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Is Nonsmoking Dangerous to the Health of Restaurants?

The Effect of California's Indoor Smoking Ban on Restaurant Revenues

Lisa Stolzenberg
Stewart J. D'Alessio
Florida International University

The state of California passed the Smoke-Free Workplace Act on January 1, 1995. This legislation effectively banned indoor smoking in all public and private workplaces including restaurants. Many restaurant owners, especially owners of restaurants that served alcohol, opposed the ban for fear that their businesses would be affected adversely because of the loss of patrons who smoked. Using an interrupted times-series autoregressive integrative moving average study design, the authors assess the effect of California's indoor smoking ban on revenue rates for all restaurants, for non-alcohol-serving restaurants, and for alcohol-serving restaurants. Results showed that revenues for alcohol-serving restaurants dropped by about 4% immediately following the establishment of the indoor smoking ban. However, this reduction was temporary because revenues for alcohol-serving restaurants quickly returned to normal levels. Findings also revealed that the indoor smoking ban had little observable impact on the revenue rate for restaurants overall and for non-alcohol-serving restaurants.

Keywords: *indoor smoking ban; restaurant revenues; secondhand smoke; time-series analysis*

Indoor smoking bans have proliferated in recent years as a means to improve public health in our society (Twombly 2004). The primary purpose of these types of laws is to reduce those illnesses that are believed to result from secondhand smoke by banning indoor smoking in public places, including restaurants. The justification for indoor smoking bans emanates from a plethora of research studies showing that secondhand smoke is correlated strongly with

lung cancer and a variety of other health-related problems including, among others, heart disease and respiratory problems (Barnoya and Glantz 2005; Hackshaw, Law, and Wald 1997; He et al. 1999; U.S. Department of Health and Human Services 1986; U.S. Environmental Protection Agency 1992). Estimates suggest that exposure to secondhand tobacco smoke is responsible for more than 53,000 nonsmoker-related deaths each year in the United States (Glantz and Parmley 1995; Wells 1988). It is also argued rather convincingly that by eliminating smoking in public places, the overall cost of medical care can be attenuated considerably (Lesmes and Donofrio 1992; Zollinger et al. 2004). Nine states currently have legislation that bans indoor smoking in restaurants (see the appendix). Twenty states and the District of Columbia require or allow designated smoking areas in restaurants, whereas California and Connecticut require a separate ventilation system, which is very uncommon, in designated smoking areas. Nineteen states have no restrictions on indoor smoking in restaurants.

Despite the potential health benefits of indoor smoking bans, disagreement persists as to the effect that these types of bans will have on restaurant revenues, particularly revenues for alcohol-serving restaurants where patron smoking is especially commonplace (Williams et al. 2004). Three fairly distinct and differing perspectives can be distinguished in the extant literature. This classification inevitably simplifies some important issues, but it does provide a means for identifying the essential distinctions between each of the perspectives. One commonly articulated viewpoint maintains that restaurants are affected adversely by indoor smoking bans because of the loss of patrons who smoke. Advocates of this position argue that indoor smoking bans not only cause smokers to dine out less frequently but also act to reduce tourism levels (Clarke et al. 1999). Such a situation has a deleterious effect on a restaurant's ability to do business, which in turn engenders layoffs and increased unemployment (Fabrizio and Associates, Inc. 1995; Penn and Schoen Associates, Inc. 1996; but also see Hyland and Cummings 1999). Indoor smoking bans are also thought to unfairly burden restaurants and can be difficult to enforce (Clarke et al. 1999).

A second perspective maintains that restaurant revenues will rise rather than decrease following the establishment of an indoor smoking ban because nonsmokers, who outnumber smokers by a ratio of about 3 to 1 nationally, regularly avoid restaurants where smoking is permitted (Higbee et al. 2004).

Authors' Note: Direct correspondence to Lisa Stolzenberg, School of Policy and Management, Florida International University, University Park Campus–PCA 260A, Miami, FL 33199; e-mail: stolzenb@fiu.edu.

