesses Started in 2007	
	Franchised Bus. Indicator		Franchised Bus. Indicator	
Male	0.007	(0.007)	0.013	(0.011)
African American	0.001	(0.020)	-0.015	(0.028)
Asian	-0.016	(0.012)	-0.031*	(0.017)
Other Race	0.034	(0.028)	ND	ND
Age: 25-34	0.019	(0.018)	0.044	(0.033)
Age: 35-44	0.037**	(0.018)	0.062*	(0.032)
Age: 45-54	0.040**	(0.018)	0.058*	(0.033)
Age: 55-64	0.048**	(0.019)	0.090***	(0.035)
Age: 65 and Older	0.005	(0.024)	0.015	(0.039)
High School	0.037***	(0.013)	0.030	(0.024)
Technical or Vocational School	0.043***	(0.016)	0.008	(0.027)
Some College	0.077***	(0.013)	0.051**	(0.024)
Associate Degree	0.095***	(0.017)	0.035	(0.026)
Bachelor's Degree	0.104***	(0.013)	0.088***	(0.024)
Postgraduate Degree	0.119***	(0.016)	0.082***	(0.026)
Operated from Home	-0.062***	0.007	-0.076***	(0.011)
Log(Population)	0.011**	(0.004)	-0.0006	(0.0078)
Log(Personal Income) (Current $)	0.004	(0.021)	0.044	(0.032)
Males (%)	-0.188	(0.356)	-0.273	(0.571)
African Americans (%)	-0.027	(0.037)	-0.003	(0.067)
Other Race (%)	-0.026	(0.078)	-0.030	(0.096)
Age: 14 and Younger (%)	0.460**	(0.183)	0.498	(0.321)
Age: 65 and Older (%)	-0.0004	(0.1370)	0.115	(0.264)
At Least High School Degree (%)	0.067	(0.096)	0.106	(0.148)
Unemployed (%)	-0.432	(0.341)	-0.642	(0.737)
Log(Geographic Area) (Sq. Miles)	-0.006	(0.005)	0.010	(0.009)
MSA Central County (%)	-0.007	(0.011)	0.026	(0.020)
MSA Outlying County (%)	0.002	(0.014)	0.013	(0.023)
FE − Industry Startup Size	Yes		Yes	
FE − State	Yes		Yes	
Observations	11,582		4,351	
R-squared	0.146		0.168	

Notes: Coefficients included in the regressions that cannot be disclosed due to U.S. Census Bureau restrictions are denoted by ND (Not Disclosed). Owner-level omitted variables were Female, Caucasian, Age: Younger than 25, and Less than High School. As well as State fixed effects, the regressions include Industry (NAICS4) interacted with Startup Size (four bins: 0, 1-5, 6-20, 21-100 employees) fixed effects. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Standard errors, in parentheses, are robust to heteroskedasticity.

Table 2.3 – Linear Probability Estimates for Survival of Different Durations

	Businesses Started in 2002						Businesses Started in 2007					
	Survived at Least						Survived at Least					
	1 Year		2 Years		3 Years		1 Year		2 Years		3 Years	
Franchised Bus. Indicator	**0.051*** **	(0.007)	**0.059*** **	(0.013)	**0.072*** **	(0.016)	**0.049*** **	(0.015)	**0.057*** **	(0.025)	**0.051***	(0.029)
Indic. for Franchised Bus. in Relat.-Law State	**-0.018**	(0.011)	**-0.011**	(0.019)	**-0.012**	(0.024)	**ND**	ND	**ND**	ND	**ND**	ND
Male	-0.010*	(0.006)	-0.013	(0.008)	-0.004	(0.009)	-0.006	(0.011)	0.007	(0.015)	0.015	(0.017)
African American	-0.053**	(0.021)	-0.105***	(0.028)	-0.105***	(0.029)	-0.069**	(0.032)	-0.123***	(0.041)	-0.157***	(0.042)
Asian	0.0008	(0.0091)	0.030**	(0.013)	0.039**	(0.015)	0.009	(0.016)	0.049**	(0.022)	0.081***	(0.025)
Other Race	-0.001	(0.023)	0.029	(0.033)	0.021	(0.037)	ND	ND	ND	ND	ND	ND
Age: 25-34	0.019	(0.021)	0.051*	(0.029)	0.061*	(0.031)	-0.019	(0.038)	0.012	(0.053)	0.038	(0.059)
Age: 35-44	0.027	(0.021)	0.067**	(0.028)	0.090***	(0.031)	-0.003	(0.038)	0.063	(0.052)	0.119**	(0.058)
Age: 45-54	0.028	(0.021)	0.078***	(0.028)	0.100***	(0.031)	0.007	(0.038)	0.061	(0.052)	0.103*	(0.059)
Age: 55-64	0.014	(0.022)	0.044	(0.030)	0.062*	(0.033)	-0.004	(0.039)	0.014	(0.054)	0.051	(0.061)
Age: 65 and Older	0.052**	(0.026)	0.076**	(0.037)	0.085**	(0.041)	-0.074	(0.051)	0.024	(0.065)	0.106	(0.072)
High School	0.014	(0.017)	0.028	(0.023)	0.011	(0.024)	0.032	(0.030)	0.035	(0.040)	0.028	(0.043)
Tech. or Vocational Sch.	0.022	(0.019)	0.053**	(0.026)	0.051*	(0.028)	0.005	(0.036)	0.016	(0.047)	-0.025	(0.051)
Some College	0.009	(0.017)	0.024	(0.023)	0.004	(0.025)	0.016	(0.030)	0.026	(0.040)	0.019	(0.044)
Associate Degree	0.013	(0.019)	0.035	(0.026)	0.014	(0.029)	-0.011	(0.035)	-0.018	(0.044)	-0.009	(0.048)
Bachelor's Degree	0.020	(0.017)	0.052**	(0.023)	0.043*	(0.025)	0.031	(0.030)	0.042	(0.039)	0.044	(0.042)
Postgraduate Degree	0.015	(0.018)	0.041*	(0.024)	0.029	(0.026)	0.014	(0.032)	0.010	(0.042)	0.009	(0.045)
Weekly Work: 20-39 H.	0.017	(0.011)	0.036**	(0.015)	0.018	(0.017)	0.021	(0.019)	0.056**	(0.025)	0.054**	(0.027)
Weekly Work: 40 Hours	0.051***	(0.011)	0.060***	(0.015)	0.072***	(0.016)	0.032*	(0.019)	0.081***	(0.024)	0.108***	(0.027)
Weekly Work: 41-59 H.	0.047***	(0.009)	0.091***	(0.012)	0.112***	(0.014)	0.027	(0.017)	0.077***	(0.022)	0.105***	(0.024)
Weekly Work: 60+ Hours	0.043***	(0.009)	0.076***	(0.013)	0.090***	(0.014)	0.034**	(0.017)	0.065***	(0.022)	0.117***	(0.024)
Sole Proprietorship	-0.066***	(0.009)	-0.125***	(0.012)	-0.163***	(0.013)	-0.059***	(0.015)	-0.108***	(0.020)	-0.124***	(0.022)
Partnership	-0.016**	(0.007)	-0.042***	(0.010)	-0.065***	(0.011)	-0.044***	(0.012)	-0.059***	(0.016)	-0.072***	(0.018)
Operated from Home	-0.048***	(0.008)	-0.058***	(0.011)	-0.063***	(0.012)	-0.073***	(0.015)	-0.091***	(0.019)	-0.106***	(0.020)
Family Owned	0.008	(0.005)	0.002	(0.008)	0.011	(0.009)	0.017	(0.010)	0.023	(0.014)	0.013	(0.016)
Initial Year Employment	0.002	(0.001)	0.001	(0.002)	0.001	(0.002)	0.006***	(0.002)	0.008***	(0.002)	0.008***	(0.002)

