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# Tort Reform and the Length of Physician Office Visits

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## Abstract

By holding healthcare providers accountable for medical errors, the medical malpractice system should steer physicians towards providing adequate levels of care. This paper tests whether tort reforms induce physicians to be more or less careful when treating patients, using the length of office visits as a proxy for physician efforts. Analyzing data from the National Ambulatory Medical Care Survey on more than half a million physician office visits between 1993 and 2011, I find that caps on noneconomic damages, caps on punitive damages, and reforms of the joint-and-several liability rule have no impact on the time physicians spend with patients. Reforms of the collateral-source rule decrease the length office visits in some specifications and act as a substitute for managed care.

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*Keywords:* Liability pressure; Tort reform; Managed care

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# 1 Introduction

Tort reform remains a heavily debated topic in the United States.<sup>1</sup> Advocates of tort reform, such as the American Tort Reform Association, argue that it improves the functioning of the civil justice system, reduces the practice of defensive medicine, and helps to curb the growth in healthcare expenditures. Opponents of tort reform, which include trial lawyer associations and consumer groups, argue that it harms patients by denying them fair compensation for injuries, reduces incentives for physicians to provide adequate levels of care, and leads to modest expected savings.

This paper contributes to the debate on tort reform by providing the first evidence on how tort reform affects the time that physicians devote to patients, which is arguably a good proxy for the level of care that physicians exercise. Using data from the National Medical Care Ambulatory Survey (NAMCS), I study how the visit duration of more than 500,000 physician office visits that took place between 1993 and 2011 is affected by caps on noneconomic damages, caps on punitive damages, reforms of the joint-and-several liability rule, and reforms of the collateral-source rule. Exploiting legislative variation across states and over time in a difference-in-differences framework, I present estimates of the causal effects of these four commonly adopted tort reforms on the length of office visits in U.S. ambulatory care. I also report evidence on which patients and doctors are particularly affected by tort reform, and I carefully consider the possibility of legislative endogeneity throughout the analysis.

Results suggest that doctors do not adjust the time they devote to patients in response to caps on noneconomic damages, caps on punitive damages, and reforms of the joint-and-several liability rule. This finding applies not only to the average patient and physician but also to various patient and physician subgroups, including privately insured patients; Medicare patients; and Medicaid patients; as well as physicians in high- and low-risk specialties. Results are less clear regarding reforms of the collateral-source rule, which, according to some specifications, reduce the length of office visits. Interestingly, I find that collateral-source rule reforms reduce the length of office visits in practices that are not owned by Health Maintenance Organizations (HMOs) but have no impact on the length of office visits in HMO-owned practices. Taking into account that visits in HMO-owned practices are almost 2 minutes shorter after adjusting for observable differences in patient and physician populations, this finding suggests that collateral-source rule reform and managed care are substitutes. Regressions with leads of tort reforms reveal no differential pretreatment trends between states that adopt reforms and states that do not, and an extensive sensitivity analysis illustrates the robustness of the empirical findings.

The remainder of the paper continues as follows. Section 2 provides background information and references to the literatures on liability for medical malpractice and tort reform. Section 3

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<sup>1</sup>Studdert *et al.* (2004) provide an excellent account of the medical malpractice system and the controversies surrounding tort reform.

describes the data and provides summary statistics of the analysis sample. Section 4 lays out the empirical strategy. Section 5 presents the results. Section 6 concludes.

## 2 Background

### 2.1 Liability for Medical Malpractice in the U.S.

Patients can sue healthcare providers for medical malpractice according to the terms set out in the tort law, which differs across states. Liability for medical malpractice is generally based on the negligence standard, which means that patients have to establish that the care they received and suffered harm from was performed negligently and fell below the standard of care that is expected in the community.

