

Restoring Vision to Consumers and Competition to the Marketplace

Analyzing the Effects of Required
Prescription Release

Edward J. Timmons and Conor Norris

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Abstract

Occupational licensing laws can allow professionals to extract rents in the marketplace. In the case of vision services, optometrists have the authority to write prescriptions for contact lenses. Optometrists may choose to conceal this information and force patients to purchase lenses from the professional writing the prescription—resulting in vendor lock-in. In this paper, we investigate the possible effect of the 2004 Fairness to Contact Lens Consumers Act (FCLCA) on the market for vision services by examining state differences in prescription release mandates before 2004. We find that requiring professionals to release prescription information to patients resulted in a 10 to 11 percent reduction in the wages of optometrists. Our results provide some evidence that the FCLCA may have increased consumer welfare by reducing the prices of contact lenses or increasing access to contact lenses.

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**Restoring Vision to Consumers and Competition to the Marketplace:
Analyzing the Effects of Required Prescription Release**

Edward J. Timmons and Conor Norris

According to data on certifications and licenses published by the Bureau of Labor Statistics, more than 22 percent of employed Americans held an occupational license in 2016.¹ The Obama administration (White House 2015) documented the costs and benefits of occupational licensing and recommended that states weigh the costs and benefits of new regulations. In the Trump administration, both the Department of Labor and the Federal Trade Commission have voiced interest in promoting occupational licensing reform.² In the market for vision services, consumers may obtain eyeglasses or contact lenses from opticians, optometrists, or ophthalmologists. Consumers also generally have the option of purchasing eyeglasses and contact lenses from eye care professionals, brick-and-mortar retail stores, or online outlets. In 2004, the landmark Fairness to Contact Lens Consumers Act (FCLCA) was passed, which required vision service providers to release contact lens prescription information to patients. With this information, patients would have the ability to shop and compare prices for contact lenses. In 2016, bills were introduced that ultimately may have reduced prescription sharing by granting providers the ability to stall the process (de Ruyg 2016). Both the House bill (H.R. 6157) and the Senate bill (S. 2777, Contact Lens Consumer Health Protection Act of 2016) died in committee. The bills were presented as a means of promoting consumer safety and preventing fraud. One of the cosponsors of the Senate bill, Senator John Boozman of Arkansas, was an optometrist before assuming his Senate position.

¹ <https://www.bls.gov/cps/certifications-and-licenses.htm>.

² <https://www.dol.gov/newsroom/releases/opa/opa20170721>; <https://www.ftc.gov/policy/advocacy/economic-liberty>.

Using data from the US Census for 1990 and 2000 and American Community Survey (ACS) for 2001–2013, we estimate the effect that requiring providers to release prescription information to patients has on the earnings of optometrists.³ We utilize a two-way fixed effects estimation strategy that takes advantage of state-to-state differences in policy on prescription release before the federal legislation. We also report triple-difference estimations including similar healthcare professionals in the sample to control for national trends in demand for healthcare services. We perform a simple placebo test using opticians as a control group. Our results suggest that requiring optometrists to release contact lens prescription information to patients is associated with an approximately 10 to 11 percent reduction in optometrists' earnings. This result is consistent with reports in the existing occupational licensing literature that licensing laws provide professionals with an opportunity to extract economic rents. Our results should provide some guidance to policymakers on the potential negative implications of scaling back the FCLCA.

Vision Market Background

According to the *Review of Optometric Business* (2013), the vision market (excluding surgery) results in almost \$30 billion in annual revenue. There are three regulated professions that generally provide services in this market. Optometrists provide primary vision care, including sight testing, diagnosis, and treatment of vision changes. Although not medical doctors in the traditional sense, optometrists receive a Doctor of Optometry degree. Licensing statutes allow optometrists to perform vision tests and eye exams and to prescribe corrective lenses and eyeglasses. Opticians are technicians trained to design and fit corrective lenses and

³ Ideally we would have liked to investigate ophthalmologists as well, but they are lumped with physicians in the Census and ACS and cannot be identified.

eyeglasses. Twenty-one states require opticians to obtain a license (Timmons and Mills, forthcoming). Texas had a certification (title protection) law in place that was removed effective September 2015.⁴

According to the Centers for Disease Control, over 30 million Americans wear contact lenses (Clayton-Jeter 2010). In order for patients to purchase contact lenses, they must first obtain a prescription from an ophthalmologist or optometrist. In theory, patients are then free to purchase contact lenses from a vendor of their choice. However, before 2004, optometrists in many cases refused to release patients' prescriptions, forcing them to purchase lenses from the prescriber (effectively creating vendor lock-in).