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Table 2.3 – Linear Probability Estimates for Survival of Different Durations (continued)

	Businesses Started in 2002						Businesses Started in 2007					
	Survived at Least						Survived at Least					
	1 Year		2 Years		3 Years		1 Year		2 Years		3 Years	
Financing – Savings	-0.002	(0.006)	0.005	(0.009)	0.009	(0.011)	0.008	(0.012)	0.022	(0.017)	0.030	(0.019)
Financing – Bank Loan	0.025***	(0.006)	0.044***	(0.009)	0.045***	(0.010)	0.037***	(0.012)	0.061***	(0.017)	0.068***	(0.019)
Financing – Personal Assets	0.009	(0.006)	0.002	(0.009)	-0.002	(0.011)	0.009	(0.013)	-0.0001	(0.0191)	-0.013	(0.022)
Financing – Credit Card	-0.005	(0.007)	-0.025**	(0.010)	-0.042***	(0.011)	-0.021	(0.013)	-0.066***	(0.018)	-0.086***	(0.020)
Financing – Govern. Loan	0.003	(0.012)	-0.007	(0.019)	-0.022	(0.024)	ND	ND	ND	ND	ND	ND
Fin. – Gov. Guaranteed Loan	0.027***	(0.009)	0.060***	(0.015)	0.082***	(0.018)	ND	ND	ND	ND	ND	ND
Financing – Outside Investor	0.007	(0.011)	0.036**	(0.015)	0.028	(0.018)	N/A	N/A	N/A	N/A	N/A	N/A
Financing – None Needed	-0.0002	(0.0126)	0.0006	(0.0173)	0.014	(0.019)	0.002	(0.028)	-0.010	(0.035)	0.031	(0.038)
Fin. – Home Equity Loan	N/A	N/A	N/A	N/A	N/A	N/A	0.022*	(0.012)	0.034*	(0.018)	0.031	(0.020)
F. – Loan from Fam./Friends	N/A	N/A	N/A	N/A	N/A	N/A	0.032*	(0.018)	0.053**	(0.025)	0.070**	(0.029)
Financing – Venture Capital	N/A	N/A	N/A	N/A	N/A	N/A	ND	ND	ND	ND	ND	ND
Financing – Grants	N/A	N/A	N/A	N/A	N/A	N/A	ND	ND	ND	ND	ND	ND
Fin. – Other Sources of Cap.	N/A	N/A	N/A	N/A	N/A	N/A	0.028	(0.022)	0.006	(0.035)	0.014	(0.038)
Financing – Do Not Know	N/A	N/A	N/A	N/A	N/A	N/A	ND	ND	ND	ND	ND	ND
Controls – Market Level	Yes		Yes		Yes		Yes		Yes		Yes	
FE – Industry Startup Size	Yes		Yes		Yes		Yes		Yes		Yes	
FE – State	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	11,582		11,582		11,582		4,351		4,351		4,351	
R-squared	0.093		0.126		0.157		0.133		0.153		0.157	

Notes: Coefficients included in the regressions that cannot be disclosed due to U.S. Census Bureau restrictions are denoted by ND (Not Disclosed). Variables unavailable in one of the SBO surveys are denoted by N/A. The regressions include the following set of market-level control variables: log of population, log of personal income per capita, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, fraction of population with at a least high school degree, unemployment rates, SBSI index, and indicator variables for central and outlying counties of the Metropolitan Statistical Area. As well as State fixed effects, the regressions include Industry (NAICS4) interacted with Startup Size (four bins: 0, 1-5, 6-20, 21-100 employees) fixed effects. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Reported standard errors, in parentheses, are robust to heteroskedasticity.

