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LIABILITY, RISK PERCEPTIONS, AND PRECAUTIONS AT BARS*

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ABSTRACT

Are state laws, regulatory practices, and allocation of public resources for enforcement reflected in perceptions by bar owners/managers that they will be cited or sued if they fail to exercise care? Among policies, which ones have the greatest impact on risk perceptions and, in turn, on such behaviors? We used data on laws, law enforcement, and regulations in the same areas as the bars to determine risk perceptions of bar owners/managers of threats of being sued or cited if they were to serve minors or obviously intoxicated adults. We found that many of the laws and regulations related systematically to risk perceptions of bar owners/managers. This was particularly true of tort. Precautionary measures were more likely to be taken by owners/managers when the risk was perceived to be high.

I. INTRODUCTION

NUMEROUS laws are enacted to deter harmful behavior and consequent injuries to others. To achieve this goal, such laws must be enforced and impose a threat on the agent who is in a position to prevent the harm. A criticism of the view that law affects the calculus of rational actors is that prospective injurers are ignorant of both law and facts, are incompetent, discount the threat of liability, and/or have a taste for risk.¹ Typically, to measure deterrence, one examines behavioral changes in care or activity levels

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¹ Don Dewees, David Duff, & Michael Trebilcock, *Exploring the Domain of Accident Law: Taking the Facts Seriously* 16 (1996).

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among the violators and/or effects of such behavioral changes on rates of injury. Failure to find an effect may be due to various causes, including lack of law enforcement, small expected penalties, and/or errors in risk perceptions on the part of prospective violators or injurers. Only rarely are these various components directly observed. More typically, analysts employ a reduced-form approach in which injury rates or behaviors are a function of statutory and regulatory changes.

In this study, we are able to distinguish between enactment of the law, levels of enforcement as indicated by public agency inputs, actual enforcement levels, the prospective injurer's perception of being sued or cited for a violation, and behavioral changes in levels of precautions taken in response to these perceived threats. The context is a national survey of nearly 800 owners and managers of bars conducted in 1996, which elicited information on establishment characteristics, bar policies, and perceived threats of suits and criminal or administrative citations. Bars are subject to a variety of laws and regulations, ranging from administrative law to criminal and tort law.

Such establishments provide an excellent laboratory for the study of the effects of laws on perceptions and behavior for these reasons. First, the probability of harm and the level of injury conditional on harm occurring are nontrivial, implying that optimal precaution levels should also be nontrivial. Second, in contrast to other less regulated spheres of activity, the probability of being caught for failing to take care is relatively high. Bar personnel often deal with unruly patrons, and they are subject to much scrutiny by regulatory and law enforcement agencies. For example, in the survey described below, 44 percent of bar owners and managers reported having had a fight on their premises within the last year. In addition, 89 percent said that police frequently patrolled around their establishments. Third, bar management is faced with a striking choice between earning additional revenue from sales of alcoholic beverages and promoting public safety.

Heavy consumption of alcohol imposes a substantial external cost on others. For this reason, and possibly in an effort to improve public morality, governments have imposed various regulations on drinkers and sellers of alcoholic beverages.² Such regulation has varied from outright sales bans to entry regulation, public monopoly of sales, criminal liability imposed on both drinkers and sellers, and tort liability on both drivers³ and commercial

² See Janet K. Smith, *An Analysis of State Regulations Governing Liquor Store Licenses*, 25 *J. Law & Econ.* 301 (1982).

³ See Dewees, Duff, & Trebilcock, *supra* note 1.

servers of alcohol.⁴ The latter type of liability is commonly called dramshop liability, which is liability imposed on a bar for serving a minor or an obviously intoxicated adult who later causes injury to him- or herself or another party as a result of the consumption of alcohol at the bar.⁵

The rationale for the imposition of liability on commercial sellers, that is, naming them as defendants in cases involving motor vehicle injuries, is that they are relatively efficient monitors of their customers' drinking behaviors.⁶ Many drunk drivers secure their alcohol from bars.⁷ In trying to respond to constituents who want a public response to curb drinking and driving, policy makers seem to give greater weight to presumed efficiency in monitoring by sellers than to the possible inequity of assigning blame to someone other than the injurer.

This study presents empirical evidence on the effects of tort and criminal liability and administrative regulation by state Alcoholic Beverage Commissions (ABCs) on precaution levels of commercial servers using a national survey of owners and managers of bars conducted in 1996. We address the following issues: (1) Are state laws, regulatory practices, and allocation of public resources for enforcement reflected in perceptions by bar owners/managers that they will be cited or sued if they fail to exercise care? (2) How do these laws relate to the actual experience of bar owners and managers with citations and lawsuits? (3) Do these perceptions, in turn, translate into socially desirable precautionary behaviors? (4) Among the

⁴ See James B. Jacobs, *Drunk Driving: An American Dilemma* (1989); Harold D. Holder *et al.*, *Alcoholic Beverage Server Liability and the Reduction of Alcohol-Involved Problems*, 54 *J. Stud. Alcohol* 23 (1993).

⁵ See Lewis A. Kornhauser, *An Economic Analysis of the Choice between Enterprise and Personal Liability for Accidents*, 70 *Cal. L. Rev.* 1345 (1982); Curtis C. Christy, *Server Intervention/Responsible Beverage Service* (Ed.D. thesis, Vanderbilt Univ. 1989) (on file with George Peabody College for Teachers Library at Vanderbilt University); James F. Mosher, *Liquor Liability Law* (1988 & Supp. 1997); Michael C. Adkins, Comment, *Negligence: Busby v. Quail Greek Golf and Country Club: A Balanced Approach to Vendor Liability and Underage Drinking*, 48 *Okla. L. Rev.* 779 (1995).

⁶ Mary L. Waring & Inez Sperr, *Bartenders: An Untapped Resource for the Prevention of Alcohol Abuse?* 17 *Int'l J. Addictions* 859 (1982).

⁷ Steven E. Meier, Thomas A. Brigham, & Gregory Handel, *Effects of Feedback on Legally Intoxicated Drivers*, 45 *J. Stud. Alcohol* 528 (1984); R. Van Houten, P. Nau, & B. Jonah, *Effects of Feedback on Impaired Driving*, in *Conference on Alcohol, Drugs and Traffic Safety—San Juan, Puerto Rico 1983*, at 1375 (U.S. Dep't Transp. DOT-HS-806-814; S. Kaye & G. W. Meier eds., September 1985); Nason W. Russ & E. Scott Geller, *Training Bar Personnel to Prevent Drunken Driving: A Field Evaluation*, 77 *Am. J. Pub. Health* 952 (1987); William Wiczorek, B. Miller, & T. Nochanjski, *Bar versus Home Drinkers: Different Subgroups of Problem-Drinker Drivers* (N.Y. State Div. Alcoholism & Alcohol Abuse, Res. Note 89-6, 1989); A. James McKnight, *Factors Influencing the Effectiveness of Server-Intervention Education*, 52 *J. Stud. Alcohol* 389 (1991).

various types of policies, which ones have the greatest impact on risk perceptions and, in turn, on such behaviors? We find considerable variation among policies in terms of the perceived probability of enforcement and some relationships between laws and public policies and risk perceptions, as well as some impacts of risk perceptions on behavior, particularly for tort.

Section II describes the relationships among our main study variables. In Section III we describe our data, which is followed by a discussion of empirical specification in Section IV. In Section V, we present our empirical findings. Section VI discusses implications of our results and the conclusions.

II. OVERVIEW OF STUDY APPROACH

This study examines three areas related to the perceptions and behaviors of alcohol establishment owners and managers. First, we measure risk perceptions as reported by the bar owners and managers. The risk perceptions are answers to hypothetical questions asked of respondents. Respondents were asked about the probability of being sued or cited if they were to serve an obviously intoxicated adult or a minor. The questions were posed as a hypothetical to distinguish their probability assessment from their actual behavior. A hypothetical should reveal the anticipated behavior of enforcers independent of the actual practices of the bar. Since the anticipated behavior may differ among enforcers and may depend on the type of violation, separate hypotheticals were asked for tort, criminal, and administrative regulations and were asked separately for obviously intoxicated adults and minors. Service to minors may be more easily prevented. Furthermore, there may be greater political pressure on public agencies to prevent service to minors. Second, we examine the relationship between objective measures of law and public policy and (a) actual experiences of the bars with the law, including tort, criminal, and administrative law, and (b) risk perceptions of bar owners and managers. Third, using these perceptions, we analyze the impact of the threat of a lawsuit or citation on the precautionary behaviors of the owners and managers.