Physicians working in the U.S. have to defend a large amount of malpractice claims each year. Jena *et al.* (2011) estimate that 7.4% of all physicians are sued in a given year, and that the lifetime risk of being sued is north of 75%. Jena *et al.* (2011) also show that the proportion of physicians facing a malpractice claim varies widely across physician specialties: more than 15% of surgeons are sued for medical malpractice in a given year compared to 3.1% of pediatricians. Most physicians are fully insured against any direct financial consequences from medical malpractice claims (Danzon 2000, Zeiler *et al.* 2007). However, there are considerable, uninsurable nonmonetary cost associated with being sued for medical malpractice, which include the time that is required to defend a claim and damages to reputation.

In theory, liability for medical malpractice should align the interests of physicians and other healthcare providers with those of patients. Because it punishes the provision of too little care, liability for medical malpractice should encourage physicians to exert adequate levels of effort and reduce adverse health outcomes. An unintended consequence of the medical malpractice system is that physicians sometimes provide treatments with social cost above social benefits because they fear legal repercussions. Such behavior is known as defensive medicine and has received a lot of interest in the economics literature.<sup>2</sup>

There is surprisingly little evidence on how the medical liability system affects the effort that physicians and other healthcare providers devote to their patients. Iizuka (2013) finds that liability-increasing tort reforms lead to fewer preventable medical complications, which may be a consequence of physicians exerting more effort in response to an increase in liability pressure. Reynolds *et al.* (1987), using a questionnaire survey, show that about a third of physicians increase the time they spend with patients, which is arguably a good proxy for physician efforts,

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<sup>2</sup>Doctors have been found to practice defensive medicine by increasing the treatment intensity for patients with heart attack (Kessler and McClellan 1996, Avraham and Schanzenbach 2015), ordering more imaging services (Baicker *et al.* 2007), and prescribing more antibiotics (Panthöfer 2016). The empirical evidence on the use of Cesarean sections, which are a usual suspect of defensive behavior by physicians, is mixed (compare, for example, Shurtz 2013 with Currie and MacLeod 2008).

in response to increasing liability pressure. Danzon *et al.* (1990) mention a positive correlation between time per visit and liability pressure but do not provide any estimates. In the present paper, I seek to fill the gap in this literature by providing the first evidence on how tort reforms affect the time physicians spend with patients.

## 2.2 Tort Reform

The U.S. tort law is organized at the state level, a fact that will be useful for identification in the empirical analysis. The state tort laws have undergone three major periods of reform (in the mid 1970s, the mid 1980s, and the early 2000s), where the following four reforms are the most frequently adapted over the period from 1993 to 2011.

1. Caps on noneconomic damages: Noneconomic damages are awarded for nonpecuniary harms – such as pain and suffering, emotional distress, and loss of consortium – and account for about 50% of the typical medical malpractice award (Hyman *et al.* 2009). Caps on noneconomic damages have a clear theoretical effect on the liability pressure that physicians experience: they reduce expected awards and, therefore, lower the incentives for patients to file a malpractice claim. Empirically, it has been shown that caps on noneconomic damages have the expected effect (see, for example, Hyman *et al.* 2009, Avraham 2007, Paik *et al.* 2013, and Thorpe 2004).
2. Caps on punitive damages: Punitive damages are awarded to plaintiffs, but the intention behind them is to punish tortfeasors and deter misconduct. In theory, caps on punitive damages should have the same effect as caps on noneconomic damages. Empirically, however, caps on punitive damages are generally not associated with jury awards, settlement amounts, and claim frequency (see the reviews by Holtz-Eakin 2004 and Mello 2006). This may be due to the fact that punitive damages are seldom awarded in medical malpractice cases, as they are typically restricted to cases that involve intent, actual malice, or gross negligence.
3. Modifications of the collateral-source rule (CSR): The common law CSR prohibits the admission of evidence that the plaintiff has been compensated from sources other than the defendant, such as the plaintiff's health insurance, effectively allowing plaintiffs to be compensated twice for the same injury. Modifications of the common law CSR generally reduce expected awards by admitting evidence that plaintiffs have been compensated by third parties and should therefore, at least theoretically, also reduce incentives for plaintiffs to file lawsuits. In practice, however, there is no clear association between measures of liability pressure and reforms of the CSR (Holtz-Eakin 2004, Mello 2006).
4. Modifications of the joint-and-several liability (JSL) rule: The common law JSL rule allows