For example, in a survey of nearly 5,000 adults in Massachusetts during 1995 and 1996, Biener and Fitzgerald (1999) found that more than 46% of nonsmoking adults reported having avoided a location in the past because they felt that they might be exposed to too much tobacco smoke. The major reasons given for why people avoided places where smoking might be present was that the smell of smoke would linger in their hair and clothing and concerns regarding their health and well-being. Biener and Fitzgerald estimated that people's aversion to secondhand smoke resulted in the loss of approximately 500,000 patrons to restaurants in Massachusetts alone.

In another important study, Hyland, Cummings, and Nauenberg (1999) reported that the implementation of New York City's Smoke-Free Air Act increased sale receipts for both the city's restaurant and hotel industries. Specifically, the authors observed that real taxable sales from restaurants rose 2.1%, when compared with levels 2 years before the smoke-free law took effect. A 38.9% rise in revenues was also observed for drinking establishments in New York City. A major limitation of this study, however, was that the law applied only to bars and restaurants with 35 or fewer indoor dining seats. As a consequence, the authors of this study were unable to detect whether there was any displacement of smokers from businesses that fell under the smoking ban to smaller ones that the ban did not affect.

A third position proffers that indoor smoking bans have relatively little effect on restaurant revenues because smokers are still going to patronize restaurants that are smoke free. A number of empirical studies buttress this perspective. For example, Sciacca (1996) conducted a pre-post smoking ordinance survey of 34 public restaurants in Flagstaff, Arizona. He observed that although many respondents were initially concerned about the potential negative impact of the indoor smoking ordinance on their business revenues, the majority of respondents claimed that the smoking ordinance had no effect on revenues, at least for the 15 months following the implementation of the ordinance. However, Sciacca also noted that 12.5% of the restaurants in his sample went out of business during the 15-month period following the enactment of the indoor smoking ban. The design of this study impeded any attempt to determine whether the smoking ban engendered an increase in failures among restaurants.

Bartosch and Pope (1999) used data from 235 communities in Massachusetts and a pooled cross-sectional time-series research design to investigate whether the implementation of smoke-free restaurant policies affected restaurant sales. Their time-series analysis, which controlled for a number of potentially salient variables, showed that smoke-free policies had little if any statistically discernable effect on restaurant business. In another study of 15 cities in California and

Colorado that passed smoke-free restaurant ordinances, Glantz and Smith (1994, 1997) found no empirical evidence that these smoking bans affected restaurant sales adversely. Studies by Huang, De, and McCusker (2004) and Hyland and Cummings (1999), among others, also reported little association between smoking bans and revenues for restaurants.

The above discussion highlights the controversy that characterizes research on the effect that an indoor smoking ban will have on restaurant revenues. Some studies find that smoking bans attenuate restaurant revenues (Fabrizio and Associates, Inc. 1995; Penn and Schoen Associates, Inc. 1996), whereas others claim that they increase business revenues (Biener and Siegel 1997; Biener and Fitzgerald 1999). Still others report that indoor smoking bans have little or no observable effect on restaurant revenues (see Scollo et al. 2003 for a comprehensive review of this literature). Based on these inconsistent findings, it appears that further empirical evidence is necessary before a defensible position can be reached regarding the effect that an indoor smoking ban will have on restaurant revenues.

The purpose of the current study is to shed additional light on this debate. Our aim, however, is not to replicate previous research in this area. Rather, we contribute to the ongoing debate by employing data over a 99-quarter period and an interrupted time-series autoregressive integrative moving average (ARIMA) study design with nonequivalent dependent variables to assess the impact of California's indoor smoking ban on restaurant revenues. The type of data and the analytic strategy used in this study have obvious methodological advantages over previous research in this area. First, the interrupted time-series design with nonequivalent dependent variables is considered an effective quasi-experimental design for drawing causal inferences (Cook and Campbell 1979). This design involves comparisons of series of observations over time expected to be affected by an intervention, with series not expected to be influenced—or influenced to a lesser degree—by the same intervention. It is assumed that these response series are conceptually related. This design helps rule out a large number of plausible alternative explanations for a hypothesized causal relationship because the comparison series act to reduce the possibility of history effects.