III. DATA

Drinking establishments were surveyed by telephone by Mathematica Policy Research in 1996 for our study. The survey inquired about dramshop liability claims against establishments; liability insurance coverage; discounts offered by insurers; promotions and pricing practices, such as happy hours; the bars' policies to educate patrons about the dangers of drinking and driving; policies to monitor and curb drinking of obviously intoxicated patrons; policies to stop consumption of alcoholic beverages by minors on the premises; alternative transportation arrangements from the establish-

ment for intoxicated patrons; hiring and employment practices; responsibilities of employees versus management in dealing with intoxicated persons; server training programs, both their existence and content; local ordinances, such as bans on happy hours and requirements for server training; server perceptions of the extent of local law enforcement; and information about competitors and the market context in which bars operate. We obtained information on ambiance/clientele, product mix, and the establishment's competitors. We also asked about the bars' experience with actual tort suits and citations from 1990 to 1996.

Of the 1,156 establishments that were eligible, 778 (67 percent) of owners/managers of the establishments agreed to participate in this study. In total, establishments from 48 states were surveyed.⁸ The samples by state reflected underlying variation in bars. The number of bars relative to population varies appreciably by state.

The survey asked owners/managers about the threat of being sued or cited for a number of different infractions: serving minors, serving obviously intoxicated adults, overcrowding, and rowdiness. For each infraction, the respondent was asked about the likelihood of being sued or cited on a 1–5 ranging scale from “not at all likely” (1) to “very likely” (5).

To assess how laws are implemented in practice, in 1996, we also surveyed state ABCs and local police departments located in the jurisdictions served by the bars we surveyed. The results of these surveys were used to connect laws, policies, and resources to threats of being cited by ABCs, state alcohol law enforcement agencies (ALEs), or police or sued, as perceived by the owners/managers of the bars we surveyed. Eight states did not respond to the ABC survey.

IV. EMPIRICAL SPECIFICATION

A. *Analysis of Determinants of Risk Perceptions*

1. Dependent Variables

Using ordered logit analysis, we analyze ordered responses described above to the perceived threat questions for being cited by (1) the state ABC, (2) the state ALE, or (3) the local police department and (4) being sued.

2. Explanatory Variables

For tort, we assess the relationships between perceived threat of a dramshop lawsuit and strictness of dramshop laws in the state. Five components

⁸ Alaska, Hawaii, and the District of Columbia were not included in the survey.

of dramshop law measure strictness of dramshop liability law from the vantage point of the bar. First, did the state have a responsible business practices defense? A responsible business defense would give the bar a defense if it could prove that it adhered to a variety of responsible server practices. The availability of this type of defense would make dramshop liability law less strict from the bars' viewpoint. Second, did the state follow the doctrine of comparative negligence rather than contributory negligence? There is no direct evidence from dramshop liability, but studies of automobile liability have found higher settlements and awards under comparative than under contributory negligence.⁹ On the basis of theoretical analysis, Michelle White concluded that incentives to avoid accidents are weaker under comparative negligence.¹⁰ Under contributory negligence, rather than comparative negligence, a bar would escape liability if it could prove that the patron at all contributed to his or her own intoxication.¹¹ Such proof should not be difficult in many cases, which implies that, on balance, contributory negligence is more favorable to bars than comparative negligence. Third, did the state implement a damage cap on liability awards? A limit on damages would make a claim less attractive to potential claimants and their attorneys. Fourth, did the state uphold restrictions on notice? Fifth, did the state have a statute of limitations? Without notice restrictions or statutes of limitations, injury victims are free to file claims for many years after an injury occurred.

For purposes of defining strictness, we consider only special damage caps, restrictions on notice, and statutes of limitations that applied specifically to dramshop liability rather than general tort limitations. A particular law is considered to be strict if the state's dramshop law had more than two of these pro-plaintiff provisions. Otherwise, states with dramshop laws are considered to be "not strict." The omitted reference group is states without a dramshop law. The adult and minor versions of a state's dramshop law are evaluated using the same criteria for strictness, only differing on the adult versus minor distinction.

For the analysis of the relationship of threat of being cited by the ABC, the ABC policies analyzed are (1) a count of specific policies the ABC fol-

⁹ Daniel Kessler, *Fault Settlement and Negligence Law*, 26 *RAND J. Econ.* 296 (1995); Stuart Low & Janet K. Smith, *Decisions to Retain Attorneys and File Lawsuits: An Examination of the Comparative Negligence Rule in Accident Law*, 24 *J. Legal Stud.* 535 (1995).

¹⁰ Michelle J. White, *An Empirical Test of the Comparative and Contributory Negligence Rules in Accident Law*, 20 *RAND J. Econ.* 308 (1989).

¹¹ Several states have adopted modified comparative negligence in which the defendant escapes liability if the plaintiff is determined to be at or above a specific percentage of fault for the accident. See Christopher Curran, *The Spread of the Comparative Negligence Rule in the United States*, 12 *Int'l Rev. L. & Econ.* 317 (1992).

lowed, (2) the number of full-time-equivalent employees of the ABC per 1,000 bars in the state, (3) whether or not the state had public monopoly for off-site establishments, and (4) whether or not alcohol enforcement was located outside the ABC. In each case, the values of the ABC variables are set equal to zero and a binary variable for nonresponding ABC is set equal to one.

The count of specific policies of ABC are (1) whether or not the state's ABC followed up on DUI violations to see if the establishment that sold alcohol to the driver was at fault, (2) whether or not the ABC followed up on accidents caused by an intoxicated driver to see if the establishment that sold alcohol to the driver was at fault, (3) whether or not the ABC followed up on fights in bars, and (4) whether or not the ABC followed up on illegal alcohol consumption or trade practices. We hypothesize that perceived probabilities are higher when ABCs followed up on more of the above-mentioned situations, when they had more resources, and when alcohol enforcement was outside the ABC. We expect states with a public monopoly for off-site establishments to be more stringent.¹² States with public monopolies are plausibly more likely to have important political opposition to commercial enterprises in the alcoholic beverage business. The binary variable on nonresponding ABCs is included to determine whether or not those eight states were perceived as more or less stringent on average by the firms they regulate.

In the analysis of the perceived threat of being cited by the local police, we study the relationship between two measures of resource allocation, full-time-equivalent employees in police departments per 1,000 population within the patrolling area (or precinct), and the police budget per 1,000 population and the perceived probability of citation by the local police for various infractions, as reported by owner/manager respondents to our survey of bars.

To assess the effects of ALE policies on the perceived probabilities of being cited by the ALE, we include a binary variable for states with a public monopoly of liquor stores as an explanatory variable. We include variables describing the organizational link between the ALE and other public agencies. The alternatives are enforcement located with local police, with the Department of Revenue, with state police, and with the ABC but receiving help from local police.

In all of the risk perception equations, we also control for the following: incorporation and chain status; age of establishment; fraction of the estab-

¹² By 1996, our review of the state statutes revealed that many states operating public monopolies of liquor sales allowed some private sales. But in all cases, they retained some aspect of a public monopoly.

lishment's revenue from food and clientele characteristics; the age, occupation, and mix of regular versus nonregular customers; and those who come alone or in groups. We also include variables for whether the bar indicated that it had a competitor and population density of the county in which the bar was located. As discussed below, this analysis validated the use of the perceived probabilities in the analysis described in the following subsection.

B. Analysis of Determinants of Actual Tort Claim and Police Activity

A second test of the impacts of state laws, regulatory policies, and resources devoted to law enforcement relates these variables to actual experiences the bar had with tort, criminal, and administrative law. We assess the probability that the establishment had one or more civil legal actions during 1990–96 using logit analysis. The tort laws used in the specification did not change during this time period. The question in the survey did not distinguish between having a claim for serving an obviously intoxicated adult, serving a minor, or some other type of dramshop claim—a regrettable omission with the benefit of hindsight. We assume that the adult laws would be most pertinent and therefore included only explanatory variables for adult dramshop laws.

To assess the effects of objective measures of police resources on enforcement, we analyze effects of resource variables and other factors on responses to two questions from our survey of bars: (1) whether or not local police regularly patrolled around the establishment in the evening and (2) whether or not police ever came into the bar and checked patron identifications. Most bar owners and managers (62 percent) said that the police never entered their establishments. When the police entered, it was often as a result of a fight, indicating that police responded to reported problems but did not frequently enter bars looking for violations. We include the same control variables as in the risk perception analysis.

C. Analysis of Effects of Risk Perceptions on Precautionary Behaviors

1. Dependent Variables

The final step in our analysis is to evaluate the impacts of risk perceptions and other factors on precaution levels of bars. We analyze the following bar policies: (1) employees not allowed to drink on the job, (2) number of services provided by the bar for intoxicated patrons, (3) checks by the bar on references before hiring, (4) the comprehensiveness of the bar's server training program, and (5) provision of written procedures to the bar's employees regarding good serving practices.