plaintiffs to recover damages from multiple defendants collectively or from each defendant individually, regardless of the shares of liability that are apportioned to the defendants. Modifications of the common law JSL rule generally restrict the way in which plaintiffs can sue the involved parties in a multi-party malpractice case. Currie and MacLeod (2008) argue that such modifications put more liability pressure on physicians because they align more closely the risk of liability with the physician's level of care. However, Currie and MacLeod also mention that JSL reforms lower the incentives for patients to initiate a malpractice claim. On balance, it is not clear – neither theoretically nor empirically – how modifications of the JSL rule affect liability pressure.

### 3 Data, Sample, and Descriptive Statistics

The empirical analysis is based on data from the National Ambulatory Medical Care Survey, which is a nationally representative survey of visits to non-federal employed office-based physicians in the U.S., excluding anesthesiologists, pathologists, and radiologists. Each of the about 1,200 physicians who participate annually in the survey is randomly assigned to a one-week reporting period. During this week, data are collected for a systematic random sample of about 25 patients. For each patient visit, the NAMCS records hold the patient's symptoms, the physician's diagnosis according to the ICD-9-CM, treatments and medications ordered or provided, and the duration of the visit (top-coded at 240 minutes). Physicians and patients may participate in multiple survey years, but it is not possible to identify longitudinal linkages.

Table 1 shows descriptive statistics for the sample, which consists of all visits with nonzero duration. Observations with a visit duration of zero minutes (4.3% of the total) are not comparable to nonzero duration visits and therefore omitted from the sample.<sup>3</sup> The sample period runs from 1993 to 2011, where the sample includes a total of 523,488 visits. The mean visit duration is slightly above 20 minutes, and 99 percent of the visits last less than one hour. Throughout the sample period, there is no trend over time in the mean visit duration.

Geographic information in the public-use NAMCS data is limited and restricted to identifiers indicating census region and MSA status. Through a refereed proposal process, I obtained access to restricted-use NAMCS data at the Research Data Center of the National Center for Health Statistics (NCHS). Using this data, I could identify the county and state in which physician practices are located and assign the corresponding state tort laws – which are based on information from Ronen Avraham's Database of State Tort Law Reforms (Avraham 2014), the state law data provided in an appendix to Currie and MacLeod (2008), the American Tort Reform Association, and the state codes – to the observations. I cover the four reforms discussed earlier and the years from 1992 to 2012 on a monthly basis, where the years 1992 and 2012 are covered to

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<sup>3</sup>Visits with a duration of zero minutes correspond to, for example, a nurse giving an inoculation.

Table 1: Descriptive statistics

	Mean	SD	25%	50%	75%	99%	N
Visit duration	20.82	13.80	15	15	25	60	523,436
Age	45.73	24.47	28	48	66	89	523,488
Female	0.57	0.49					523,488
White	0.77	0.42					491,782
Black	0.09	0.29					491,782
Latino	0.10	0.30					491,782
Private insurance	0.53	0.50					506,980
Medicare	0.23	0.42					506,980
Medicaid	0.11	0.32					506,980
MD	0.92	0.28					523,488
MSA	0.86	0.35					523,488

*Notes:* Table reports descriptive statistics for office visits with nonzero duration. Percentages indicate percentiles. Age, gender, race, and ethnicity are patient characteristics. MD indicates whether physician has a Doctor of Medicine (MD) as opposed to a Doctor of Osteopathic Medicine (DO). MSA indicates whether practice is located in a MSA.

allow for the inclusion of reform lags and leads of up to one year. Following Frakes (2012), I say that noneconomic damages and punitive damages are capped if a state caps the total amount of damages that can be awarded. Table 2 lists the reforms that have taken place over the sample period.

