



Malpractice Laws and Incentives to Shield Assets: Evidence from Nursing Homes

James A. Brickley, Susan F. Lu, and Gerard J. Wedig*

Empirical research on medical malpractice liability has largely ignored incentives to restructure to protect assets. This study provides evidence on asset shielding in the nursing home industry. There was a rapid increase in lawsuits alleging patient neglect or abuse in states with plaintiff-friendly tort environments beginning in the second half of the 1990s. We document two apparent asset-shielding trends in these states during the 1998–2004 period: (1) sales of homes by large chains to smaller, more judgment-proof owners; and (2) a reduced propensity to “brand” chain-owned units with names that linked them directly to the central corporation or sister units. Twelve states enacted tort reforms during the 2003–2006 period that placed caps on noneconomic damages. Using a difference-in-differences (DD) methodology, we find that the trends in asset-shielding behavior abated or reversed in the states that enacted tort reforms. These findings suggest that tort law affects ownership and other organizational choices in this industry.

I. INTRODUCTION

Empirical research on medical malpractice tort laws has focused on defensive medicine, the supply of physician services, and the frequency of lawsuits and their outcomes.¹

*Address correspondence to James A. Brickley, Simon Business School, University of Rochester, Rochester, NY 14627; email: brickley@simon.rochester.edu. Brickley is Gleason Professor, Simon Business School, University of Rochester. Lu is Assistant Professor of Management, Krannert School of Management, Purdue University. Wedig is Associate Professor, Simon Business School, University of Rochester.

The authors thank Paulo Albuquerque, Bernie Black, John Bouman, Paul Ellickson, Richard Hirth, Michael Mazzeo, Sanjog Misra, David Oliveiri, Sam Peltzman, Ivan Png, Michael Raith, Subramaniam Ramanarayanan, Cliff Smith, Jerry Zimmerman, and Mark Zupan for helpful discussions and comments. They also thank the referees for useful suggestions and the seminar participants at the University of Rochester and Indiana University–Purdue University and conference participants at the 10th International Industrial Organization Conference (IIOC), the 6th Biennial Conference of the American Society of Health Economists (ASHE), the 2013 Academy of Management Conference (AOM), and the 2015 American Economic Association Meeting, as well as David Grabowski for sharing the state Medicaid rates data.

¹Papers on the effects of malpractice laws on the supply of physician services include Dranove and Gron (2005), Dubay et al. (2001), Kessler et al. (2005), Klick and Stratmann (2007), and Mello et al. (2005). Avraham et al. (2012) evaluate the effects of malpractice laws on employer-provided health insurance premiums. The literature on so-called positive defensive medicine is more extensive and too lengthy to summarize here. The issue in this research is whether tort liability provides incentives to physicians to “overtreat” patients (e.g., by performing unnecessary tests and procedures). For surveys of this research, see Kachalia and Mello (2011), Kessler (2011), and Van Velthoven (2009). Papers examining the impacts of tort reforms on the frequency of malpractice lawsuits and their outcomes include Avraham (2007), Holtz-Eakin (2004), Mello (2006), and Paik et al. (2012). Jelislow and Ohlander (2010) provide evidence on the effects of reforms on the state-level sanctioning of physicians.

Malpractice liability also creates incentives for deep-pocketed providers to protect their assets from liability, for example, by selling them to more “judgment-proof” buyers and/or by restructuring their legal form of organization. Although the incentive to shield assets is well recognized in the legal literature, it has received scant attention in the empirical research on malpractice.² Asset shielding is important to consider in evaluating malpractice liability because it reduces the deterrent effects of tort laws and makes it less likely that victims will be compensated (Shavell 1986, 2004; Konetzka et al. 2013). It also has potential effects on economic efficiency, for example, if it results in suboptimal organizational choices. This study provides evidence on this issue by studying the behavior of nursing home owners in contrasting periods of increasing and decreasing litigation risk.

Various states adopted strongly pro-plaintiff resident rights laws during the 1980s and 1990s with the stated intent of protecting nursing home residents. These laws were not associated with an immediate increase in litigation, reportedly due to the widespread belief that the expected proceeds from nursing home cases would not cover the high costs of litigation. Pioneering lawsuits in the 1990s demonstrated that cases asserting neglect or abuse of nursing home patients could be highly lucrative to plaintiffs and their attorneys. States with plaintiff-friendly tort environments subsequently witnessed a dramatic increase in the frequency of lawsuits, the size of settlements/judgments, and the costs of liability insurance. Legal experts advised large nursing home chains to divest homes in high-litigation states or to adopt legal structures that would better shield them from liability. Previous studies provide examples of national chains that sold their homes in Florida and Texas (the two states with the most pro-plaintiff legal environments at that time) to smaller more judgment-proof owners or otherwise restructured in apparent response to litigation concerns (e.g., Stevenson et al. 2006b).

This article provides more systematic evidence on the relation between changes in the tort environment and judgment-proof behavior using a two-part empirical methodology. In the first part of our analysis, we present descriptive and fixed effects regression evidence that provides support for the hypothesis that large nursing home chains undertook actions to shield assets in pro-plaintiff legal environments during the 1998 to 2004 period when the threat of litigation was dramatically increasing. First, large chains sold many homes in high-litigation states to smaller, more judgment-proof owners, that is, owners with fewer assets, little or no liability insurance coverage, and protective legal structures. Second, chains in these states reduced the frequency with which they “branded” their homes with names that linked them directly to either the central corporation or sister units (we discuss below how branding affects legal liability)—a potential dimension of judgment-proof behavior not considered in previous studies.

While the findings from this first stage of our analysis are highly suggestive, we are reluctant to infer a causal relation between the legal environment and judgment-proof

²One exception is a recent working paper by Helland et al. (2016), which provides evidence that physicians respond to liability exposure by investing more of their assets in personal homes when they are shielded from claims due to the state’s bankruptcy law.

behavior from this evidence alone. A common approach to studying the effects of state laws is to conduct a difference-in-differences (DD) analysis, which helps to remove the biases that result from permanent differences between the treatment and nontreatment states, as well as comparisons over time in the treatment group that could be the result of trends. Unfortunately, ambiguous and multiple enactment dates, as well as the lack of historic information on the ownership of nursing homes prior to the late 1990s, preclude us from conducting a DD analysis around the enactment of resident rights laws.³

To help resolve the issue of causality, the second part of our empirical analysis focuses on a subsequent inflection point in the litigation environment that occurred in various states. During the interval 2003–2006, 12 states enacted laws that placed meaningful caps on noneconomic damages in malpractice cases. These tort reforms particularly impacted the nursing home industry, where a large fraction of litigation awards is based on noneconomic considerations (e.g., pain and suffering and punitive damages). If increases in litigation risk caused the changes in ownership and branding in the earlier period, we would expect to find an abatement or reversal of these trends following the enactment of reforms that reduced the risk in the legal environment. Data availability and knowledge of the precise enactment dates allow us to conduct a more convincing DD analysis of the effects of these reforms.

In the aftermath of these reforms, we find that the earlier-documented trends abated or reversed in the states that enacted damage caps. In particular, we find that nursing homes in these states experienced a positive shift in their underlying time trends in both large chain affiliation and branding postenactment. In our basic distributed lag model, the estimated likelihood of large chain ownership increases by about 12 percentage points over the *ensuing* five-year period after the reform relative to past trends. The estimated likelihood of being branded increases by about 6 percentage points. The measured effects are statistically significant and robust to a series of checks for endogeneity and other concerns. The collective evidence from our two-part methodology provides relatively strong support for the hypothesis that there is a causal link between changes in tort liability and asset-shielding behavior in the nursing home industry.

While our study focuses on the nursing home industry, it has potentially broader implications for the topic of tort law and asset shielding. Ringleb and Wiggins (1990) document that a substantial increase in tort liability motivated large manufacturers to sell hazardous plants (producing carcinogens and other disease-causing byproducts) to smaller firms, which were either “more likely to go out of business before latent claims emerge or have insufficient assets to pay damages and declare bankruptcy when claims are filed.” We consider the use of asset shielding by a set of *service industry* firms (i.e., nursing homes). In so doing, we extend the literature on asset shielding by considering a different set of tradeoffs and firm behavior.

³For example, the first patient rights law in Florida was passed in 1980 but additional laws that clarified and provided remedies for patients were passed in 1993 and 2001. Systematic information on the ownership of individual nursing homes prior to 1999 is not publicly available.

Similar incentives to shield assets from malpractice liability exist in other health-care subsectors. For example, the *New York Times* reported in 2012 that several of the city's hospitals were partially or completely uninsured for malpractice (Hartocollis, July 15).⁴ According to quoted hospital executives, "it is better to be effectively uninsured, because lawyers follow the money." More generally, other firms and professionals, such as attorneys and accountants, have similar incentives to shield assets from tort liability. Our study suggests that it is important to consider these incentives in evaluating the effects of tort laws in other environments.⁵

Our study makes four additional contributions. First, it provides evidence that the tort environment is a potentially important factor in helping to explain the horizontal ownership structures of some service industries.⁶ Second, the economics and marketing literatures on branded retail and service chains (e.g., fast food and hotels) has focused on one external audience and issue—the signaling or bonding of quality to potential customers (e.g., Ingram 1996; Brickley & Dark 1987; Jin & Leslie 2009; Luca 2011; Mazzeo 2004; Png & Reitman 1995). Our evidence suggests that future research on brands and chains should consider additional audiences and issues, such as potential litigants and tort liability. Third, it adds to the small body of evidence on the factors that affect the choice of business names.⁷ Fourth, it has other specific health-care policy implications. Consumers often do not have complete information about service quality in the health-care sector. Branded chain ownership can potentially provide a credible signal or bond of a consistent level of quality in some settings.⁸ Our study suggests that one potential byproduct of laws/regulations that ostensibly are directed toward helping patients (e.g., giving them greater litigation rights) is less branded chain ownership—potentially increasing consumer search costs.

This article focuses on a reduced-form analysis of asset-shielding responses to malpractice tort liability and reform in the nursing home industry. The evidence suggests

⁴<http://www.nytimes.com/2012/07/16/nyregion/some-hospitals-in-new-york-lack-a-malpractice-safety-net.html>

⁵The evidence on the supply of physician services in high-tort-liability environments (cited above) can be interpreted in the context of this study and its possible implications beyond the nursing home industry—similar to large nursing home chains, a potential response by some physicians to high tort liability is to "exit" the market.

⁶Empirical research on ownership concentration in the traditional industrial organization literature has concentrated on manufacturing firms and the effects of scale economies, market size, endogenous sunk costs, and other entry barriers on industrial concentration. Over 80 percent of private-sector jobs are now in service-related industries, where factors such as scale economies are likely to be less important (Hubbard 2004). Most of the empirical research on the ownership structures of service industries has focused on the vertical dimension (see Lafontaine & Slade 2007). Past empirical studies examining issues related to horizontal ownership in service industries include Brickley et al. (2003) (banks), Lu and Wedig (2013) (nursing homes), Mazzeo (2004) (motels), Png and Reitman (1995) (gasoline stations), and Shepard (1993) (gasoline stations). These studies focus on incentive and information-related issues—not the regulatory environment.

⁷Research on the choice of business names includes Horsky and Swyngedouw (1987), Klein and Leffler (1981), Kreps (1990), Mailath and Samuelson (2001), McDevitt (2011), and Tadelis (1999, 2002).

⁸While not the focus of this article, supplemental tests (discussed below) document that branded homes have less variation in quality than unbranded units during our study period.

that high tort liability motivates nursing home operators to engage in potentially less efficient organizational practices relating to the ownership and branding of nursing homes. As noted above, asset shielding also reduces the deterrent effects of tort laws and makes the compensation of victims less likely. Assessing the broader welfare implications of state tort laws and reform and presenting a more generalized structural analysis of the multiple investment and policy responses by nursing home operators (such as changes in the quality of services) goes beyond the scope of this article and presents potentially fruitful areas for additional research.