TABLE 1
CIRCUMSTANCES UNDER WHICH EMPLOYEES ARE ALLOWED TO
DRINK ON THE JOB: MOST FREQUENT RESPONSES

	Number of Responses
Toward end of shift	24
Special occasion (birthday party, New Year's Eve, and so on)	21
When the server wants to	19
When the server gets thirsty	19
If someone buys them a drink	16

Three of the dependent variables, not drinking on the job, checking references before hiring, and providing written procedures, are binary variables based on the owners and managers' stated policy (Table 1). To analyze the implementation of bar policies to prevent drunk driving by intoxicated adults, we compiled a measure of services provided to drunk drivers that vary from zero to five. These five services include getting a drunk person to (1) give up his or her car keys, (2) accept a ride from a friend, (3) accept a ride from an employee, (4) accept a ride in a cab, and (5) sleep it off at a nearby hotel.

Our measure of employee training describes whether or not seven items were discussed in the bar's employee training program, including (1) the possibility of a server being named as a defendant in a dramshop suit; (2) potential employee involvement in depositions, lawsuits, or administrative hearings; (3) potential fines; (4) potential jail terms for employees; (5) potential criminal records for serving minors; (6) types of identification that are acceptable; and (7) how particular identifications can be altered, forged, or illegally obtained. For the 8 percent of bars with no employee training, this variable takes the value of zero.

For minors, we analyze three dependent variables: (1) the bar designated a specific employee to monitor drinking by minors, (2) the bar employed a specific person to monitor patron identifications at the door, and (3) the bar used "pat downs" in situations when the probability of minors bringing in their own alcohol into the bar was high. A "pat down" is a check of patrons' pockets for hidden alcohol.

2. Explanatory Variables

The key explanatory variables are the perceived threats of suit and citations by police, the ABC, and the ALE. In contrast to the analysis of risk

perceptions as dependent variables, we treat perceived threats as “probabilities” (continuous variables) here.¹³ We use the variables for perceived threat of being cited or sued for serving obviously intoxicated adults in the analysis of adults. In the analysis of precautions against alcohol use by minors, we use the corresponding threat variables for minors.

Servers may differ in both their risk perceptions and their behavior for reasons other than the laws to which they are subjected. For example, more risk-averse individuals may be more aware of penalties for unsafe serving practices and undertake greater precautions. To the extent that this is so, the observed correlation between perceptions and behavior may not represent a causal link between the perceptions of the importance on the liability system and behavior but rather some unspecified server characteristic. There are various ways to account for such heterogeneity. Since we have responses to risk questions that are not used in this analysis, we specify a “risk score,” which is the sum of all the values to the risk questions not used in the analysis of a particular dependent variable. We always use responses to questions about the likelihood of (a) being sued or cited by the police, the ABC, the ALE, or the fire department for having rowdy patrons (five questions) and (b) being cited by the police, the ABC, the ALE, or the fire department for overcrowding (four questions). These variables are used for the risk score but are not used as explanatory variables for risk perceptions. In the analysis of obviously intoxicated adults, we also use the responses to the questions on minors and, conversely, use the responses on adults in the minors’ analysis. A risk-averse server should have a high risk score.

Other explanatory variables are the same as in the analysis with perceived threats and actual bar experience with laws as dependent variables. Religious preference has been shown to have some effect on drinking patterns.¹⁴ Accordingly, in the analysis of precautionary behaviors, we include religious preference variables that reflect fractions of persons in each state in 1991 who were affiliated with these religious groups: Catholic, Baptist, Mormon, other Protestant, and Jewish.¹⁵ Percentages of the population affiliated with other religions or no religious preference are the omitted reference group. In some regressions, we add a variable for whether or not the

¹³ In practice, no one was very likely to be sued or cited for an infraction, but the true underlying probability was plausibly monotonically related to the ordered responses.

¹⁴ Frank J. Chaloupka, Henry Saffer, & Michael Grossman, *Alcohol Control Policies and Motor-Vehicle Fatalities*, 22 *J. Legal Stud.* 161 (1993).

¹⁵ Religious preference data for each state were obtained from M. E. Bradley *et al.*, *Churches and Church Membership in the United States 1990* (1992).

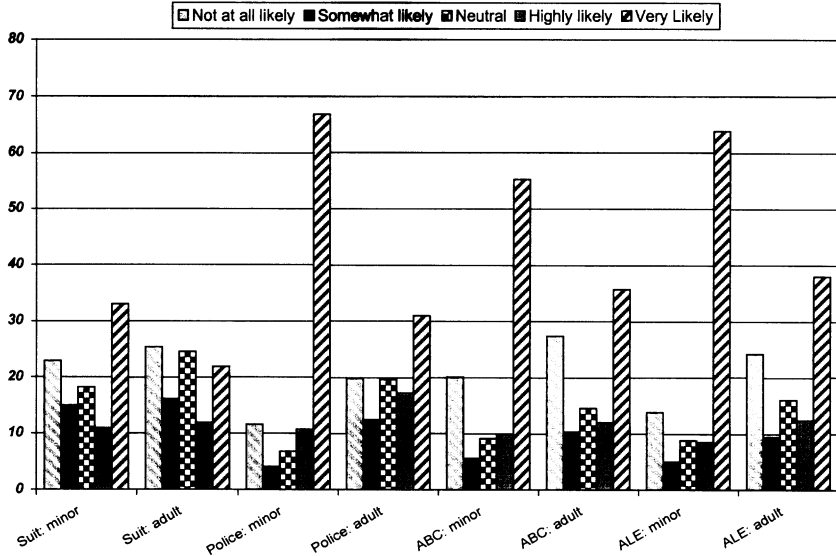


FIGURE 1.—Owner perceptions of being sued or cited for serving a minor or obviously intoxicated adult, by number of respondents.

bar's liability insurer gave a premium discount for bars that implemented employee training in good serving practices.

V. RESULTS

A. Description

The frequency distributions of responses for the threat variables used in our analysis are shown in Figure 1. In general, the perceived threat of being cited or sued for serving minors was greater than the corresponding threat for serving an obviously intoxicated adult. There is appreciable variation in the distributions by threat and type of patron. This variation suggests that servers are able to discern differences in the risk of being cited or sued. To the extent that servers did not discriminate among risks but rather gave the same answers repeatedly, we should not have observed this much variation.¹⁶ Many respondents said they would be “very likely” to be cited or

¹⁶ Uniform answers to differing probability questions have been termed “focal responses.” See Michael Hurd, Daniel McFadden, & Li Gan, *Subjective Survival Curves and Life Cycle Behavior*, in *Inquiries in the Economics of Aging* (David A. Wise ed. 1998). In our analysis, only 14.3 percent of respondents gave the same perceived risk for each of the four threats for serving obviously intoxicated adults and the four threats for serving mi-

sued. Clearly, this could not be true for a single incident, but it could be an accurate assessment if the bar engaged in continuous bad serving behavior.¹⁷

The vast majority of establishments undertook some monitoring, although few carried out all of the monitoring components (Table 2). Eighty-one percent of establishments did not allow employees to drink on the job under any circumstances. Another way of looking at this, however, is that 19 percent of bars allowed drinking on the job under some circumstances. On average, respondents provided 3.8 out of five services to intoxicated patrons. The most prevalent service was to try to get an obviously intoxicated patron to accept a ride from a friend. Variable definitions, means, and standard deviations are shown in Table 3.

B. Determinants of Perceived Probabilities of Suit and Citation

Overall, we find a statistically significant relationship between the probability of being sued as perceived by the bar owners/managers and the actual status of dramshop laws in the states (Table 4). In states with strict dramshop laws, respondents perceived a higher probability of being sued for serving an obviously intoxicated adult. The parameter estimate on this threat variable is positive and statistically significant at better than the 1 percent level.

The marginal effects show the magnitude of response to a change in an explanatory variable. Since we use ordered logit analysis, there is a marginal effect for each of the categories. In Table 4, we show the marginal effect for the highest category, "very likely" that the bar would be sued or cited if it engaged in the practice mentioned in the question. The marginal effect of a dramshop law being strict on the perceived probability of "very likely" being sued for serving an obviously intoxicated adult is 0.073.

Other variables with statistically significant impacts on the perceived probability of being sued for serving an obviously intoxicated adult (not shown in Table 4) are being incorporated (+) and having a higher fraction of patrons who come alone (+). The net worth of the alcohol establishment does not affect the perceived probability, but the binary variable identifying

nors. Considering the two additional threats not used as risk perception variables but included in the risk score, only 0.3 percent of respondents gave the same risk perception answer.