## 4 Empirical Strategy

The empirical strategy is centered around tort reforms. The main identifying assumption is that states that adopt a specific tort reform would, if they had not adopted the reform, experience the same trend in the length of office visits as states that do not adopt the given reform. This assumption leads naturally to the following difference-in-differences specification for the length of office visits:

$$\text{TIMEMD}_{ist} = \alpha + \beta \text{LAW}_{st} + \gamma X_{ist} + \theta_t + \phi_s + \varepsilon_{ist}. \quad (1)$$

$\text{TIMEMD}_{ist}$  is the recorded visit duration, where the subscripts  $i$ ,  $s$ , and  $t$  stand for, respectively, a visit, a state, and a year-month combination.  $\text{LAW}_{st}$  is a vector of dummies that indicate whether state  $s$  imposes a cap on noneconomic damages, a cap on punitive damages, modifications of the joint-and-several liability rule, and modifications of the collateral-source rule in period  $t$ .  $X_{ist}$  is a vector of visit-level controls. In its most basic form, this vector includes dummies for patient age

Table 2: Tort reforms, 1993-2011

	Law enacted				Law repealed			
Cap on non-economic damages	IL	03/09/95	ND	08/01/95*	IL	12/18/97	OH	02/25/98
	MT	10/01/95*	OH	01/27/97	OR	07/15/99	WI	07/14/05*
	NV	10/01/02*	MS	01/01/03*	IL	02/04/10*	GA	03/22/10*
	OK	07/01/03*	TX	09/01/03*				
	GA	02/16/05*	SC	07/01/05*				
	IL	08/24/05*	WI	04/06/06*				
	NC	10/01/11*	TN	10/01/11				
Joint-and-several liability reform	IL	03/09/95	WI	05/17/95	IL	12/18/97	OH	02/25/98
	OH	01/27/97	PA	08/18/02	PA	07/26/05		
	NV	10/01/02*	AR	03/25/03				
	OH	04/09/03	GA	02/16/05				
	SC	07/01/05	PA	06/28/11				
	OK	11/01/11						
Cap on punitive damages	ND	04/30/93	IN	06/30/95	AL	06/25/93	OH	08/25/98
	OK	08/25/95	NJ	10/27/95	AR	12/08/11		
	NC	01/01/96	PA	01/25/97*				
	OH	01/27/97	AK	08/07/97				
	AL	06/07/99	MS	01/01/03				
	AR	03/25/03	ID	07/01/03				
	MT	10/01/03	OH	01/06/05				
	MT	06/27/05	TN	10/01/11				
Collateral-source rule reform	WI	05/25/95*	OH	02/25/98*	KS	04/16/93	KY	01/19/95
	AL	09/22/00	PA	03/20/02*	AL	07/12/96	OH	01/27/97*
	WV	03/08/03*	OK	07/01/03*				

Notes: Asterisk indicates that the law applies/applied only to medical malpractice rather than to all torts.

Table 3: Impact of tort reforms on length of office visits

	No controls	Basic controls	Basic controls and reason for visit	Basic controls and physician's diagnosis
Cap on noneconomic damages	-0.55 (0.33)	-0.13 (0.30)	-0.12 (0.30)	-0.19 (0.30)
Joint-and-several liability reform	-0.10 (0.76)	-0.57 (0.72)	-0.63 (0.69)	-0.56 (0.70)
Cap on punitive damages	0.10 (0.47)	0.11 (0.48)	0.14 (0.49)	0.15 (0.48)
Collateral-source rule reform	-0.62 (0.44)	-0.47 (0.53)	-0.56 (0.53)	-0.47 (0.53)
$R^2$	0.02	0.15	0.17	0.17
N	523,488	462,787	457,533	456,609

Notes: Table reports results from OLS estimation of equation (1). Standard errors adjusted for clustering at the state level in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

(<5, 5-17, 18-44, 45-64, 65-79, 80+), patient gender, patient race and ethnicity (white, black, latino, other), health insurance (private, Medicare, Medicaid, other), physician degree (MD, DO), physician specialty (14 categories), physician age (<35, 35-54, 55+), physician gender, and practice (MSA, non-MSA). In some regressions, I additionally control for the patient's reason for visit (43 categories) or the physician's diagnosis (159 categories).  $\theta_t$  indicates a year-month combination,  $\phi_s$  indicates a state, and  $\varepsilon_{ist}$  is the error term. Following Bertrand *et al.* (2004), I report standard errors that are clustered at the state level.