Table 2.4 – Linear Probability Estimates, Conditional Survival

	Businesses Started in 2002				Businesses Started in 2007			
	One Year Survival Conditional on Having Survived				One Year Survival Conditional on Having Survived			
	1 Year		2 Years		1 Year		2 Years	
Franchised Business Indicator	**0.017**	(0.012)	**0.025***	(0.013)	**0.017**	(0.024)	**0.006**	(0.025)
Indicator for Franchised Bus. in Relationship-Law State	**0.003**	(0.018)	**-0.007**	(0.019)	**ND**	ND	**ND**	ND
Male	-0.005	(0.007)	0.006	(0.008)	0.015	(0.014)	0.010	(0.015)
African American	-0.069***	(0.026)	-0.026	(0.026)	-0.082**	(0.039)	-0.095**	(0.043)
Asian	0.031***	(0.011)	0.016	(0.013)	0.042**	(0.019)	0.049**	(0.019)
Other Race	0.036	(0.027)	-0.003	(0.031)	ND	ND	ND	ND
Age: 25-34	0.040	(0.027)	0.031	(0.030)	0.032	(0.050)	0.033	(0.057)
Age: 35-44	0.050*	(0.026)	0.049*	(0.030)	0.077	(0.049)	0.086	(0.056)
Age: 45-54	0.060**	(0.027)	0.050*	(0.030)	0.065	(0.049)	0.069	(0.057)
Age: 55-64	0.038	(0.028)	0.039	(0.031)	0.018	(0.051)	0.049	(0.059)
Age: 65 and Older	0.040	(0.034)	0.037	(0.038)	0.104*	(0.059)	0.120*	(0.067)
High School	0.023	(0.021)	-0.011	(0.021)	0.010	(0.035)	-0.008	(0.033)
Technical or Vocational School	0.045*	(0.023)	0.012	(0.023)	0.016	(0.041)	-0.057	(0.044)
Some College	0.022	(0.021)	-0.017	(0.022)	0.016	(0.036)	-0.012	(0.034)
Associate Degree	0.031	(0.024)	-0.012	(0.025)	-0.008	(0.039)	0.004	(0.037)
Bachelor's Degree	0.043**	(0.021)	0.002	(0.021)	0.023	(0.035)	0.007	(0.033)
Postgraduate Degree	0.037*	(0.022)	-0.004	(0.023)	-0.001	(0.038)	-0.003	(0.036)
Weekly Work: 20-39 Hours	0.024*	(0.013)	-0.013	(0.015)	0.041*	(0.023)	0.014	(0.026)
Weekly Work: 40 Hours	0.019	(0.013)	0.026*	(0.014)	0.061***	(0.022)	0.058**	(0.025)
Weekly Work: 41-59 Hours	0.056***	(0.011)	0.044***	(0.012)	0.065***	(0.020)	0.061***	(0.022)
Weekly Work: 60 Hours or More	0.044***	(0.011)	0.033***	(0.012)	0.045**	(0.021)	0.087***	(0.022)
Sole Proprietorship	-0.077***	(0.011)	-0.075***	(0.012)	-0.065***	(0.018)	-0.038**	(0.019)
Partnership	-0.031***	(0.009)	-0.034***	(0.009)	-0.027*	(0.015)	-0.030*	(0.016)
Operated from Home	-0.023**	(0.009)	-0.020**	(0.010)	-0.038**	(0.017)	-0.040**	(0.019)
Family Owned	-0.004	(0.007)	0.010	(0.007)	0.011	(0.013)	-0.012	(0.014)
Initial Year Employment	-0.0003	(0.0013)	0.0009	(0.0018)	0.004**	(0.001)	0.001	(0.001)

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Table 2.4 – Linear Probability Estimates, Conditional Survival (continued)

	Businesses Started in 2002				Businesses Started in 2007			
	One Year Survival Conditional on Having Survived				One Year Survival Conditional on Having Survived			
	1 Year		2 Years		1 Year		2 Years	
Financing – Savings	0.010	(0.008)	0.007	(0.009)	0.017	(0.015)	0.013	(0.016)
Financing – Bank Loan	0.025***	(0.007)	0.012	(0.009)	0.030**	(0.015)	0.022	(0.016)
Financing – Personal Assets	-0.005	(0.008)	-0.004	(0.009)	-0.007	(0.017)	-0.016	(0.018)
Financing – Credit Card	-0.023***	(0.009)	-0.027***	(0.010)	-0.054***	(0.016)	-0.038**	(0.018)
Financing – Government Loan	-0.010	(0.017)	-0.014	(0.020)	ND	ND	ND	ND
Financing – Gov. Guaranteed Loan	0.037***	(0.014)	0.032**	(0.015)	ND	ND	ND	ND
Financing – Outside Investor	0.033***	(0.012)	-0.0008	(0.0150)	N/A	N/A	N/A	N/A
Financing – None Needed	0.003	(0.015)	0.020	(0.016)	-0.016	(0.033)	0.050	(0.032)
Financing – Home Equity Loan	N/A	N/A	N/A	N/A	0.014	(0.016)	0.005	(0.017)
Financing – Loan from Family/Friends	N/A	N/A	N/A	N/A	0.030	(0.023)	0.035	(0.023)
Financing – Venture Capital	N/A	N/A	N/A	N/A	ND	ND	ND	ND
Financing – Grants	N/A	N/A	N/A	N/A	ND	ND	ND	ND
Financing – Other Sources of Capital	N/A	N/A	N/A	N/A	-0.015	(0.032)	0.010	(0.032)
Financing – Do Not Know	N/A	N/A	N/A	N/A	ND	ND	ND	ND
Controls – Market Level	Yes		Yes		Yes		Yes	
FE – Industry Startup Size	Yes		Yes		Yes		Yes	
FE – State	Yes		Yes		Yes		Yes	
Observations	10,650		9,435		3,876		3,343	
R-squared	0.086		0.101		0.120		0.129	

Notes: Coefficients included in the regressions that cannot be disclosed due to U.S. Census Bureau restrictions are denoted by ND (Not Disclosed). The coefficients of variables unavailable in one of the SBO surveys are denoted by N/A. The regressions include the following set of market-level control variables: log of population, log of personal income per capita, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, fraction of population with at a least high school degree, unemployment rates, SBSI index, and indicator variables for central and outlying counties of the Metropolitan Statistical Area. As well as State fixed effects, the regressions include Industry (NAICS4) interacted with Startup Size (four bins: 0, 1-5, 6-20, 21-100 employees) fixed effects. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Reported standard errors, in parentheses, are robust to heteroskedasticity.

Appendix 2.A – Data

We focus on single-establishment businesses started in the years to which the Survey of Business Owners (SBO) pertains, namely, 2002 and 2007. We identify the starting and ending years of a business's existence by means of the Longitudinal Business Database (LBD), which tracks all businesses over time, and the SBO, which identifies when a business was originally established. Our sample is restricted to for profit, neither publicly held nor owned by another organization including trust, estate, or members of a club or cooperative, businesses organized as proprietorships, partnerships, or corporations with a startup year number of employees not exceeding one hundred. We also require that businesses not have been established for a one-time event and not be of a seasonal or occasional nature, and that the main owner holds at least a fifty percent share and works in the business. We exclude businesses owned by Alaska Native or American Indian tribal entities, businesses sold to another party by the time the survey was conducted, and businesses with missing or imputed values for the variables needed to apply the sample restrictions or conduct the analyses. SBO 2007 indicates whether a franchisor had more than a fifty percent stake in a business, and we exclude those for which this is true. Finally, to restrict our analyses to sectors of activity in which franchising was a relevant option for business owners, we include only industries (NAICS4) in which at least three percent of businesses in our cleaned SBO sample were franchised (see Appendix 2.B).