The remainder of this article is organized as follows. Section II discusses the relevant industry background and presents the empirical predictions. Section III describes our data. Section IV presents the first stage of our empirical analysis, which focuses on the earlier period of increasing litigation risk, while Section V presents the second stage, which focuses on the postreform period when litigation risk had decreased in various states. The study concludes with a brief summary and discussion.

II. INDUSTRY BACKGROUND AND HYPOTHESES

A. The Nursing Home Industry and Litigation Trends

In the fourth quarter of 2012, 15,643 certified nursing homes provided services to over 1.4 million residents in the United States (Centers for Medicare and Medicaid Services 2013). For-profit companies owned 69 percent of these homes, nonprofit organizations 25 percent, and government entities 6 percent. This study focuses on for-profit nursing homes, since government and nonprofit owners (e.g., churches) presumably have goals other than value maximization. For-profit homes also have been the primary target of large lawsuits in this industry.

1. Resident Rights Laws, the Rise in Litigation, and Judgment-Proof Behavior

During the 1980s and 1990s, various states passed pro-plaintiff resident rights laws, ostensibly to protect the elderly and other nursing home patients from neglect and abuse. For example, California passed important legislation in 1992, Florida in 1980 and 1993, Texas in 1997, and Arkansas in 1999. Some states, such as Florida, passed multiple resident rights laws at different points in time during this period.

In most states, litigation did not immediately increase in response to these laws. Initially, the legal community was skeptical that patient lawsuits could result in awards or settlements commensurate with the high costs of litigating these cases. Pioneering lawsuits that resulted in multimillion-dollar awards for noneconomic damages in the 1990s convinced plaintiffs' attorneys that these cases could be highly lucrative in pro-plaintiff legal environments. Once this was recognized, patient liability lawsuits mushroomed in the industry during the second half of the 1990s and early part of the 21st century. The incidence of these lawsuits varied substantially across states, depending on the existence and strength of the state's resident rights law and other factors (Johnson et al. 2004; Schaefer et al. 2006). Florida and Texas were widely acknowledged as having

the most pro-plaintiff legal environments at that time. In 2001, Florida nursing homes made estimated total compensation payments of \$1.1 billion to plaintiffs (Stevenson & Studdert 2003).

Prior to the late 1990s, liability insurance was relatively inexpensive to obtain and was largely priced independently of the home's risk or history of claims (Burwell et al. 2006). The dramatic rise in litigation motivated primary liability companies to stop selling insurance entirely in Florida and Texas by the early 2000s. Homes in these states could still purchase insurance at very high prices from "surplus line carriers." Many states did not require nursing homes to have liability coverage during this period, and other states required only minimal coverage. Consistent with existing economic theory (Huberman et al. 1983; Keeton & Kwerel 1984; Shavell 1986), many independent owners and smaller chains responded to the increased threat of multimillion-dollar suits by purchasing little or no liability insurance in high-litigation states (since they would be paying to cover claims that they would not otherwise have to pay given their assets, as well as becoming more attractive to target in a lawsuit). Personal injury lawyers asserted that defense lawyers were actively advising owners of nursing homes not to carry insurance (Jurand 2006). Anecdotal evidence suggests that in Florida "facilities with policies with low limits were less likely to be sued" than large self-insured chains (Schaefer et al. 2006).

Large multistate nursing home chains were organized as typical multidivisional firms in the 1990s (Carter 2006). Most had regional divisions with all homes being directly owned and operated by the central corporation. The increased threat of tort litigation in the late 1990s imposed significant potential liability on the national chains that owned homes in the affected states, since their system-wide assets would be subject to claim in a lawsuit. For example, Beverly Enterprises, Inc., the largest nursing home chain at the time and a frequent target of early lawsuits in the industry, owned assets that had an approximate book value of \$1.9 billion in 2000. In a market with low transaction costs and perfect information, large chains could potentially have passed the costs of increased liability coverage back to customers through higher prices (Coase 1960; McKean 1970; Oi 1973). This, however, was not possible in the nursing home industry since prices are largely fixed by the government (Medicare and Medicaid) and potential residents do not have perfect information to assess the risks of individual homes. Absent ownership or legal restructuring, large chains faced the choice of incurring the high expected liability costs *ex ante* by purchasing expensive liability coverage (when available) or *ex post* by paying for claims through self-insurance. The randomness of accidents, juries with sympathies for elderly plaintiffs, unclear negligence standards and the potential for frivolous suits implied that these costs were likely to be high and hard to predict, even for chains exerting a high level of care.

Independent owners and small chains faced lower expected tort liability than a large chain (absent significant legal restructuring as described below) for at least three reasons. First, the assets of the smaller companies, while potentially sufficient to cover smaller claims, were not large enough to cover the sizable jury awards and settlements

observed in some cases (tens of millions of dollars).⁹ Second, as discussed above (and supported by our data below), many of the smaller owners purchased little or no liability insurance. Large chains implicitly provided insurance coverage for claims at individual homes whether they purchased policies from third parties or not. Limited insurance in combination with a relatively small asset base made the smaller owners both more judgment proof and less attractive to plaintiffs than large “deep-pocketed” chains. Third, juries are potentially more sympathetic toward local or small regional defendants than large national corporations. All three reasons help explain why plaintiff attorneys are reluctant to incur large costs to pursue cases against small nursing home operators.

As a result of these considerations, lawyers advised nursing home chains operating in high-litigation environments to restructure by separating the chain’s real assets from its operations, for example, by selling real estate to a real estate investment trust that would lease it back to the company (Casson & McMillen 2003; Jurand 2006; Pearce et al. 2009). In the extreme, a chain with 100 homes could restructure to have 100 legally independent companies (limited liability companies (LLCs) or corporations) that each owned the assets of one home and 100 other legally independent companies that leased the homes for operation (Casson & McMillen 2003). The services provided by the operating companies might be subdivided further into other special-purpose LLCs or corporations to provide additional protection.

While legal restructures provide some protections to large chains, they are costly and not completely foolproof as a judgment-proof strategy. An alternative for reducing legal liability in high-litigation states was simply to sell their assets to smaller chains or independent owners, which, as discussed above, are more likely to be judgment proof against large claims (Cohen 1997; Dari-Mattiacci & Mangan 2008; Gilles 2006; Ringleb & Wiggins 1990; Shavell 2004). There were at least four reasons why a large chain might prefer this option to internal legal restructuring. First, a firm that restructures to form legally independent subsidiaries must govern them in a manner that reduces the likelihood that the corporate veil will be pierced in a lawsuit. This entails maintaining an appearance of subsidiary independence by adhering to various formalities, keeping separate records, maintaining distinctiveness among units, not having the parent intervene to a great extent in subsidiary decisions, and so on (Casson & McMillen 2003). Operating the homes within a chain as quasi-independent entities, however, potentially thwarts the very multi-establishment economies that motivated the large chain to acquire the

⁹Courts have awarded damages against chains that staggeringly exceed the value of the typical nursing home in some cases. One example is the 2011 West Virginia case (*Manor Care et al. v. Douglas*) where the jury awarded the plaintiff \$90 million in compensatory and punitive damages. In a more recent case, a Florida jury awarded the plaintiffs \$1.2 billion in damages, including \$1 billion in punitive damages (Geary 2013). Large damage awards are not just a recent phenomenon. For example, in two high-profile cases in Texas in 2001 juries awarded plaintiffs \$82 million and \$315 million, respectively (Stevenson et al. 2006a). These large awards are sometimes reduced on appeal and can be difficult to collect. For example, the West Virginia Supreme Court reduced the award in the *Manor Care* case to \$32 million (White 2014). Nevertheless, sizeable awards have the potential to place even large corporations in financial distress. In contrast to the magnitude of these awards, the estimated average selling price for a 100-bed home in 2013 was \$7,300,000 (Health Care Transaction Group 2014). Punitive damages are not always dischargeable under bankruptcy, but a single-unit operator would typically not have the assets to pay such large claims (and thus would be less likely to be sued in the first place than a large chain).

homes in the first place (e.g., shared operating formats, shared information, personnel, and other systems, marketing/advertising economies, and branding). Second, it is costly for a large company to form and continue to manage complex legal structures on an ongoing basis. Many small chains already were organized as LLCs (Jurand 2006), making it potentially less expensive to shield their existing assets from liability that might arise at newly acquired homes. Third, a plaintiff can name a deep-pocketed parent corporation in a lawsuit, even if the parent is likely not to be held responsible for a subsidiary's torts, thus generating legal, settlement, and reputational costs. Fourth, there is the potential that a court will "pierce the corporate veil" and hold the parent corporation liable for a subsidiary's tort claim.¹⁰ Even if the veil is not pierced, the parent runs some risk of being liable for contributing directly to the harm (*Forsythe v. Clark USA, Inc.*, 224 Ill.2d 274 (Ill. 2007)). By selling homes in high-litigation states to distinct owners with whom they hold no ownership interest, a large chain substantially removes itself from future litigation risk in these states.

2. Tort Reform and the Reversal of Judgment-Proof Behavior

Beginning around 2003, the tort environment began to change in various states due to tort reform legislation. This study focuses on the 12 states (described below) that enacted meaningful caps on noneconomic damages in medical malpractice cases during the 2003 through 2006 period.¹¹

The enactments of laws that place caps on noneconomic damages, which compensate plaintiffs for "pain and suffering," are of particular importance to the nursing

¹⁰Pearce et al. review the history of cases involving piercing the corporate veil in the nursing home industry. They conclude that while courts have been hesitant to pierce corporate veils, there was a trend toward being more willing to pierce veils when it comes to protecting a "vulnerable class of plaintiffs with a particular social policy implicated." They surmise that "the intrinsic fragility of the elderly, coupled with the forecasted increase in the elder population, could leave nursing home corporate structures increasingly susceptible to veil piercing" (2009:745).

¹¹An analysis of the political economy behind the enactment of damage caps in these states is beyond the scope of this article. However, a few observations are worth noting. There is significant debate and disagreement over the merits of tort reform. The likelihood that a state will enact tort reform at a particular point in time presumably depends on the state's existing tort environment and political makeup. Florida, Georgia, and Texas, which were noted for having the highest levels of malpractice litigation prior to reform, were among the first to enact reforms. Republicans in these states tended to argue strongly that high levels of litigation were having negative effects on their states' health-care industries (e.g., causing doctors, other health-care providers, and insurance companies to leave their states) and overall economies, while Democrats often argued that significant tort liability was necessary to deter negligent behaviors among health-care providers. The political power of the proponents and opponents of tort reform varies across states. Consider Texas, which is noted for having adopted among the strongest reforms in the nation in 2003. George W. Bush, a prominent Republican, promoted tort reform as a very high priority both while he was governor of Texas (1995–2000) and when he was running for president. Rick Perry, another Republican who strongly advocated tort reform, succeeded Bush as governor of Texas in 2000. In 2003, the Texas Senate and House both had Republican majorities. Voters, who in aggregate had elected a majority of Republicans, voted in a state-wide election to overturn the 1988 Texas Supreme Court decision against caps on noneconomic damages, which was important for the reform to have its full effect. In 2003, all nine justices on the Supreme Court of Texas also were Republicans. Given the very high level of litigation in Texas at the time and the political makeup of the state's executive, legislative, and judicial branches, it is not hard to explain why Texas was among the first to adopt strong tort reforms.

home industry. Most of the residents in nursing homes are senior citizens. Their age and condition naturally limit the economic damages that can be claimed due to lost future earnings, and legal claims typically focus on pain and suffering. Studdert and Stevenson (2004) report that noneconomic damages average around 80 percent of total damages for nursing home cases, compared to just 35 percent for general malpractice cases. Nursing home operators argue that there is no scientific method for calculating noneconomic damages and that the subjective nature of these awards increases the level of uncontrollable risk. Empirical studies generally find that caps on noneconomic damages reduce the number of malpractice lawsuits and the size of awards (e.g., Avraham 2007; Holtz-Eakin 2004; Mello 2006; Paik et al. 2012). There is anecdotal evidence, moreover, of several large law firms that specialized in nursing home litigation leaving states that implemented reform and entering states that had not passed reforms.¹²

B. Hypotheses

The primary objective of this article is to test the hypothesis that changes in the legal (tortious) environment influence the asset-shielding behavior of nursing home operators. We refer to this overall hypothesis as the *Judgment-Proof Hypothesis*. This hypothesis, in turn, is divided into two subhypotheses relating to two specific asset-shielding actions: the *Ownership Hypothesis* and the *Branding Hypothesis*.