¹⁷ Unfortunately, there are no data on objective probabilities of citation or suit for bars. For drinking and driving, probabilities of arrest or injury, conditional on drinking and driving, are 0.001 per trip. H. Laurence Ross, *Detering the Drinking Driver* 106 (1984). Our risk perception questions did not refer to a single instance of serving obviously intoxicated adults or minors. Rather, our questions were probably interpreted as referring to a pattern of such behavior.

TABLE 2
MONITORING VARIABLES

Variable	Question	Mean	SD	Min	Max
Adults: Not drinking on the job	Under certain circumstances, are employees allowed to drink on the job?	.81	.39	0	1
Services provided for intoxicated patrons	(Recorded as 1 = no, 0 = yes.) Number of "yes"'s to the following questions: Have the employees ever tried to get a drunk patron to 1. Give up his/her car key? 2. Accept a ride from a friend? 3. Accept a ride from an employee? 4. Accept a ride in a cab? 5. Sleep it off at a nearby hotel?	3.83	.98	0	5
Check references before hiring	Does bar routinely require references for employees and check them?	.63	.48	0	1
Comprehensiveness of employee training	Number of "yes"'s to the following questions: Does bar's employee training course discuss 1. The possibility of an employee being named as a defendant in a dramshop suit? 2. Potential employee involvement in depositions, lawsuits, or administrative hearings? 3. Potential fines? 4. Potential jail terms for employees? 5. Potential criminal records for service to minors? 6. Which types of patron identifications are acceptable? 7. How particular patron identifications can be altered, forged, or illegally obtained?	4.96	2.30	0	7
Provide written procedures to employee regarding good serving practices	Does bar provide written procedures for employees regarding appropriate serving practices?	.61	.49	0	1
Minors: Specific monitor for minors	Does bar designate a specific employee to monitor drinking by minors?	.63	.48	0	1
Check identification	Is there a door person whose chief responsibility is to check patron identifications?	.39	.49	0	1
Pat downs	Does bar use "pat down" for situations when the chance of minors bringing in their own alcohol may be higher than normal?	.11	.32	0	1

TABLE 3
SAMPLE CHARACTERISTICS

Variable	Mean	SD
Threats: serving an obviously intoxicated adult:		
Dramshop suit	2.84	1.51
Citation by police	3.18	1.54
Citation by ABC	2.96	1.70
Citation by ALE	3.10	1.68
Threats: serving a minor:		
Dramshop suit	3.06	1.61
Citation by police	4.10	1.46
Citation by ABC	3.51	1.74
Citation by ALE	3.84	1.61
Tort law: obviously intoxicated adult:		
State had strict tort laws from the defendant's perspective	.53	.50
State did not have strict tort laws from the defendant's perspective	.10	.30
Tort law: minor:		
State had strict tort laws from the defendant's perspective	.53	.50
State did not have strict tort laws from the defendant's perspective	.29	.45
Police resources (per 1,000 population in jurisdiction):		
Police budget	.16	.39
Full-time-equivalent employees	.65	1.53
ABC policies:		
Count of number of activities investigated by ABC:	2.19	1.53
State ABC follows up on DUI		
State ABC follows up on accidents caused by intoxicated driver		
State ABC follows up on fights in bars		
State ABC follows up on illegal trade practices		
Full-time-equivalent ABC employees per 1,000 bars in state	3.01	4.26
State has a public monopoly for liquor sales	.29	.46
ALE policies		
Enforcement primarily by state police	.20	.40
Enforcement primarily by local police	.28	.45
Enforcement primarily by state department of revenue	.03	.18
Enforcement primarily by ABC with help from local police	.42	.49
Enforcement primarily by ABC personnel	.49	.50
Bar identified a competitor	.85	.36
Insurer offered a discount for server training	.18	.39
Establishment characteristics:		
Part of a chain	.05	.22
Age of establishment	20.31	19.28
Incorporated	.53	.50
Fraction of sales from food	.20	.22
Clientele characteristics (fraction):		
Customers aged 25–40	.50	.20
Customers aged 40+	.30	.21
Students	.10	.14
Blue-collar customers	.58	.29
Regular customers	.66	.24
Men	.67	.15
Customers who come alone	.37	.23
Customers who come in groups	.29	.19
Customers who come by car	.89	.31

TABLE 3 (Continued)

Variable	Mean	SD
Religious preference in state:		
Catholic	.24	.11
Baptist	.08	.09
Mormon	.02	.07
Other Protestants	.13	.08
Jewish	.02	.02
Population density (1,000 county population per square mile)	3.18	1.54

NOTE.—SD = standard deviation. ABC = Alcoholic Beverage Commission; ALE = alcohol law enforcement agency.

those establishments that did not report net worth is positive and statistically significant at better than the 10 percent level.

For the perceived probability of being sued for serving minors, having a strict dramshop law again has a positive effect on the perceived probability. Here, however, the parameter estimate is statistically significant only at the 0.12 level. Having “not strict” dramshop laws also has positive effects on the perceived probability of being sued for serving a minor. Other determinants of this probability related to the establishment as being incorporated (+) and years in business (-). The variable for net worth missing also has a statistically significant impact (+).

The coefficients on the police staffing variable are uniformly positive, suggesting that higher staffing leads to an increased perceived probability of being cited by the police. However, only in the equation for serving intoxicated adults is the coefficient statistically significant at the 10 percent level. For the budget per 1,000 population in the equation for the perceived probability of serving an obviously intoxicated adult, a \$100 increase in per capita budget would increase the probability of it being “very likely” that a citation would be issued by 0.014. Clearly, there is a link between resource allocation measures and servers’ perceptions of the probability of being cited. In contrast, the paucity of significant results from the clientele and establishment characteristics variables (not shown) indicates that the perception of the likelihood of being cited was not generally affected by bar characteristics.

In the analysis of the perceived probability of being cited by the ABC, two of the policies are statistically significant at the 5 percent level or better in both cases. The count of policies, as anticipated, has a positive effect on the perceived probability of citation by the ABC in both regressions. The binary variable for alcohol enforcement based in an organization other than the ABC has a negative effect in both regressions and is statistically significant at the 1 percent level. The measure of resources, full-time-

TABLE 4

PERCEPTIONS OF THREATS FOR SERVING AN OBVIOUSLY INTOXICATED ADULT OR A MINOR

EXPLANATORY VARIABLE	INTOXICATED ADULT			MINOR		
	Coeff.	SE	ME	Coeff.	SE	ME
Dramshop suit:						
Tort law:						
Strict	.43**	.16	.073	.32	.20	.069
Not strict	.41	.27	.019	.16	.22	.035
Citation by police (per 1,000 population in jurisdiction):						
Budget per capita	.66*	.33	.14	1.10	1.46	.23
Full-time-equivalent employees	.11 ⁺	.064	.024	.11	.10	.023
Citation by ABC						
Number of follow-up situations	.23**	.062	.051	.15*	.0071	.038
Full-time-equivalent ABC employees per 1,000 bars	.026	.025	.0059	.047	.030	.012
Monopoly	.25	.21	.056	.17	.24	.043
Alcohol enforcement outside ABC	-.51**	.18	-.11	-.57**	.19	-.14
Nonresponding ABC	.46*	.21	.10	.61**	.23	.15
Citation by ALE						
Monopoly	.70**	.19	.16	.56**	.23	.13
ALE:						
With local police	-1.01**	.36	-.23	-.47	.42	-.11
With Department of Revenue	-1.19*	.56	-.27	-.14	.64	-.033
With state police	-.34	.35	-.078	.063	.42	.014
With ABC but got help from local police	-.28	.35	-.06	.056	.42	.013

NOTE.—Coeff. = coefficient; SE = standard error; ME = marginal effect. ABC = Alcoholic Beverage Commission; ALE = alcohol law enforcement agency.

⁺ Significant at the 10% level.

* Significant at the 5% level.

** Significant at the 1% level.

equivalent ABC employees per 1,000 bars in the state, has positive effects. Moreover, the coefficients exceed their respective standard errors. However, neither of the coefficients is statistically significant at conventional levels.

The variable for public monopoly has a positive effect, but the coefficient is imprecisely estimated. For both the adult and minor dependent variables, the perceived probability of citation by the ABC is higher for bars located in states in which the ABC did not respond to our survey. Overall, these results indicate a considerable amount of correspondence between ABC

policies as stated by the state ABCs and the actual perceptions of the parties they regulate.

Other variables affecting perceived probabilities of citation by the ABC are being incorporated (+), blue-collar customers (+), and regular customers (-). Most of the other coefficients are not statistically significant at conventional levels.