I extend the baseline analysis in two directions. First, I study which doctors and patients are particularly affected by tort reforms. To this end, I estimate models that include interaction terms between the law indicators and variables such as the patient's type of health insurance, the physician's specialty, and the physician's association to an HMO, which have previously been identified as sources of heterogeneity in the malpractice literature. Second, I conduct a variety of sensitivity analyses in order to document that the results are robust and the identification strategy is valid.

## 5 Results

Table 3 shows how the four tort reforms under study affect the length of office visits. As we can see, none of the reforms seems to have an impact on how much time physicians devote to their patients. The 95-percent confidence intervals exclude the possibility that any of the four tort reforms changes visit durations by more than two minutes. For caps on noneconomic damages,



which is the reform with the clearest impact on liability pressure, we can even rule out changes of more than one minute in three of the four specifications with 95 percent confidence. These results hold independently of whether all reforms enter into the regression model (as in Table 3) or each reform enters separately. Adding more controls increases the predictive power of the regression model but does not result in statistically significant estimates.

Given that the probability of being sued for medical malpractice exhibits a more than fivefold variation across physician specialties, one may expect that certain specialties are more sensitive to tort reform than others. However, Table 4 shows that this does not seem to be the case. Physicians in high-risk specialties such as general surgery, orthopedic surgery, and obstetrics and gynecology do not adjust the length of office visits, as does the rest of physicians. Likewise, physicians in low-risk specialties such as general practice and pediatrics do not behave differently from the rest of their peers. It turns out that this finding generalizes to other subgroups of patients and physicians. For example, both primary care physicians and specialists do not adjust the length of office visits after tort reform. The same applies to young and old patients, male and female patients, patients with different types of health insurance, young and old physicians, male and female physicians, MDs and DOs, and solo and group practices.

The one exception to the above pattern is shown in Table 5. Physicians who work in HMO-owned practices react differently to the passage of caps on punitive damages and reforms of the collateral-source rule than other physicians. In contrast to their peers, physicians in HMO-owned practices do not reduce the amount of time they spend with patients after modifications of the collateral-source rule. Also, after the adoption of caps on punitive damages, physicians in HMO-owned practices increase the time they spend with patients relative to physicians who do not work in HMO-owned practices. Taking into account also that, on average, office visits are almost 2 minutes shorter in HMO-owned practices after controlling for the tort law and the basic controls from above, these results tell a similar story as Kessler and McClellan (2002), who find that managed care and tort reform are substitutes.

Why do doctors in HMO-owned practices do not react to tort reforms in the same way as other physicians? One explanation could be that doctors in HMOs are providing the minimum level of effort that they find ethically acceptable. As a result, liability-reducing tort reforms, which would lead some physicians to provide less effort, may not have an effect on physicians in HMOs: they simply cannot reduce the amount of time they spend with patients any further because they are ethically constrained. While it is hard to assess whether physicians in HMOs are in fact ethically constrained, it is clear that HMOs, through capitation and other high-powered incentives, successfully induce physicians to keep office visits short (Melichar 2009). Thus, there may be reason to believe that ethical constraints play a role in explaining the interaction between tort reform and managed care.

