Constraining Rivals

The Effect of State-Mandated Facility Requirements on the Locations and Sizes of Funeral Homes

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Abstract

Thirty-four states require death-care firms that specialize in low-cost cremations to have embalming rooms, despite the fact that such firms have no use for them. Many states also require death-care firms to have chapels and casket display rooms. We test whether such requirements affect funeral markets where critics of the regulations claim they do the most harm by artificially suppressing the number of small funeral homes. We focus on Arizona and Florida because Arizona imposes more demanding facility requirements on funeral homes and cremation specialists than Florida does. We present evidence that Arizona's more extensive facility requirements reduce the number of very small funeral homes and prevent them from locating in shopping centers; these requirements also increase funeral prices. These increasingly antiquated laws have created thousands of dormant embalming rooms across the country and have increased consumer costs while providing few if any discernible benefits.

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I. Introduction

Many states require funeral homes to have specific facilities, such as embalming rooms, chapels, and casket display rooms. The licensing requirements are often quite specific, stipulating the minimum seating capacity of chapels, the minimum square footage of casket display rooms, and the required supplies and equipment of embalming rooms. State auditors, academics, and entrepreneurs have long criticized these requirements for imposing unnecessary costs on the rivals of traditional funeral homes and, thereby, impeding the entry of funeral home chains and firms specializing in cremations, eco-friendly funerals, and home-oriented funerals. The detrimental effects of these facility requirements may extend even further by forcing some death-care firms to locate in larger commercial spaces than they would otherwise choose and constraining them from locating in shopping centers and commercial parks.

The required facilities are often of so little value that death-care firms leave them dormant. Embalming rooms are left dormant for two reasons: (1) firms specializing in low-cost cremation services and eco-friendly funerals have no need for them, and (2) funeral home chains frequently centralize their embalming work at a single location to exploit economies of scale. To get a sense of the potential number of dormant embalming rooms, consider the case of Florida, where funeral homes are not required to have embalming rooms. In 2006, 31.4 percent of Florida's death-care establishments did not embalm bodies at their facilities. If the same fraction

were to choose to leave embalming rooms dormant in the 34 states that require them, there would be 6,728 dormant embalming rooms across the country.[1]

The proliferation of dormant embalming rooms has raised the eyebrows of state auditors and sparked lawsuits challenging the constitutionality of requiring them. In 2003, Arizona's auditor general recommended repealing the state's embalming room requirement, arguing it was a "costly barrier" and "outdated in light of the current industry practice of using centralized embalming facilities" (Arizona Auditor General 2003). Ten years earlier, the Pennsylvania Audit Report characterized its embalming room requirement as "burdensome and unnecessary" (Pennsylvania General Assembly 1994). Neither state repealed its law, nor has any other state willingly done so. In 2012, a Minnesota entrepreneur wanted to open a funeral home branch without an embalming preparation room but was barred from doing so by state law. He sued in state court and won, compelling Minnesota to repeal the law in 2014. A similar lawsuit in Pennsylvania won in federal district court in 2012 but was reversed in the US Court of Appeals for the Third Circuit.

The state auditors and plaintiffs made identical arguments, focusing on the cost of unnecessary embalming rooms. All four presented estimates of the cost of constructing and equipping embalming rooms in their states; for example, the Minnesota plaintiffs cited estimates ranging from $30,000 to $50,000 for each embalming room. The complaints and reports argued that the cost of embalming rooms is a barrier to entry, leading consumers to pay more for funeral services. They did not challenge the desirability of requiring chapels or casket display rooms, nor the cumulative effect of facility requirements on the minimum sizes of death-care firms. And

[1]In the fall of 2006, a survey of Florida's 874 licensed death-care establishments found that 31.4 percent of them did not embalm bodies at their facilities (Chevalier, Harrington, and Scott Morton 2009). According to the 2012 Economic Census, there were 21,427 funeral homes (North American Industry Classification System code 81221) in the 34 states that have an embalming room requirement (Ellig 2015; Wilson 2013). Hence, an upper-bound estimate of the number of dormant preparation rooms nationally is 6,728.

none argued that facility requirements prevent funeral establishments from locating in shopping centers and commercial parks.

State laws barring optometrists and eyeglass companies from locating in shopping centers raised concerns and led the Federal Trade Commission (FTC) to investigate these laws in the 1970s. At that time, 28 states restricted optometrists from "locating in high-traffic, high-visibility areas such as shopping centers and department stores" (Haas-Wilson 1986, 174). These location restrictions made it more difficult for optometrists to create large practices and inhibited the growth of chains of vision care companies. Using data compiled by the FTC, Haas-Wilson (1986) finds that commercial practice restrictions, including location restrictions, increased the price of eye examinations and glasses without increasing the quality of ophthalmic services.[2]

In this research, we investigate the effect of minimum facility requirements on the sizes and locations of death-care firms in Arizona and Florida. We chose these states because Arizona requires every funeral establishment to have an embalming room, a chapel, and a merchandise display room, while Florida does not. We also chose them because the sizes of their funeral homes are relatively easy to measure using Google Earth.[3] Our focus on the effect of funeral regulations on the location of funeral homes and the distribution of funeral home sizes differs from previous research that measures these regulations' effects on average prices, expenditures, or cremation rates across states (Harrington and Krynski 2002; Sutter 2005; Harrington 2007; Sutter 2007; Chevalier and Scott Morton 2008; Harrington and Treber 2012; Ellig 2015). Our study is similar to the work of Larsen (2015), who looks at the effect of the licensing of teachers

[2] The other commercial practice restrictions were prohibitions against (1) corporations hiring optometrists, (2) optometrists operating branch offices, and (3) optometrists using trade names. The four commercial practice restrictions are jointly significant in explaining the price of eye exams and eyeglasses at the 1 percent level (Haas-Wilson 1986, 182).

[3] Florida was also appealing because we possessed historical pricing data for a large sample of the funeral homes in the state.

on the distribution of their students' test scores rather than just averages and finds that stricter licensing requirements are associated with greater variation in the distribution of test scores. We find that more stringent facility requirements truncate the lower tail of the distribution of funeral home sizes and reduce the probability of finding funeral homes in shopping centers and commercial parks.

We also collected data on the prices of direct cremations and traditional funerals. We find that small funeral homes and funeral homes located in shopping centers charge lower prices for these funeral services. Assuming that our estimates are causal, back-of-the-envelope calculations suggest that 2,700 additional Arizonians would be purchasing funeral services at very small funeral homes and ones located in shopping centers if Arizona's minimum facility requirements did not exist. These consumers would be saving roughly 13 percent compared to what they are currently spending on caring for their dead. Other Arizonians would also benefit from the likely spillover effects via the competitive pressure these low-cost funeral homes would exert on the prices charged by other funeral homes.

The next section provides some general background on the regulation of funeral markets. Particular attention is given to minimum facility requirements and the difference in the regulatory mechanisms for Arizona and Florida. The third section discusses the data that we compiled for this study and provides some preliminary analysis. The fourth section outlines the empirical approach we use to tease out the effects of minimum facility requirements on the size and location of funeral homes; it then concludes with a discussion of the regression results. The fifth section examines pricing effects to provide additional evidence of the anticompetitive effects of these regulations.

II. Regulatory Design of Funeral Homes

Nearly all states license funeral homes, and most states require them to display their licenses conspicuously, which allows dissatisfied consumers to see the names of licensing agencies where they can lodge complaints.[4] To help consumers identify funeral directors, the websites of these agencies usually include "license verification systems," which allow consumers (and researchers) to obtain the names and addresses of funeral homes and funeral directors.