In terms of sample size, the SBO targeted 2,247,200 businesses in 2002 and 2,245,100 in 2007 and realized response rates of 75 percent and 62 percent, respectively.[36] Focusing on single unit establishments gives us 158,600 businesses in the 2002 and 96,700 businesses in the 2007, wave. Our data cleaning process, as noted above, has many steps. We list the most important

[36] To satisfy U.S. Census Bureau disclosure procedures, all counts are rounded to hundreds.

ones from the perspective of sample size reduction. Considering only observations with non-missing and non-imputed values, specifically in ownership share, leaves us with 98,300 businesses in the 2002 and 45,800 businesses in the 2007 wave.[37] Considering only businesses started in one of the years to which the SBO pertains, that is, only businesses that responded to the survey question, "When was the business originally established, purchased, or acquired by the owner(s) [..]?" with "2002" or "2007," reduces the 2002 sample to 32,200 businesses and 2007 sample to 18,300 businesses. Selecting only businesses that responded to the similar survey question, "In what year was this business originally established?" (missing in the 2002 SBO) with "2007" reduces the sample to 15,100 businesses. Considering only industries in which franchising was a relevant option for business owners (see Appendix 2.B) reduced the 2002 sample to 15,400 and the 2007 sample to 6,000 businesses. The remaining data cleaning steps result in final samples of 11,582 observations for the SBO 2002 wave and 4,351 observations for the SBO 2007 wave.

In the survival regressions, we control for the following business characteristics: legal form of organization (sole proprietorship, partnership, or corporation), industrial sector (4-digit NAICS) interacted with startup size (0, 1-5, 6-20, 21-100 employees), geography (state fixed effects), and startup number of employees. We also control for the following business owner characteristics: age (younger than 25, 25-34, 35-44, 45-54, 55-64, 65 and older), gender, race (White, African American, Asian, Other), education (less than high school, high school, technical or vocational school, some college, associate degree, bachelor's degree, postgraduate degree), and average weekly number of hours worked in the business (less than 20 hours, 20-39 hours, 40 hours, 41-59 hours, 60 hours or more). We include indicators for whether the majority

[37] Considering non-missing and non-imputed values for other key variables would result in similar final sample sizes.

of a business is owned by members of the same family and whether the business is operated primarily from a home. We control as well for the source of capital used to start the business (in the SBO 2002: personal/family savings, business loan from a bank or financial institution, personal/family assets, personal/business credit card, business loan from government, government guaranteed business loan, outside investor, or none needed; in the SBO 2007: personal/family savings, business loan from a bank or financial institution, personal/family assets, personal/business credit card, business loan from government, government guaranteed business loan, none needed, personal/family home equity loan, business loan from family/friends, venture capital investment, grants, other sources of capital, or do not know). We include the following market conditions variables for the year in which a business was started: log of county population, log of county per capita mean personal income, log of county geographic area, county fraction of males, county fraction of African Americans, county fraction of population other than African American or Caucasian, county fraction of population age 14 and younger, county fraction of population age 65 and older, and county unemployment rate. We also control for county fraction of population age 25 and older with at least a high school degree or equivalent, and include indicators for central and outlying counties of the Metropolitan Statistical Areas.

Appendix 2.B – List of Selected Industries

List of NAICS4 Industries, SBO 2002					
2131	3372	4451	4853	5331	6241
2213	3399	4452	4885	5418	6244
2330	4200	4461	4889	5419	7112
2340	4231	4471	4921	5511	7113
2352	4239	4481	4922	5613	7131
2353	4242	4482	4931	5614	7139
2357	4243	4483	5100	5617	7211
2359	4246	4511	5133	5619	7220
2372	4249	4529	5151	6100	7221
2380	4400	4532	5173	6111	7222
2383	4411	4539	5182	6114	8111
3113	4412	4541	5242	6115	8112
3115	4413	4542	5300	6116	8114
3118	4421	4543	5310	6117	8121
3231	4422	4800	5312	6200	8123
3272	4431	4812	5321	6215	8129
3273	4441	4832	5322	6216	
3332	4442	4842	5323	6233	
List of NAICS4 Industries, SBO 2007					
1152	4400	4512	5241	5621	7112
3118	4411	4532	5242	5622	7139
3119	4412	4533	5312	5629	7211
3149	4413	4539	5322	6114	7220
3152	4421	4800	5331	6115	7221
3231	4422	4853	5418	6116	7222
3259	4431	4885	5511	6117	7223
3261	4442	4889	5610	6200	8111
3371	4451	4921	5613	6215	8112
3399	4452	4922	5614	6216	8114
4200	4461	4931	5615	6230	8121
4231	4471	5111	5616	6233	8129
4238	4482	5161	5617	6241	
4244	4511	5181	5619	6244	

Notes: To restrict our focus to sectors of activity in which franchising is a relevant option for business owners, we select only industries (NAICS4) in which at least three percent of businesses in our cleaned SBO sample were franchised.

Appendix 2.C – States with Franchise Relationship Regulation

State	Relationship Reg.	State	Relationship Reg.
Alabama	–	Montana	–
Alaska	–	Nebraska	Yes
Arizona	–	Nevada	–
Arkansas	Yes	New Hampshire	–
California	Yes	New Jersey	Yes
Colorado	–	New Mexico	–
Connecticut	Yes	New York	–
Delaware	Yes	North Carolina	–
D.C.	–	North Dakota	–
Florida	–	Ohio	–
Georgia	–	Oklahoma	–
Hawaii	Yes	Oregon	–
Idaho	–	Pennsylvania	–
Illinois	Yes	Rhode Island	–
Indiana	Yes	South Carolina	–
Iowa	Yes	South Dakota	–
Kansas	–	Tennessee	Yes
Kentucky	–	Texas	–
Louisiana	–	Utah	–
Maine	–	Vermont	–
Maryland	–	Virginia	Yes
Massachusetts	–	Washington	Yes
Michigan	Yes	West Virginia	–
Minnesota	Yes	Wisconsin	Yes
Mississippi	–*	Wyoming	–
Missouri	–*	*Total (States)*	*16*

* Because franchisors in those two states can terminate franchise agreements without good cause, we do not consider Mississippi and Missouri to have franchise relationship laws, although technically they do. *Source:* Information on relationship laws is from Klick, Kobayashi, and Ribstein (2006).

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CHAPTER 3

THE EFFECT OF PERSONAL BANKRUPTCY LAWS ON ENTREPRENEURSHIP[‡]

3.1 Introduction

Bankruptcy laws determine how costly it is for entrepreneurs to shut down insolvent businesses. As many startups do not succeed and some end up insolvent, making the consequences of bankruptcy less daunting may increase entrepreneurs' willingness to start businesses. The 2005 Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) made it more difficult for individual bankruptcy filers to take advantage of more lenient state bankruptcy laws. We examine the impact of bankruptcy legislation, in particular homestead exemptions, on entrepreneurship, measured by business entry rates.