Before 2004, a patchwork of state laws allowed consumers in the United States to purchase contact lenses from sellers other than their prescription provider. Table 1 displays the year in which each state required vision professionals to release patients' prescriptions. As displayed in the table, in 2004, all 50 states and the District of Columbia required prescription release. In 2004, the FCLCA unified purchasing rights for all citizens in the United States, with the intent of allowing consumers to purchase lenses from sellers other than the prescription provider. This act extended to contact lens patients the protection established 25 years earlier for eyeglass wearers.⁵ The law defines contact lens providers as ophthalmologists, optometrists, and licensed opticians who are permitted under state law to fit contact lenses.

⁴ In our sample, there were no changes to licensing requirements for opticians or optometrists. State fixed effects capture changes in these regulatory variables.

⁵ For more information on the eyeglasses rule, see the Federal Trade Commission website: <https://www.ftc.gov/news-events/press-releases/2004/10/contact-lens-rule-16-cfr-part-315-and-eyeglass-rule-16-cfr-part>.

Table 1. State Regulation of Contact Lens Prescriptions

| State | Prescription length | Prescription release | State | Prescription length | Prescription release |
|----------------------|---------------------|----------------------|----------------|---------------------|----------------------|
| Alabama | 1 | 1991 | Montana | 1 | 2004 |
| Alaska | 1 | 2004 | Nebraska | 1 | 2001 |
| Arizona | 1 | 1991 | Nevada | 2 | 2004 |
| Arkansas | 1 | 2003 | New Hampshire | 1 | 1994 |
| California | 2 | 2002 | New Jersey | 1 | 1991 |
| Colorado | 1 | 1992 | New Mexico | 2 | 2004 |
| Connecticut | 1 | 2004 | New York | 2 | 1981 |
| Delaware | 1 | 1990 | North Carolina | 1 | 1981 |
| District of Columbia | 1 | 2004 | North Dakota | 1 | 2004 |
| Florida | 2 | 1986 | Ohio | 1 | 1978 |
| Georgia | 1 | 1995 | Oklahoma | 1 | 1996 |
| Hawaii | 1 | 2004 | Oregon | 1 | 1991 |
| Idaho | 1 | 1987 | Pennsylvania | 1 | 2004 |
| Illinois | 1 | 2004 | Rhode Island | 1 | 2004 |
| Indiana | 1 | 1993 | South Carolina | 1 | 2004 |
| Iowa | 1.5 | 1994 | South Dakota | 1 | 1995 |
| Kansas | 1 | 2000 | Tennessee | 1 | 2004 |
| Kentucky | 1 | 2003 | Texas | 1 | 1998 |
| Louisiana | 1.5 | 1995 | Utah | 1 | 2000 |
| Maine | 2 | 1993 | Vermont | 1 | 1993 |
| Maryland | 2 | 1998 | Virginia | 1 | 1988 |
| Massachusetts | 1 | 1993 | Washington | 2 | 1994 |
| Michigan | 1 | 2002 | West Virginia | 1 | 2004 |
| Minnesota | 2 | 2002 | Wisconsin | 1 | 2002 |
| Mississippi | 2 | 2004 | Wyoming | 1 | 1995 |
| Missouri | 1 | 2004 | | | |

Note: All data were obtained from the American Optometric Association and by consulting the statutes of each state.

Under the FCLCA and some earlier state legislation, prescription providers are required to release prescriptions to the patient with or without their request. Previously, providers in some states could refuse to release the prescriptions, forcing patients to purchase their contact lenses from the testing vision professional. The statute prohibits providers from placing any restrictions or requirements on the patient in order to release the prescription. With the increased demand for lenses from online and other brick-and-mortar contact sellers, Congress enacted this statute to

allow consumers to purchase directly from these vendors. It allows consumers to purchase from any vendor as long as the vendor has had the prescription verified.

Verification of the prescription can be achieved through direct communication with the prescriber. This verification must occur within eight hours. The direct communication can be done in a number of ways. Fax, email, and phone calls are acceptable forms of verification, and these communications must be kept on record by the seller for at least three years. Furthermore, this law requires patients to obtain prescriptions in order to purchase contact lenses.