Holding other factors constant, bar owners/managers in states with public monopolies of liquor sales believed that they would be more likely to be cited by the ALE in their localities. Parameter estimates on this variable are statistically significant at the 5 percent level or better. The marginal effects of being in a monopoly state are substantial, 0.16 for serving obviously intoxicated adults and 0.13 for serving minors. When the ALE was run by the local police or by the state Department of Revenue, rather than the ABC, the perceived probability of being cited for serving intoxicated adults is much lower. We obtain no statistically significant differences on ALE organization for the perceived probability of being cited for serving minors.

C. Determinants of Actual Tort Claims and Police Activity

Overall, we find that laws and resource allocation relate to bar owners' and managers' actual experience with the law. Both strict and not-strict tort laws have positive effects on the actual probability of being sued (Table 5). Both parameter estimates are statistically significant at the 1 percent level. For reasons we cannot explain, the not-strict laws have a greater marginal effect on the probability of having been sued than the strict ones.

Other factors explaining the actual probability of having been sued are years in business (+), fraction of sales from food (-), being incorporated (+), clientele ages 25-40 (-), clientele over age 40 (-), student clientele (+), and blue-collar clientele (+). Net worth does not affect the probability of having been sued. Overall, the results are highly plausible.

Although both parameter estimates are positive, only one of the two resource allocation variables has positive and statistically significant effects on the measures of police activity. Bars located in communities with high police budgets are more likely to report that police came into their establishments to check patron identifications. The probability of this occurring rises by about 0.015 per \$100 increase in the budget per 1,000 population for local law enforcement. Police are significantly less likely to check patrons' identifications in bars that have a high fraction of sales from food, older customers, and regular customers. Police are significantly more likely to check patrons' identifications at bars where more customers come by groups, probably because these types of bars cater to a younger clientele.

TABLE 5
DETERMINANTS OF ACTUAL TORT AND POLICE ACTIVITY

EXPLANATORY VARIABLE	HAD A CIVIL LEGAL ACTION BETWEEN 1990-1996			LOCAL POLICE REGULARLY PATROLED IN EVENING			POLICE CAME INTO BAR AND CHECKED PATRON IDENTIFICATION		
	Coeff.	SE	ME	Coeff.	SE	ME	Coeff.	SE	ME
Adult law:									
Strict	.73*	.28	.079						
Not strict	1.19**	.40	.13						
Police resources (per 1,000 population in jurisdiction):									
Budget per capita				.43	.98	.029	.65*	.33	.15
Full-time-equivalent employees				.24	.30	.016	-.0040	.074	-.0009
Establishment characteristics:									
Net worth \$150,000-\$500,000	.28	.28	.030						
Net worth \$1,500,000+	.50	.42	.054						
Net worth missing	-.72	.47	.078						
Part of a chain	-.14	.55	-.015	.33	1.10	.022	-.0069	.52	-.0016
Age of establishment	.018**	.0057	.0019	.0049	.010	.0003	.0094	.0059	.0021
Incorporated	.98**	.26	.11	.90*	.39	.061	.30	.24	.068
Fraction of sales from food	-.91**	.62	-.098	-1.14	.86	-.077	-2.19**	.61	-.49
Clientele characteristics (fraction):									
Customers aged 25-40	-1.58+	.91	-.17	-.33	1.62	-.022	-1.25	.97	-.28
Customers aged 40+	-2.61**	.96	-.28	-1.29	1.53	-.087	-1.85+	.96	-.42
Students	1.87+	1.09	.20	1.90	2.39	.13	.045	1.17	.010
Blue-collar customers	1.30*	.51	.14	.96	.67	.065	.23	.46	.051
Regular customers	-.34	.54	-.037	-.67	.91	-.046	-.99+	.54	-.22
Men	-.55	.91	-.059	-.46	1.32	-.031	-.71	.86	-.16
Customers who come alone	.35	.83	.038	.33	1.16	.022	.81	.79	.18
Customers who come in groups	-.11	.92	-.011	.21	1.28	.014	1.87*	.87	.42
Customers who come by car	-.31	.40	-.034	-.84	-.79	-.057	-.13	.38	-.030
Population density	-.0011	.0022	-.0001	.018	.017	.0012	.0075	.0083	.0017
Constant	-1.81	1.23	-.19	2.88	1.99	.19	.68	1.20	.15

NOTE.—Coeff. = coefficient; SE = standard error; ME = marginal effect.

+ Significant at the 10% level.

* Significant at the 5% level.

** Significant at the 1% level.

D. Effects of Risk Perceptions on Precaution Levels in Bars: Obviously Intoxicated Adults

Several of the risk perception variables have positive and statistically significant effects on precaution levels in bars (Table 6). This is particularly true of tort. The risk score has a positive and statistically significant impact only in the regression for services provided to intoxicated patrons. In that regression, adding the risk score reduces the coefficient on tort from a positive and statistically significant value at the 10 percent level to a positive and insignificant value.

In the other four regressions, imposing tort liability increases server precaution levels. Statistical significance is at the 1 percent level in two, at the 5 percent level in one, and at the 10 percent level in the remaining regression. For services provided for intoxicated patrons and content of server training, we use ordered logit analysis. As above, the marginal effects are shown only for the highest category corresponding to the highest level of precaution. For services provided by the bar to intoxicated patrons, a unit increase in the threat of being sued (on the 1–5 scale) produces a 0.01 increase in the probability of providing the entire list of services. For server training, the corresponding marginal effect of tort is 0.05.

To study the remaining precaution variables, we use logistic analysis. The marginal effects imply that a unit increase in the threat of a tort suit increases the probability of employees not drinking on the job by 0.02 on average, of checking references of perspective employees by 0.04, and of providing written procedures regarding serving by 0.05.

By contrast, neither police nor ABC threats have any deterrent effects. The threat of citation by the ALE increases the probability of checking references but has no other statistical significant effect. When the liability insurer provides a discount for server training, the bar offers more comprehensive server training and is more likely to provide written procedures to employees regarding server training. In general, bars that could identify a competitor had higher precaution levels. Where Mormons are more numerous, bars take greater precautions.

E. Effects of Risk Perceptions on Precaution Levels in Bars: Minors

In the analysis of minors, the risk perception of a tort suit and of an ALE citation have about the same effect in one of the regressions (Table 7). Otherwise, risk perceptions do not have a direct link to behavior. As discussed above, perceived threats for serving minors were somewhat higher on average than the perceived threat for serving obviously intoxicated adults. The risk score is positive and statistically significant at the 5 percent level only in the “conduct pat downs” regression.