In this study, we plan on comparing trends in revenues for restaurants, non-alcohol-serving restaurants, and alcohol-serving restaurants before the indoor smoking ban went into effect with revenue trends after the ban was passed into law. If the differences between the preintervention and postintervention series are greater than one should expect from chance alone, then a substantive effect of the indoor smoking ban's implementation on restaurant revenues can be inferred. Of course, because smoking is more common

in alcohol-serving restaurants (Schoenborn and Benson 1988; Williams et al. 2004), it is expected that the ban's greatest effect on revenues, if any, would be for these types of establishments.

Second, the state of California provides an interesting context for this study because the state completely prohibits smoking indoors in both public and private workplaces. Laws enacted in other states allow smoking only in designated areas, prohibit smoking only in public workplaces, or prohibit smoking only in certain types of workplaces such as hospitals. A large number of restaurants were also affected under California's indoor smoking ban, more than in any other state. Because of these factors, we believe that the state of California provides an excellent context for evaluating the relationship between an indoor smoking ban and restaurant revenues.

Third, we use quarter rather than year as our unit of analysis because quarterly data are considered superior to yearly data for interpreting change and for reducing the confounding of history effects (Tiao and Wei 1976). Analyzing quarterly data also permits greater flexibility in applying more sophisticated and efficient statistical procedures such as ARIMA because of the increased number of observations. Furthermore, it is anticipated that restaurant revenues will vary in quarterly rather than yearly cycles because of seasonal fluctuations in tourism levels and because of the possibility of outdoor patron seating being added during those times of the year with more favorable weather conditions. Finally, because this study compares changes in revenues for restaurants in one state over time and does not predict changes across different states, potential biases resulting from differences in state revenue–reporting practices are minimized.

The policy implications of this study are noteworthy. If the enactment of California's indoor smoking ban affected restaurant revenues adversely, then alternative strategies to safeguard the public from secondhand smoke might need to be identified (Ong and Glantz 2005). Yet if the establishment of California's indoor smoking ban had a null or even a positive effect on restaurant revenues, then public health can be improved through the use of indoor smoking bans without the worry of harming the economic well-being of restaurants.

Data and Variables

The data used in this analysis were obtained from the State Board of Equalization, Research and Statistics Division, Taxable Sales in California (quarterly reports). These data represent a 99-quarter period (January 1, 1980, to September 30, 2004) for the state of California. Three dependent

variables are used in the analysis. The first response variable of theoretical import is measured as the quarterly revenues for all restaurants in California divided by the total number of restaurant business permits per quarter and multiplied by 10,000. The second dependent variable, the revenue rate for non-alcohol-serving restaurants, is measured as quarterly revenues for non-alcohol-serving restaurants divided by the total number of permits per quarter for these types of eating establishments and multiplied by 10,000. The third response variable used in this study is the revenue rate for alcohol-serving restaurants. This variable is operationalized as the number of alcohol-serving restaurants per quarter divided by the total number of business permits for these restaurants and multiplied by 10,000.

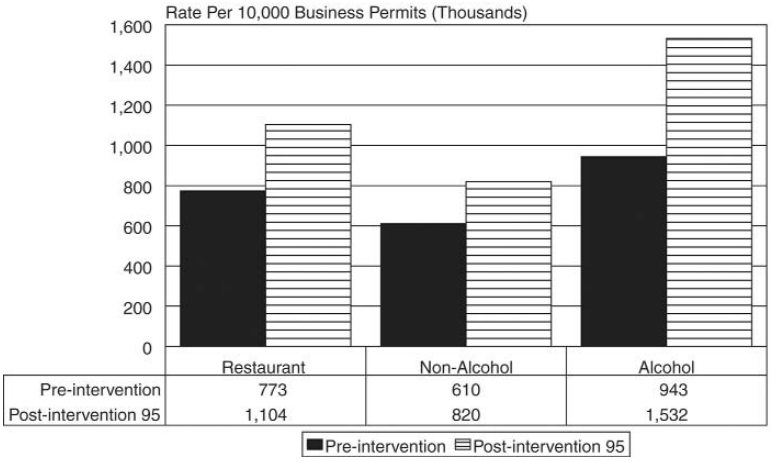
We analyze the effect of California's Smoke-Free Workplace Act with a dummy variable coded 0 before January 1, 1995, and 1 otherwise. We do not anticipate, however, that the impact of the indoor smoking ban will be captured entirely by the one intervention measuring its inception. The indoor smoking ban was amended on January 1, 1998, to encompass bars and casinos. It is possible that this modification may have influenced restaurant revenue rates in some way. To analyze this change in the law, we added a second dummy-coded variable to the analysis. This variable was coded 0 before January 1, 1998, and 1 thereafter.