Prescriptions also must not expire within one year, but the states retain the option to require that prescriptions last more than one year. Several states have mandated that contact lens prescriptions last for 18 months or two years. Table 1 also displays the duration of prescriptions. Although there is variation across states within our sample, there is no variation within states with respect to prescription duration over time. As a result, we are unable to empirically identify the effect of prescription duration on the vision market.

The Economics of Licensing and “Lock-in”

In the past decade, there have been a number of studies estimating the effects of occupational licensing (Kleiner 2006). Studies have found evidence that licensing decreases the quantity of Vietnamese immigrant manicurists (Federman, Harrington, and Krynski 2006), increases costs while simultaneously decreasing the quantity of cosmetologists (Adams, Jackson, and Ekelund 2002), increases barbers’ wages by between 11 and 22 percent (Timmons and Thornton 2010), increases massage therapists’ wages by as much as 16.2 percent (Thornton and Timmons 2013), and increases the wages of radiologic technologists by as much as 6.9 percent (Timmons and Thornton 2008).

A segment of the literature focuses specifically on the market for vision services. In the late 1970s, a number of economic studies examined the effect of a different restraint on trade in the market for vision services—bans on advertising. Feldman and Begun (1978) found evidence that advertising bans increase eyeglass prices by as much as 16 percent. A Federal Trade Commission report (Bond et al. 1980) found evidence of even larger price effects—as much as a 30 percent increase. A recent paper by Timmons and Mills (forthcoming) estimates the effects of licensing requirements on opticians' wages. Their findings suggest that licensing increased opticians' earnings by as much as 16.9 percent compared to those in states that did not require licensing. Additionally, more stringent licensing requirements were associated with increased wages. Timmons and Mills found a 3 percent increase in wages per each exam required and a 2 percent increase for 100 additional days of educational training (Timmons and Mills, forthcoming).

Some products or services require that specific complementary goods or services be utilized. In some cases, the firm that produces the primary good or service also controls access to the specific complementary good or, at the very least, the consumer faces significant costs to obtain the required complementary good or service. This provides the firm with a form of monopolistic leverage or “lock-in” (Bowman 1957; Shapiro 1995). Firms with leverage from bundling their products or services for sale with other products or services can use it to increase profits. By bundling the goods or services together, the firm can defend both products against competitors without having to reduce prices on each of them separately. The market for eye exams and contact lenses seems to fit this description.

An example of bundling goods is the market for funeral services. Regulations restrict entry into the market for providing funeral services in the United States. In some cases, states

also restrict the sale of caskets only to licensed professionals. In most states, the purchase of a casket is tied to the embalming and funeral services offered. Restrictions on casket sales may give the funeral home that performs the embalming services leverage or lock-in power. This allows funeral homes to extract rents from the sale of caskets. Research by Chevalier and Morton has shown that where such restrictions are in place, funeral homes are able to obtain lock-in pricing profits from caskets of around \$260 per casket. That equals nearly 6 percent of the total cost of deathcare goods and services for an average funeral (Chevalier and Morton 2008). Funeral homes in states without restrictions on the sales of caskets, however, offset the reduction in casket prices by raising prices on funeral services.

Funeral services are an infrequent expense, however, rather than a recurring service like contact lenses and eye exams for consumers. In addition, much of the theoretical literature focuses on a consumer durable (e.g., a printer or camera). Eye care providers must consider the possible effects on their reputation and their ability to earn future profits from customers when choosing the prices they will charge for eye exams and contact lenses. In addition, many consumers may have vision insurance that partially offsets the cost of contact lenses or eye exams. Contact lenses, an aftermarket good, are tied to the purchase of eye exams. Before the FCLCA, some optometrists refused to release prescriptions to patients, giving patients little opportunity to shop for contact lenses. Because of the high switching cost of obtaining an eye exam from another professional, patients were forced to purchase contact lenses from their initial vision care provider. By locking patients into purchasing contact lenses, it is possible that the providers were able to extract higher prices, and this may have resulted in higher salaries for optometrists.