The Ownership Hypothesis predicts that the likelihood of large chain ownership will fall (increase) relative to ownership by smaller, more judgment-proof owners as the litigation environment becomes more (less) costly. Stevenson et al. (2006a) provide examples of several large nursing home chains that exited high-litigation states around the beginning of the 21st century, ostensibly due to the concerns about the increased threat of high litigation costs. Although these examples are consistent with the Ownership Hypothesis, there were other considerations, such as low Medicaid rates in certain states, that could have motivated some of the ownership changes (as the authors state). These authors also provide examples of relatively large chains that did not exit high-litigation states during this time period, and some that increased their ownership of homes in states such as Texas. Finally, the timing of such exits relative to the passage of residence rights laws clouds their underlying motives. It is therefore important that the Ownership Hypothesis also predicts that large chain ownership should *increase*, ceteris paribus, in the aftermath of legal reforms (e.g., caps on damages) that reduce expected liability costs.

Large chains that do not opt to sell their homes can take internal steps to reduce their expected legal liability in high-litigation environments. One policy that we can observe, in this regard, is whether a chain brands a given home with the corporate

¹²The *Wall Street Journal* reported in 2014 that “two decades after its start in Florida, the legal strategy has moved into tort friendly states . . . [because] cases filed in states with limited or nonexistent curbs on noneconomic damages means lawsuits that elsewhere might be settled for \$50,000 can generate much larger settlements or verdicts.” The article goes on to say that “ground zero for the continuing tussle appears to be Northern Appalachia: Kentucky, West Virginia and Appalachia” (*WSJ* Oct. 3, 2014).

name or some other name that clearly links it to either the central corporation or sister units. The Branding Hypothesis predicts that the likelihood of branded homes will fall (increase) as the litigation environment becomes more (less) costly. The reasoning is as follows. First, to reduce the likelihood of corporate veil piercing, experts advised chains to “preserve the distinction between the operating entity and its affiliates” by, among other things, conducting business under unique company names (Casson & McMillen 2003).¹³ Second, a shared brand name can increase the costs of litigation due to negative demand spill-over effects. Dranove et al. (2012) provide evidence that malpractice lawsuits can have significant negative effects on the demand and profits of health-care providers. Lawsuits involving the elderly and other vulnerable patients often generate widespread adverse media coverage and publicity that can have negative demand spillovers and impose costs throughout a nursing home chain, particularly if the homes are linked by a common name.¹⁴ Third, management might refrain from branding units in high-litigation environments to avoid signaling to potential plaintiffs that the unit is affiliated with a deep-pocketed corporation. According to Carter (2006), in the 1990s “most facilities’ names contained the name of the chain, as did the policy and procedure manuals, admissions packets, promotional materials and other documents.” Carter claims by 2006 that:¹⁵

Now it is difficult, if not impossible, to identify the entity that owns, operates and controls any skilled nursing facility. A nursing home and its literature no longer bear the name of its owners and operator. The business model is focused on shielding the true corporate owners from liability or responsibility for their residents’ injuries.

Rosenfeld (2009) similarly asserts that chains carefully name or rename facilities to give the impression that they are “small mom-and-pop operations as opposed to being operated by a large health care conglomerate.” Carter provides detailed advice to other plaintiff attorneys for determining the identities of the owners through interviews,

¹³The legal case history at the time included an El Paso Court of Appeals decision in 1997 in *Beneficial Personnel Services of Texas, Inc. v. Rey* that approved a submission under which a jury had found two companies to be a “single business enterprise.” One of the factors considered by the jury in piercing the corporate veil was the use of a “common business name” (Brown 2009).

¹⁴A relatively common strategy of plaintiff attorneys is to attack the reputation of the defendant company through negative media campaigns. The threat of large negative spillovers potentially gives plaintiffs additional power to extract settlements, since higher costs are imposed on the chain if a lawsuit is filed and publicized. Sullivan (1990) finds that not using a shared brand name can reduce the negative spill-over effects of an adverse event on a company’s products, even if the identity of the common owner is relatively well known. For example, she finds that mechanical problems with a particular Audi model had greater negative effects on the demands for other Audi models than for Volkswagens, which many prospective customers knew are made by the same manufacturer. Lawsuits involving alleged abuse and neglect of elderly residents filed against large nursing home chains, such as Beverly Enterprises, were picked up by the Associated Press and reported throughout the nation. Prominent examples of this type of widespread news coverage highlighted the potential negative effects that litigation can have on a company’s brand name and potentially affected the branding policies of other nursing home chains throughout the industry.

¹⁵Current federal disclosure rules make it relatively easy for the public to obtain online information on identities of nursing home owners. We are interested in the informational environment during our study period.

document review, discovery, and depositions. The first two reasons for being less likely to brand in high-litigation environments, however, continue to hold even if the ownership of homes was relatively well known. The three potential reasons are not mutually exclusive, and we are unable to identify their relative importance in explaining changes in branding policy in our tests.

III. DATA

A. Sample

The Online Survey, Certification and Reporting (OSCAR) database, maintained by CMS, provides detailed facility-level information for all certified nursing homes in the United States. Our panel data consists of 111,213 observations of for-profit nursing homes covered by OSCAR from 1998 through 2008.

While OSCAR provides detailed information on nursing home names, their addresses, and whether the nursing home is part of a chain, the names of owners were not available publicly prior to 2010. We purchased owner names for our sample period from a private data vendor. All homes with a common owner are defined as being members of the same chain.

Chain size (number of affiliated units) varies widely across the sample. For descriptive purposes, consider the distribution of chain size in 2004 (the median year in which our treatment states enacted damage caps). The typical chain is small (average and median of 11 and four nursing homes, respectively).¹⁶ For this study, we define a “large chain” as one that owns more than 40 homes. We chose 40 homes because it is approximately the 95th percentile for chain size. Other chains are defined as “small.” As discussed below, our results are robust to other cutoffs. The Ownership Hypothesis focuses on relative size. No matter where we draw the line, it makes the same empirical prediction—homes owned by larger chains are less likely to exist in high-litigation environments.

We examined the names of the individual nursing homes within each chain to determine which ones had names that clearly linked them to at least one sibling unit. Nursing homes with linked names were coded as “branded” chain units, while others were coded as “unbranded.”¹⁷ No empirical method for classifying homes by branding status is likely to be perfect. To help ensure that our results are not driven by our

¹⁶Similar to other service industries (Hubbard 2004), ownership concentration in the nursing home industry, measured at the national level, is relatively low. In our sample, the top 10 chains collectively owned 1,900 nursing homes in 2004 (18.5 percent of the sample). Beverly Enterprises, which operated in 25 states, was the largest nursing home chain in 2004 with 354 nursing homes and a 3.5 percent national market share.

¹⁷We began by developing a computer algorithm to identify whether a chain unit used a common name for some or all sibling units. This algorithm excluded various words that are not a brand name, like “rehabilitation” and “center.” We then manually checked whether the common name is indeed a brand name using the information from these chains’ websites, online documents, and advertising brochures. Some chains use multiple brand names. In these cases, all are labeled as branded (we do not distinguish among subbrands). All of the 10 largest chains branded some units and left others unbranded in 2004, except UHS-PRUITT, which used unique names for all 82 of its units. There is wide variation in the proportion of branded units among large chains (0 to 88 percent).

Table 1: Descriptive Statistics

<i>Variable</i>	<i>Observations</i>	<i>Mean</i>		<i>1999</i>	<i>2004</i>	<i>2008</i>
Panel A: Nursing home characteristics			<i>25th Perc</i>	<i>75th Perc</i>		
Total beds	100,829	110	71	130	109	110
Occupancy rate	100,829	82%	75%	94%	81%	82%
Patients funded by Medicaid	100,829	62%	35%	80%	62%	61%
					60%	
Panel B: Ownership/branding status						
% Chain owned	100,829	61%			65%	61%
% Branded	61,662	32%			33%	30%
% Unbranded	61,662	68%			67%	70%
% Owned by small chain (≤ 40 units)	100,829	33%			34%	34%
Owned by large chain (> 40 units)	100,829	28%			31%	27%
% Branded	28,114	40%			43%	35%
% Unbranded	28,114	60%			57%	65%
					59%	

This table reports descriptive statistics for our sample. There are 100,829 nursing home/year observations from the period 1999–2008.

classification procedure, in our robustness checks we employ an alternative definition where we label a home as “branded” only if its name includes that of the central corporation. The results are robust to this check.¹⁸

Panel A of Table 1 presents descriptive statistics for the total number of beds, occupancy rate, and patients funded by Medicaid for the homes in our sample. Included are the sample means and interquartile range for the 111,213 observations in our 11-year panel dataset. Also reported are the means for each of these variables for the years 1999, 2004, and 2008. The full sample means are 110 beds, 82 percent occupancy, and 62 percent patients funded by Medicaid. There is little variation in the means across the years in our sample. Panel B reports sample statistics on ownership and branding status. In the full sample, 61 percent of the homes are chain owned. The remaining 39 percent are independently owned (single-unit owners). Among the chain-owned homes, 32 percent are branded and 68 percent are unbranded. Small chains owned 33 percent of the total homes, while large chains owned 28 percent. Forty percent of the homes owned by large chains were branded. Between 1999 and 2004, homes owned by large chains declined from 31 percent to 27 percent, falling slightly more to 26 percent by 2008. The percentage of homes branded by large chains declined from 43 percent to 35 percent between 1999 and 2004, but increased between 2004 and 2008 to 41 percent.

¹⁸We conducted various other tests to help verify our classification procedure (available from the authors). Existing theories of the informational role of branded chain units argues that branded chain ownership signals or bonds a consistent level of quality (not necessarily a high level) to customers. For example, a customer at a given McDonald’s outlet expects a similar menu and quality of products as found at other units in the chain. Consistent with these arguments, our supplemental regression tests reveal that the homes we have labeled as branded are associated with more consistent quality than our unbranded homes (less variation around the average number of deficiency citations in government inspections for the branded and unbranded cohorts, respectively). Also consistent with the claims of Carter (2006) and Rosenfeld (2009), the marketing materials on the historic websites of our unbranded units generally did not provide references or links to the central corporate owner.