Most states impose many more regulations on funeral directors and establishments than just requiring that they be registered. For example, many states regulate the layout of funeral homes. Consider Arizona. A funeral home in Arizona must have a fully equipped and fully supplied embalming room with "sanitary flooring, drainage and ventilation"[5] that satisfies the specifications of the funeral board. The level of detail is exemplified by the fact that 25 states give detailed instructions concerning the floors of preparation rooms. For example, Maryland specifies that "the floors, walls, and ceilings [of embalming rooms] shall be smooth and made of tile or other high gloss, impervious, washable material."[6] These sorts of requirements make it nearly impossible to locate funeral homes in shopping centers and commercial parks, which rarely, if ever, have retail spaces capable of being hosed with water from ceiling to floor.

Many of these elaborately designed preparation rooms do not need to be cleaned because thousands of them are not used. They are similar to the bedrooms of sons and daughters who left home long ago; stuff just ends up getting stored in there. An inspector for the Arizona State Board of Funeral Directors and Embalmers said that she frequently orders funeral directors to remove boxes from unused preparation rooms because the law says that the space can be used in

[4] For example, see *Arizona Revised Statutes* (A.R.S.) § 32–1387 (2016) and *Florida Statutes* (Fla. Stat.) § 497.380 (2017).
[5] A.R.S. § 32-1382.
[6] *Code of Maryland Regulations* (COMAR) 10.29.03.04 (2017).

no other way. Some states have even added language to their laws specifying the ways in which idle preparation rooms cannot be used—Kentucky says they "shall not be used as storage areas other than for supplies pertaining to embalming," and New Jersey says they cannot be used as "break rooms."[7]

Every funeral home in Arizona must have a chapel, although the statute does not specify how large it must be. According to the inspector for the Arizona Funeral Board, some of them are very small, and a few appear as if they were rarely, if ever, used for a funeral service. Other states are more specific: for example, Michigan requires that chapels be capable of seating at least 50 people, while Massachusetts requires they be at least 300 square feet.[8]

Arizona requires funeral homes to have merchandise display rooms but is silent about what they need to display. Other states are more specific. For example, Louisiana requires display rooms to contain at least "six adult caskets of a variety of styles and quality." Similarly, Texas requires they display at least two full-size adult caskets.[9] Funeral homes outside of states like Louisiana and Texas often display only pieces of caskets, called "end cuts," which are mounted on walls, or simply use electronic catalogs. The inspector for the Arizona Funeral Board could not remember a case where she had to comment on a funeral home's display room—she said they all had them, arguing that even small funeral homes specializing in low-cost cremations wanted to display urns.

Unlike Arizona, Florida's statutes do not require funeral homes to have preparation rooms, chapels, or merchandise display rooms. However, they do specify minimum size

[7] *Kentucky Administrative Regulations*, 201 KAR 15:110 (2016) and *New Jersey Administrative Code* (N.J.A.C.) 13:36-5.4 (2017).
[8] *Michigan Administrative Code* (Mich. Admin. Code) R 339.18931 (2017) and *Code of Massachusetts Regulations*, 239 CMR 3.06 (2016).
[9] *Louisiana Revised Statutes* (La. R.S.) § 37:842 (2017) and *Texas Occupations Code* (Tex. Occ. Code) § 651.351 (2016).

requirements for the two types of licenses available for death-care firms in the state. The first license type is for funeral homes that offer the full range of funeral services, and the second is for firms that sell only low-cost cremations. The latter are called direct disposition establishments, and the service they sell, direct cremations, is defined as the "cremation of human remains without preparation of the human remains by embalming and without any attendant services or rites such as funeral or graveside services or the making of arrangements for such final disposition."[10]

Direct disposition establishments in Florida face less stringent licensing requirements than funeral establishments. One of the differences is the minimum size of their buildings. The smallest funeral homes must be twice as large as the smallest direct disposition offices, having interiors of at least 1,250 square feet versus 625 square feet. Unlike many other states, Florida does not require funeral firms to have preparation rooms, instead requiring that they have access to either mortuary refrigerators or embalming services, a provision that can be satisfied by having a contract with a wholesaler of mortuary services.

Neither Arizona nor Florida prohibits where funeral homes can be located, but some states do. The most common prohibition, found in 11 states, forbids funeral homes from being located in cemeteries (Harrington and Treber 2012). One might wonder whether some states explicitly prohibit funeral homes from locating in shopping centers because they are not found there in many states. However, we could only find one state that comes close to prohibiting funeral homes from being located in shopping centers.[11] Georgia says that "funeral

[10] Fla. Stat. § 497.005 (2016).
[11] Marsh (2013) argues that shopping center owners may bar funeral homes from locating in shopping centers because of "longstanding norms" shared by their tenants that funeral homes do not belong there.

establishments shall not be located in the same facility as public cafes, restaurants or any place where food is prepared and sold for public consumption."[12]

III. Data

For this study, we wanted to estimate the impact of minimum facility requirements on the location of funeral homes and the distribution of their sizes. Specifically, we wanted to test whether minimum facility requirements (1) decrease the probability of finding funeral homes in retail shopping centers and commercial parks and (2) truncate the lower tail of the distribution of funeral home sizes. We chose to collect data on the funeral homes of Arizona and Florida because they differ in their minimum facility requirements and have funeral homes that are relatively easy to measure using the satellite imagery of Google Earth.[13]

In May 2016, we extracted lists of death-care establishments in Arizona and Florida using their license verification systems. Twelve establishments were dropped from our sample because they could not be found using Google Earth, and another was dropped because it was a cremation facility owned by a nearby funeral home. This left a sample of 1,093 funeral homes, of which 171 are located in Arizona and 922 in Florida.[14] Licensing data were also used to identify whether each funeral home operated a crematory at its location or, in one case, nearby.

Using the satellite imagery of Google Earth, we examined whether each funeral home was in a retail shopping center or commercial park, which we define to include professional and

[12] *Compilation of Rules and Regulations of the State of Georgia* (Ga. Comp. R. & Regs.) r. 250-6-.06 (2016).
[13] We initially planned to collect data on the sizes and assessed values of funeral homes using the property tax records of county assessors. We discovered, however, that many records were not available electronically, and many of those that were available did not include information on the sizes of funeral homes, especially if the funeral homes were located in shopping centers or commercial parks.
[14] Our sample is very nearly a census of all the death-care establishments in Arizona and Florida, raising the question of whether it is appropriate to apply statistical tests to infer the statistical significance of differences in means and regression coefficients (McCloskey 1985). We are using the differences in means (and regression coefficients) in our paper as an indication of whether other states with minimum facility requirements have fewer small funeral homes than does Arizona. Hence, our data "can be seen as a sample of a population that extends across other [states] as well as other times and over realizations that never occurred" (Hoover and Siegler 2008, 22).

business parks. Retail shopping centers and commercial parks differ principally in their types of signage and the sorts of businesses located there. Shopping centers have more prominent signage, and commercial parks have a wider range of businesses, including wholesalers, professional practices, and business-service companies.[15]

After categorizing the location of funeral homes, we hired a group of freelancers from the online workplace Upwork.com to help us measure the sizes of funeral homes.[16] We created a set of four instructional videos to teach the freelancers how to measure the sizes of funeral homes using Google Earth Pro.[17] The first one, which is nine minutes long, takes them step by step through the process of measuring the size of a funeral home, showing them how to enter the address, zoom in to find the funeral home, and zoom back out to measure the roof using the polygon shape tool. The last few minutes of the video show them how to convert the polygon into square footage and enter their estimate into an Excel spreadsheet.[18] The other three videos teach them how to deal with more challenging cases: funeral homes with second stories (video 2), multiple buildings (video 3), and unusual locations, such as retail shopping centers (video 4).