We were able to find only one paper that empirically attempts to measure the effect of the FCLCA on the market for vision services. A working paper by Cooper (2012) estimated the effect of the FCLCA on contact lens prices. The author was unable to find any evidence of an effect, but the study focused solely on Northern Virginia and estimated the effect of the FCLCA as a year dummy (2004)—the research design does not acknowledge the difference in prescription release legislation before the passage of the FCLCA. The Federal Trade Commission (2004) issued a report noting the possible negative consequences of requiring all contact lens sellers to obtain licenses—effectively the result of “lock-in” in the market. In addition, an earlier paper by Cooper (2007) notes the possible negative effects on consumers from limiting their access to prescription information. In the present paper, we extend the existing literature by examining the market for optometrists in 1990 and 2000–2013. We examine differences across states in the timing of requiring the release of contact lens prescription information to patients by utilizing a two-way fixed effects framework. Before turning to the results of our empirical estimations, we first further discuss our empirical framework and data in the next section.

Data and Estimation Strategy

We rely on data obtained from the *Integrated Public Use Microdata Series* (IPUMS) database for the 1990 and 2000 US Censuses and the 2001–2013 American Community Surveys (Ruggles et al. 2017). Table 2 presents the summary statistics for our samples. We separate the samples by occupation—opticians, lab technicians, optometrists, and dentists. Our primary focus is on optometrists. We use opticians as a placebo test since they are unable to write prescriptions but are working in the same industry, and we use lab technicians and dentists as further control groups. We use the occupation codes from the ACS to identify the individuals

for the sample. For opticians, we include respondents working in the “optical goods workers” category. We examine industry classifications and retain opticians who work in an optometrist’s or a physician’s office (presumably for an ophthalmologist), a clinic, a retail setting, or in the general health services category. If the listed industry is unrelated to eye care, it is not included in our sample. The laboratory technicians sample includes respondents who listed “clinical laboratory technician” as an occupation. We include those working in physicians’ offices, health services, hospitals, research and development, drug production, and medical supplies. Once again, observations that list unrelated industries are not included in the sample. We utilize a very similar procedure (keeping observations only from related industries) when building a sample of optometrists and dentists. The ACS and Census surveys include information on individuals’ age, race, gender, educational status, and working characteristics. Using the consumer price index (CPI), we place wages for each year in 2012 dollars. Our sample includes a total of 110,618 observations across the four occupations when restricted to respondents with nonzero earnings, weeks worked, and hours worked.⁶

⁶ The sample is slightly larger when restricted to respondents with nonzero weeks and hours worked for the purposes of the regressions estimating hours worked.

Table 2. Summary Statistics

| Optician | | | Lab technician | | |
|-----------------------------|-------------|---------------------------|-----------------------------|-------------|---------------------------|
| Variable | Mean | Standard deviation | Variable | Mean | Standard deviation |
| Hourly wage (2012 \$) | 19.29 | 12.02 | Hourly wage (2012 \$) | 25.39 | 13.49 |
| Hours worked | 34.35 | 13.8 | Hours worked | 35.0 | 14.1 |
| Prescription release | 0.69 | 0.46 | Prescription release | 0.69 | 0.46 |
| Prescription length (years) | 1.34 | 0.47 | Prescription length (years) | 1.34 | 0.47 |
| Age (years) | 41.6 | 13.9 | Age (years) | 41.8 | 13.0 |
| Female | 0.69 | 0.46 | Female | 0.76 | 0.43 |
| African American | 0.04 | 0.19 | African American | 0.11 | 0.31 |
| Hispanic | 0.084 | 0.28 | Hispanic | 0.065 | 0.25 |
| Other minority | 0.083 | 0.25 | Other minority | 0.14 | 0.26 |
| Bachelor's | 0.12 | 0.31 | Bachelor's | 0.44 | 0.50 |
| Master's | 0.01 | 0.10 | Master's | 0.05 | 0.22 |
| Doctorate | 0.002 | 0.05 | Doctorate | 0.005 | 0.07 |
| <i>n</i> | 10,120 | | <i>n</i> | 61,811 | |
| Optometrist | | | Dentist | | |
| Variable | Mean | Standard deviation | Variable | Mean | Standard deviation |
| Hourly wage (2012 \$) | 61.76 | 35.11 | Hourly wage (2012 \$) | 101.75 | 45.23 |
| Hours worked | 39.9 | 11.3 | Hours worked | 38.7 | 11.1 |
| Prescription release | 0.72 | 0.45 | Prescription release | 0.70 | 0.46 |
| Prescription length (years) | 1.35 | 0.45 | Prescription length (years) | 1.40 | 0.48 |
| Age (years) | 46.88 | 12.57 | Age (years) | 48.0 | 12.2 |
| Female | 0.29 | 0.45 | Female | 0.18 | 0.38 |
| African American | 0.012 | 0.11 | African American | 0.026 | 0.16 |
| Hispanic | 0.027 | 0.16 | Hispanic | 0.039 | 0.19 |
| Other minority | 0.11 | 0.25 | Other minority | 0.11 | 0.23 |
| <i>n</i> | 6,689 | | <i>n</i> | 31,998 | |

Note: All data are from the US Census (1990 and 2000) and American Community Survey (2001–2013). Data on prescription release and length were obtained from the American Optometric Association and by consulting the statutes of each state.