Table 2: Treatment States

<i>State</i>	<i>Action</i>	<i>Year*</i>
Alaska	Enactment of \$250,000 Damage Cap	2006
Florida	Enactment of \$500,000 Damage Cap	2003
Georgia	Enactment of \$350,000 Damage Cap	2005
Idaho	Enactment of \$250,000 Damage Cap	2004
Illinois	Enactment of \$500,000 Damage Cap	2006
Louisiana	Extended \$500,000 Damage Cap to NH's	2003
Mississippi	Enactment of \$500,000 Damage Cap	2003
Nevada	Enactment of \$350,000 Damage Cap	2003
Oklahoma	Enactment of \$300,000 Damage Cap	2004
South Carolina	Enactment of \$350,000 Damage Cap	2006
Texas	Enactment of \$250,000 Damage Cap	2004
West Virginia	Enactment of \$250,000 Damage Cap	2003

This table lists the states that passed laws placing caps on noneconomic damages in malpractice lawsuits between 2003–2006. The list is compiled from a dataset maintained by Avraham (2015) and described as the “clever” version of the database. The “clever” database excludes laws with very high caps or with liberal exclusions from the law.

*If a law is passed in the second half of a calendar year, it is coded as being enacted in the following calendar year.

SOURCE: Avraham (2014)

Hospitals owned less than 1 percent of the homes, and approximately 50 percent of the homes had family monitoring committees (not shown in the table).

B. Tort Reforms

Our primary source for information on the yearly status of state laws that cap noneconomic damages is the State Tort Reform Database (Avraham 2015). Other sources include Aon Global Risk Consulting (2008) and various web searches. As in Avraham (2015), we define as treatment states those states that enacted laws during our sample period (1998–2008) that capped noneconomic damages to \$500,000 or less per occurrence. Prior to the enactment of these laws, these states either had no caps on these damages or had caps greater than \$500,000.¹⁹ Table 2 presents a list of our 12 treatment

¹⁹As suggested by Avraham (2015), we do not include laws that waived damage caps for “serious injuries.” Alaska had a law capping damage caps prior 2005, but the caps were lifted for injuries involving permanent physical impairment or severe disfigurement. We include Alaska as a treatment state, since it enacted a new law capping noneconomic damages at \$250,000 without this exclusion. Ohio, which enacted a damage cap in 2003, is not included as a treatment state because its caps were “lifted for serious injuries.” Aon Global Risk Consulting (2008) discusses the liberal waivers in the Ohio law and finds in its actuarial analysis that “Ohio tort reform is not having a material effect on the trend in patient care liability” in nursing homes. We focus on caps on noneconomic damages because of their particular importance in nursing home litigation. The state law database also contains information on other tort reforms in addition to caps on noneconomic damages. Our sample period does not allow us to provide meaningful evidence on the marginal effects of different tort reforms on organizational decisions in the industry. In any case, our interest is on how an important change in the legal environment that reduced the threat of litigation affects the ownership and branding of nursing homes and not on the specific effects of any one given reform. Large punitive damages have also been levied against nursing homes in some cases. Four states adopted meaningful caps on punitive damages in malpractice cases during our 1999

states, the sizes of their caps, and years of adoption.²⁰ Eleven states adopted new laws that introduced or lowered caps on noneconomic damages to \$500,000 or less in malpractice cases. Louisiana had an existing law that limited noneconomic damages to \$500,000, but it did not cover nursing homes. In 2003, Louisiana extended the damage cap to nursing homes.

The \$500,000 caps enacted by Florida and Illinois applied to individual defendants, such as physicians and their businesses, but did not cover nursing homes as institutions (the Florida law did not include institutions, while the Illinois law imposed a \$1 million limit on institutions). While these laws arguably made it easier for nursing homes to hire qualified medical directors and other staff (something they reportedly had trouble doing in high-litigation environments), they did not apply to corporate owners more generally. In our sensitivity analysis, we document that our results are not driven by the homes in Florida and Illinois.

IV. STAGE 1 EMPIRICAL RESULTS: PERIOD PRIOR TO TORT REFORM

This section provides evidence on judgment-proof behavior during the earlier part of our sample period when nursing homes in various states were experiencing a dramatic increase in litigation risk. For this analysis, we focus on the years 1998–2004, since the first reforms did not occur until 2003 and ownership changes are likely to occur with a lag.

A. Litigation Risk Measures

For descriptive purposes, we classify states as either having “high” or “low” litigation risk in the 1998–2004 period based on past research studies. Following Johnson et al. (2004), we classify Arkansas, California, Florida, Georgia, and Texas as “high-litigation” states and all others as “low-litigation” states. This simple dichotomy is useful for graphically displaying and highlighting changes that occurred over the early years in our sample.

For our regression analysis, we utilize three *proxies* for litigation risk that vary across time and states. The first is the lagged *statewide average of nursing home malpractice insurance* expenses for the year expressed on a per-resident, per-day basis

through 2008 sample period. Missouri, which adopted a cap on punitive damages in 2006, already had a noneconomic damage cap in place. Idaho adopted new caps on noneconomic and punitive damages at the same time. Ohio adopted a cap on punitive damages in 2005 without adopting a cap on noneconomic damages. Idaho is included as a treatment state in our analysis because it adopted a noneconomic damages cap. The other three states are not. The Wisconsin Supreme Court ruled in 2006 that the specific damage cap law in place in the state at the time was unconstitutional. Circumventing the typical legislative process, the Wisconsin Assembly passed a bill imposing a new cap. A new law with a somewhat higher cap was signed into law in 2006. The Oregon Supreme Court ruled in 1999 (one year into our sample period) that the Oregon damage cap law was unconstitutional. We have used these two states in some sensitivity checks, but not in our primary tests.

²⁰The State Tort Reform Database codes laws enacted during the second half of the year as being adopted in the next calendar year. The table reflects this convention. We obtain similar results when we use the calendar year of adoption.

(calculated from government-mandated cost reports).²¹ The second is the lagged *statewide average paid losses of nursing homes* for the year expressed on a per-resident, per-day basis. The third is *statewide medical malpractice filings per 1,000 active physicians*.²² The results are similar for all three measures. In this article, we report the results for the first measure.

Approximately 55 percent of the homes in our sample left the insurance expense lines in their SNF cost reports blank. CMS representatives informed us that a missing value typically implies that the home did not incur an expense in the category. Indeed, it is relatively rare to observe an actual zero recorded for one of these lines in the cost report. The large number of homes not purchasing insurance implied by the missing values is consistent with previous evidence that many nursing homes did not purchase insurance during this period. The lack of insurance, coupled with a relatively small asset base, would have made many of the smaller homes relatively judgment proof against large claims.²³ Based on our discussions with CMS, we treated missing values as zeros in our calculations of average insurance expenses and average paid losses. The regressions reported in the article employ these calculated values. We have also conducted all tests using average insurance expenses and paid losses calculated by treating missing values as missing. All tests produce highly similar results.

B. Descriptive Evidence on Judgment-Proof Behavior

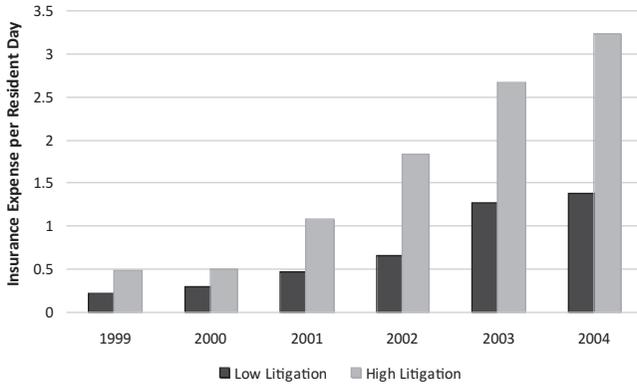
Figure 1 displays the average lagged malpractice insurance expenses in high- and low-litigation states over the 1999–2004 period (1998 is not included because we do not have lagged values for this year). The average expense was relatively small in all states in 1999 (less than 50 cents per resident per day). Insurance expenses, however, increased substantially over the period. In 2004, the average expense in the high-litigation states was nearly \$3.24 compared to about \$1.38 in the low-litigation states. A difference in means test rejects the null hypothesis of equal means with a p value < 0.01 . The collective evidence in this figure is consistent with our maintained assumptions that tort risk increased substantially in the nursing home industry over the period and that there

²¹The SNF cost reports for our analysis period include three insurance-related expenses: malpractice insurance premiums (money paid by the provider to a commercial insurer to protect the provider against negligence claims made by their residents), malpractice paid losses (money paid by the health-care provider to compensate a resident for professional negligence), and malpractice self-insurance (where the health-care provider acts as its own insurance company and allocates expenses to the home for the year). Self-insurance includes the purchase of policies from parent-sponsored captive insurance companies. Our calculations of average insurance expenses are based on the sum of insurance premiums and self-insurance. These variables are obtained from Worksheet S2, Line 45. Using the U.S. individual nursing home data over our sample period, the daily malpractice insurance expense is \$156 at the mean with standard deviation 674.

²²The medical malpractice filings information is obtained from the National Practitioner Data Bank.

²³Among the for-profit nursing homes with zero insurance expenses, the bed size is 112.8 at the mean and 103 at the median with standard deviation 56. The bed size for those with nonzero insurance expense is 117.9 at the mean and 114 at the median with standard deviation 52. The distributions suggest that small nursing homes tend to have no records or recorded as zero.

Figure 1: Trends in insurance expenses in high- and low-litigation states (1999–2004)



This figure depicts overall litigation risk trends from 1999 through 2004 based on observed insurance expenses (per resident per day). Insurance expenses are equal to insurance premiums plus self-insurance (one-year lag). The figure depicts separate trends for states classified by Johnson et al. (2004) as “high-litigation states” (AR, CA, FL, GA and TX) versus all other states (“low-litigation” states).

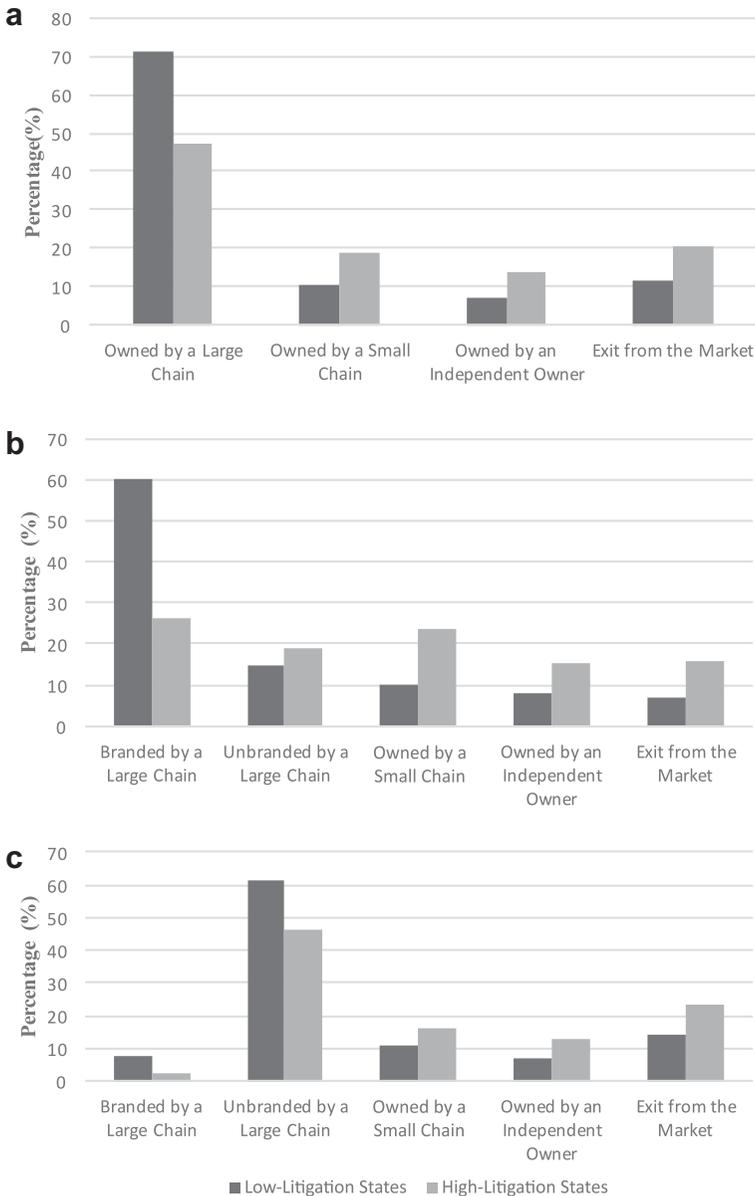
were substantial differences between the states we have classified as high versus low risk.²⁴

To provide descriptive evidence related to the Ownership and Branding Hypotheses, we examine the extent to which large chains sold homes or otherwise restructured in response to increased tort liability. Figure 2 displays the 2004 ownership/branding status for homes that were owned by large chains at year-end 1998, categorized by high- and low-litigation states. The differences in changes between the two sets of states over the six-year period are striking and consistent with the Ownership Hypothesis. The top panel reveals that the percentage of homes that continued to be owned by large chains in 2004 is much higher for the low-litigation states (70 percent vs. about 45 percent). Correspondingly, the percentages of homes that were owned by small chains, independent owners, or no longer existed in 2004 were higher for the high-litigation states. The other two panels, which display separate results for branded and unbranded homes owned by large chains in 1998, present similar pictures. Of particular note is that 60 percent of the branded homes in 1998 continued to be branded in 2004 in the low-litigation states, while only 25 percent of the 1998 branded homes continued to be branded in the high-litigation states in 2004.