TABLE 6
COMMERCIAL SERVER PRECAUTION: ADULTS

EXPLANATORY VARIABLE	NOT DRINKING ON THE JOB			SERVICES PROVIDED FOR INTOXICATED PATRONS			CHECK REFERENCES OF POTENTIAL EMPLOYEES			CONTENTS OF SERVER TRAINING			PROVIDE WRITTEN PROCEDURES TO EMPLOYEES REGARDING SERVING		
	Coeff.	SE	ME	Coeff.	SE	ME	Coeff.	SE	ME	Coeff.	SE	ME	Coeff.	SE	ME
Threats: serving an obviously intoxicated adult:															
Dramshop suit	.16*	.090	.018	.063	.061	.010	.18*	.072	.037	.20**	.066	.047	.20**	.074	.046
Citation by police	-.11	.11	-.012	.008	.074	.001	-.055	.087	-.012	-.075	.080	-.017	.12	.088	.029
Citation by ABC	.12	.12	.013	-.072	.079	-.012	-.26**	.10	-.055	-.032	.083	-.008	-.17	.099	-.040
Citation by ALE	.12	.12	.013	-.025	.081	-.0041	.32**	.10	.069	.16*	.087	.038	.081	.100	.019
Risk score	-.007	.014	-.001	.024*	.010	.004	.012	.012	.003	.013	.011	.003	.004	.012	.001
Had an identified competitor insurer offered a discount for server training	.43	.28	.049	.56**	.21	.091	.43*	.24	.091	.27	.22	.063	.12	.26	.027
Establishment characteristics:															
Part of a chain	.63	.69	.071	.19	.39	.030	.34	.52	.072	.37	.41	.086
Age of establishment	-.017	.59	-.39	.71	.41	.001	-.39	.49	-.083	-.52	.42	-.001	.51	.52	.12
Incorporated	.23	.24	.026	.34*	.17	.056	.53**	.19	.11	.43*	.17	.010	.48*	.20	.11
Fraction of sales from food clientele characteristics (fraction):	2.12**	.68	.24	-.16	.39	-.025	1.30**	.49	.28	-.90*	.42	-.21	-.51	.51	-.12
Customers aged 25-40	.035	.91	.0040	.44	.65	.072	.65	.77	.14	1.17*	.67	.27	-.29	.81	-.067
Customers aged 40+	.20	.91	.023	-.056	.63	-.009	.058	.74	.012	1.07*	.65	.25	-.49	.78	-.11
Students	1.47	1.12	-.17	1.31*	.79	.21	.35	.95	.074	.38	.85	.088	-.050	1.02	.012
Blue-collar customers	-.74	.46	-.083	-.13	.30	-.021	.093	.35	.020	.14	.32	.033	-.60*	.36	-.14
Regular customers	-.16	.53	-.018	-.23	.38	.038	-.73*	.43	-.15	.19	.38	.044	-.88*	.46	-.20
Men	1.02	.81	.12	.35	.59	.057	-.34	.66	-.071	-.143*	.61	.33	-.07	.72	-.016
Customers who come alone	-.194*	.80	-.22	.52	.54	.085	.42	.68	-.089	-.29	.56	.083	-.91	.67	-.21
Customers who come in groups	1.36	.90	-.15	.51	.60	.083	-.90	.68	-.19	.29	.63	.070	.86	.75	.20
Customers who come by car	-.84*	.46	-.095	-.25	.28	-.041	-.40	.33	.085	.38	.28	.088	.003	.33	.001
Population density	-.003	.0020	-.0003	-.0019	.0018	-.0003	-.0040	.0018	-.0008	-.0026	.0016	-.001	-.0057**	.0020	-.0013
Religious preference in state:															
Catholic	-.020	.016	-.002	-.007	.010	.001	.008	.013	.000	-.005	.010	-.001	-.002	.013	-.000
Baptist	-.003	.017	-.0003	.011	.011	.002	.002	.014	.002	-.002	.012	.0005	-.005	.015	-.001
Mormon	.24*	.14	.023	.007	.013	.001	.18*	.088	.038	.037*	.022	.009	.12	.089	.028
Other Protestant	.019	.022	.002	-.046	.013	-.007	-.019	.017	-.004	-.001	.013	-.0003	-.019	.017	-.004
Jewish	.051	.073	.006	-.075	.052	-.012	.096	.066	.020	.039	.054	.009	.14*	.069	.032
Constant	1.86	1.52		-.2,94***	1.01		-.44	1.19		-.57*	1.02		.53		

NOTE.—Coeff. = coefficient; SE = standard error; ME = marginal effect.

* Other constant terms for the ordered logit model are omitted.

+ Significant at the 10% level.

* Significant at the 5% level.

** Significant at the 1% level.

TABLE 7
COMMERCIAL SERVER PRECAUTION: MINORS

EXPLANATORY VARIABLE	HAVE MONITOR FOR MINORS			CHECK IDENTIFICATIONS			CONDUCT "PAT DOWNS"		
	Coeff.	SE	ME	Coeff.	SE	ME	Coeff.	SE	ME
Threats (serving a minor):									
Dramshop suit	.14*	.064	.033	.059	.066	.014	-.024	.11	-.002
Citation by police	-.14	.084	-.031	-.039	.089	-.009	-.33*	.16	-.021
Citation by ABC	-.16+	.080	-.036	.070	.086	.016	.003	.16	.000
Citation by ALE	.16+	.081	.036	-.018	.086	-.0042	.22	.17	.014
Risk score	-.013	.010	.003	.012	.011	.003	.038*	.019	.002
Has an identified competitor	.059	.25	.013	.005	.25	.0012	-.61	.38	-.039
Establishment characteristics:									
Part of a chain	.39	.45	.088	.27	.47	.063	.068	.65	.004
Age of establishment	1.42**	.52	.33	-.82	.54	-.19	-.92	1.02	-.059
Incorporated	-.21	.19	-.047	.091	.20	.021	.012	.34	.001
Fraction of sales from food	-2.10**	.46	-.48	-2.53**	.53	-.60	-.57	.83	-.037
Clientele characteristics (fraction):									
Customers aged 25-40	-1.94*	.81	-.44	-1.38+	.80	-.32	-1.07	1.12	-.069
Customers aged 40+	-1.67*	.79	-.39	-2.45**	.80	-.58	-2.27+	1.20	-.15
Students	-.72	1.00	-.16	4.11	1.15	.97	.63	1.39	.041
Blue-collar customers	-.81*	.36	-.19	-.080	.37	-.019	.63	.66	.040
Regular customers	.70+	.43	.16	-1.73**	.45	-.41	.15	.76	-.0080
Men	-.97	.68	-.22	-1.24	.70	-.29	-2.44*	1.20	-.15
Customers who come alone	.66	.62	.15	-.40	.67	-.093	.96	1.14	.010
Customers who come in groups	.11	.67	.025	.21	.73	.050	.48	1.29	.031
Customers who come by car	.007	.32	.002	.43	.35	.10	-.027	.58	-.002
Population density	-.0009	.0019	-.0002	-.0020	.002	-.0005	.0074	.0027	.0005
Religious preference by state:									
Catholic	.030**	.012	.007	.026*	.012	.006	-.003	.019	-.0002
Baptist	.0090	.013	.002	.030	.013	.007	.004	.021	.0003
Mormon	.024	.017	.005	.027*	.014	.006	-.006	.021	-.0004
Other Protestant	-.020	.015	-.005	-.000	.016	-.000	-.078*	.032	-.005
Jewish	-.041	.064	-.009	.12+	.066	.028	-.075	.11	-.005
Constant	1.84	1.15		1.12	1.16		.42	1.87	

NOTE.—Coeff. = coefficient; SE = standard error; ME = marginal effect.
+ Significant at the 10% level.
* Significant at the 5% level.
** Significant at the 1% level.

A higher perceived threat of tort liability increases the probability that the bar designated a specific employee to monitor drinking by minors. A unit increase of the perceived threat of being sued increases this probability by 0.03 on average. The perceived threat of citation by the ALE increases the probability of a specific monitor for minors with the associated marginal effects of 0.04.

Clearly, improved safety is not always the motive for these activities. For example, as the fraction of male patrons increases, the probability of pat downs decreases. The parameter estimate for this variable is statistically significant at the 5 percent level, and the associated marginal effect is substantial (-0.15). The marginal effect implies that a 0.1 increase in the fraction of male patrons decreases the probability of pat downs by about 0.015.

F. Relative Productivity of Dramshop Liability versus Public Expenditures on Police

To further assess the relative productivity of tort versus local expenditures on police, we reestimated the two risk perception equations presented in Table 3 (intoxicated adult and minor) for being cited by police, dropping the explanatory variable for full-time-equivalent employees per 1,000 population in the jurisdiction. This left police budget per capita population as the sole policy explanatory variable. The estimated marginal effects for the police budget were virtually identical to those in Table 3.

We then compared the cost versus effect of raising per capita expenditure on police by \$100 versus implementing a strict dramshop law. We assumed a community population of 100,000. Thus, the \$100 increase for this hypothetical community translated into an annual increase in expenditures of \$10 million.¹⁸ In only two of the five commercial server precaution regressions for adults (Table 6) were the coefficients on the police threat variable positive. None of the corresponding coefficients in the analysis of server precaution behavior for minors (Table 7) was positive. Thus, we limited our comparison to the two server behaviors for adults. These were services provided for intoxicated persons and providing written procedures to employees regarding serving. The variable for services is an ordered variable, with the maximum number of services being five. The marginal effect is for increasing the number of services provided by the bar from four to five. Provision of written procedures is a binary variable.

We computed the product of the marginal effect of the change in the po-

¹⁸ In 1995, the most recent estimates available, local governments spent \$131 per capita on police (U.S. Dep't Commerce, Statistical Abstract of the United States, tables 506 and 514 (1995)). In our sample, the mean for 1996 is \$192.

lice budget on the perceived risk of being cited by police and the marginal effect of the change in risk perception on services provided for intoxicated persons and a similar calculation for providing written procedures. The marginal product of implementing a strict dramshop law on providing services for intoxicated adults was 100 times the marginal product of the \$10 million increase in spending on police. Thus, a \$10 million increase in public spending on police would have the same effect as a \$100,000 expenditure on tort. For providing written procedures, the difference was less dramatic. The strict dramshop law was 16 times more productive, implying an equivalent effect of \$10 million versus over \$625,000 on tort.

The next issue is what an investment of \$100,000 on tort would purchase. Unfortunately, there are no data on litigation expense of dramshop claims. In 1996 dollars, litigation expense for other types of tort claims varied from \$14,000 for auto torts¹⁹ to about \$140,000 for medical malpractice claims²⁰ involving major personal injury and about \$200,000 for aviation-related tort claims.²¹ These estimates include costs incurred by both plaintiffs and defendants but exclude such other costs as for courts. Supposing that a dramshop claim would be somewhere within the high and low figures, one or two dramshop claims may be about as productive as the \$10 million in police spending for encouraging bars to add a service for dealing with intoxicated patrons.