To estimate the effect that requiring the release of contact lens prescription information to patients has had on optometrists' earnings and hours worked, we use the equation

$$\ln(\text{hourly wages}_{ist} \text{ or hours worked}_{ist}) = \alpha + \beta_s (R) + \lambda_i (I) + \mu_{st}(FE) + \varepsilon_{ist}, \quad (1)$$

where hourly wages and hours worked are reported by the surveyed individual i living in state s at time t . It is important to note that our estimates use hourly wages as the dependent variable and also perform regressions using hours worked as the dependent variable. R is a dummy variable representing whether state s requires prescriptions to be released by the vision professional at time t . The prescription release dummy variable is coded “0” if prescription release is not required in state s at time t and “1” if prescription release is required in state s at time t .

The dummy variables for individual i 's characteristics (I) control for some of the factors impacting earnings that have been found most commonly in empirical human capital studies dating back to Mincer (1958). We use age as a proxy for experience because experience is not readily available from these surveys. Research has demonstrated that age has a positive effect on earnings. However, as individuals age, its effect diminishes, so we include a squared term of age to account for this. Age squared should have a negative coefficient. In general, studies have found that minorities tend to earn less than their white counterparts. Additionally, females often earn less than males, and higher levels of education tend to increase wages relative to workers with less education.

To control for unobserved state heterogeneity, we include both state and time fixed effects (FE) in all our regressions. Given the length of our period of study, it is unlikely that the standard “parallel paths” assumption of our estimation is met. To account for this, we also report estimations including both linear and quadratic state-specific time trends.

Our primary variable of interest is a dummy variable for prescription release requirements in state s at time t . We anticipated that states requiring prescriptions to be released would be associated with lower hourly wages because of the increased competition

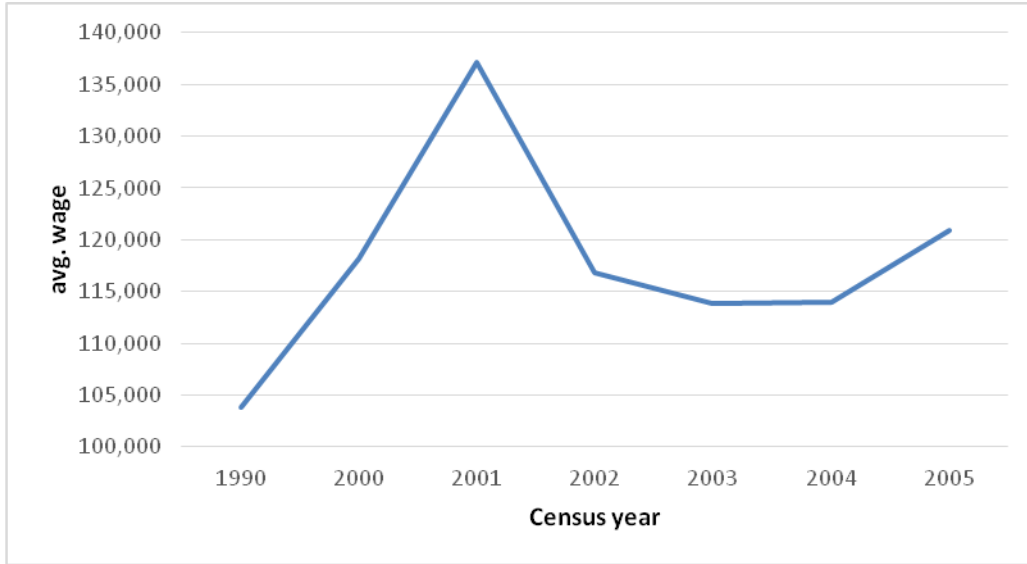
resulting from consumers purchasing from online retailers or other eye care professionals. This will be true for optometrists but not for opticians, who do not have the authority to write prescriptions. We perform regressions using opticians as a simple “placebo” test—we would not expect prescription release requirements to impact the earnings of opticians a priori. For hours worked, we hypothesized that requiring professionals to release prescriptions could either increase or decrease hours worked—optometrists might try to compensate for their lower hourly wage by working longer hours or perhaps choose to consume more leisure as a result of the hourly wage being lower. Hours worked might also just gauge the volume of customers (demand) for each professional.