We initially paid 24 freelancers to watch the videos and measure the sizes of 30 funeral homes of varying difficulty. Twelve of the funeral homes were assigned to all 24 freelancers, giving us a "small project test"[19] of their skills. Their scores ranged from 40 to 91 percent, with

[15] Funeral homes sometimes share a building with one other business, but otherwise they look like many other funeral homes. To be classified as a shopping center, they had to share a building with at least two other businesses.
[16] Upwork was created by the merger of two online workplaces, oDesk and Elance. For more on online workplaces, see Pallais (2014), Pallais and Sands (2016), and Einav, Farronato, and Levin (2016).
[17] The links to the four videos posted May 13–May 18, 2016, are (1) https://www.youtube.com/watch?v=At3qx-8X8sw&feature=youtu.be, (2) https://www.youtube.com/watch?v=8wZ0Elc83yU&feature=youtu.be, (3) https://www.youtube.com/watch?v=ZRK8XidvjbI&feature=youtu.be, and (4) https://www.youtube.com/watch?v=GOJ5Qi4hEb0&feature=youtu.be.
[18] The coordinates of the polygons are converted to square footage using Earth Point at www.earthpoint.us/shapes.aspx.
[19] An essay on the website Bplan.com recommends 11 strategies for finding high-quality freelancers through online workplaces. One such strategy is to hire them to do a "small project test" to judge whether to hire them to do larger jobs. See Morgaine (2018).

an average of 78.3 percent. We rehired 10 of the best[20] to help us estimate the sizes of 961 funeral homes, leaving 132 funeral homes for us to measure. The latter funeral homes were especially challenging to measure because they were either located in cemeteries, shrouded by trees, or difficult to identify within retail shopping centers and commercial parks. Each funeral home was measured by two freelancers, and disagreements of greater than 20 percent triggered us to measure the funeral home and replace one of the freelancers' scores. The size of a funeral home is the average of two estimates for 961 funeral homes and our estimate for the other 132.[21] Funeral homes are, on average, smaller in Florida than Arizona: the mean size is 7,513 square feet in Florida compared with 8,318 in Arizona, a difference of 805 square feet.

Figures 1A and 1B show the histograms of funeral home sizes in Arizona and Florida and highlight funeral homes located in retail shopping centers. The most striking difference is that Arizona has far fewer funeral homes located in retail shopping centers: only 4 of Arizona's 171 funeral homes are located in retail shopping centers compared with 50 of Florida's 922 funeral homes—in other words, 2.3 percent of Arizona's funeral homes versus 5.4 percent of Florida's. The numbers and percentages roughly double when commercial parks are added, but the patterns remain the same. Figure 2 places the (gray-colored) histogram of the sizes of Arizona's funeral homes over Florida's (white with black border) histogram, along with the corresponding estimates of the kernel density functions. Arizona's lower tail covers only part of Florida's, implying that Arizona has fewer small funeral homes. For example, only 15 of Arizona's 171 funeral homes are less than 2,500 square feet, compared with 130 of Florida's 922 funeral homes—in other words, 8.8 percent of Arizona's funeral homes and 14.1 percent of Florida's.

[20] Their average score on the embedded test was 88.9 percent.
[21] A PowerPoint file is available upon request that documents how these 132 funeral homes were measured.

Figure 1A. Arizona Funeral Homes Located in Shopping Centers

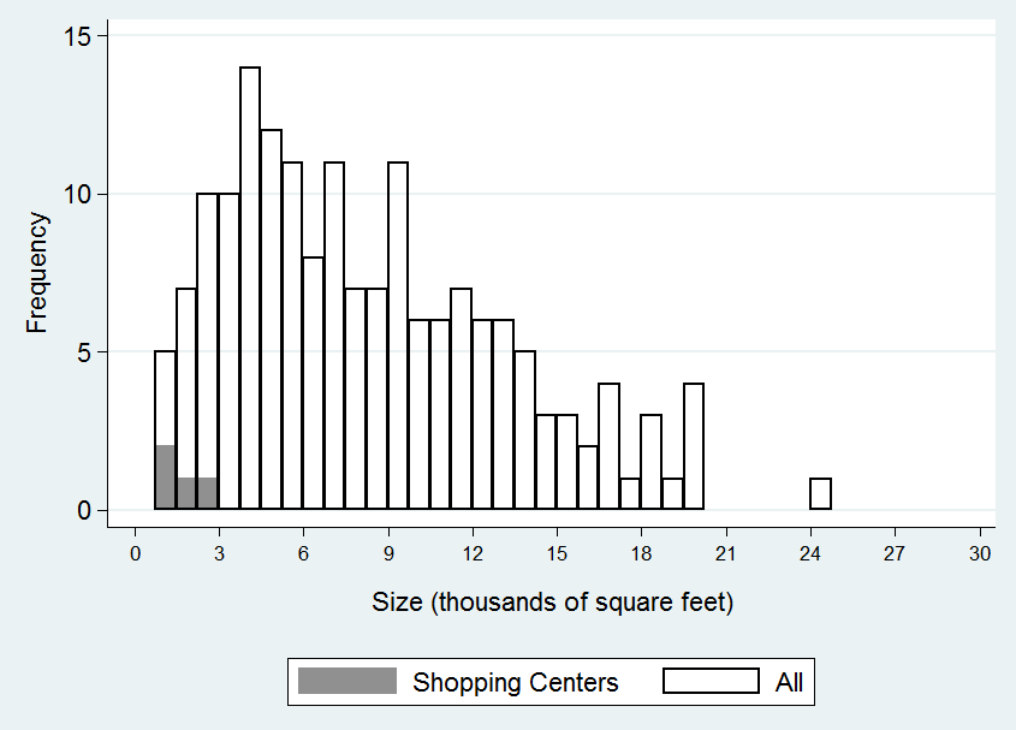
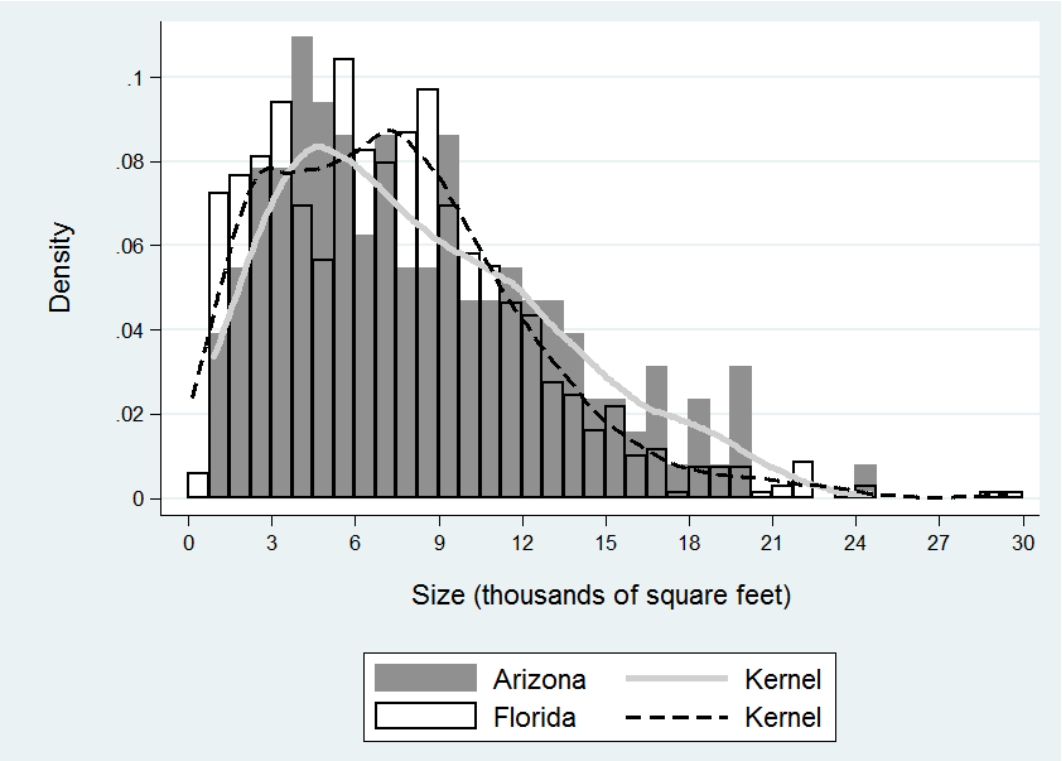