We did not perform a full cost-benefit analysis of the effect of stepped-up criminal enforcement versus implementation of tort liability. Although tort appears to be more productive in this context in influencing the behavior of bar personnel, the added police expenditures would also have many other potential community benefits on alcohol control (for example, controlling drunk driving on the roads) and other types of conduct that we did not measure.

VI. DISCUSSION

We find that laws and public policies affect risk perceptions of bar owners and managers; their actual experience with the law and some risk perceptions, in turn, affect precaution levels. The results are particularly good for tort.

Although the study of risk perceptions allows one to probe into the black box of decision making, there is always a chance that risk perceptions do

¹⁹ J. S. Kakalik & N. M. Pace, Costs and Compensation Paid in Tort Litigation (Rand Corp. R-3391-ICJ, 1986).

²⁰ F. A. Sloan *et al.*, Suing for Medical Malpractice (1993).

²¹ J. S. Kakalik *et al.*, Compensation Paid in Aviation Accident Litigation (Rand Corp. R-3421-ICJ, 1988).

not really measure a perceived threat but rather reflect some unmeasured characteristic of the respondent. Here, the danger is that risk-averse respondents may have systematically reported a high threat and engaged in precautionary behaviors. If so, the link between the two would not be causal.

It is unlikely that the relationships are spurious for these reasons. First, we include an explanatory variable explicitly designed to capture systematically high- or low-risk perceptions on policies not directly applicable to the analyses. This variable is positive and statistically significant in only two of the eight risk perception regressions and in only these two cases has an impact on the risk perception coefficients. Second, the measured effects of risk perceptions differ systematically by type of threat. If we were measuring only risk aversion, it is doubtful that one of the threats would appear more real than the others. Third, the respondents gave different answers to individual threat questions. Fourth, these risk perceptions of owners/managers also translate into better server practices by bartenders and waitstaff employed in the same establishments.²² Employees of the bars were surveyed separately. They were not present when the owners/managers were surveyed and vice versa.²³

We experimented with other approaches, including two-stage least squares and generalized methods of moment/instrumental variables. These approaches were not fruitful, primarily because we have four risk perception variables in each behavior equation. If we had collapsed the four risk perception variables into one, we would not have been able to discern effects of individual threats. Also, we estimated reduced-form behavior equations with the laws and policies as the main exogenous variables of interest. Because there were so many laws and policies, we encountered considerable multicollinearity.

The analysis of actual experience with the law employed far fewer laws and policies in each regression, with the result that the findings are easily interpreted. These results indicate that some specific laws and policies affect the bars' actual experiences with the legal system. In particular, bars located in states with dramshop laws were more likely to report having had a tort claim filed against them. Police were more likely to have come into the bars to check patron identifications when local public spending on police per capita was relatively high. Even in states without dramshop liability, bars may be subject to civil legal action for various reasons, such as

²² Of course, it is a conceptual possibility that risk-averse bosses select risk-averse employees, but such precise matching seems unlikely in practice.

²³ See Frank Sloan, Lan Liang, & Emily Stout, *Effects of Tort Liability versus Regulation in Controlling Heavy Drinking in Public Places* (unpublished manuscript, Duke Univ., Ctr. Health Pol'y, Law & Mgmt 1998).

from plaintiffs alleging that a personal injury occurred in the bar due to the bar's negligence.

Dramshop liability represents an expansion of tort law to include parties who may be in a position to influence the behavior of the wrongdoer. The motives for the adoption of dramshop liability may have been a combination of deep pockets and a perception that drunk drivers lack the capacity to act responsibly. Indeed, many drunk drivers obtain alcohol from bars.

There is limited empirical evidence on the impacts of specific kinds of "responsible server practices" that dramshop laws are designed to promote. With the notable exception of a large community trial,²⁴ most studies of the effects of specific server interventions have been small scale and localized. With this caveat duly noted, the literature indicates what servers and their establishments should and should not do. In the former category, employee drinking on the job promotes patron drinking, as do "happy hours."

Interestingly, several previous empirical studies have found that implementation of dramshop liability lowers motor vehicle fatality rates as well as fatality rates for other alcohol-related causes such as liver cirrhosis and homicides.²⁵ In these studies, a link has been made between the implementation of dramshop statutes or case law and the effect of reduced harm.

Our study's key finding about impacts of laws and public policies is that the increased probability of a suit, as perceived by the management of the establishment, increased the bar's level of precaution in serving obviously intoxicated adults. The probability of a suit also had a significant impact on the level of monitoring undertaken by establishments to avoid serving alcoholic beverages to minors. In the monitoring regression, the perceived risk of being cited by the ALE had about the same effect as tort. This may be because preventing service to minors may be a high priority of such organizations.

The deterrent effect of tort liability has not been well documented in any field in the past. Much of the work has focused on outcomes rather than the care process.²⁶ There is also a lack of understanding regarding the role of

²⁴ Robert F. Saltz & Paula Stanghetta, A Community-wide Responsible Beverage Service Program in Three Communities: Early Findings, 92 *Addiction* S237 (1997); Harold D. Holder *et al.*, A Community Prevention Trial to Reduce Alcohol-Involved Accidental Injury and Death: Overview, 92 *Addiction* S155 (1997); Harold D. Holder *et al.*, Summing Up: Lessons from a Comprehensive Community Prevention Trial, 92 *Addiction* S293 (1997).

²⁵ Chaloupka, Saffer, & Grossman, *supra* note 14; Frank A. Sloan, Bridget A. Reilly, & Christoph M. Schenzler, Tort Liability versus Other Approaches for Deterring Careless Driving, 14 *Int'l Rev. L. & Econ.* 53 (1994); Sloan, Liang, & Stout, *supra* note 23; Christopher J. Ruhm, Alcohol Policies and Highway Vehicle Fatalities, 15 *J. Health Econ.* 435 (1996).

²⁶ See, for example, Elisabeth M. Landes, Insurance, Liability, and Accidents: A Theoretical and Empirical Investigation of the Effect of No-Fault Accidents, 25 *J. Law & Econ.* 49

tort relative to other forms of law and regulation. However, the theoretical analyses of tort as a deterrent are quite optimistic about its effects.²⁷

Although tort has several goals—compensating victims, providing retribution, and furnishing information for injury victims—its main goal is to influence incentives for care and thereby reduce the rate of accidents. Conceptually, the negligence standard is to be set at the point where the marginal cost of prevention and the marginal benefit of loss averted meet. Once the negligence standard of care is set, under a well-functioning system, there should be no negligence and no need for liability insurance.

Reality clearly conflicts with this prediction. Measured against this tough standard of eliminating the need for liability insurance and lawsuits, tort is clearly a failure. Accidents are frequent. Intoxicated drivers cause many motor vehicle accidents, Tort is under attack from many quarters, ranging from firms that face the danger of being named in lawsuits to legal scholars who base their arguments in large part on the high cost of litigation, the slowness with which the system operates, the comparatively few injury victims who are compensated, and the variability of results from the judicial system, both in determining liability—enforcing the negligence standard—and in setting damages.²⁸ Variability in results is not only unfair but may interfere with the signals tort transmits to a party in a position to undertake precautions.

Although the effectiveness of tort as a deterrent in any one area may not generalize to others, the accumulation of evidence on the deterrent effects of tort in a number of fields may ultimately help societies decide whether to enhance or, alternatively, curb its use. Favorable findings from previously conducted studies on tort as a deterrent of motor vehicle fatalities in general, and of dramshop liability in particular, encouraged us to conduct this more detailed investigation. To our knowledge, our study is the first one to conduct a national survey of commercial servers of alcohol with reference to the actions they take (or do not take) to deter alcohol abuse.

States have varied in the extent to which they have implemented tort laws for regulating drinkers, drivers, and bartenders. Yet the most consistent pat-

(1982); Daniel Kessler & Mark McClellan, Do Doctors Practice Defensive Medicine? 111 Q. J. Econ. 353 (1996).

²⁷ See, for example, John P. Brown, Towards an Economic Theory of Liability, 2 J. Legal Stud. 323 (1973); Steven Shavell, Strict Liability versus Negligence, 9 J. Legal Stud. 1 (1980).