Descriptive Analysis

Figure 1 depicts mean changes between the preintervention (January 1, 1980, to December 31, 1994) and postintervention (January 1, 1995, to September 30, 2004) periods for restaurants, non-alcohol-serving restaurants, and alcohol-serving restaurants. A cursory glance at this figure reveals an increase in revenue for each of the series following the implementation of the indoor smoking ban. The overall revenue means for restaurants, non-alcohol-serving restaurants, and alcohol-serving restaurants before the indoor smoking ban were 773, 610, and 943, respectively. After the enactment of the indoor smoking ban, the revenues for restaurants increased by 43%, whereas revenues for non-alcohol-serving restaurants and alcohol-serving restaurants rose by 34% and 62%, respectively.

However, although these results appear to support the position that California's indoor smoking ban had a positive effect on restaurant revenues, it is important to recognize that simple comparisons of pre- and postintervention means are only suggestive at best. Further empirical evidence is needed before accepting these findings as definitive because it is not possible to say whether the observed rise in restaurant revenues was the

Figure 1
Means for Preintervention and Postintervention Restaurant Revenue Rates in California

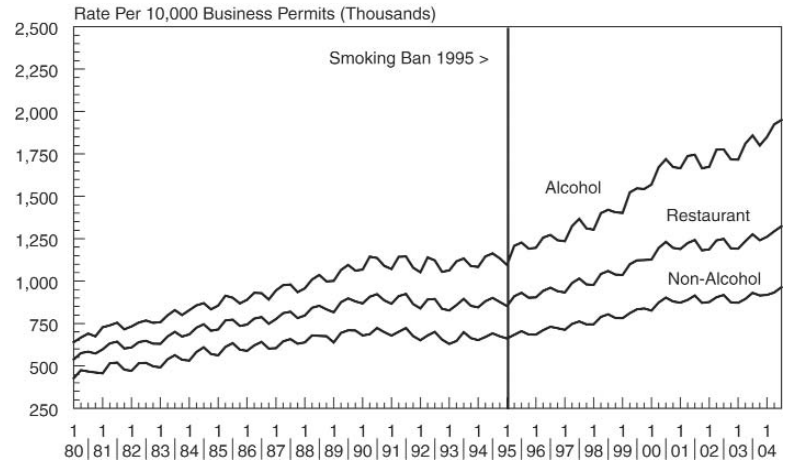


result of a preexisting upward trend. To illustrate this point, we constructed a diagram that depicted the revenue rate for restaurants, non-alcohol-serving restaurants, and alcohol-serving restaurants over time. The vertical line in Figure 2 represents the actuation of the indoor smoking ban in California. A visual examination of this figure suggests that revenues for restaurants, non-alcohol-serving restaurants, and alcohol-serving restaurants were all trending upward prior to the establishment of the indoor smoking ban. Consequently, a question remains as to whether the observed increase in restaurant revenues during the postintervention period, as depicted in Figure 2, resulted from a preexisting upward trend in revenues. To answer this question, it was necessary to undertake an intervention analysis.

Intervention Analysis

We began the intervention analysis by constructing univariate ARIMA models for each of the three series for the 60-quarter period prior to the establishment of the indoor smoking ban. The univariate ARIMA model, which typically is developed through an iterative model-building strategy,

Figure 2
Restaurant Revenue Rates in California



accounts for the stochastic processes associated with a series (Box, Jenkins, and Reinsel 1994). There are a number of statistical assumptions that must be met when selecting an appropriate univariate ARIMA model. One important assumption is that the series have a single constant variance throughout its course. A nonstationary variance is engendered by dramatic fluctuations in variation between observations in a series. To determine whether each of the three series were stationary in variance, we consulted a rule-based expert system in the statistical software program Forecast Pro (Stellwagen and Goodrich 2000). This system, which uses a goodness-of-fit measure (Bayesian information criterion) to compare competing models, suggested that a natural logarithm transformation was not necessary to stabilize the variance of any of the three series.