Figure 1B. Florida Funeral Homes Located in Shopping Centers

Figure 2. Distributions of the Sizes of Funeral Homes in Arizona and Florida



Comparing the two distributions, we see that Arizona has fewer small funeral homes and that they are less likely to be located in retail shopping centers, results that are consistent with Arizona's more extensive facility requirements. The size and location of funeral homes may also be determined by the socioeconomic characteristics of the markets in which they operate. To account for these factors, we matched each funeral home to its census tract[22] and collected socioeconomic data on the tracts using the most recent five-year American Community Survey (ACS).[23] Summary statistics are provided in table 1. The first three variables in table 1 summarize what we have already discussed—Arizona's funeral homes are larger than Florida's

[22] Census tracts were obtained using the Reverse Geocoding service provided by Texas A&M GeoServices (http://geoservices.tamu.edu/Services/ReverseGeocoding/).

[23] Data from the 2011–2015 ACS five-year estimate files were obtained from the National Historical Geographic Information System (NGHIS), which can be accessed at http://www.nhgis.org/. Census tract land areas used to calculate population density were obtained from the 2015 US Gazetteer Files (https://www.census.gov/geo/maps-data/data/gazetteer2015.html).

and less likely to be located in shopping centers or commercial parks. They are also more likely to operate crematories. The most noticeable difference in their socioeconomic characteristics is that Arizona is home to many more Hispanic individuals and fewer black individuals than is Florida. Other statistically significant differences are that funeral homes in Arizona are less likely to be located in metropolitan areas, more Arizonians were born out of state, and fewer have college degrees.

Table 1. Summary Statistics

	Arizona		Florida	
	Mean	*Std. Dev.*	*Mean*	*Std. Dev.*
	(1)	(2)	(3)	(4)
Funeral Home Variables:				
Located in shopping center	0.023	0.152	0.054	0.227
Located in shopping center or commercial park	0.059	0.235	0.091	0.288
Funeral home size (square feet)	8,318	4,960	7,513	4,717
Funeral home includes a crematory	0.269	0.445	0.152	0.359
Located in metropolitan statistical area	0.778	0.417	0.892	0.311
Census Tract Variables:				
Median house value (hundreds of thousands of dollars)	1.365	0.817	1.396	0.887
Median household income (thousands of dollars)	39.90	16.12	41.44	16.81
Percentage of the population that is black	3.819	4.624	24.53	26.57
Percentage of the population that is Hispanic	36.03	24.36	16.98	18.50
Percentage of the population that is Asian	1.859	2.612	1.686	2.246
Percentage of the population that was born in the state	39.69	15.73	42.94	17.18
Percentage of the population that is 65 or older	19.17	15.53	19.10	11.19
Percentage of the adult population with a college degree	27.75	13.80	30.26	14.04
Population density (persons per square mile)	2,780	2,485	3,032	2,720
Observations (i.e., number of funeral homes)	171		922	

Note: Median house value was not available for two of the Florida census tracts represented in our data. For these two observations, the median house values were imputed from the bordering census tract nearest to the funeral home.

IV. Impact of Minimum Facility Requirements on Funeral Home Size and Location

Previous studies have estimated the effect of state funeral regulations on cremation rates (Harrington and Krynski 2002), online casket sales (Harrington 2007), expenditures per death

(Ellig 2015), and the relative prices of funeral goods and services (Chevalier and Scott Morton 2008). This paper widens the net by looking at the effects of minimum facility requirements on the size and location of funeral homes.

Funeral Home Size

The iconic example of a minimum facility requirement is the requirement that funeral homes have embalming preparation rooms, a status earned more from economic reasoning than empirical evidence. Embalming room variables are either statistically insignificant in regressions (Harrington and Krynski 2002; Ellig 2015) or combined with other regulations to combat multicollinearity (Harrington 2007). One of the motivations of this research is to test whether minimum facility requirements affect funeral markets where critics of the regulations claim they do the most harm—by artificially suppressing the number of small funeral homes. The best way to do this is to estimate a quantile regression that zeros in on the lower end of the distribution of funeral home sizes.

One of our specifications is

$$Size_{ij} = \alpha_\theta + \beta_\theta AZ_i + \gamma_\theta CRM_i + \delta_\theta X_j + u_{\theta ij}, \quad (1)$$

where $Size_{ij}$ is the size, measured in square feet, of funeral home i located in census tract j; AZ_i equals one if the funeral home is located in Arizona; CRM_i equals one if it has a crematory on site; and X_j represents a set of variables measuring the characteristics of the funeral home's census tract that are commonly found in previous empirical studies.[24] We estimate equation (1)

[24] The control variables can be interpreted as factors that influence the size of funeral homes via the demand and supply of funeral goods and services. The demand factors include population density, median household income, and the percentages of the population who are elderly, minorities, college-educated, and native-born. We also include median house value as a proxy for land prices that might influence the size and location of funeral homes. We omit religion variables because they are not available at the census tract level and often omit Jewish adherents at the county level.

using quantile regressions that allow β_θ to differ by the quantiles of the distribution of funeral home sizes, where θ represents the θth quantile. Our variable of central interest, AZ_i, is a proxy for minimum facility requirements because Arizona requires every funeral home to have an embalming preparation room, chapel, and casket display room while Florida does not. Since it is difficult to squeeze all these facilities into a small space, we expect Arizona to have fewer very small funeral homes than Florida, implying that β_θ should be positive at small quantiles such as the 5th quantile. Beyond some modest threshold, facility requirements ought not to affect the size of funeral homes, leading us to expect our estimate of β_θ at the median ($\theta = 50$) to be insignificant.