We focus on the homestead exemption, which protects the houses of individuals who default on unsecured loans, because it is the largest and most variable exemption. Our analyses exploit variation in these exemptions together with changes caused by the 2005 enactment of the BAPCPA. We use comprehensive, confidential U.S. Census Bureau databases that include the universe of all U.S. businesses, employer and nonemployer, namely, the Longitudinal Business Database (LBD) and the Integrated Longitudinal Business Database (ILBD). The U.S. Census

[‡] This essay represents joint work with Xiaoyang Li of the Cheung Kong Graduate School of Business.

Bureau defines a nonemployer business as a business with no paid employees, an employer business as a business with paid employees. We also observe the legal form of organization under which businesses are established, sole proprietorships, which have unlimited liability, being expected to be affected, corporations, which have limited liability, not to be directly affected, by personal bankruptcy laws.

Lenient personal bankruptcy laws can enhance entrepreneurial activity by inducing risk-averse individuals to become entrepreneurs (Kihlstrom and Laffont, 1979). Fan and White (2003) and Armour and Cumming (2008), for example, find individuals protected by debtor-friendly bankruptcy systems to be more likely to be business owners. Paik (2013), however, finds the BAPCPA to have virtually no noticeable effect on the overall level of entrepreneurship, in part because entrepreneurs have become more likely to start businesses as limited liability instead of unlimited liability companies.

Our essay makes two main contributions to the literature. First, ours is the first essay to explore the impact of bankruptcy homestead exemptions on entry rates of both employer and nonemployer businesses. The literature on the impact of bankruptcy laws has focused on self-employment, a small segment of the economy, and relied on survey data, such as the Survey of the Income and Program Participation (Fan and White, 2003) and the Current Population Survey (Paik, 2013). Moreover, it has examined mostly the effect of bankruptcy legislation on *being* self-employed (Fan and White, 2003, Armour and Cumming, 2008) or outcomes of already operating businesses (Cerqueiro and Penas, 2011). We explore instead business creation for both employer and nonemployer businesses, for which we are able to construct measures without selection issues because our data include all U.S. businesses. Our second contribution is that our analyses of the effects of homestead exemptions take into account state house values, which is

critical because they affect an entrepreneur's possible downside in the event of bankruptcy. Finally, we control for various market-level characteristics that might affect the rate of business creation.

We find moderate positive effects of the bankruptcy homestead exemption on entry rates of sole proprietorships, more pronounced for nonemployer businesses, and no significant effects for corporations. Entrepreneurs' choice of legal form of organization seems not to be affected by homestead exemptions, nor do we find evidence of any significant effect of the BAPCPA on entry rates.

The essay is organized as follows. In Section 3.2, we discuss bankruptcy laws, in Section 3.3 the theoretical framework. We describe the data in Section 3.4, and discuss our empirical approach and present our results in Section 3.5. Concluding remarks are offered in Section 3.6.

3.2 Bankruptcy Laws

The 1978 U.S. Bankruptcy Code includes two bankruptcy procedures, Chapter 7 and Chapter 13. Prior to the restrictions imposed by the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) of 2005, most unsecured debt was discharged under both chapters. Filing under Chapter 7, which required that debt be repaid only from income above an exemption level, offered immediate and complete relief. Debtors who filed under Chapter 13, on the other hand, were required to repay debt from post-bankruptcy incomes according to a court-approved plan. Not surprisingly, filers permitted to choose between the two mostly file under Chapter 7.

The BAPCPA, which went into effect on October 17, 2005, overhauled the 1978 Bankruptcy Code. Under the BAPCPA, the two bankruptcy procedures were retained, but

debtors' right to choose between them was restricted. Income must now be below a cutoff level based on the median family income in a state to file under Chapter 7, and debtors who file under Chapter 13, after considering allowed exemptions and payments on secured loans, must use their income for five years post bankruptcy to repay their obligations. We expect a negative effect on the willingness of some prospective entrepreneurs to start a business, but no differential impact of this change across states. Our empirical approach hence does not focus on this aspect of BAPCPA, as any effect would be captured by year fixed effects.

Bankruptcy legislation also specifies exemptions that enable individuals who default on unsecured loans, that is, loans secured only by the borrower's creditworthiness rather than collateral, to protect certain assets from liquidation. There are a number of bankruptcy exemptions including personal property and motor vehicle exemptions. The largest and most variable across states, however, is that for equity in owner-occupied housing, namely, the homestead exemption.[38] Homestead exemptions range from zero (in Maryland) to unlimited (in Arkansas, Florida, Iowa, Kansas, Oklahoma, South Dakota, Texas, and Washington, D.C.). A high homestead exemption reduces the risk of starting sole proprietorship businesses because the entrepreneurs, in the event the businesses fail, are less likely to lose their homes. Entrepreneurs who have a home mortgage may also be able to protect some non-housing assets with a homestead exemption by using those assets to pay down the mortgage.

The BAPCPA capped the homestead exemption at $125,000 for debtors who acquired their homes within 1,215 days of filing for bankruptcy. Bankruptcy reform also made it more difficult to use the homestead exemption to shelter financial assets by imposing restrictions on both converting non-exempt assets into home equity and relocating to states with unlimited

[38] We include in any mention of the U.S. states the District of Columbia (D.C.).

homestead exemptions before filing. These changes are expected to have a differential impact across states, affecting business activity the most in states with high or unlimited exemptions. Because the changes affect only a fraction of potential entrepreneurs, however, specifically those who acquired their homestead property within 1,215 days of filing for bankruptcy, the effects on states' business entry rates might be small.

3.3 Theoretical Framework

Kihlstrom and Laffont (1979) build a general equilibrium model in which, more risk averse individuals become workers and less risk averse individuals entrepreneurs. Given that many startups do not succeed and some become insolvent, making the consequences of bankruptcy less costly should increase the number of individuals willing to start businesses.

We focus on businesses of two legal forms of organization, sole proprietorships, the owners of which incur unlimited personal liability, and corporations, the owners of which incur only limited liability. Because of the differences in liability between these two organizational forms, we anticipate a differential impact of bankruptcy exemptions; sole proprietorships should be directly affected, corporations not affected. Based on Kihlstrom and Laffont's (1979) framework, we expect to find in states in which the consequences of bankruptcy are less costly higher sole proprietorship entry rates and a higher percentage of businesses started as sole proprietorships.