It is also important that the series have a single constant level throughout its course. It is important that a series not "trend" or "drift" upward or downward over time. We examined the autocorrelation function (ACF) plots and found that in all three series, the ACF plot began with large positive values that died out very slowly at increasing lags. This pattern indicated that the three series were not stationary. We also tested for the presence of an unstable level by using the augmented Dickey-Fuller test (Dickey, Bell, and Miller 1986), which assesses whether a series has a unit

root. This test confirmed that all three series were trended and required first-order differencing. First-order differencing produced a constant error variance in all three series.

A third assumption is that the series not have any cyclical or periodic fluctuation that repeats itself each time at the same phase of the cycle or period. This repetitive variation is commonly known as seasonality. Our examination of each of the series ACFs at lags of 4, 8, 12, and 16 quarters indicated that all the series needed to be seasonally differenced.

Once the three series were determined to be stationary in variance and level, we examined each series ACF and partial ACF for autoregressive and for moving-average processes. In an autoregressive process, the current value in a series is influenced by an exponentially weighted sum of one or more previous values. That is, the effect of one or more prior observations (i.e., the order of the autoregressive parameter) on the current observation diminishes over time: $(Y_t = \phi_1 Y_{t-1} + \ldots + \phi_p Y_{t-p} + a_t)$. In contrast, each value in a moving-average process is determined by the average of the current disturbance and one or more previous disturbances. The effect of a moving-average process lasts for a finite number of periods (i.e., the order of the moving-average parameter) and then vanishes abruptly: $(Y_t = a_t - \theta_1 a_{t-1} - \ldots - \theta_a a_{t-q})$.

After constructing the univariate ARIMA models, we added the intervention term (I_t) to the ARIMA equation, which is now a noise component (N_t): $Y_t = f(I_t) + N_t$. We used the automatic ARIMA estimation in Decision Time 1.0 (SPSS Inc. 1999) to assess the impact of the indoor smoking ban on restaurant revenues. DecisionTime uses the traditional Box-Jenkins methodology to generate maximum-likelihood estimates for a standard linear regression model with an error structure that is not independently and identically distributed. The autoregressive and/or moving-average terms are included in the maximum-likelihood equation as lagged values of the response variable. We considered three different types of intervention models. First, we evaluated the possibility that restaurant revenues changed sharply (i.e., increased or decreased) after the indoor smoking ban went into effect and then remained at this new level over time $(\omega_0 I_t)$. We also considered the possibility that the indoor smoking ban had a small initial impact on business revenues that grew larger or smaller over time $((\omega_0/1-\delta_1 B)I_t)$. BMDP (1992) was used to undertake this analysis. The transfer function has two effect parameters. The intervention or omega parameter (ω) measures the degree of change in the level of each of the revenue series; the delta parameter (δ) estimates the amount of time required for these changes to be actualized. The larger the value of the delta parameter, the more gradual the impact of the indoor smoking ban on restaurant revenues. Conversely, a small delta coefficient would suggest that the effect

of the smoking ban's implementation on restaurant revenues occurred more rapidly. Finally, we tested a pulse model ($\omega_0[1 - B]I_t$). This model implies an initial abrupt increase or decrease due to the intervention, which then quickly decays, without permanently changing the mean of the series. These preliminary analyses indicated that the pulse model provided the best fit to the data for all three series.

Results

Tables 1 through 3 report the maximum-likelihood coefficients along with standard error to evaluate statistical significance. We used two-tailed tests at the .05 level of significance. All nonsignificant parameters were eliminated from the models. A Box-Ljung Q statistic (Ljung and Box 1978), which tests the null hypothesis that a set of sample autocorrelations is associated with a random process, indicated that the residuals for all of the final models were uncorrelated (i.e., constituted "white noise"). Contrary to some individuals' predictions, the findings reported in Table 1 do not lend credence to the importance of the indoor smoking ban as a factor in affecting revenues for restaurants overall. Examination of this table shows that the indoor smoking ban had relatively little impact on restaurant revenues during the period of observation.