In addition to standard two-way fixed effects estimations, we also perform triple-difference estimations. We pool dentists with our optometrist sample and lab technicians with our optician sample—again using the opticians as a placebo test. We then add dummy variables for our occupations of interest (optometrist and optician) and interact these dummies with the dummy variable for prescription release. The coefficients on these interaction terms (optometrist \times presrelease and optician \times presrelease) represent the triple-difference estimates. Occupations were paired in this fashion in an attempt to match healthcare professionals with similar education and licensing requirements and wage levels. Triple-difference specifications were performed to control for trends unrelated to prescription release that may have also influenced vision professional labor market outcomes. In figures 1A–1D, we present simple trends in annual earnings for optometrists and dentists for the period of our study preceding the FCLCA. All earnings are in 2012 dollars. We define “treated” states as states that required prescription release during the time period (1990–2004) and “untreated” states as states that did not require prescription release before the FCLCA. Focusing first on figures 1A and 1B, it can be seen that

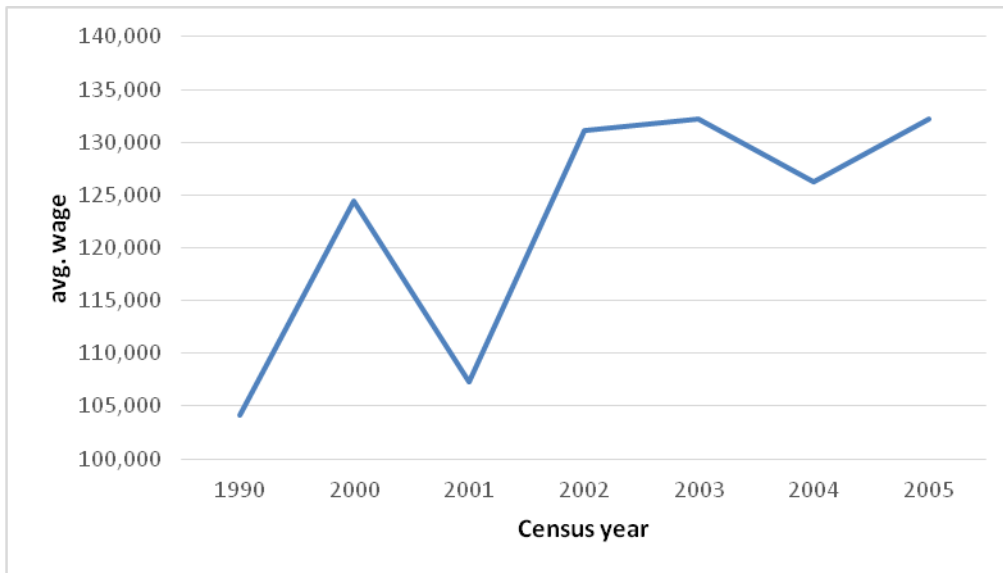
optometrists' earnings followed noticeably different trends in treated and untreated states. Optometrist earnings increased substantially more from 1990 to 2001 in untreated states (more than 30 percent) than in treated states (approximately 3 percent). But by 2004, the year the FCLCA was passed, earnings of optometrists in untreated states fell below the earnings of optometrists in treated states; however, it is not clear if the FCLCA is responsible for this difference. A similar comparison of dentists' earnings in figures 1C and 1D suggests that dentists' earnings in both groups of states followed similar trends—there is little evidence that dentists' earnings in “treated” and “untreated” states grew at different rates.

Figure 1. Trends in Health Professional Annual Earnings (1990–2004)