Because possible downsides of starting a business depend on the value of entrepreneurs' home as well as on the homestead exemption, to better capture the costs of possible bankruptcy we create a measure of exposure defined as the difference between the state median house price

and homestead exemption, truncated at zero. States with an unlimited homestead exemption have an exposure of zero.

That exposure directly affects only sole proprietors (due to their unlimited liability) leads to our hypothesis that higher exposure is associated with lower levels of entrepreneurship, measured by entry rates. If entrepreneurs in higher exposure states are more likely to start businesses as corporations, entry rates for corporations should be higher, and for sole proprietorships lower, in such states. The percentage of businesses started as sole proprietorships should also be lower in such states. Expecting, based on industry dynamics models going back to Jovanovic (1982) and Hopenhayn (1992), that in long-run equilibrium entry and exit rates will be similarly affected, we analyze as well whether higher exposure is associated with lower business exit rates for sole proprietors.

3.4 Data

3.4.1 Bankruptcy Regulation

Our period of analysis, 2000-2009, spans several years before and after the 2005 BAPCPA reform. Table 3.1 reports states' mean homestead exemptions over this period. We measure home values using state-year data on median house prices (also reported in Table 3.1) from the Federal Housing Finance Agency (Leventis, 2010).[39] As noted above, the exposure variable is defined as the difference between the state median house price and homestead exemption. Not being permitted to be negative, this measure is equal to zero in states in which the homestead exemption is unlimited. Mean exposure, as can be seen in Table 3.2, is $107,603 (2010 $). We

[39] Our analyses being conducted at an annual level, we calculate an arithmetic mean of quarterly median house prices to obtain an annual median house price.

create a binary variable equal to one for states with unlimited homestead exemption, as these states might be different from other states with zero exposure.

3.4.2 Dependent Variables

Relative to publicly available data sources like the County Business Patterns or Nonemployer Statistics, the confidential U.S. Census Bureau databases on which we rely, the Longitudinal Business Database (LBD) and Integrated Longitudinal Business Database (ILBD), include detailed information about businesses as well as unique identifiers that enable us to track them over time. The LBD provides annual information on the geographic location and legal form of organization of all private sector employer establishments, the ILBD annual information on the location and legal form of organization of all nonemployer businesses, in the United States.[40]

Entrants are defined as nonemployer businesses operating in the market during the current period that were not present in the market in the previous period. We define the nonemployer sole proprietorship entry rate at the state-year level as the number of entering nonemployer sole proprietorships in year *t* divided by the number of nonemployer sole proprietorships in year *t-1*. Table 3.2 shows the mean entry rate of nonemployer sole proprietorship businesses to be 32.4 percent. To analyze whether entrepreneurs' choice of legal form of organization is strategic, we define nonemployer entrants that are sole proprietorships as a percentage of nonemployer entrants that are sole proprietorships or corporations. The mean is 94.9 percent. We define exiters as nonemployer businesses operating in the market during the current period that are no longer present in the following period. The exit rate of nonemployer sole proprietorships is defined as the number of exiting nonemployer sole proprietorships in year

[40] Information on construction of the LBD can be found in Jarmin and Miranda (2002). The ILBD, described by Davis et al. (2007), draws on information from individual and corporate tax returns and various business surveys conducted by the U.S. Census Bureau.

t divided by the number of nonemployer sole proprietorships in year *t*. The sample mean is 29.2 percent. The measures are defined similarly for corporations. In the same way, we construct entry and exit rates (both sole proprietorships and corporations), and percentage of entering sole proprietorships, for employer business establishments. Table 3.2 lists our ten dependent variables of interest. Our analyses draw on data from 1999 to 2010, the first year being used to define entry rates and the last year being used to define exit rates. Our sample thus spans a ten-year period from 2000 to 2009.

The U.S. Census Bureau's Nonemployer Statistics data for 2009 identify 86.2 percent and 6.6 percent of 21,695,828 nonemployer businesses as sole proprietorships and corporations, respectively. Although nonemployer businesses are more abundant, the vast majority of economic activity comes from employer businesses, which generated 97 percent of revenues in the United States in 2007.[41] The County Business Patterns data, also compiled by the U.S. Census Bureau, show that the most prevalent legal form of organization in the employer universe is corporation. Of 7,433,465 employer establishments, 68.8 percent were corporations and only 13.3 percent sole proprietorships.

3.5 Econometric Specifications and Results

We identify the effects of personal bankruptcy laws in terms of variation in entrepreneurs' exposure levels across states and time by estimating the following specification,

$$Y_{st} = \alpha_1 E_{st} + \alpha_2 D\_un_{st} + \alpha_3 D\_un2005_{st} + \beta X_{st} + \eta_t + \delta_r + \varepsilon_{st}$$

where the *s* subscript indexes states, the *r* subscript geographical regions within the United States (namely, Northeast, Midwest, South, and West), and the *t* subscript years. Our analyses cover 50

[41] See https://www.census.gov/econ/smallbus.html.

states and Washington, D.C. over the period 2000-2009. Y_{st} is the outcome variable, being entry or exit rate of a particular type or percentage of nonemployer or employer entrants that are sole proprietorships. The main independent variable of interest is entrepreneurs' exposure (E_{st}), which is measured at the state-year level in hundreds of thousands of 2010 dollars. As states with an unlimited homestead exemption might be different from other states with zero exposure, our specification includes a binary variable D_un_{st} that indicates observations with unlimited homestead exemption. To analyze whether the 2005 BAPCPA affected outcomes of interest in states with the most generous exemptions, in which the effect is expected to be the most pronounced, we include as an indicator for states with unlimited exemptions in the post-2005 years the variable D_un2005_{st}.

The vector of market-level control variables (X_{cst}) includes the state-year log of median house price, log of population, log of per capita personal income, and county demographics, specifically, gender, race, and age compositions of the population.[42] These data are from the Federal Housing Finance Agency, State Population Estimates of the U.S. Census Bureau, and Regional Economic Accounts of the Bureau of Economic Analysis. Data on state-level yearly unemployment rates are from the Local Area Unemployment Statistics of the Bureau of Labor Statistics (BLS). Geographic areas of states, which may affect the intensity of competition and are entered in log form, are from the U.S. Census Bureau State and County QuickFacts. To account for the possibility that states with more stringent bankruptcy exemption laws may have also adopted other business regulations that might affect our analyses, we include the *Small Business Survival Index* (SBSI) for the year 2000. Produced by the Small Business &

[42] Campbell and Hopenhayn (2005) and Asplund and Nocke (2006) show market size to increase competition intensity and industry turnover, which is why we include proxies for market size as control variables in our specifications.