The results reported in Table 2 also show that non-alcohol-serving restaurants in California were not affected in either the positive or negative direction by the indoor smoking ban. Somewhat surprisingly, a visual inspection of Table 3 shows that the enactment of the establishment of the indoor smoking ban initially decreased restaurant revenues slightly below that expected from preexisting trends. The intervention parameter indicated that the revenue rate for alcohol-serving restaurants decreased by approximately $38,970 per 10,000 restaurant business permits (about a 4% reduction) following the onset of the indoor smoking ban. However, after one time period, revenues for alcohol-serving restaurants returned to preexisting levels. The fitted values derived from this model also closely resemble the historical data, as shown in Figure 3. Inspection of Tables 1 through 3 also indicates that the effect of the expansion of the indoor smoking ban to include bars and casinos was trivial in magnitude and not of substantive importance in all the estimated equations.

Conclusion

At the outset of this article, we noted that although California and several other states enacted indoor smoking bans, important questions still remain

Table 1
Maximum-Likelihood Coefficients for the Restaurant Revenue Rate Equation (0, 1, 0)(0, 1, 1)

Model Parameter	Estimate	Standard Error	*t* Value
Moving average seasonal lag 1	.657	.087	7.515

Note: All variables are differenced and seasonally differenced (first order). Ljung-Box statistic (18) = 13.7 (*p* value = .688).

Table 2
Maximum-Likelihood Coefficients for the Non-Alcohol Restaurant Revenue Rate Equation (1, 1, 0)(1, 1, 1)

Model Parameter	Estimate	Standard Error	*t* Value
Autoregressive lag 1	–.231	.102	–2.266
Autoregressive seasonal lag 1	.374	.138	2.711
Moving-average seasonal lag 1	.894	.103	8.714

Note: All variables are differenced and seasonally differenced (first order). Ljung-Box statistic (18) = 10.25 (*p* value = .803).

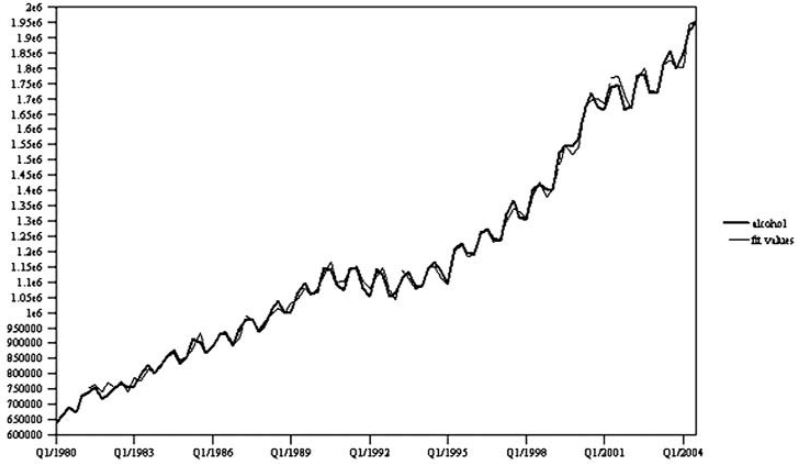
Table 3
Maximum-Likelihood Coefficients for the Alcohol Restaurant Revenue Rate Equation (0, 1, 0)(0, 1, 1)

Model Parameter	Estimate	Standard Error	*t* Value
Moving-average seasonal lag 1	.570	.093	6.099
1995 point intervention numerator lag 0	–3.897e+004	1.195e+004	–3.261

Note: All variables are differenced and seasonally differenced (first order). Ljung-Box statistic (18) = 14.37 (*p* value = .641).

unanswered regarding the effect that these bans have on restaurant revenues. We organized our study in terms of three competing hypotheses. The first two of these hypotheses debate the causal direction of the relationship between an indoor smoking ban and restaurant revenues. Some people suggest that indoor smoking bans decrease restaurant revenues, whereas others posit that restaurant revenues will rise following a ban. It is also proffered that indoor

Figure 3
Historical Data and Fit Values for Estimated Alcohol Restaurant Revenue Rate Autoregressive Integrative Moving Average Model



smoking bans have little tangible effect on restaurant revenues either way. For a variety of reasons, previous studies have found it difficult to adjudicate between these competing perspectives.