Table 2 presents the results from estimating equation (1). According to the OLS regression presented in column (1), there is no statistically significant difference in the size of funeral homes between Arizona and Florida, holding the other characteristics constant. In contrast, the quantile regression finds that Arizona funeral homes are 504 square feet larger than those of Florida at the 5th quantile of the size distribution, an estimate that is statistically significant at the 10 percent level using bootstrap standard errors. This estimate is reasonable given the minimum facility sizes in states that specify them in square feet. For example, embalming rooms must be at least 120 square feet in Massachusetts; chapels, 300 square feet in New York; and casket display rooms, 450 square feet in New Mexico.[25] The sum of these three specific minimum facility size requirements, 870 square feet, is similar in magnitude to our estimated difference of 504 square feet at the 5th quantile. This makes sense because Arizona requires all these facilities (embalming room, chapel, and casket display room) while Florida

[25] 239 CMR 3.06; *New York Codes, Rules, and Regulation*s, 10 NYCRR § 77.5; and *New Mexico Administrative Code*, 16.64.4.9 NMAC.

requires none. Relative to the largest Florida funeral home in the 5th quantile, the estimated coefficient of 504 square feet represents a 37 percent increase in the size of the funeral home.[26]

Table 2. Funeral Home Size: Quantile Regression Results

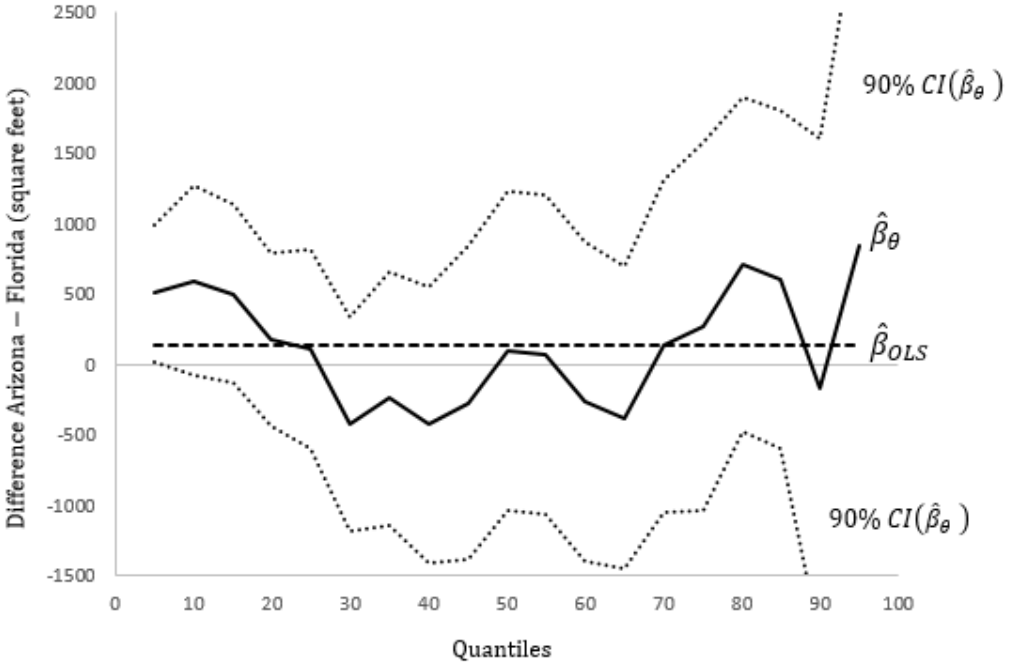
		Quantile Regressions		
	OLS	5th Quantile	10th Quantile	50th Quantile
	(1)	(2)	(3)	(4)
Funeral home located in Arizona	141.3	504.4*	595.7	97.93
	(0.33)	(1.71)	(1.52)	(0.14)
Funeral home includes a crematory	3,603***	1,474***	1,867***	3,891***
	(9.71)	(4.03)	(2.66)	(6.23)
Median house value (hundreds of thousands of dollars)	–260.0	20.02	–167.9	–449.6
	(–0.97)	(0.14)	(–0.78)	(–1.42)
Median household income (thousands of dollars)	18.82	2.335	0.721	28.07
	(1.29)	(0.25)	(0.05)	(1.61)
Percentage of the population that is black	–16.64*	–1.422	–7.819	–19.76
	(–1.82)	(–0.23)	(–0.92)	(–1.46)
Percentage of the population that is Hispanic	9.046	–8.451	4.440	–1.585
	(0.96)	(–1.20)	(0.47)	(–0.13)
Percentage of the population that is Asian	65.70	–6.661	–39.72	42.07
	(0.98)	(–0.17)	(–0.70)	(0.59)
Percentage of the population that was born in the state	45.06***	10.30	26.37*	40.57**
	(3.12)	(1.10)	(1.85)	(2.14)
Percentage of the population that is 65 or older	35.59**	–0.405	5.368	34.12
	(2.13)	(–0.05)	(0.35)	(1.54)
Percentage of the adult population with a college degree	22.79	–15.08	7.909	39.86*
	(1.31)	(–1.38)	(0.49)	(1.76)
Population density (persons per square mile)	0.257***	0.0585	0.138**	0.243**
	(3.76)	(1.15)	(2.06)	(2.48)
Constant	2,609**	1,289**	436.6	2,042
	(2.32)	(2.13)	(0.42)	(1.50)
Observations	1,093	1,093	1,093	1,093

Note: The dependent variable *size* = total square footage of the funeral home. Robust t-statistics are presented in parentheses below the coefficient estimates. ***, **, and * denote 1 percent, 5 percent, and 10 percent levels of statistical significance, respectively. The quantile regression estimates result from 1,000 bootstrap repetitions.

[26] Using the natural log of size as the dependent variable implies that Arizona's funeral homes are 23.7 percent larger than Florida's at the fifth quantile.

Figure 3 presents the quantile estimates of the difference of funeral home sizes between Arizona and Florida at the 5th quantile through 95th quantile, surrounded by bands representing 90 percent confidence intervals. The horizontal dashed line represents the OLS estimate, which is not statistically significant.[27] Figure 3 confirms what table 1 suggests—that the difference in the size of funeral homes between Arizona and Florida is only statistically significant for very small funeral homes, which is exactly what one would expect to see, given how challenging it would be to squeeze an embalming preparation room, chapel, and casket display room into a very small space.

Figure 3. The Effect of Minimum Facilities on Funeral Home Sizes: Quantile versus OLS Estimates



[27] To reduce clutter, we did not include the confidence bands for the insignificant OLS estimate.