A. Optometrists' Annual Earnings (Untreated States)



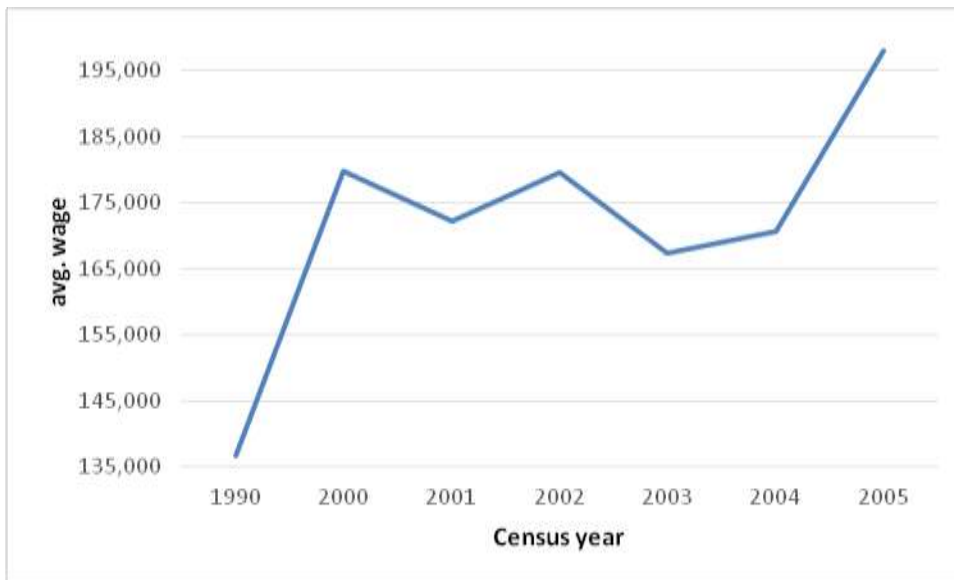
B. Optometrists' Annual Earnings (Treated States)



C. Dentists' Annual Earnings (Untreated States)



D. Dentists' Annual Earnings (Treated States)



Note: All data are from the US Census (1990 and 2000) and American Community Survey (2001–2004).

Results

The results of our first set of estimations are in table 3 for our variables of interest. Here we focus on optometrists and opticians (as a placebo test) and perform two-way fixed effects estimations. All standard errors are clustered at the state level. We find little evidence in table 3A that prescription release is associated with a reduction in optometrists' earnings. When we do not include linear and quadratic time trends, we do find evidence of prescription release being associated with a 5.3 percent reduction in opticians' wages. When we include controls for linear and quadratic time trends, the effect becomes -4.0 percent and lacks statistical significance. In table 3B, we estimate the effects of prescription release on hours worked. We find little evidence that requiring eye care professionals to release prescription information is associated with a measurable change in the wages or hours worked of optometrists or opticians.

Table 3. Two-Way Fixed Effects Estimates of the Effects of Required Prescription Release

| Panel a: Hourly wage | | | | |
|-----------------------------------|---|------------------|---------------------------------------|-------------------|
| Variable | Optometrist <i>n</i> = 6,689 | | Optician <i>n</i> = 10,120 | |
| Prescription release dummy | 0.059 (0.046) | 0.067 (0.057) | -0.053* (0.020) | -0.040 (0.031) |
| State linear and quadratic trends | no | yes | no | yes |
| R^2 | 0.06 | 0.07 | 0.17 | 0.17 |
| Panel b: Hours worked | | | | |
| Variable | Optometrist <i>n</i> = 6,730 | | Optician <i>n</i> = 11,373 | |
| Prescription release dummy | 0.22 (0.43) | -0.02 (0.50) | -0.085 (0.42) | -0.18 (0.68) |
| State linear and quadratic trends | no | yes | no | yes |
| R^2 | 0.16 | 0.17 | 0.11 | 0.11 |

Notes: * Significant at the 5 percent level. State clustered standard errors are given in parentheses. All data are from the US Census (1990 and 2000) and American Community Survey (2001–2013). Data on prescription release were obtained from the American Optometric Association and by consulting the statutes of each state. All regressions include individual controls (e.g., age, age², race, ethnicity) and state and time fixed effects. All standard errors are clustered by state.

In table 4, we reestimate the model, this time pooling optometrists and dentists. For our placebo test, we pool opticians and lab technicians. We created an occupation dummy variable and an interaction variable to perform a triple-difference estimation. In the top part of table 4, we estimate the association of the prescription release dummy variable with hourly wages. After controlling for unobserved time-varying heterogeneity in the healthcare market via our triple-difference estimation strategy and including linear and quadratic time trends, we do find evidence that optometrists earned less (as much as 11 percent less) in states that required contact lens prescription release. Our results in the simple two-way fixed effects specification (table 3) appear to have been downwardly biased by unobserved heterogeneity. For example, there has been a gradual decrease in demand for traditional brick-and-mortar eyeglass and contact lens dispensers as a result of new entrants into the online marketplace (e.g., 1-800-CONTACTS). For our placebo test using opticians, we find no evidence that requiring the professionals to release contact lens prescriptions reduces wages—the coefficient is both economically and statistically insignificant. The reduction in optometrists’ wages after prescription release requirements are initiated suggests that optometrists are negatively affected by the laws.