Many of the changes displayed in Figure 2 involve changes in both ownership and branding (e.g., a large branded chain selling a home to a small chain or independent owner who does not brand it). It is interesting to consider whether the increased threat of litigation motivated the dropping of brand names without a corresponding change in

²⁴The fact that many nursing homes declined to purchase insurance in high-litigation states actually works against our finding higher average insurance costs in high-litigation states. In spite of this downward bias, we still find that insurance expenses were significantly higher, on average, in high-litigation states.

Figure 2: Ownership and branding status in 2004 of homes owned by large chains in 1998.



(a) Distribution of ownership status in 2004 for 3,196 homes that were owned by large chains in 1998. (b) Distribution of ownership/branding status in 2004 for 1,269 homes that were branded by large chains in 1998. (c) Distribution of ownership/branding status in 2004 for 1,927 homes that were not branded by large chains in 1998. High-litigation states are AR, CA, FL, GA, and TX (Johnson et al. 2004).

Table 3: Changes in Branding Status of Homes that Did Not Change Ownership During the 1998–2004 Period

	<i>Units with Initial Status: Branded</i>			<i>Units with Initial Status: Not Branded</i>		
	<i>Total Frequency</i>	<i>Converted from Branded to Not Branded</i>		<i>Total Frequency</i>	<i>Converted from Not Branded to Branded</i>	
		<i>Frequency</i>	<i>Percent</i>		<i>Frequency</i>	<i>Percent</i>
Low-litigation states	2,164	259	11.97	4,607	254	5.51
High-litigation states	878	166	18.91	2,089	48	2.3
Chi square test	35.3 ($p < 0.000$)			39.1 ($p < 0.000$)		

This table focuses on chain-owned homes for which ownership did not change over the years 1998–2004. It displays the number of homes that were branded or unbranded at year-end 1998 partitioned by low- and high-litigation states (AR, CA, FL, GA, TX). It also displays the number of homes in the two sets of states that converted to the opposite branding status by year-end 2004. Chi square tests of the hypothesis of equal proportions of conversions between the two sets of states are provided.

ownership. Table 3 compares the changes in branding status of chain-owned homes that did not undergo ownership changes over the sample period. The table reveals that about 19 percent of the initially branded homes in high-litigation states dropped their brand names, compared to only 12 percent of the homes in the low-litigation states. This statistically significant difference is consistent with our hypothesis that an increase in litigation risk makes branding of homes relatively less desirable. The table also shows that some homes in each set of states converted from being initially unbranded to being branded. Consistent with our Branding Hypothesis, the percentage of unbranded homes that became branded is smaller for the high-litigation states (2.3 percent vs. 5.5 percent). This difference is also statistically significant with a p value < 0.01 .

C. Regression Analysis

For the purposes of our regression analysis, owners are divided into three categories: large chains, small chains, and independent owners (IO). The Ownership Hypothesis predicts that large chains are relatively less likely to own homes in high-litigation environments. All models are estimated using panel data with nursing home and year fixed effects. Nursing home fixed effects control for home-specific factors, including state-specific factors, that might affect ownership and do not vary over time, while the year fixed effects control for factors that change over time and affect all nursing homes (such as changes in federal government policies). Data variation results from changes in the ownership and branding status *within* a given nursing home during our sample period. Additional covariates, which potentially vary over time for a given nursing home, are included in the estimations. These include individual nursing home and market characteristics (measured at the county level), which control for various determinants of ownership/branding from the consumer demand side (as suggested by the existing literature on chains, as well as nursing homes). We cluster the standard errors by nursing home (results are robust to clustering by chain).

Table 4 displays our regression results. For presentation purposes, we focus on models where average statewide insurance expense is used as the proxy for litigation risk. The first two columns of Table 4 report our results for large chain affiliation. These correspond to linear probability models of the conditional, binary choice of ownership by a large chain versus a small chain and independent owner, respectively.²⁵ Consistent with the Ownership Hypothesis, the results indicate that litigation risk significantly increased the likelihood of nursing home ownership by a smaller organizational form. The coefficient on the proxy variable for litigation risk is negative and significant at the 1 percent level in both cases. An increase in litigation cost of \$1 per patient per day is associated with a reduction in the likelihood of large chain ownership of approximately 4 percentage points. Not surprisingly, few of the other controls are significant given that many of them have little intertemporal variation. Among the significant controls, we find that large chain ownership is more likely in counties with higher per-capita income and greater market concentration (HHI) among nursing homes.

Table 4 also presents tests of branding behavior, which predicts that chains are relatively less likely to brand homes in high-litigation environments. We estimate models for three distinct samples (Columns 3–5 in Table 4). The regressions in Column 3 are estimated using our full sample of chain observations while the regressions in Column 4 are estimated using the subsample of homes owned by large chains. Column 5 is estimated using large chain-owned homes that did not change ownership over the sample period.²⁶

Turning to the results, we also find strong support for the Branding Hypothesis. The coefficients on the variable of interest are negative and significant at the 1 percent level in all three estimations. In the full sample, an increase in litigation cost of \$1 per patient per day is associated with a reduction in the likelihood of branding of approximately 4 percentage points. The significant coefficient in Column 5 of Table 4 indicates that the likelihood of branding falls as litigation risk increases, even when ownership of the home is held constant. Most of the control variables are insignificant.

²⁵We employ linear probability models (LPMs), rather than probit or logit models, because we include nursing home fixed effects in our estimates. We have estimated models without fixed effects using both LPMs and multinomial probit models, and the results are qualitatively the same.

²⁶We view the results for the subsample of homes where ownership did not change as particularly important. We have argued that small chains have incentives not to brand homes when they purchase them from large chains in high-litigation environments for reasons related to liability risk and concerns about veil piercing. It could be, however, that small chains are simply less likely to brand homes because they do not have known brand names. If this were the case (and the primary driver of our branding results), then what we interpret as support for the Branding Hypothesis may simply be support for a “large chain exit” effect, and not a deliberate effort by chains to suppress branding in high-litigation environments. Focusing on the subsample where ownership did not change helps to rule out this alternative explanation.

Table 4: The Impact of Litigation Risk on Ownership and Branding: 1999–2004

Variable	Large Chain Ownership		Branding of Chain-Owned Homes		
	LC vs SC	LC vs IO	Full Sample	Large Chains	LC Excluding M&A
Malpractice expenses per resident per day	-0.044*** (0.005)	-0.035*** (0.004)	-0.043*** (0.005)	-0.038*** (0.007)	-0.027*** (0.006)
<i>Nursing home characteristics</i>					
Beds	0.0002 (0.0003)	0.0003* (0.0002)	0.0004 (0.0003)	0.0001 (0.0004)	-0.0001 (0.0005)
Percentage of Medicaid	-0.025 (0.019)	0.01 (0.011)	-0.016 (0.016)	-0.006 (0.023)	-0.0004 (0.024)
Hospital-based	0.09 (0.059)	0.071 (0.088)	-0.056 (0.056)	0.154 (0.118)	0.008 (0.032)
Monitoring committee	0.002 (0.005)	0.004 (0.003)	0.008* (0.005)	0.011** (0.005)	0.015*** (0.006)
<i>Market characteristics</i>					
Ln Income per capita (County)	0.185*** (0.063)	0.117*** (0.039)	-0.052 (0.054)	-0.066 (0.064)	-0.096 (0.071)
Ln Elderly population (county)	0.004 (0.050)	-0.003 (0.035)	-0.049 (0.044)	-0.04 (0.094)	0.014 (0.089)
HHI (county)	0.174*** (0.053)	0.131*** (0.037)	0.086** (0.041)	0.052 (0.055)	0.070 (0.070)
Adjusted state Medicaid rates	0.0002 (0.0003)	0.0001 (0.0002)	0.001*** (0.0002)	0.0002 (0.0003)	-0.0001 (0.0003)
Year dummies	Y	Y	Y	Y	Y
Nursing home dummies	Y	Y	Y	Y	Y
Observations	41,518	41,281	41,518	19,711	16,957
R-square	0.818	0.946	0.856	0.902	0.920
Number of nursing homes	9,013	8,507	9,013	4,635	4,262

Robust standard errors in parentheses.

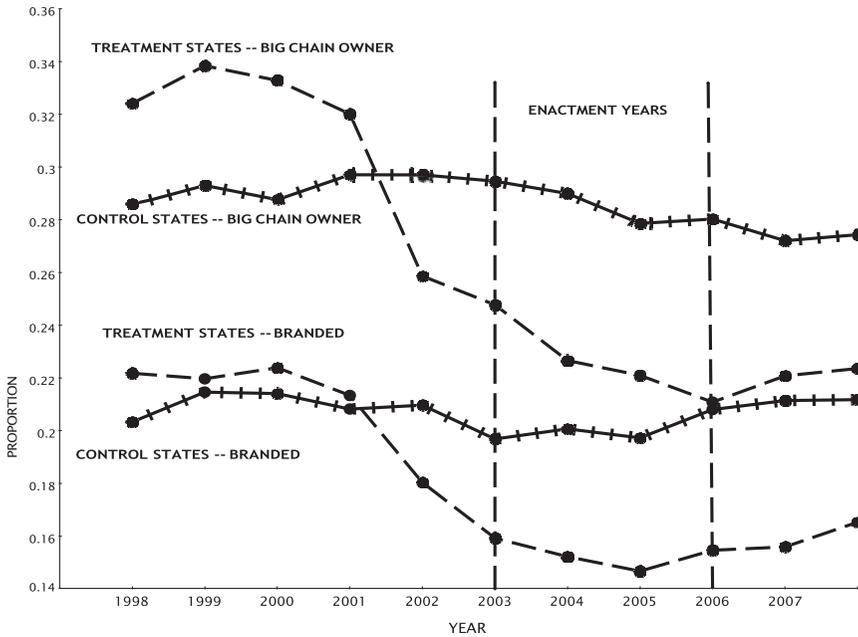
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

This table presents LPM estimates of our basic ownership and branding models with nursing home and year fixed effects. Litigation risk is defined as the statewide average nursing home malpractice insurance expense per resident per day, lagged one year. Columns 1 and 2 report OLS estimations of large chain ownership (>40 units), while Columns 3–5 report the OLS results of branding of chain-owned homes. Ownership types include large chain (LC), small chain (SC), and independent (IO). The Ownership Hypothesis predicts that large chains will be less likely to own homes in high-litigation legal environments. The Branding Hypothesis predicts that chains will be less likely to brand their homes in high-litigation legal environments. The models are estimated using panel data from 1999–2004.