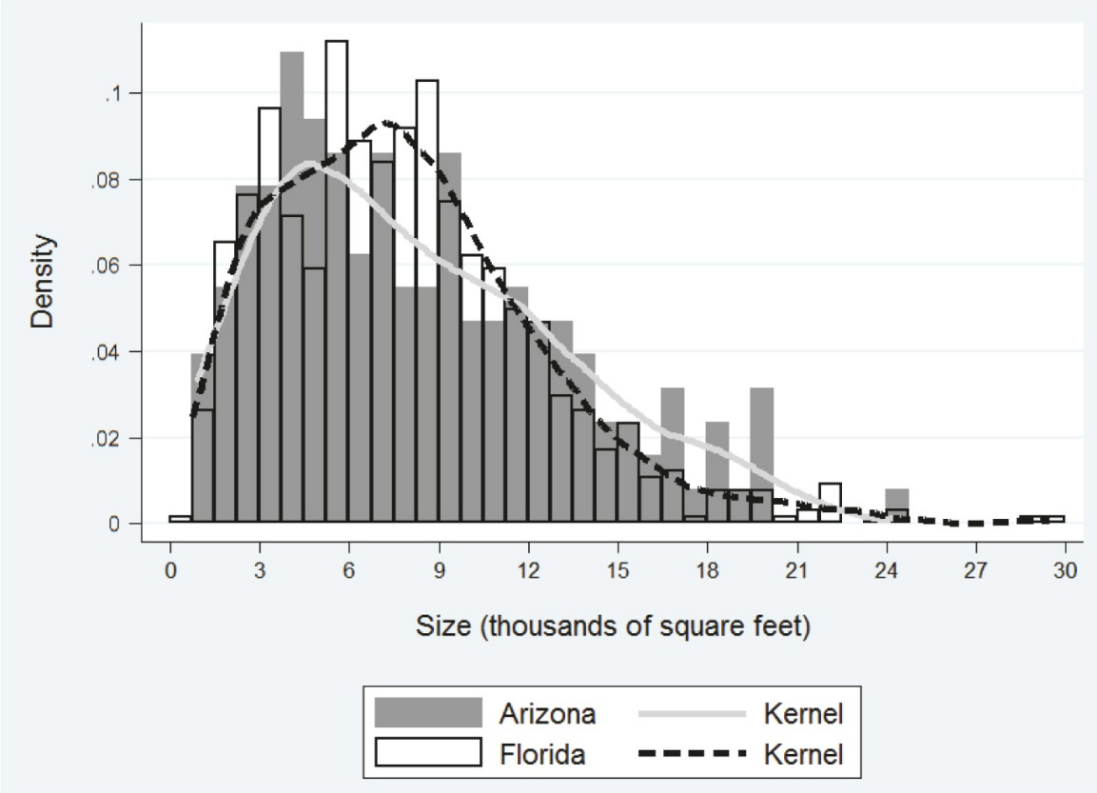
One might wonder how much can be learned about the causal effect of mandatory facility requirements when many other factors differ across Arizona and Florida. For example, the greater diversity in the ethnic, racial, and religious characteristics of Floridians might increase their taste for small funeral homes. Haitians, African Americans, and Jews may be more prevalent in Florida and may also prefer funeral homes that cater to their beliefs, increasing the demand for small funeral homes in Florida relative to Arizona. This hypothesis is plausible and should make us cautious about inferring too much from our estimates. But it also begs the question: what sorts of funeral homes populate the left tail of the size distribution in Florida? Are they funeral homes that cater to niche markets?

Most of the firms in the left tail of Florida's distribution sell direct cremations and are licensed as direct disposition firms. These firms comprise 6.9 percent of Florida's death-care firms but 66.7 percent of those that are smaller than 1,500 square feet. Figure 4 reproduces figure 2 after dropping direct disposition firms from the sample. The left sides of the distributions of the two states are now nearly identical, suggesting that Arizona's minimum facility requirements are principally excluding firms specializing in low-cost cremations—exactly the type of firm that has no use for embalming rooms and little use for chapels. It is hard to spin a story of some difference other than the difference in mandatory facility requirements that could account for the difference in low-cost cremation firms between the two states.

One might also wonder why Arizona's minimum facility requirement did not more dramatically chop off the left-hand side of its size distribution relative to Florida's. While Florida does not require its full-service funeral homes to have embalming rooms, chapels, or merchandise display rooms, it does impose minimum size requirements of 1,250 square feet for funeral homes and 625 square feet for direct disposition firms. We suspect that the contrast in the

size distributions of the two states would have been more dramatic had Florida not had its minimum size requirement for funeral homes. We believe that the minimum facility requirements in Arizona "chop off" many small firms specializing in direct cremations and may "chop off" many funeral homes if the comparison state has neither minimum facility requirements nor minimum facility sizes.

Figure 4. Distributions of the Sizes of Funeral Homes in Arizona and Florida, Excluding Direct Disposition Firms



Funeral Home Location

It may also be difficult to install an embalming preparation room in retail shopping centers and commercial parks. Our second specification tests this hypothesis:

$$Location_{ij} = \pi_0 + \pi_1 AZ_i + \pi_2 CRM_i + \pi_3 X_j + \pi_4 MSA_i + \pi_5 (AZ_i \cdot MSA_i) + \varepsilon_{ij}, \qquad (2)$$

where the dependent variable, $Location_{ij}$, is measured in two ways. First, it is measured narrowly, as a variable equal to one if the funeral home is located in a retail shopping center, and second, more broadly, as a variable equal to one if it is located in either a retail shopping center or commercial park. MSA_i is equal to one if the funeral home is located in a metropolitan statistical area. We included the interaction between AZ_i and MSA_i to allow Arizona's minimum facility requirements to have a larger dampening effect in metropolitan areas where the benefits of high-traffic, high-visibility locations ought to be greater. If new funeral homes have a harder time getting noticed in metropolitan areas, then more of them would likely prefer to locate in retail shopping centers; hence, requiring embalming rooms with washable floors, walls, and ceilings would have a greater impact on location decisions in metropolitan areas. Therefore, we expect π_4 to be negative given that π_1 measures the effect of minimum facility requirements in nonmetropolitan areas and $\pi_1 + \pi_4$ in metropolitan areas. Equation (2) is specified as a linear probability model and was estimated using least squares regression.[28]

The regression results in column (1) of table 3 confirm that funeral homes are less likely to be located in retail shopping centers in Arizona than in Florida, a difference that is statistically significant. At first glance, it appears that this effect disappears in column (2) with the addition of the crematory indicator variable and census tract characteristics, as the stand-alone coefficient

[28] Logit regression yields qualitatively similar results.

estimate for the Arizona indicator variable (AZ) is no longer statistically significant. However, the coefficient estimate for the interaction term ($AZ \cdot MSA$) is statistically significant, and an F-test confirms that the sum of the stand-alone (AZ) and interaction term ($AZ \cdot MSA$) coefficients is also statistically significant. This result implies that funeral homes are 4.6 percentage points less likely to be located in the retail shopping centers of Arizona's metropolitan areas than Florida's. Assuming that this difference is attributable to Arizona's minimum facility requirements, as we argue is the case, a back-of-the-envelope calculation multiplying this estimate by the number of funeral homes located in Arizona's metropolitan areas (133) suggests that there would be three more funeral homes located in retail shopping centers in the absence of its minimum facility requirements. This would double the number of funeral homes located in retail shopping centers in Arizona's metropolitan areas. The sign of this impact remains the same when the dependent variable is broadened to include funeral homes located in commercial parks, but the magnitude is no longer statistically significant.

Table 3. Funeral Home Location: OLS Regression Results

	DV: *center*	DV: *center*	DV: *center_park*	DV: *center_park*
	(1)	(2)	(3)	(4)
Funeral home located in Arizona	–0.0308**	0.0471	–0.0326	0.0319
	(–2.24)	(1.23)	(–1.61)	(0.78)
Funeral home includes a crematory		–0.0401***		–0.0633***
		(–2.89)		(–3.32)
Median house value (hundreds of thousands of dollars)		–0.0102		–0.0191
		(–0.75)		(–0.98)
Median household income (thousands of dollars)		0.0004		–0.0003
		(0.62)		(–0.29)
Percentage of the population that is black		–0.0007		8.48e-05
		(–1.53)		(0.14)
Percentage of the population that is Hispanic		–0.0007*		–0.0002
		(–1.66)		(–0.49)
Percentage of the population that is Asian		0.0031		0.0023
		(0.88)		(0.56)
Percentage of the population that was born in the state		–0.0005		–0.0017*
		(–0.75)		(–1.91)
Percentage of the population that is 65 or older		0.0006		0.0004
		(0.61)		(0.29)
Percentage of the adult population with a college degree		–0.0004		0.0019
		(–0.61)		(1.60)
Population density (persons per square mile)		3.56e-06		–3.83e-06
		(1.33)		(–1.04)
Funeral home located in metropolitan statistical area (MSA)		0.0476***		0.0653***
		(2.69)		(2.97)
Interaction term (Arizona indicator × MSA indicator)		–0.0935**		–0.0598
		(–2.28)		(–1.27)
Constant	0.0542	0.0526	0.0911	0.101
	(7.26)	(0.94)	(9.60)	(1.41)
Observations	1,093	1,093	1,093	1,093

Note: Dependent variable (DV) *center* = 1, if funeral home located in a shopping center; 0 otherwise. Dependent variable *center_park* = 1, if funeral home located in shopping center or commercial park; 0 otherwise. Robust t-statistics are presented in parentheses below the coefficient estimates. ***, **, and * denote 1 percent, 5 percent, and 10 percent levels of statistical significance, respectively.