Table 4. Triple Difference Estimates of the Effects of the Required Prescription

| Panel a. Hourly wage | | | | | |
|-----------------------------------|---|---------|-----------------------------------|---|---------|
| Variable | Optometrists and dentists sample <i>n</i> = 38,030 | | Variable | Opticians and lab technicians sample <i>n</i> = 72,925 | |
| Prescription release dummy | 0.029 | 0.034 | Prescription release dummy | 0.00011 | 0.0073 |
| | (0.026) | (0.030) | | (0.013) | (.014) |
| Optometrist dummy | -0.29* | -0.29* | Optometrist dummy | -0.25* | -0.25* |
| | (0.016) | (.017) | | (0.015) | (.015) |
| Optometrist × presrelease | -0.11* | -0.10* | Optometrist × presrelease | -0.0020 | -0.0039 |
| | (0.027) | (.027) | | (0.022) | (.022) |
| State linear and quadratic trends | no | yes | State linear and quadratic trends | no | yes |
| R^2 | 0.11 | 0.12 | R^2 | 0.17 | 0.17 |
| Panel b. Hours worked | | | | | |
| Variable | Optometrists and dentists sample <i>n</i> = 38,235 | | Variable | Opticians and lab technicians sample <i>n</i> = 80,138 | |
| Prescription release dummy | -0.01 | 0.03 | Prescription release dummy | 0.10 | 0.35 |
| | (0.23) | (.31) | | (0.33) | (0.23) |
| Optometrist dummy | 1.95* | 1.95* | Optometrist dummy | -0.13 | -0.17 |
| | (0.32) | (0.32) | | (0.33) | (0.34) |
| Optometrist × presrelease | -0.34 | -0.35 | Optometrist × presrelease | -0.22 | -0.17 |
| | (0.32) | (0.33) | | (0.34) | (0.36) |
| State linear and quadratic trends | no | yes | State linear and quadratic trends | no | yes |
| R^2 | 0.10 | 0.11 | R^2 | 0.08 | 0.08 |

Notes: * Significant at the 1 percent level. All data are from the US Census (1990 and 2000) and American Community Survey (2001–2013). Data on prescription release were obtained from the American Optometric Association and by consulting the statues of each state. All regressions include individual controls (e.g., age, age2, race, ethnicity) and state and time fixed effects. All standard errors are clustered by state.

The change in optometrists' wages (since we calculate wages by dividing annual earnings by weeks worked multiplied by weekly hours worked) may be a result of optometrists working

longer hours or earning less—perhaps from charging lower prices for contact lenses. Turning to the bottom part of table 4, we find little evidence that requiring professionals to release prescription information is associated with any measurable changes in hours worked for optometrists or opticians. This is consistent with the possibility that prescription release is placing pressure on optometrists to reduce contact lens prices.

Conclusion

In this paper, we have estimated the effect of the Fairness to Contact Lens Consumers Act (FCLCA) on the professional market for vision services. We use pre-2004 state-by-state differences in prescription release requirements to better understand the potential effects of the law. Our results suggest that the requirement for professionals to release contact lens prescription information to patients is associated with as much as an 11 percent reduction in optometrists' wages. We find little evidence that the change in regulation is associated with a change in hours worked for optometrists. We performed a simple placebo test using the closely related occupation of opticians and found no similar evidence of an effect. Before the passage of the FCLCA, professionals effectively were able to enjoy rents from “lock-in” or leverage—there was no requirement for the professional to release prescription information, and patients were effectively forced to purchase lenses from the professional conducting the eye exam. The FCLCA removed this restriction, and our results suggest that consumers reacted by seeking lower-priced alternatives. In the absence of removing or scaling back existing occupational licensing laws (delicensing remains very rare, as detailed by Thornton and Timmons 2015), legislation similar to the FCLCA may prove beneficial in improving competition and reducing prices for consumers. In the context of the market for medical services, medical professionals can recommend tests and minor procedures, and the tests could be performed outside the

medical provider's office, potentially at a lower cost to the patient. It would seem that the needs of contact lens and eyeglass consumers will continue to be better met by maintaining the intent of the 2004 law, which encourages competition in the marketplace.

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