Entrepreneurship Council (Keating, 2000), the index is designed to reflect major state-level costs imposed on businesses, the greater its value, the greater the costs. The index ranges from 24.9 (South Dakota) to 68.2 (Washington, D.C.). For the same reason, we include an indicator for right-to-work states. We also include year fixed effects to account for common unobserved factors within years, such as effects of macroeconomic fluctuations, and Census region fixed effects to account for unobserved geographic differences across regions.[43] The fixed effects are denoted η_t and δ_r. Because the outcomes of interest may be correlated within a state over time, standard errors ε_{st} are clustered at the state level.

Results in Table 3.3 show there to be a negative and statistically significant relationship between sole proprietorship entry rates and level of exposure. Column 1 shows a hundred thousand dollar increase in exposure to be associated with a 0.77 percentage point reduction in the entry rate of nonemployer sole proprietorships. The coefficient for employer sole proprietorships (column 3) is also negative and significant at -0.54 percentage points. The coefficients for corporations (columns 2 and 4), which should not be negatively affected by exposure, given their limited liability, are not statistically significant.

Although relative to the 32.4 percent mean state entry rate of nonemployer sole proprietorships (see Table 3.2), and mean exposure level of 107,603 (2010 $), the effects might not seem large, because bankruptcy regulation directly affects millions of businesses even small differences in entry rate can translate into large effects in the economy.[44] For instance, a one standard deviation increase in entrepreneurs' exposure is estimated to lead to a 0.75 percentage

[43] Although the effects of bankruptcy laws can be identified even with state fixed effects, because limited variation in the exposure variable E_{st} precludes precise estimation of the effect, we include instead region fixed effects together with an extensive set of control variables.

[44] The U.S. Census Bureau reports there being 18,701,855 nonemployer (Nonemployer Statistics) and 987,858 employer (County Business Patterns) sole proprietorships in 2009.

point reduction in entry rate of nonemployer sole proprietorships and 0.53 percentage point reduction in entry rate of employer sole proprietorships.[45] For 2009, this would translate into 139,547 fewer nonemployer, and 5,205 fewer employer, sole proprietorship establishments having been started.

We also analyze changes brought about by the federal Bankruptcy Reform Act of 2005 by focusing on the indicator for states with unlimited exemption in post-2005 years. As can be seen from the third row in Table 3.3, even in the states with the most generous homestead exemptions, in which the effect of the BAPCPA should be most pronounced, we do not find any significant negative effects.

Table 3.4 shows the absence of statistically significant results of exposure on choice of legal form of organization. If entrepreneurs' decision to start a business as a corporation in higher exposure states is strategic, we should observe higher entry rates for corporations in such states. Lack of significant results in Table 3.4 suggest this is not the case. These findings are in line with the lack of positive effects of exposure on entry rates of corporations reported in Table 3.3; if entrepreneurs were more likely to incorporate businesses as a result of higher exposure, higher entry rates for corporations would be expected in such states, which, again, is not the case.

Theory predicts exit and entry rates to be the same in long-run equilibrium. To check whether the effect of entrepreneurs' exposure on entry rates is reflected in business exit rates, we run the same specifications using exit rate as the dependent variable. Table 3.5 shows the effect

[45] The 0.75, rounded to two decimal digits, is derived by multiplying the estimated coefficient of 0.769 by one standard deviation in the exposure (which, from Table 3.2, is 0.97031), the 0.53, rounded to two decimal digits, by multiplying the estimated coefficient of 0.543 by one standard deviation in the exposure (which, again from Table 3.2, is 0.97031).

of entrepreneurs' exposure to be negative and significant (albeit somewhat smaller than the estimates for entry rates) for sole proprietorships (columns 1 and 3), and not significant for corporations (columns 2 and 4).

3.6 Conclusion

This essay provides empirical evidence on the effect of personal bankruptcy laws on entrepreneurship, measured by business entry rates. We find the effect of the bankruptcy homestead exemptions on entry rates to be positive for businesses operated as sole proprietorships and not significant for corporations. Entrepreneurs' choice of legal form of organization does not seem to be affected by homestead exemptions and we find no evidence of a significant effect of the BAPCPA on entry rates when we focus on states in which the homestead exemption is unlimited.

Although relative to mean entry rates, the estimated effects of homestead exemptions on entry rates might not seem large, considering the number of affected business in the economy, the effects are significant. Follow-up research focusing on businesses within particular industrial sectors might uncover effects of substantially larger magnitudes.

Table 3.1 – Mean Homestead Exemptions and House Prices

State	Exemption	House Price	State	Exemption	House Price
Alabama	11,328	132,151	Montana	279,830	163,014
Alaska	75,336	223,864	Nebraska	28,794	122,791
Arizona	145,448	198,196	Nevada	292,872	236,670
Arkansas	Unlimited	113,803	New Hampshire	167,624	240,810
California	84,961	409,297	New Jersey	41,553	309,973
Colorado	100,548	232,745	New Mexico	86,454	160,973
Connecticut	169,921	290,747	New York	55,956	251,627
Delaware	20,812	228,297	North Carolina	29,732	159,149
D.C.	Unlimited*	336,264	North Dakota	90,625	112,624
Florida	Unlimited	190,727	Ohio	17,497	132,649
Georgia	20,159	160,761	Oklahoma	Unlimited	109,620
Hawaii	41,553	475,031	Oregon	41,187	216,521
Idaho	72,045	150,296	Pennsylvania	41,553	153,285
Illinois	21,613	182,885	Rhode Island	214,631	261,246
Indiana	23,236	122,697	South Carolina	48,791	146,755
Iowa	Unlimited	118,858	South Dakota	Unlimited	143,194
Kansas	Unlimited	120,865	Tennessee	8,496	124,545
Kentucky	11,328	134,240	Texas	Unlimited	132,744
Louisiana	28,320	139,529	Utah	45,312	193,662
Maine	70,706	177,763	Vermont	169,921	204,642
Maryland	0	273,401	Virginia	12,461	237,000
Massachusetts	418,559	329,680	Washington	71,500	255,534
Michigan	41,553	145,773	West Virginia	51,645	115,217
Minnesota	257,370	192,424	Wisconsin	45,312	165,592
Mississippi	169,921	119,644	Wyoming	22,656	165,666
Missouri	13,566	132,618	*Mean*	*84,682***	*193,099*

Notes: The values reported are means for 2000-2009, the years used in the analyses. All values are in 2010 dollars. The homestead exemptions are based on searches of individual states statutes supplemented by information on exemptions from Elias et al. (2005), Cerqueiro and Penas (2011), and Corradin et al. (2013). * D.C. has unlimited homestead exemption only from year 2005. ** The mean is calculated over observations with limited homestead exemption. Median house prices are provided by the Federal Housing Finance Agency (Leventis, 2010).