Although no single study can definitely settle this debate, the present study attempted to furnish a more accurate and timely appraisal of the relationship between the establishment of an indoor smoking ban and restaurant revenues than previously available. Using quarterly data and an ARIMA statistical procedure, we assessed whether the implementation of California's Smoke-Free Workplace Act had any statistically discernable effect on restaurant revenues. Results show that the implementation of California's indoor smoking ban had a negative but temporary impact on the revenue rate for alcohol-serving restaurants. Immediately after the indoor smoking ban went into effect, revenues for alcohol-serving restaurants declined significantly. However, this decline was short lived, and revenues for these restaurants returned to preexisting levels rather quickly. Such a finding diverges somewhat from results generated in prior research (Scollo et al. 2003). However, findings from the ARIMA analyses do not lend credence to the importance of the indoor smoking ban as a factor in determining revenues for restaurants

overall and for non-alcohol-serving restaurants. The effect of the indoor smoking ban on revenues for these types of restaurants was negligible because the coefficients for the dummy-coded intervention parameters were essentially zero.

We would be remiss to point out that although the evidence presented in this study supports the position that California's indoor smoking ban adversely affected revenues for alcohol-serving restaurants in the short term, it does not provide an explanation for this effect. In other words, why was the negative effect of the indoor smoking ban on revenues for alcohol-serving restaurants only temporary? At this preliminary stage, we can offer a few explanations that merit future exploration. One possibility is that a considerable drop in revenues for alcohol-serving restaurants was experienced immediately after the implementation of the indoor smoking ban because smokers stopped patronizing these establishments. However, as smokers became more accustomed and accepting of the ban, they might have returned to alcohol-serving restaurants.

A second intriguing possibility for our findings concerns proactive enforcement of the indoor smoking ban by police (Weber et al. 2003). Empirical research shows that the police typically become more proactive in their enforcement immediately following the onset of a new law (Mastrofski and Ritti 1992) and that this intensification in enforcement often tends to be effective in producing public adherence to the new law (Snortum 1990). However, although the police are initially successful in producing public adherence to the new law, it becomes increasingly difficult for them to maintain atypically high levels of proactive enforcement over time. This situation manifests itself because policing is labor intensive and police resources tend to be relatively inelastic in the short term (Geerken and Gove 1977). In addition, because violation of the indoor smoking ban would usually come to the attention of police officers by citizen complaints, law enforcement officials might have deemed it more expedient to redirect their efforts from proactive enforcement to calls for enforcement from citizens once the initial media attention surrounding the indoor smoking ban subsided. Thus, if smokers simply ignored the ban once proactive enforcement subsided, it is plausible that California's indoor smoking ban would show an initial negative effect on restaurant revenues that would return to normal levels. Anecdotal evidence on the aftereffects of the indoor smoking ban in California suggests that people began to smoke in restaurants once the initial hoopla surrounding the ban had subsided (CNN 1998; but also see Weber et al. 2003).

A third possibility is that alcohol-serving restaurants adapted to the indoor smoking ban by creating outdoor areas where smokers could legitimately smoke. In California, outdoor smoking areas can be created with relative

ease by restaurant owners as long as they are not within 20 feet of building entrances, exits, operable windows, and air intakes. The few restrictions placed on outdoor smoking, coupled with the relatively moderate year-round climate in California, might have motivated alcohol-serving restaurant owners to provide patrons with an outdoor smoking area to recoup lost business engendered by the indoor smoking ban.