V. STAGE 2 EMPIRICAL RESULTS: POST TORT REFORMS

The collective results in the first stage of our empirical analysis are highly consistent with the Ownership and Branding Hypotheses. However, our methodology does not allow us to rule out the possibility that omitted time-varying factors within a state are causing the observed changes in ownership/branding. In this section, we test whether the previously documented trends in ownership and branding are reversed or abated when tort reforms were adopted that reduced the litigation risk within a given state. Data availability and knowledge of enactment dates allow us to conduct a standard DD analysis of the effects of these reforms. Evidence

Figure 3: Trends in the difference in large chain ownership and branding between treatment and nontreatment states in years surrounding the enactment of the law.



This figure shows the “event-time” trends in the difference in the percentage of homes owned by large chains and branded between treatment and nontreatment states around the enactment year of the state laws. Year 0 for the treatment states is the year the law capping noneconomic damages was enacted. Year 0 for the nontreatment states is 2004 (the median year in which caps were enacted by the treatment states).

of such an abatement or reversal would provide more convincing evidence that there is a causal relation between the tort environment and the ownership and branding of nursing homes.

A. Model Specification and Estimation

Researchers studying the effects of changes in state policies frequently observe that the variables of interest follow different trends in the treatment states than in the control states during the pretreatment period. Figure 3, which compares the trends in large chain ownership and branding between treatment and control states over our sample period, shows this is true for this study. Consistent with our earlier results, the treatment states, which include Georgia, Florida, and Texas (previously categorized as “high-litigation” states), witnessed more significant declines in both large chain ownership and branding than did control states during the preenactment period (1998–2003). The figure also suggests possible reversals in the ownership and branding trends in the treatment states following the enactment of the damage caps, as predicted by the Ownership and Branding Hypotheses. The observed differences in trends across states imply that it would be inappropriate to assume that all states follow similar trends in the

pretreatment years without additional dynamic controls. This issue is often addressed in DD studies by including state-specific time trends in the models (for an example from the tort reform literature, see Currie & McLeod 2008). We employ this strategy.

Changes in ownership and branding take time to implement, and it is reasonable to assume that the effects of new damage caps occur over multiple years in the post-enactment period. We employ two DD specifications that allow for dynamic effects. The first is a simple piece-wise linear model that allows for a change in the time trends in the treatment states following the enactment of a law. The second is a distributed lag model, which allows for more general dynamic effects during the post-enactment period. The two models are as follows:

$$ORG-POLICY_{i,t} = a_i + b_1 YEAR_t + b_2 (STATE_s * TIME_t) + b_3 X_{i,t} + \beta_1 YEARS|SINCE|ENACTMENT_{s,t} + \mu_{i,t} \quad (1)$$

$$ORG-POLICY_{i,t} = a_i + b_1 YEAR_t + b_2 (STATE_s * TIME_t) + b_3 X_{i,t} + \sum_{n=1}^5 \beta_n DAMAGE|CAP_{s,t-n} + \mu_{i,t} \quad (2)$$

In both specifications, $ORG-POLICY_{i,t}$ represents the ownership or branding status of the nursing home i in year t ; a_i are nursing home fixed effects; $YEAR_t$ is a vector of year indicators; $STATE_s * TIME_t$ is a vector of state-specific linear time trends; $X_{i,t}$ is a vector of individual nursing home characteristics in year t , which potentially vary over time (including state-level policies), and $\mu_{i,t}$ is a random error term.

In the first specification, $YEARS|SINCE|ENACTMENT_{s,t}$ allows the slope of the state's time trend to change after a law is enacted. It takes on the value 1 in year + 1, 2 in year + 2, and so on. Support for the main hypotheses is indicated by a positive coefficient on this variable. The second specification replaces the single post-enactment trend variable with five lags of the dummy variable = 1 if the state has a damage cap in the given year, $DAMAGE|CAP_{s,t-n}$. Five lags are employed since five is the maximum number of lags possible, given our sample ends in 2008 and the first enactments occur in 2003. Lag 1 = 1 in all post-enactment years, Lag 2 = 0 in the first post-enactment year and 1 in subsequent years, and so on. The estimated cumulative effect of the enactment of a damage cap over the following five years is equal to the sum of the five estimated coefficients for the damage cap variables. Support for the hypothesis is indicated by positive coefficients on the lagged variables with a sum that is significantly different from 0. The key identifying assumption in both models is that the homes in all states would continue to follow their state-specific ownership and branding trends without a change in the law. Given this assumption, the β coefficients capture the effects of damage cap laws on the ownership and branding of nursing homes.

The inclusion of nursing home fixed effects, which control for permanent factors (including any fixed differences in state legal environments) that could affect the ownership and branding of the specific home, implies that only homes with observations on

both sides of a newly enacted law contribute to the identification of the coefficients of interest.²⁷ Fortunately, our sample contains many homes in the reform states that meet this condition. Year fixed effects control for variables that changed over time that could affect the organizational decisions of all nursing homes (e.g., changes in federal Medicare reimbursement policies). Finally, other controls ($X_{i,t}$) include total beds, number of residents, occupancy rates, percent of patients funded by Medicaid and Medicare, variables measuring patient condition, county population, county per-capita income, and state-level Medicaid rates. Our initial estimations revealed that these variables are generally insignificant and do not affect the estimated coefficient of interest. This is not surprising given the inclusion of nursing home fixed effects and the fact that most of the control variables do not change significantly over time. Since they do not add meaningful explanatory power to our models or affect our results, we drop them from the final estimations that are reported in this article.

OLS with standard errors clustered at the state level produces a consistent estimate of the variance-covariance matrix. Bertrand et al. (2004) and Hansen (2007) provide evidence that statistical tests based on OLS and state clustered standard errors are relatively well specified when there are at least 10 treatment states. We have 12 treatment states and use state clustered errors in all our tests.

B. Results

Table 5 presents our estimates for the simple piece-wise linear specification, which allows for a common change in the slopes of the linear time trends in the treatment states after a law is enacted. The dependent variable in the regressions in the first two columns is an indicator for large chain ownership (> 40 units). The first includes all observations in the sample, while the second restricts the sample to chain-owned homes. Consistent with the Ownership Hypothesis, the estimated coefficients on $YEARS | SINCE | ENACTMENT_{s,t}$ are positive and significant in both samples (at the 1 and 5 percent levels, respectively). The point estimates suggest that the probability of a home being owned by a large chain increases about 2 percentage points per year after the enactment of a damage cap law (relative to its past trend). These results are consistent with the Ownership Hypothesis.

The dependent variable in the remaining two columns of Table 5 is an indicator for being a branded unit. Again we estimate the model for the full sample and for the subsample of chain-owned homes. We include a large chain indicator variable ($= 1$ if the home is owned by a chain with more than 40 homes) as an additional explanatory variable to help assure that the branding results are not simply a reflection of the previously documented trend in increased large chain ownership after the enactment of the laws (large chains are more likely to brand than small ones). The results of interest are similar if we exclude this variable. The estimated coefficient for the time-trend shift is positive in both cases and is significantly different from 0 at the 1 percent level for the

²⁷For example, states that had caps in place prior to our timeframe do not contribute to identification. The effects of these caps are included in the nursing home fixed effects.

Table 5: DD Analysis of Damage Caps: Model 1 (Piecewise Linear)

Variable	Large Chain Ownership		Branding	
	Large Chain vs. Other	Large Chain vs. Small Chain	Full Sample	Chain Owned
Number of years since enactment ^a	0.019*** (0.006)	0.023** (0.012)	0.011*** (0.004)	0.01 (0.006)
Owned by large chain (>40 units)			0.170*** (0.024)	0.090*** (0.018)
NH fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y
State-specific time trend	Y	Y	Y	Y
R-squared	0.78	0.79	0.76	0.8
Observations	111,213	68,384	111,213	68,382

This table presents DD regression results of large chain ownership (> 40 units) and branding behavior in the aftermath of legislation imposing damage caps. The identifying assumption is that state-specific time trends in ownership and branding would continue in the absence of this legislation. Columns 1 and 2 report estimations of large chain ownership, while Columns 3 and 4 report the results of branding of chain-owned homes. This specification allows for a shift in the preenactment time trends in the treatment states upon enactment of a damage cap. The models are estimated using panel data from 1999–2008.

^aVariable equals N in all postenactment years, where N = the years since enactment of the damage cap law (1, 2, 3, ...) and zero in all other years.

Robust standard errors in parentheses.

*** $p < 0.01$, ** p , 0.05, * $p < 0.1$.

full sample, but not the subsample of chain-owned homes. The point estimates suggest that the probability of a home being branded increases about 1 percent per year after the enactment of a damage cap (relative to its past trend). The significant results for the full sample are consistent with the Branding Hypothesis.

Table 6 reports the results for the distributed lag specification. The dependent variable in the first two columns is the large chain indicator. Again the first estimation is based on the full sample, while the second is based on the subsample of chain-owned homes. All the estimated coefficients for the lagged damage cap indicator are positive in both models. Three of the estimated coefficients are individually significant for the full sample, while two are significant for the subsample of chains. The hypothesis that the coefficients for the five lagged terms are jointly equal to 0 is rejected at the 1 percent level for both samples. The hypothesis that the sum is equal to 0 is rejected at the 1 percent level for the full sample and at the 5 percent level for the chain subsample. The sum of the coefficients on the lagged variables predicts that the likelihood of being owned by a large chain five years after enactment increases by 11+ percentage points (relative to the past trend). This estimate is consistent with the first specification, which predicted a postenactment increase of about 2 percentage points per year. The distributed lag model, however, suggests that the primary effect on large chain ownership occurs after the law has been in place for more than one year. This is not surprising given that the buying and selling of homes takes time. These results provide additional support for the Ownership Hypothesis.

The dependent variable in the remaining two columns of Table 6 is the branded home indicator. The estimated coefficient for the first lag is negative for both the full

Table 6: DD Analysis of Damage Caps: Model 2 (Distributed Lag)

Variable	Large Ownership		Branding	
	Large Chain vs. Other	Large Chain vs. Small Chain	Full Sample	Chain Owned
≥ 1 year since enactment of cap = 1	0.005 (.030)	0.012 (.045)	-0.009 (.008)	-0.022* (.013)
≥ 2 years since enactment of cap = 1	0.028*** (.007)	0.037*** (.011)	0.009 (.006)	0.010* (.006)
≥ 3 years since enactment of cap = 1	0.017 (.010)	0.019 (.015)	0.028** (.012)	0.031 (.021)
≥ 4 years since enactment of cap = 1	0.018** (.008)	0.016* (.009)	0.013 (.008)	0.015 (.015)
5 years since enactment of cap = 1	0.043*** (.016)	0.040*** (.012)	0.020** (.010)	0.023** (.011)
Owned by large chain (> 40 units)			0.170***	0.090***
Nursing home fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y
State-specific time trend	Y	Y	Y	Y
Sum of the coefficients for the five postenactment variables	0.111	0.124	0.061	0.057
<i>p</i> value for <i>F</i> test of the hypothesis that the coefficients for the five postenactment variables jointly = 0	.001	.006	.000	.000
<i>p</i> value for <i>F</i> test of the hypothesis that the sum of the coefficients for the five postenactment variables = 0	.002	.038	.006	.069 ^a
Observations	111,213	68,384	111,213	68,384
<i>R</i> -squared	.78	.79	.77	.80

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

This table presents DD regression results of large chain ownership (> 40 units) and branding behavior in the aftermath of legislation imposing damage caps. The identifying assumption is that state-specific time trends in ownership and branding would continue in the absence of this legislation. Columns 1 and 2 report estimations of large chain ownership, while Columns 3 and 4 report the results of branding of chain-owned homes. The identification is a distributed lag model that allows for a shift in the pre-enactment trends in the treatment states over the five years following enactment of a damage cap. The models are estimated using panel data from 1999–2008.

sample and subsample of chains, while all others are positive. Two of the coefficients are individually significant for the full sample at the 5 percent level, while one is significant for the subsample of chains. The hypothesis that the coefficients are jointly equal to 0 is rejected for both samples at the 1 percent level. The hypothesis that the sum of the coefficients is equal to 0 is rejected at the 1 percent level for the full sample, but only at the 10 percent level for the second ($p < 0.05$ on a one-tail test). The estimated total effect for the increased probability of being a branded home over the five-year postenactment period is approximately 6 percent. Again the estimates suggest that the effect of a new law occurs after it has been in place for more than a year. These results provide additional support for the Branding Hypothesis.