Table 3.2 – Descriptive Statistics

Dependent Variables	Mean	SD
Entry Rate (%) – Sole Proprietorships, Nonemployers	32.42	6.35
Entry Rate (%) – Corporations, Nonemployers	32.49	6.41
Entry Rate (%) – Sole Proprietorships, Employers	15.81	7.64
Entry Rate (%) – Corporations, Employers	10.58	2.70
Percentage of Entrants that are Sole Proprietorships, Nonemployers (%)	94.94	2.40
Percentage of Entrants that are Sole Proprietorships, Employers (%)	33.22	2.12
Exit Rate (%) – Sole Proprietorships, Nonemployers	29.16	4.01
Exit Rate (%) – Corporations, Nonemployers	33.48	4.96
Exit Rate (%) – Sole Proprietorships, Employers	16.47	2.54
Exit Rate (%) – Corporations, Employers	9.71	1.58
Regulation Variables	**Mean**	**SD**
Exposure* (2010 $)	107,603	97,031
Indicator – Unlimited Homestead Exemption States	0.1471	0.3545
Indicator – Unlimited Homestead Exemption States Post-2005	0.0627	0.2427
Other Market-Level Variables	**Mean**	**SD**
Median House Price** (2010 $)	193,099	85,468
Population**	5,771,888	6,430,736
Population: Mean Personal Income** (2010 $)	38,580	6,504
Population: Males (%)	49.23	0.79
Population: Caucasians (%)	81.13	13.65
Population: African Americans (%)	11.33	11.41
Population: Other Race (%)	7.54	10.14
Population: Age 14 and Younger (%)	20.34	1.71
Population: Age 15-65 (%)	66.99	1.44
Population: Age 65 and Older (%)	12.67	1.73
Population: Unemployed (%)	5.19	1.67
Geographic Area** (Square Miles)	138,723	169,871
SBSI	42.52	8.66
Indicator – Right-to-Work States	0.43	0.50
Number of Observations	510	
Period	2000-2009	

Notes: Observations are at the state-year level (50 states and D.C. times 10 years). Geographic Area, SBSI index, and Indicator for Right-to-Work States vary only across states. The index is designed to take into account major state-level costs imposed on businesses; the greater the value, the greater the costs. In the sample, the index ranges from 24.9 (South Dakota) to 68.2 (D.C.). * Exposure is defined as state median house price in a given year minus the homestead exemption (the measure can only be non-negative; states with unlimited homestead exemption have an exposure of zero). ** Median house price, population, personal income per capita, and geographic area are entered into the regressions in logs.

Table 3.3 – Entry Rates

	Nonemployers Entry Rate (%)		Employers Entry Rate (%)	
	Sole Prop.	**Corporations**	**Sole Prop.**	**Corporations**
Exposure (in $100,000)	-0.769**	-0.762	-0.543**	-0.259
	(0.372)	(0.588)	(0.229)	(0.233)
Indicator for States with Unlimited Exemption	0.155	1.461	0.379	1.079*
	(0.726)	(1.535)	(0.622)	(0.636)
Indicator for States with Unlimited Exemption in Post-2005 Years	-0.098	-1.576	-0.260	-0.490
	(0.362)	(1.240)	(0.522)	(0.391)
Control Variables	Yes	Yes	Yes	Yes
Fixed Effects – Year	Yes	Yes	Yes	Yes
Fixed Effects – Region	Yes	Yes	Yes	Yes
Number of Observations	510	510	510	510
Period	2000-2009	2000-2009	2000-2009	2000-2009

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Observations are at the state-year level. All regressions include the following set of controls: log of median house price, log of population, log of per capita mean personal income, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, unemployment rate, log of geographic area, SBSI index, and indicator for Right-to-Work states.

Table 3.4 – Percentage of Entrants that are Sole Proprietorships

	Percentage of Nonemployer Entrants that are Sole Proprietorships (%)	Percentage of Employer Entrants that are Sole Proprietorships (%)
Exposure (in $100,000)	0.251	0.825
	(0.285)	(1.560)
Indicator for States with Unlimited Exemption	-0.017	-1.310
	(0.781)	(4.090)
Indicator for States with Unlimited Exemption in Post-2005 Years	-0.070	1.420
	(0.273)	(1.260)
Control Variables	Yes	Yes
Fixed Effects – Year	Yes	Yes
Fixed Effects – Region	Yes	Yes
Number of Observations	510	510
Period	2000-2009	2000-2009

Notes: The percentage of the dependent variable is of the entrants that are sole proprietorships or corporations of nonemployer (column 1) or employer (column 2) type. Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Observations are at the state-year level. All regressions include the following set of controls: log of median house price, log of population, log of per capita mean personal income, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, unemployment rate, log of geographic area, SBSI index, and indicator for Right-to-Work states.

Table 3.5 – Exit Rates

	Nonemployers Exit Rate (%)		Employers Exit Rate (%)	
	Sole Prop.	**Corporations**	**Sole Prop.**	**Corporations**
Exposure (in $100,000)	-0.531*	-0.215	-0.467**	-0.213
	(0.280)	(0.244)	(0.221)	(0.210)
Indicator for States with Unlimited Exemption	0.365	0.114	0.671	0.131
	(0.551)	(0.629)	(0.574)	(0.378)
Indicator for States with Unlimited Exemption in Post-2005 Years	-0.195	0.0499	-0.505*	-0.262
	(0.309)	(0.374)	(0.275)	(0.320)
Control Variables	Yes	Yes	Yes	Yes
Fixed Effects – Year	Yes	Yes	Yes	Yes
Fixed Effects – Region	Yes	Yes	Yes	Yes
Number of Observations	510	510	510	510
Period	2000-2009	2000-2009	2000-2009	2000-2009

Notes: Standard errors are clustered by state. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level. Observations are at the state-year level. All regressions include the following set of controls: log of median house price, log of population, log of per capita mean personal income, fraction of males, fraction of African Americans, fraction of population other than African American or Caucasian, fraction of population age 14 and younger, fraction of population age 65 and older, unemployment rate, log of geographic area, SBSI index, and indicator for Right-to-Work states.

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