Although the results of this study have important policy implications, it would be premature to accept them as definitive and final. It is necessary that certain questions be entertained. First, the data analyzed in this study were drawn from one large state. Although California's Smoke-Free Workplace Act provided an excellent opportunity to evaluate the effect of an indoor smoking ban on restaurant revenues, the question still remains as to whether our findings of a negative, temporary effect of the indoor smoking ban on alcohol-serving restaurant revenues would hold for other geographic locations. Consequently, it is of vital importance for researchers to replicate this study in other jurisdictions. The more frequently such research is undertaken, the greater confidence we can place in the generalizability of our findings. Another question of import relates to police enforcement of the indoor smoking ban. Do the police play a salient role in determining whether an indoor smoking ban will impact restaurant revenues? Although speculative on our part, it is entirely possible that restaurant revenues for alcohol-serving restaurants might have been reduced permanently if aggressive enforcement of the indoor smoking ban had been maintained by police. To discern such an effect, police enforcement of the indoor smoking ban would have to be monitored over an extended period of time. Such information was not available to us in the current study, but this possibility should be investigated by other researchers.

Notwithstanding these caveats, the implications of our findings for public policy are clear. When preexisting revenue trends are taken into account, California's indoor smoking ban had an initial impact on decreasing revenues for alcohol-serving restaurants. But this effect was only temporary. It would seem prudent for other investigators to identify more precisely the specific causal mechanisms responsible for this finding. Such a specification will enable us to better understand why restaurant revenues for alcohol-serving restaurants decreased for only a short period of time following the implementation of the indoor smoking ban.

Indoor smoking bans and other types of measures to reduce smoking in public places are likely to remain of interest to both policy makers and social scientists. The effect of indoor smoking bans on restaurant revenues is a salient and timely question that is often broached, with relatively little sound

empirical evidence on which to base definitive answers. This study attempted to bring additional evidence to bear on this important topic. It is anticipated that future empirical work will elaborate our findings and conclusions.

Appendix
Smoke-Free Indoor Air Legislation for Restaurants State Comparison, Quarter 1, 2005

Alabama	No restrictions
Alaska	Designated smoking areas required or allowed
Arizona	No restrictions
Arkansas	No restrictions
California	Designated smoking areas with separate ventilation
Colorado	No restrictions
Connecticut	Designated smoking areas with separate ventilation
Delaware	No smoking allowed
District of Columbia	Designated smoking areas required or allowed
Florida	No smoking allowed
Georgia	No restrictions
Hawaii	Designated smoking areas required or allowed
Idaho	No smoking allowed
Illinois	Designated smoking areas required or allowed
Indiana	No restrictions
Iowa	Designated smoking areas required or allowed
Kansas	Designated smoking areas required or allowed
Kentucky	No restrictions
Louisiana	No restrictions
Maine	No smoking allowed
Maryland	Designated smoking areas required or allowed
Massachusetts	No smoking allowed
Michigan	Designated smoking areas required or allowed
Minnesota	Designated smoking areas required or allowed
Mississippi	No restrictions
Missouri	Designated smoking areas required or allowed
Montana	Designated smoking areas required or allowed
Nebraska	Designated smoking areas required or allowed
Nevada	Designated smoking areas required or allowed
New Hampshire	Designated smoking areas required or allowed
New Jersey	No restrictions
New Mexico	No restrictions
New York	No smoking allowed
North Carolina	No restrictions

(continued)

Appendix (continued)

North Dakota	Designated smoking areas required or allowed
Ohio	No restrictions
Oklahoma	Designated smoking areas required or allowed
Oregon	Designated smoking areas required or allowed
Pennsylvania	Designated smoking areas required or allowed
Rhode Island	No smoking allowed
South Carolina	No restrictions
South Dakota	Designated smoking areas required or allowed
Tennessee	No restrictions
Texas	No restrictions
Utah	No smoking allowed
Vermont	No smoking allowed
Virginia	Designated smoking areas required or allowed
Washington	No restrictions
West Virginia	No restrictions
Wisconsin	Designated smoking areas required or allowed
Wyoming	No restrictions

Source: National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, State Tobacco Activities Tracking and Evaluation (STATE) System, State Comparison Report, Quarter 1, 2005.

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Lisa Stolzenberg is an associate professor of criminal justice at Florida International University. She received her BA in criminal justice from the University of Florida and her MS and PhD in criminology from Florida State University. Her research interests are in evaluating the impact of new laws and policies.

Stewart J. D'Alessio is an associate professor of criminal justice at Florida International University. He received his BA in history from Stetson University and his MS and PhD in criminology from Florida State University. His current research focuses on the relationship between age and crime.