V. Impact of Funeral Home Size and Location on Prices

The evidence convinces us that requiring funeral homes to have embalming preparation rooms, chapels, and casket display rooms reduces the number of very small funeral homes, especially those specializing in low-cost cremations, and makes it less likely that funeral homes will locate in high-visibility shopping centers. These mandatory facility requirements should increase prices for at least three reasons: (1) They increase overhead costs and decrease the ability of funeral homes to partner with other funeral homes in clusters to exploit economies of scale; (2) they increase marketing costs for some new entrants that would benefit from locating in high-traffic, high-visibility shopping centers; and (3) they prevent new entrants from locating in run-down strip malls where rents are lower.[29]

To get a sense of whether mandatory facility requirements are costly to consumers, we gathered data on the prices of direct cremations and traditional funerals from the website Parting.com. A direct cremation is a standard set of services that includes cremating the body, completing paperwork, and delivering the remains to the family. A traditional funeral is a larger bundle of services that includes a casket, embalming the body, and holding a visitation and funeral ceremony at the funeral home. In March 2017, we scraped Parting.com for prices at funeral homes in Arizona and Florida, yielding samples of 690 direct cremation prices and 673 traditional funeral prices. Sixty-three percent of the death-care firms in our sample were listed on Parting.com, a "coverage rate" that is slightly lower than the 75 percent of US funeral homes claimed by Parting.com (Benincasa 2017). We also have a second source of data on direct cremation prices in Florida. In the early summer of 2014, we surveyed licensed funeral homes and direct disposition firms in 46 of Florida's 67 counties, asking them for the price of a direct

[29] Affordable Cremations in North Fort Myers is an example of a direct disposition firm that is located in a run-down strip mall. Five of its neighboring storefronts are empty, and according to Loopnet.com, the rent is $5 per square foot per year, compared to an average rent of $10.40 for the other 17 nearby commercial properties.

cremation. This survey gives us a coverage rate of 80 percent for the death-care firms within these counties.

Table 4 presents the summary statistics for the price data. According to the Parting.com data, the cost of a traditional funeral is about four times the cost of a direct cremation in both states, and the mean prices in Arizona are lower than in Florida. The latter comparison is surprising, given our argument that the minimum facility requirements in Arizona ought to increase their prices relative to Florida. But we also argue that it is necessary to look for the effect of the facility requirements where they are likely to "bite"—i.e., at funeral homes in the left-hand side of the size distribution. The price data from Parting.com are valuable, but the website under-samples (often small) direct disposition firms in Florida: Parting.com reports prices for only 11 percent of the direct disposition firms in Florida, compared to 67 percent in our 2014 survey. As a result, the average price of a direct cremation using Parting.com's data ($1,742.89) is 15 percent higher than the average price using ours ($1,516.92).[30] Drilling down further and focusing only on the small funeral homes captured in the Parting.com data yields an average price of $1,255.64, which is well below the average price in Arizona. Thus, prices are lower in the Florida funeral homes where we would most expect the minimum facility requirements to bite.

[30] Parting.com almost surely used a national directory of funeral homes rather than state licensing records to create the list of funeral homes to survey. These directories are not complete because only funeral homes that offer wholesale services, such as shipping bodies out of state, benefit from listing in the directories.

Table 4. Summary Statistics on the Prices of Direct Cremation and Traditional Funerals in Arizona and Florida

	Arizona		Florida					
			All Funeral Homes		Shopping Centers		Small Funeral Homes (≤ 1,500 sq. ft.)	
	Sample Size	Mean (Std. Dev.)	Sample Size	Mean (Std. Dev.)	Sample Size	Mean (Std. Dev.)	Sample Size	Mean (Std. Dev.)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Price of a direct cremation								
2014 (Harrington and Treber)	—	—	581	1516.92 (725.50)	28	937.11 (267.63)	28	808.43 (184.29)
2017 (Parting.com)	105	1496.56 (552.33)	585	1742.89 (750.22)	19	1388.00 (614.26)	11	1255.64 (737.24)
Price of a traditional funeral								
2017 (Parting.com)	102	6001.16 (877.94)	571	6487.77 (1161.74)	14	5488.57 (1053.87)	9	5247.22 (1008.29)

To estimate the cost of mandatory facility requirements to consumers, we need to answer the question of whether very small funeral homes and ones located in shopping centers charge lower prices than other funeral homes. Our specification for this analysis is

$$Price_{ij} = \beta_0 + \beta_1 SC_i + \beta_2 SMALL_i + \pi_k QRT_{ik} + \beta_3 DIST_i + \beta_4 CRM_i + \theta X_j + \varepsilon_{ij}, \quad (3)$$

where the dependent variable, $Price_{ij}$, is the price of a direct cremation at funeral home i in census tract j in the first and second specifications and the price of a traditional funeral in the third. Our explanatory variables of central interest are indicator variables for whether the funeral home is located in a shopping center, SC_i, and whether it is less than 1,500 square feet, $SMALL_i$. We also include indicator variables for whether funeral homes are in the top three quartiles of funeral home size, QRT_{i2}, QRT_{i3}, and QRT_{i4}. As a result, the coefficient on $SMALL_i$ measures the difference in price charged by small funeral homes relative to slightly larger ones—i.e., the ones in the (omitted) lowest quartile that are not small. In addition to charging lower prices, very small funeral homes may also exert competitive pressure on their larger neighbors. To control for this effect, we include the variable $DIST_i$, which is the mileage from funeral home i to the nearest funeral home of less than 1,500 square feet. The regressions also include whether there was a crematory on site, CRM_i, and the census tract characteristics included in our previous regressions.

Table 5 presents the results from these regressions. The first set, presented in column (1), uses the direct cremation prices we collected in 2014, while the estimates in columns (2) and (3) use prices scraped from Parting.com in 2017. The estimates in column (1) imply that Florida funeral homes located in shopping centers charge $218 less for direct cremations than funeral homes located elsewhere, and that very small funeral homes charge $245 less for direct cremations than slightly larger funeral homes. These are large differences, representing 14 to 20

percent reductions in the price of direct cremations.[31] The corresponding estimates in column (2) are similar in magnitude but not statistically significant, which is not surprising given that Parting.com under-samples direct disposition firms in Florida. The estimates in column (3) imply that these types of firms also charge lower prices for traditional funerals that involve a more varied set of services ranging from embalming to burial vaults. In this case, funeral homes located in shopping centers charge $591 less than funeral homes located elsewhere, and very small funeral homes charge $737 less than slightly larger funeral homes. Once again, these are large differences, representing decreases of 10 to 13 percent in the price of traditional funerals.[32]

The estimates in columns (1) and (2) of table 5 also imply that funeral homes charge higher prices for direct cremations when they are farther away from very small funeral homes, which are more likely to charge low prices. The estimated effect is $0.84 per mile when using the 2014 direct cremation price data and slightly larger, $1.39 per mile, for the 2017 direct cremation price data. Since there are fewer very small funeral homes in Arizona, it is not surprising that the average distance to one of these very small funeral homes is approximately 1.5 times longer in Arizona (45 miles) than in Florida (30 miles). Combined, these findings suggest that Arizona's facility requirements are preventing consumers of direct cremations from reaping the benefits of competitive pressure that very small funeral homes may exert on the market. The impact may be small when considered in isolation, but it should be viewed as additional icing on the cake of funeral regulation imprudence.