In the following two paragraphs, I discuss the validity and robustness of the empirical results. A major concern with any difference-in-differences analysis is that the treatment is motivated by

Table 4: Impact of tort reforms on physician specialties

	General practitioners		Pediatricians		Ob/gyns		General surgeons		Orthopedic surgeons	
	Law	Law × GP	Law	Law × PD	Law	Law × OB	Law	Law × GS	Law	Law × OS
Cap on noneconomic damages	-0.17 (0.33)	0.18 (0.42)	-0.12 (0.31)	-0.26 (0.41)	-0.15 (0.31)	0.28 (0.36)	-0.10 (0.30)	-0.50 (0.53)	-0.15 (0.31)	0.41 (0.49)
Joint-and-several liability reform	-0.52 (0.71)	-0.23 (0.34)	-0.57 (0.72)	0.05 (0.45)	-0.57 (0.71)	0.05 (0.36)	-0.64 (0.70)	1.05** (0.42)	-0.59 (0.72)	0.32 (0.48)
Cap on punitive damages	0.06 (0.48)	0.31 (0.37)	0.06 (0.48)	0.70 (0.45)	0.11 (0.49)	0.13 (0.36)	0.08 (0.48)	0.39 (0.41)	0.04 (0.49)	1.10** (0.46)
Collateral-source rule reform	-0.45 (0.53)	-0.20 (0.35)	-0.44 (0.52)	-0.39 (0.37)	-0.44 (0.53)	-0.57 (0.36)	-0.54 (0.53)	0.54 (0.47)	-0.51 (0.53)	0.62 (0.48)
$R^2$	0.15		0.15		0.15		0.15		0.15	
N	462,787		462,787		462,787		462,787		462,787	

Notes: Table reports results from OLS estimation of equation (1) augmented for interaction terms between indicators of the laws and physician specialties. The dependent variable is the length of office visits. Standard errors adjusted for clustering at the state level in parentheses. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

Table 5: Interaction between tort reforms and HMOs

	Law	Law × HMO
Cap on noneconomic damages	-0.21 (0.28)	0.18 (0.90)
Joint-and-several liability reform	-0.42 (0.79)	0.06 (0.85)
Cap on punitive damages	-0.33 (0.65)	1.57** (0.76)
Collateral-source rule reform	-0.98** (0.48)	1.26* (0.71)
$R^2$	0.15	
N	349,377	

*Notes:* Table reports results from OLS estimation of equation (1) augmented for interaction terms between indicators of the laws and HMO ownership of the practice. The dependent variable is the length of office visits. Sample corresponds to survey years from 1997 to 2011 because the data on HMOs is available only after 1996. Standard errors adjusted for clustering at the state level in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

different pretreatment trends in the outcome variable between adopters and nonadopters of the treatment. Fortunately, none of the tort reform leads in Column 1 of Table 6 affects the length of office visits, suggesting that differential pretreatment trends are less of a concern. Two alternative tests of validity, whose results are shown in Columns 2 and 3 of Table 6, are motivated by the following considerations. First, tort reforms that apply also to product liability cases, auto accidents, etc. are less likely to suffer from legislative endogeneity than tort reforms that are specific to medical malpractice cases. Second, tort reforms that have been abolished typically stood in conflict with the relevant state constitution, which itself is arguably exogenous to trends in medical care, so that reforms turning off provide a source of variation that is less susceptible to legislative endogeneity. A final test validity test, whose results are shown in Column 4 of Table 6, involves the inclusion of state-specific linear time trends. The results of the validity tests suggest that there is robust evidence that caps on noneconomic damages, caps on punitive damages, and reforms of the joint-and-several liability rule do not affect the length of office visits in U.S. ambulatory care, and that the picture is less clear for reforms of the collateral-source rule.

Table 7 presents the results of four robustness checks. The first robustness check excludes observations with imputed values.<sup>4</sup> The second robustness check excludes visits that last longer

<sup>4</sup>The following variables are imputed by the NCHS if the information is missing on the patient record form: age, ethnicity, race, gender, time spent with physician, visit date.