C. Robustness Checks

1. Endogeneity Concerns

A concern in all studies involving changes in laws is the potential endogeneity of the statutory actions. In our case, it is possible that omitted variables that motivate state legislatures to enact damage caps are also associated with omitted factors that affect the ownership and branding of nursing homes. There are three factors that potentially reduce this concern. First, aside from Louisiana, all the damage cap laws are general medical malpractice laws that affect participants throughout the health-care sector in the state, including, among others, physicians and hospitals. The laws were not obviously motivated by or related to specific ownership and branding patterns in the nursing home sector. Second, the laws were enacted by states from a variety of regions of the country and at different points in time. Third, states tend not to operate quickly. Nevertheless, concerns about endogeneity and violations of modeling assumptions remain.

The key identifying assumption in our models is that homes in all states would continue to follow their state-specific ownership and branding linear time trends without a change in the law. Deviations from these trends in the years just prior to the enactment of a law would suggest that this assumption is potentially invalid.²⁸ The fact that we find in our distributed lag estimations that the significant changes in the trends occur beyond the first year after enactment mitigates this concern to some degree. As an additional test, we estimate distributed lag models that include indicator variables for each of the two years prior to the enactment of the laws. This check helps ensure that changes in underlying trends in treated states were not due to some underlying omitted factor (that might operate on both sides of the legislation boundary) and in fact only occurred after the laws were passed. Table 7 reports these estimations. The questions of interest are whether the coefficients for the years preceding the law are significant and whether they have a material effect on the magnitude and significance levels for the postenactment variables of interest. The answers to both questions are no. The estimated cumulative effects of the law in the postenactment period are reasonably similar in magnitude to our previously reported results. The hypotheses that the coefficients on the lagged terms are jointly equal to 0 and sum to 0 are rejected in all eight tests (five at the 1 percent level; one at the 5 percent level; two at the 10 percent level). In contrast, the two leading terms are not jointly significant. Six of the eight estimated coefficients for the leading terms are negative and none are significant individually at the 5 percent level. The estimates also continue to suggest that the effects of the law and both ownership and branding do not occur before the second year of enactment. These results help to confirm that the changes in ownership and branding only occurred after the laws were enacted and not before.

²⁸Correlated pre-and posttrends do not necessarily imply endogeneity. They could reflect anticipation that the reform would be enacted (Malani & Reif 2015).

Table 7: DD Analysis of Damage Caps—Robustness Check 1: Inclusion of Preenactment Indicators

Variables	Large Chain Ownership		Branding	
	Large Chain vs. Other	Large Chain vs. Small Chain	Full Sample	Chain Owned
Two years prior to enactment of cap = 1	-0.016 (0.016)	-0.020 (0.025)	0.004 (0.005)	0.014* (0.008)
One year prior to enactment of cap = 1	-0.013 (0.012)	-0.020 (0.021)	-0.009 (0.007)	-0.008 (0.008)
≥ 1 year since enactment of cap = 1	-0.005 (0.028)	-0.002 (0.042)	-0.012 (0.008)	-0.021* (0.012)
≥ 2 years since enactment of cap = 1	0.027*** (0.007)	0.035*** (0.012)	0.009 (0.006)	0.010* (0.006)
≥ 3 years since enactment of cap = 1	0.015 (0.009)	0.017 (0.013)	0.027** (0.012)	0.031 (0.021)
≥ 1 year since enactment of cap = 1	0.016** (0.008)	0.014 (0.009)	0.012 (0.008)	0.015 (0.015)
5 years since enactment of cap = 1	0.041** (0.016)	0.037*** (0.013)	0.019* (0.010)	0.022** (0.011)
Owned by big chain (> 40 units)			0.170*** (0.024)	0.090*** (0.017)
Nursing home fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y
State-specific time trends	Y	Y	Y	Y
Sum of the coefficients for the five post-enactment variables	0.094	0.101	0.055	0.057
p value for F test of hypothesis that the coefficients for the five postenactment variables jointly = 0	.003	.017	.000	.000
p value for F test of hypothesis that the sum of the coefficients for the five postenactment variables = 0	.004	.063	.010	.058
p value for F test of hypothesis that the coefficients for two preenactment years jointly = 0	.535	.626	.333	.180
Observations	111,213	68,384	111,213	68,384
R-squared	.78	.79	.76	.80

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The DD models in this table add indicator variables for each of the two years prior to enactment and the year of enactment to Model 2 of Table 6 as a robustness check. Columns 1–3 report estimations for large chain ownership (> 40 units), while Columns 4–6 report the results of branding of chain-owned homes. The models are estimated using panel data from 1999–2008.

2. Large State Checks

Another potential concern is that the specific provisions in the law of one large state or a random shock affecting all homes in the large state around the enactment of the law are driving our results. If so, our findings would not suggest a more general association between damage cap laws and organizational choices. Similar to Currie and MacLeod

Table 8: DD Analysis of Damage Caps—Robustness Checks 2: Eliminating Large States

Variable	Excluding Texas		Excluding Illinois and Florida	
	Large Chain vs. Other	Branded	Large Chain vs. Other	Branded
≥ 1 year since enactment of cap = 1	-0.013 (0.036)	-0.013 (0.009)	0.018 (0.018)	0.001 (0.007)
≥ 2 years since enactment of cap = 1	0.034*** (0.008)	0.005 (0.006)	0.027*** (0.009)	0.013* (0.007)
≥ 3 years since enactment of cap = 1	0.005 (0.011)	0.033* (0.018)	0.017 (0.012)	0.026* (0.014)
≥ 4 years since enactment of cap = 1	0.014 (0.012)	0.011 (0.012)	0.010 (0.009)	0.008 (0.010)
5 years since enactment of cap = 1	0.044*** (0.013)	0.018** (0.009)	0.013 (0.015)	0.009 (0.015)
Owned by large chain (> 40 units)		0.175*** (0.026)		0.154*** (0.017)
Nursing home fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
State-year time trend	Yes	Yes	Yes	Yes
Sum of the coefficients for the five post-enactment variables	0.084	0.054	0.085	0.057
<i>p</i> value for <i>F</i> test of the hypothesis that the coefficients for the five post-enactment variables jointly = 0	.000	.004	.002	.004
<i>p</i> value for <i>F</i> test of the hypothesis that the sum of the coefficients for the five post-enactment variables = 0	.019	.025	.030	.025
Observations	100,944	100,944	99,982	99,982
<i>R</i> -squared	0.78	.77	.78	.75

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The table presents estimates of the basic distributed lag model based on subsamples that (1) exclude Texas homes (the state with the largest number of homes; and (2) exclude Illinois and Florida (the states with the second and third most homes and that adopted laws that apply to suits against individuals, such as physicians, not institutions). The models are estimated using panel data from 1999–2008.

(2008), we reestimate our basic distributed lag model using subsamples that exclude selected large states. The results are reported in Table 8. The first two columns contain the results for large chain ownership and branding when we exclude all the homes in Texas (the state with the largest number of homes). The last two columns display the results for the subsample that excludes Illinois and Florida homes. These two states had the second and third most homes in our sample, and they had laws that covered individuals, but not nursing homes as institutions (at or below the \$500,000 level). In all these checks, the hypotheses that the lagged coefficients are jointly equal to 0 and that they sum to 0 are rejected at conventional significance levels.

3. Alternative Definition of “Large Chain”

We have defined a large chain as one owning more than 40 homes. This choice was justified based on the distribution of chain sizes in our sample. A chain that owned an average

of 41 units during its years in our sample would have ranked 50th out of 1,242 chains (top 4 percent). A chain with 41 homes and 4,500 total beds would have ranked in the top 25 on *Provider Magazine's* list of the "Top 50 Largest Nursing Homes" for December 31, 2010. To check the sensitivity of our results to variations in this choice, we reestimated our basic distributive lag model predicting large chain ownership in the full sample using definitions of 50 and 100 homes for large chains, respectively. The estimates and significance levels are qualitatively similar to what is reported in the article.

4. Potential Data Errors

As with most studies of the nursing home industry, OSCAR is our primary data source for individual nursing home characteristics. OSCAR is known for being reasonably reliable, but errors in the original reports filed by nursing homes or in recording the data are known to occur. Nursing homes sometimes convert from for-profit to nonprofit status or vice versa. We are suspicious of homes in our dataset that are listed as being owned by a nonprofit organization (e.g., the Catholic Church), but recorded as a nonprofit home in most years and as a for-profit home in one or more other years. We suspect that these are reporting errors. Our sample is designed to include only for-profit homes. To be conservative, we reestimate our basic models, as well as all our robustness checks, using the subsample that excludes nursing homes that are recorded as having switched between for-profit and nonprofit status. This criterion eliminates 7,490 observations (6.7 percent of the sample). The coefficients of interest in all cases are of similar magnitude and significance to those reported for the full sample.

VI. CONCLUSIONS

Previous empirical research on the incentive effects of medical malpractice tort laws has focused on defensive medicine and the supply of physician services. This study extends the literature by providing statistical evidence on asset-shielding responses in plaintiff legal environments and subsequent tort reforms in the nursing home industry.

We consider two asset-shielding behaviors: the sale of homes owned by large chains in high-litigation environments to smaller, more judgment-proof owners and the reduced use of brand names that link individual homes either to the central corporation or sister units. The first stage of our empirical analysis reveals that both large chain ownership and branding of nursing homes fell in states with pro-plaintiff legal environments (relative to other states with less threatening legal environments) during the 1999–2004 period—a period of greatly increasing litigation risk in this industry. Twelve states enacted tort reforms between 2003 and 2006 that placed meaningful caps on non-economic damage awards. The second stage of our empirical analysis uses a standard difference-in-differences methodology to provide evidence of the effects of these tort reforms on the ownership and branding of homes. We find that the trends in asset-shielding behavior abated or reversed in the states that enacted tort reforms. The collective evidence provides relatively strong support for the hypothesis that the legal environment in the state affects both the ownership and branding of nursing homes.

While our study has focused on the nursing home industry, similar incentives to shield assets from malpractice liability exist in other health-care subsectors. More generally, other firms and professionals, such as attorneys and accountants, have similar incentives to shield assets from tort liability. Our study suggests that it is important to consider these incentives in evaluating the effects of tort laws in other environments.

While our emphasis is on asset shielding and tort laws, our study also provides new evidence related to a larger set of topics from the organizational economics literature. First, it provides new evidence on how the legal environment can affect the horizontal ownership structure of some service industries. Second, our findings suggest that future research on brands and chains should move beyond the traditional focus on signaling/bonding of quality to customers to consider additional audiences and issues, such as potential litigants and tort liability. Third, the article contributes to research on the choice of business names.