²⁸ See, for example, Randall R. Bovbjerg, Frank A. Sloan, & James F. Blumstein, Valuing Life and Limb in Tort: Scheduling "Pain and Suffering," 83 Nw. U. L. Rev. 908 (1989); Peter W. Huber, Liability: The Legal Revolution and Its Consequences (1988); Jeffrey O'Connell & David F. Partlett, An America's Cup for Tort Reform? 21 U. Mich. J. L. Reform 443 (1988); Gary T. Schwartz, Mixed Theories of Tort Law: Affirming Both Deterrence and Corrective Justice, 75 Tex. L. Rev. 1801 (1997); Stephen D. Sugarman, Doing Away with Personal Injury Law (1989).

tern of our findings is in the effectiveness of tort in deterring commercial servers from engaging in unsafe practices in serving adults. Given our results, and those of past studies, there is a strong rationale for relying on tort law as a method for controlling excessive alcohol use. Commercial servers of alcohol are not unique in opposing tort as another complicating factor in operating their businesses. However, the public interest appears to outweigh such arguments.

BIBLIOGRAPHY

- Adkins, Michael C. "Negligence: *Busby v. Quail Greek Golf and Country Club: A Balanced Approach to Vendor Liability and Underage Drinking.*" *Oklahoma Law Review* 48 (1995): 779-96.
- Bovbjerg, Randall R.; Sloan, Frank A.; and Blumstein, James F. "Valuing Life and Limb in Tort: Scheduling 'Pain and Suffering.'" *Northwestern University Law Review* 83 (1989): 908-76.
- Bradley, M. B., et al. *Churches and Church Membership in the United States 1990*. Atlanta: Glenmary Research Center, 1992.
- Brown, John P. "Towards an Economic Theory of Liability." *Journal of Legal Studies* 2 (1973): 323-50.
- Chaloupka, Frank J.; Saffer, Henry; and Grossman, Michael. "Alcohol-Control Policies and Motor-Vehicle Fatalities." *Journal of Legal Studies* 22 (1993): 161-86.
- Christy, Curtis C. *Server Intervention/Responsible Beverage Service*. Unpublished dissertation. Nashville: George Peabody College for Teachers of Vanderbilt University, 1989.
- Curran, Christopher. "The Spread of the Comparative Negligence Rule in the United States." *International Review of Law and Economics* 12 (1992): 317-32.
- Deweese, Don; Duff, David; and Trebilcock, Michael. *Exploring the Domain of Accident Law*. New York: Oxford University Press, 1996.
- Holder, Harold D., et al. "Alcoholic Beverage Server Liability and the Reduction of Alcohol-Involved Problems." *Journal of Studies on Alcohol* 54 (1993): 23-26.
- Holder, Harold D., et al. "A Community Prevention Trial to Reduce Alcohol-Involved Accidental Injury and Death: Overview." *Addiction* 92 (1997): S155-S171.
- Holder, Harold D., et al. "Summing Up: Lessons from a Comprehensive Community Prevention Trial." *Addiction* 92 (1997): S293-S301.
- Huber, Peter W. *Liability: The Legal Revolution and Its Consequences*. New York: Basic Books, 1988.
- Hurd, Michael; McFadden, Daniel; and Gan, Li. "Subjective Survival Curves and Life Cycle Behavior." In *Inquiries in the Economics of Aging*, edited by David A. Wise. Chicago: University of Chicago Press, 1998.
- Jacobs, James B. *Drunk Driving: An American Dilemma*. Chicago: University of Chicago Press, 1989.

- Kessler, Daniel. "Fault Settlement and Negligence Law." *RAND Journal of Economics* 26 (1995): 296–313.
- Kessler, Daniel, and McClellan, Mark. "Do Doctors Practice Defensive Medicine?" *Quarterly Journal of Economics* 111 (1996): 353–90.
- Kornhauser, Lewis A. "An Economic Analysis of the Choice between Enterprise and Personal Liability for Accidents." *California Law Review* 70 (1982): 1345–92.
- Landes, Elisabeth M. "Insurance, Liability, and Accidents: A Theoretical and Empirical Investigation of the Effect of No-Fault Accidents." *Journal of Law and Economics* 25 (1982): 49–65.
- Low, Stuart, and Smith, Janet K. "Decisions to Retain Attorneys and File Lawsuits: An Examination of the Comparative Negligence Rule in Accident Law." *Journal of Legal Studies* 24 (1995): 535–57.
- McKnight, A. James. "Factors Influencing the Effectiveness of Server-Intervention Education." *Journal of Studies on Alcohol* 52 (1991): 389–97.
- Meier, Steven E.; Brigham, Thomas A.; and Handel, Gregory. "Effects of Feedback on Legally Intoxicated Drivers." *Journal of Studies on Alcohol* 45 (1984): 528–33.
- Mosher, James F. *Liquor Liability Law*. New York: Matthew Bender, 1988; supplement, 1997.
- O'Connell, Jeffrey, and Partlett, David F. "An America's Cup for Tort Reform? Australia and America Compared." *University of Michigan Journal of Legal Reform* 21 (1988): 443–87.
- Page, Joseph A. *The Law of Premises Liability*. Cincinnati: Anderson Publishing, 1988; supplement, 1998.
- Ross, H. Laurence. *Detering the Drinking Driver: Legal Policy and Social Control*. Lexington, Mass.: Lexington Books, 1984.
- Ruhm, Christopher J. "Alcohol Policies and Highway Vehicle Fatalities." *Journal of Health Economics* 15 (1996): 435–54.
- Russ, Nason W., and Geller, E. Scott. "Training Bar Personnel to Prevent Drunken Driving: A Field Evaluation." *American Journal of Public Health* 77 (1987): 952–54.
- Saltz, Robert F., and Stanghetta, Paula. "A Community-wide Responsible Beverage Service Program in Three Communities: Early Findings." *Addiction* 92 (1997): S237–S249.
- Schwartz, Gary T. "Mixed Theories of Tort Law: Affirming Both Deterrence and Corrective Justice." *Texas Law Review* 75 (1997): 1801–34.
- Shavell, Steven. "Strict Liability versus Negligence." *Journal of Legal Studies* 9 (1980): 1–25.
- Shavell, Steven. *Economic Analysis of Accident Law*. Cambridge, Mass.: Harvard University Press, 1987.
- Sloan, Frank A.; Liang, Lan; and Stout, Emily M. "Effects of Tort Liability versus Regulation in Controlling Heavy Drinking in Public Places." Unpublished manuscript. Durham, N.C.: Duke University, Center for Health Policy, Law and Management, 1998.
- Sloan, Frank A.; Reilly, Bridget A.; and Schenzler, Christoph M. "Effects of

- Prices, Civil and Criminal Sanctions, and Law Enforcement on Alcohol-Related Mortality.” *Journal of Studies on Alcohol* 55 (1994): 454–65.
- Sloan, Frank A.; Reilly, Bridget A.; and Schenzler, Christoph M. “Tort Liability versus Other Approaches for Deterring Careless Driving.” *International Review of Law and Economics* 14 (1994): 53–71.
- Sloan, Frank A.; Reilly, Bridget A.; and Schenzler, Christoph M. “Effects of Tort Liability and Insurance on Heavy Drinking and Drinking and Driving.” *Journal of Law and Economics* 38 (1995): 49–77.
- Sloan, Frank A., et al. *Drinkers, Drivers, and Bartenders: Balancing Private Choices and Public Accountability*. Chicago: University of Chicago Press, 2000.
- Smith, Janet K. “An Analysis of State Regulations Governing Liquor Store Licenses.” *Journal of Law and Economics* 25 (1982): 301–19.
- Sugarman, Stephen D. *Doing Away with Personal Injury Law*. New York: Quorum Books, 1989.
- Thun, Michael J., et al. “Alcohol Consumption and Mortality among Middle-Aged and Elderly U.S. Adults.” *New England Journal of Medicine* 337 (1997): 1705–14.
- Van Houten, R.; Nau, P.; and Jonah, B. “Effects of Feedback on Impaired Driving.” In *Conference on Alcohol, Drugs and Traffic Safety—San Juan, Puerto Rico 1983*, DOT-HS-806-814, edited by S. Kaye and G. W. Meier, pp. 1375–94. Washington, D.C.: U.S. Department of Transportation, September 1985.
- Waring, Mary L., and Sperr, Inez. “Bartenders: An Untapped Resource for the Prevention of Alcohol Abuse?” *International Journal of the Addictions* 17 (1982): 859–68.
- White, Michelle J. “An Empirical Test of the Comparative and Contributory Negligence Rules in Accident Law.” *RAND Journal of Economics* 20 (1989): 308–30.
- Wieczorek, William; Miller, B.; and Nochanjski, T. “Bar versus Home Drinkers: Different Subgroups of Problem-Drinker Drivers.” Research Note 89-6. Albany: New York State Division of Alcoholism and Alcohol Abuse, 1989.