Table 6: Tests for legislative endogeneity

	Six-month lead of reforms	Only reforms turning off	Excluding reforms specific to medical malpractice	State-specific time trends
Cap on noneconomic damages	-0.64 (0.77)	-0.05 (0.31)	0.15 (0.55)	0.15 (0.63)
Joint-and-several liability reform	-0.55 (0.61)	-0.27 (0.47)	-0.70 (0.67)	0.59 (0.67)
Cap on punitive damages	1.45 (0.89)	-0.19 (0.66)	0.24 (0.61)	-0.41 (0.47)
Collateral-source rule reform	2.04 (1.40)	1.71** (0.78)	-1.75* (1.02)	-1.21** (0.53)
$R^2$	0.15	0.15	0.15	0.14
N	462,787	462,787	462,787	482,452

*Notes:* Table reports results from OLS estimation of equation (1). Column 1 reports coefficients on dummies that equal one in the six months before the tort reforms are enacted. Column 2 reports coefficients on dummies that equal one as long as the tort reforms have been turned off. Column 3 reports coefficients on tort reform indicators that are not affected by reforms that are specific to medical malpractice. Column 4 reports coefficients on tort reform indicators from a model that includes state-specific time trends and visits with zero duration. Standard errors adjusted for clustering at the state level in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 7: Robustness Checks

	Excluding imputed	Excluding visits >60 min	Including 0-min visits	Binary dependent variable
Cap on noneconomic damages	-0.38 (0.36)	-0.02 (0.27)	0.06 (0.37)	0.01 (0.01)
Joint-and-several liability reform	-0.71 (0.79)	-0.61 (0.79)	-0.42 (0.83)	(0.02) (0.03)
Cap on punitive damages	-0.02 (0.51)	0.11 (0.48)	0.11 (0.46)	-0.00 (0.03)
Collateral-source rule reform	-0.83 (0.55)	-0.48 (0.54)	-0.61 (0.52)	0.02 (0.02)
$R^2$	0.16	0.20	0.14	0.09
N	366,211	458,730	482,452	462,787

*Notes:* Table reports results from OLS estimation of equation (1). Column 1 excludes observations with imputed values. Column 2 excludes visits lasting longer than one hour. Column 3 includes visits with zero duration. The dependent variable in Column 4 is a dummy indicating whether the visit lasted longer than 15 minutes. Standard errors adjusted for clustering at the state level in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

than one hour. The third robustness check includes visits with zero duration. Finally, the fourth robustness check assesses whether the bunching of visit durations (in particular, at 10, 15, and 20 minutes) affects the estimates. To this end, I use a binary dependent variable, which equals one if the office visit lasted longer than 15 minutes (the median visit length). As we can infer from Table 7, none of the robustness checks alters the conclusions about the absence of an impact of tort reforms on the duration of office visits.

## 6 Conclusion

What is the impact of tort reforms on the practice of medicine? Much of the literature on tort reforms has focused on their impact on the use of procedures and treatments, such as Caesarean sections, coronary artery bypass grafting, imaging services, and prescription drugs. While the conclusions vary on a case-by-case basis, many papers have found that tort reforms influence physicians' decisions. In contrast to these findings, I show in this paper that tort reforms, with the possible exception of reforms of the collateral-source rule, do not affect how much time physicians spend with patients. I also present evidence suggesting that HMOs and reforms of the collateral-source rule are substitutes: each on their own tend to reduce the length of office visits, but CSR reforms do not reduce the length of office visits in HMO-owned practices.

The question then becomes, why do physicians not adjust the duration of office visits after tort reform? One explanation for the absence of an effect is that tort reforms have only a modest impact on physicians' perception of liability pressure (Carrier *et al.* 2010); though, the evidence on the change in the use of procedures and treatments largely tells a different story. Another explanation is that tort reforms affect physicians in different areas of a state differently, because of varying local standards, which could imply that the effects of tort reform cancel out at the state level (Frakes and Jena 2016). Yet another explanation is that physicians are constrained, for example by ethical or financial considerations, in their choice of time to spend with the patients. Differentiating between these potential explanations and exploring in more detail the mechanism behind physicians' reactions to tort reforms is left as an interesting avenue for future research.

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