[31] These estimates were obtained from regressions using the natural log of the price of direct cremations as the dependent variable.

[32] Direct cremation prices are lower at funeral homes located in census tracts with larger black and Hispanic populations. The only census tract characteristic that helps explain the price of traditional funerals is median household income, which has a positive and statistically significant coefficient.

Table 5. Prices of Direct Cremations and Traditional Funerals in Florida: OLS Regression Results

	Price of Direct Cremation		Price of Traditional Funeral
	2014 Prices	2017 Prices	2017 Prices
	(1)	(2)	(3)
Located in a shopping center	–218.04***	–170.22	–591.48**
	(–3.07)	(–1.11)	(–2.01)
Small funeral home (≤ 1,500 sq. ft.)	–245.16***	–125.83	–736.61**
	(–3.17)	(–0.44)	(–2.04)
Second quartile funeral home size (3,799 to 6,989 sq. ft.)	223.40***	80.39	–9.62
	(3.36)	(0.89)	(–0.06)
Third quartile funeral home size (6,990 to 10,036 sq. ft.)	452.98***	449.89***	467.86***
	(6.02)	(5.09)	(3.00)
Fourth quartile funeral home size (≥ 10,037 sq. ft.)	818.60***	639.83***	883.80***
	(10.69)	(7.18)	(5.52)
Crematory on site	–105.44	–25.92	–91.84
	(–1.53)	(–0.36)	(–0.78)
Miles to the nearest small funeral home (≤ 1,500 sq. ft.)	0.85**	1.39***	–0.66
	(2.02)	(3.06)	(–0.99)
Observations	581	585	571
R-squared	0.31	0.26	0.18

Notes: Dependent variables are prices of direct cremations and traditional funerals. Robust t-statistics are presented in parentheses below the coefficient estimates. ***, **, and * denote 1 percent, 5 percent, and 10 percent levels of statistical significance, respectively. The regressions also include census tract variables for population density, median household income, median house value, and the percentages of the population that are college-educated, black, Hispanic, Asian, native-born, and elderly. Omitted category is a dummy variable equal to one if the funeral home is in the first quartile of size but is larger than 1,500 square feet.

VI. Conclusion

We present evidence that mandatory facility requirements for funeral homes increase the size of small funeral homes by about 500 square feet and make it highly unlikely for anyone ever to stumble across one in a retail shopping center. We also present evidence that funeral homes located in shopping centers charge 10 to 14 percent less for funeral services than funeral homes located elsewhere and that very small funeral homes charge 13 to 20 percent less than slightly

larger funeral homes, which could conceivably contain an embalming preparation room, chapel, and casket display room.

Suppose Arizona had never imposed the requirement that all funeral homes have embalming preparation rooms, chapels, and casket display rooms. Rough estimates based on our regression results suggest that the composition of Arizona's funeral homes would be different enough today that an additional 2,700 consumers would be purchasing funeral services at either very small funeral homes or ones located in shopping centers.[33] These consumers would be paying approximately 14 percent less for their funeral services, collectively saving $1 million.[34] This is a lower-bound estimate of the savings to all consumers of funeral services because it does not account for the likely competitive effects that these lower-cost funeral homes would have on the prices charged by other funeral homes.

The cremation rate in Arizona was 64.3 percent in 2013 and is projected to reach 77.3 percent by 2025 (Madrid 2015; National Funeral Directors Association 2015). Most of these bodies will not be embalmed, nor will those handled by the growing number of firms offering eco-friendly and home-oriented funerals (Madrid 2015; Chumsky 2014). The demand for embalming is decreasing, yet every death-care firm in Arizona must have an embalming room, even firms that have absolutely no use for one. We estimate that Arizona has 54 dormant

[33] Applying Arizona's cremation rate in 2015 (data from the National Funeral Directors Association as reported in Kiersz 2015) to the total number of deaths in 2015 (Arizona Department of Health Services) and dividing by the number of funeral homes (171) yields averages of 212 cremations and 105 burials per funeral home. Assuming that our regression estimates are causal, and accounting for potential double-counting among very small funeral homes and funeral homes located in shopping centers, we estimate that there would have been six additional very small funeral homes and three additional funeral homes located in shopping malls. These firms would have handled approximately 1,200 and 600 cremations, respectively, and 600 and 300 traditional funerals, respectively.

[34] According to the 2012 Economic Census, average funeral expenditure per death was $2,717 in Arizona. Drawing from our estimates in table 5, each direct cremation handled by one of the six new small funeral homes or one of the three new funeral homes located in a shopping center would have generated savings of $245 and $218, respectively. Similarly, the estimated savings from table 5 for each traditional funeral are $737 and $591, respectively. Multiplying these savings by the number of direct cremations and traditional funerals handled by these new firms produces a total savings of $1 million, or roughly 14 percent of the estimated expenditures for these cremations and burials.

embalming rooms and that there are roughly 7,000 dormant embalming rooms nationally because of embalming room requirements. These numbers will almost surely grow over time.

A primary rationale for state laws requiring funeral establishments to have embalming preparation facilities is to ensure that any problem with an embalmed body prior to visitations could be corrected in a "timely manner" (Arizona State Board of Funeral Directors and Embalmers 2003, 6). But dormant embalming rooms are rarely ready to be used, even to touch up a body. Another rationale, one that covers dormant embalming rooms, is that embalming rooms will be valuable during "mass fatality events" such as severe hurricanes, terrorist attacks, and pandemics. This rationale was offered to us by an inspector for the Arizona Funeral Board and used in the legal defense of the Minnesota law. It is also discussed in a report called *Medical Surge Capacity*, which explains how to deal with major public health threats (Institute of Medicine 2010, 50–51). But most dormant preparation rooms are small, just big enough to satisfy the minimum requirements set by states, while temporary morgues during mass casualty events need to be large. For example, during Hurricane Katrina, the federal government commandeered a "huge warehouse" in the small town of St. Gabriel just off I-10 north of New Orleans (Pesca 2005).

Have we measured causation or just association, given that many of our estimates are based on a comparison of just two states? While we are convinced by the evidence, others may remain understandably skeptical. But what is the cost of inferring that our estimates are causal when they are not? The only cost is that policymakers might repeal facility requirements that generate no discernible benefits and have undeniable costs in the form of dormant embalming rooms. The cost to consumers could easily be much greater than it appears if these facility requirements impede the entry of low-cost competitors to traditional funerals. For example, if the

funeral industries in the 34 states that require all funeral firms to have embalming rooms looked like Florida's industry, and their consumers behaved like Florida's, their consumers would save roughly $179 million on cremation expenditures each year.[35] Even a fraction of that amount is a lot to pay for regulations that appear to have no discernible benefits.

[35] Direct disposition firms in Florida handled 13.9 percent of cremations in 2012 (Funeral Industry Consultants 2013) and, according to our 2014 survey, charged $737 less for direct cremations than did funeral homes. We estimated the savings by multiplying the number of cremations in each of the 34 states by 0.139 times $737. The number of cremations in each state was obtained by multiplying the number of deaths in 2015 (Centers for Disease Control and Prevention 2017) by the cremation rate in 2013 (Kane 2015).

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