REFERENCES

- Aon Global Risk Consulting (2008) *Long Term Care, General Liability and Professional Liability Analysis*. Columbia, MD: Aon Global Risk Consulting.
- Avraham, R. (2007) "An Empirical Study of the Impact of Tort Reforms on Medical Malpractice Settlement Payments," 36(2) *J. of Legal Studies* S183.
- (2015) "Database of State Tort Reforms," *Law & Economics Research Paper* e555 (February 15 version). Univ. of Texas School of Law.
- Avraham, R., S. D. Leemore, & M. M. Schanzenbach (2012) "The Impact of Tort Reform on Employer-Sponsored Health Insurance Premiums," 28(4) *J. of Law, Economics, & Organization* 657.
- Bertrand, M., E. Duflo, & S. Mullainather (2004) "How Much Should We Trust Differences-in-Differences Estimates?" 119(1) *Q. J. of Economics* 249.
- Brickley, J., & F. Dark (1987) "The Choice of Organizational Form—The Case of Franchising," 18(2) *J. of Financial Economics* 401.
- Brickley, J., J. Linck, & C. Smith (2003) "Boundaries of the Firm: Evidence from the Banking Industry," 70(3) *J. of Financial Economics* 351.
- Brown, N. (2009) "Texas High Court Rejects Single Business Enterprise Theory," 24(2) *Legal Backgrounder* 1.
- Burwell, B., D. Stevenson, E. Tell, & M. Schaefer (2006) *Recent Trends in the Nursing Home Liability Insurance Market*. Department of Human & Health Services. Available at: <https://aspe.hhs.gov/basic-report/recent-trends-nursing-home-liability-insurance-market>.
- Carter, N. P. (2006) "Who's Really Running the Nursing Homes?" 42(12) *Trial*.
- Casson, J., & J. McMillen (2003) "Protecting Nursing Home Companies: Limiting Liability Through Corporate Restructuring," Fall *J. of Health Law* 577.
- Center for Medicare and Medicaid Services (2013) *Nursing Home Data Compendium*. Woodland, MD: Center for Medicare and Medicaid Services.
- Coase, R. (1960) "The Problem of Social Cost," 3 *J. of Law & Economics* 1.
- Cohen, G. (1997) "Legal Malpractice: Insurance and Loss Prevention: A Comparative Analysis of Economic Institutions," 4 *Connecticut Insurance J.* 305.
- Dari-Mattiacci, G., & B. Mangan (2008) "Disappearing Defendants Versus Judgment-Proof Injurers," 75(300) *Economica* 749.
- Dranove, D., & A. Gron (2005) "Effects of the Malpractice Crisis on Access to and Incidence of High-Risk Procedures: Evidence from Florida," 24(3) *Health Affairs* 802.

- Dranove, D., S. Ramanarayanan, & Y. Watanabe (2012) "Delivering Bad News: Market Responses to Negligence," 55(1) *J. of Law & Economics* 1.
- Dubay, L., R. Kaestner, & T. Waidmann (2001) "Medical Malpractice Liability and its Effect on Prenatal Care Utilization and Infant Health," 20(4) *J. of Health Economics* 591.
- Geary, J. (2013) "Polk Jury Awards \$1.1 Billion Verdict in Nursing Home Negligence Case," *Ledger.com* July 22.
- Gilles, S. (2006) "The Judgement-Proof Society," 63(2) *Washington & Lee Law Rev.* 603.
- Hansen, C. (2007) "Generalized Least Squares Inferences in Panel and Multilevel Models with Serial Correlation and Fixed Effects," 140 *J. of Econometrics* 670.
- Health Care Transaction Group (2014) "Skilled Nursing Facilities and Nursing Homes for Sale," *healthcaretransactions.com* Oct. 9.
- Helland, E., A. Jena, D. Ly, & S. Seabury (2016) "Self-Insuring Against Liability Risk: Evidence from Physician Home Values in States with Unlimited Homestead Exemptions," *Working Paper* 22031. National Bureau of Economic Research (February).
- Holtz-Eakin, Douglas (2004) *The Effects of Torts Reform: Evidence from the States*. Washington, DC: Congressional Budget Office.
- Horsky, D., & P. Swyngedouw (1987) "Does it Pay to Change Your Company's Name—A Stock-Market Perspective," 6(4) *Marketing Science* 320.
- Hubbard, T. (2004) "Affiliation, Integration, and Information: Ownership Incentives and Industry Structure," 52(2) *J. of Industrial Economics* 201.
- Huberman, G., D. Mayers, & C. Smith (1983) "Optimal Insurance Policy Indemnity Schedules," 14(2) *Bell J. of Economics* 415.
- Ingram, P. (1996) "Organizational Form as a Solution to the Problem of Credible Commitment: The Evolution of Naming Strategies Among US Hotel Chains, 1896–1980," 17 *Strategic Management J.* 85.
- Jin, G., & P. Leslie (2009) "Reputational Incentives for Restaurant Hygiene," 1(1) *American Economic J.—Microeconomics* 237.
- Johnson, C., A. Dobalian, J. Burkhard, D. Hedgecock, & J. Harman (2004) "Predicting Lawsuits Against Nursing Homes in the United States, 1997–2001," 39(6) *Health Services Research* 1713.
- Jurand, S. (2006) "Lack of Insurance Hinders Recovery in Nursing Home Cases," 42(2) *Trial* 14.
- Kachalia, A., & M. M. Mello (2011) "New Directions in Medical Liability Reform," 364(16) *New England J. of Medicine* 1564.
- Keeton, W., & E. Kwerel (1984) "Externalities in Automobile Insurance and the Underinsured Driver Problem," 27(1) *J. of Law & Economics* 149.
- Kessler, D. (2011) "Evaluating the Medical Malpractice System and Options for Reform," 25(2) *J. of Economic Perspectives* 93.
- Kessler, D., W. Sage, & D. Becker (2005) "Impact of Malpractice Reforms on the Supply of Physician Services," 293(21) *J. of the American Medical Association* 2618.
- Klein, B., & K. Leffler (1981) "The Role of Market Forces in Assuring Contractual Performance," 89(4) *J. of Political Economy* 615.
- Klick, J., & T. Stratmann (2007) "Medical Malpractice Reform and Physicians in High-Risk Specialties," 36 *J. of Legal Studies* S121.
- Konetzka, R. T., J. Park, R. Ellis, & E. Abbo (2013) "Malpractice Litigation and Nursing Home Quality of Care," 48(6) *Health Services Research* 1920.
- Kreps, D. (1990) "Corporate Culture and Economic Theory," in J. E. Alt & A. S. Kenneth, eds., *Perspectives on Positive Political Economy*, pp. 90–143. New York: Cambridge Univ. Press.
- Lafontaine, F., & M. Slade (2007) "Vertical Integration and Firm Boundaries: The Evidence," 45(3) *J. of Economic Literature* 629.
- Lu, S., & G. Wedig (2013) "Clustering, Agency Costs and Operating Efficiency: Evidence from Nursing Home Chains," 59(3) *Management Science* 677.
- Luca, M. (2011) "Reviews, Reputation, and Revenue: The Case of Yelp.Com," *Harvard Business School Working Paper*. Cambridge, MA.

- Mailath, G., & L. Samuelson (2001) "Who Wants a Good Reputation?" 68(2) *Rev. of Economic Studies* 415.
- Malani, A., & J. Reif (2015) "Interpreting Pre-Trends as Anticipation: Impact on Estimated Treatment Effects from Tort Reform," 124 *J. of Public Economics* 1.
- Mazzeo, M. (2004) "Retail Contracting and Organizational Form: Alternatives to Chain Affiliation in the Motel Industry," 13(4) *J. of Economics & Management Strategy* 599.
- McDevitt, R. (2011) "Name and Reputation: An Empirical Analysis," 3(3) *American Economic J.: Microeconomics* 193.
- McKean, R. (1970) "Products Liability—Trends and Implications," 38(1) *Univ. of Chicago Law Rev.* 3.
- Mello, M. 2006. "Medical Malpractice: Impact of the Crisis and Effect of State Tort Reforms," *Research Synthesis Report* 10. Princeton, NJ: RWJF.
- Mello, M., D. Studdert, C. DesRoches, J. Peugh, K. Zapert, T. Brennan, & W. Sage (2005) "Effects of a Malpractice Crisis on Specialist Supply and Patient Access to Care," 242(5) *Annals of Surgery* 621.
- Oi, W. (1973) "Economics of Product Safety," 4(1) *Bell J. of Economics* 3.
- Paik, M., B. Black, D. Hyman, & C. Silver (2012) "Will Tort Reform Bend the Cost Curve? Evidence from Texas," 9(2) *J. of Empirical Legal Studies* 173.
- Pearce, J., J. O'Brien, & D. Rapisarda (2009) "Protecting Nursing Home Residents from Attacks on Their Ability to Recover Damages," 61(3) *Rutgers Law Rev.* 705.
- Png, I., & D. Reitman (1995) "Why Are Some Products Branded and Others Not," 38(1) *J. of Law & Economics* 207.
- Ringleb, A. H., & S. N. Wiggins (1990) "Liability and Large-Scale, Long-Term Hazards," 98(3) *J. of Political Economy* 574.
- Rosenfeld, J. (2009) "What's in a Name? Are Large Nursing Home Chains Intentionally Attempting to Deceive the Public When it Comes to Corporate Ownership?" *Nursing Home Abuse Blog*.
- Schaefer, M., B. Burwell, & T. Medstat (2006) *The Nursing Home Liability Insurance Market: A Case Study of Florida*. Department of Human & Health Services. Available at: <https://aspe.hhs.gov/basic-report/nursing-home-liability-insurance-market-case-study-florida>.
- Shavell, S. (1986) "The Judgement Proof Problem," 6 *International Rev. of Law & Economics* 45.
- (2004) "Extensions of the Analysis of Deterrence," in *Foundations of Economic Analysis of Law*. Cambridge, MA: Belknap Press.
- Shepard, A. (1993) "Contractual Form, Retail Price, and Asset Characteristics in Gasoline Retailing," 24(1) *Rand J. of Economics* 58.
- Stevenson, D., B. Burwell, & Schaefer (2006a) *The Nursing Home Liability Insurance Market: A Case Study of Texas*. Department of Health & Human Services. Available at: <https://aspe.hhs.gov/basic-report/nursing-home-liability-insurance-market-case-study-texas>.
- Stevenson, D., D. Grabowski, & L. Coots (2006b) *Nursing Home Divestiture and Corporate Restructuring: Final Report*. Department of Health and Human Services. Available at: <https://aspe.hhs.gov/basic-report/nursing-home-divestiture-and-corporate-restructuring-final-report>.
- Stevenson, D., & D. Studdert (2003) "Trends—The Rise of Nursing Home Litigation: Findings from a National Survey of Attorneys," 22(2) *Health Affairs* 219.
- Studdert D., & D. Stevenson (2004) "Nursing Home Litigation and Tort Reform: A Case for Exceptionalism," 44(5) *Gerontologist* 588.
- Sullivan, M. (1990) "Measuring Image Spillovers in Umbrella-Branded Products," 63(3) *J. of Business* 309.
- Tadelis, S. (1999) "What's in a Name? Reputation as a Tradeable Asset," 89(3) *American Economic Rev.* 548.
- (2002) "The Market for Reputations as an Incentive Mechanism," 110(4) *J. of Political Economy* 854.
- Van Velthoven, B. (2009) *Empirics of Tort*. Cheltenham, UK: Edward Elgar Publishing.
- White, K. (2014) "Justices Reduce \$90 Million Verdict Against Charleston Nursing Home," *Charleston Gazette* June 18.