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## The Impact of Smoking Bans on the Hospitality Industry: New Evidence from Stock Market Returns

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# The Impact of Smoking Bans on the Hospitality Industry: New Evidence from Stock Market Returns\*

Jonathan T. Tomlin

## Abstract

The majority of over 150 studies conclude that smoking bans do not have adverse effects on the revenues, profits, or employment of hospitality industry firms. However, several important criticisms have recently been raised which call into question many of the prior results. I examine the market value impact of a proposed smoking ban using a sample and methodology not subject to the perceived shortcomings in prior studies – an event study on the Indian hospitality industry. Contrary to the results in most prior studies, I find negative abnormal stock returns to portfolios of the hospitality industry firms examined upon the announcement of a proposed smoking ban. These results support the conclusion that a smoking ban lowered the aggregate market value of these firms.

**KEYWORDS:** smoking, smoking bans, cigarettes, hospitality, hotels

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## I. INTRODUCTION

As local and national governments worldwide continue to consider whether or not to adopt laws restricting smoking in public places, and the extent of any such restrictions, a critical issue has often been the impact of smoking bans on the local hospitality industry (Eriksen and Chaloupka, 2007). Because of the importance of this issue, over 150 studies have examined the economic effects of smoking bans on the hospitality industry by studying such metrics as sales, employment, firm value, bankruptcy, the number of establishments, or some combination of these (Fleck and Hanssen, 2008; Scollo and Lal, 2008). With a few exceptions, these studies conclude that smoking bans have no economic effects or positive economic effects on the firms studied. However, methodological shortcomings in the prior studies have been identified and the area of study has become emotionally charged (Marlow, 2008).

In this paper, I employ a method and data sample which are not subject to the primary criticisms that have been raised against prior empirical studies. I perform an event study to examine the stock market reaction of firms in the Indian hospitality industry upon the announcement that the government would introduce legislation banning smoking in public places. The event study approach measures the expected impact on profitability of firms upon the public revelation of new information to investors.

As I explain below, although it appears unlikely that an event study can be successfully performed to analyze many smoking bans, India provides a good opportunity to employ this method. Because the sample of firms used are relatively homogenous in terms of their operating characteristics and the legal restrictions they faced, the concern with aggregating heterogeneous firms, often present in prior studies, is not a concern for this sample of firms. An event study is also a well established empirical method that overcomes previous concerns about the use of sales data as it employs stock price data and measures impact on a well defined event date.

I find negative abnormal stock market returns to all portfolios of hospitality firms I examine upon the announcement of impending legislation implementing a public smoking ban.<sup>1</sup> Contrary to the findings in most prior studies, this result supports the conclusion that a proposed smoking ban lowered the expected profitability of this sample of firms.

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<sup>1</sup> I only examine the stock market returns of firms currently operating in the hospitality industry. I do not examine the stock price reaction of competing firms in other industries or potential entrants.

## **II. PREVIOUS LITERATURE**

### *A. Previous Findings*

The previous literature examining the economic impact of smoking bans on the hospitality industry is quite large. Scollo and Lal (2008) summarize over 150 studies occurring since 1988. The majority of these studies are based on sales data, employment data, or surveys and many aggregate across firms that have different operating characteristics, have been subject to differing smoking regulations, or both. Most of these studies conclude that there is no economic impact or there is a positive economic impact on the hospitality industry firms studied (mostly bars and restaurants although hotels and gaming have also been studied) (Scollo and Lal, 2008). For example, Alamar and Glantz (2004) examine the sales prices of bars and restaurants for a sample of U.S. firms. After regressing the ratio of price to sales on several explanatory variables and a “smoke free” dummy variable for their sample, they conclude that smoke free policies increase the sales price of restaurants and “smoke-free ordinances substantially increase the profitability of restaurants.” (p. 521)

The conclusion that the implementation of a public smoking ban increases the profitability of restaurants, bars, or hotels appears economically counterintuitive since these firms could have presumably always implemented such a ban on their own. It is at least conceivable, however, that a smoking ban could be unilaterally unprofitable yet jointly profitable if all firms implement such a ban, much like a price fixing cartel. However, prior studies concluding that smoking bans have a positive impact on the profitability of firms in the hospitality industry have provided no rigorous theoretical underpinnings for their results.

While the majority of studies conclude that smoking bans do not have adverse economic implications for firms in the hospitality industry, a few have shown a negative impact for particular groups of firms. Pakko (2008), for example, concludes that Delaware racetracks suffered a negative and statistically significant decline in revenues following the Delaware Clean Indoor Air Law. As another example, Dunham and Marlow (2000) utilize a survey of restaurant and bar owners to conclude that smoking bans have a differential effect across bars and restaurants and that bars and taverns are “predicted to experience adverse effects more than twice as often as restaurants.” (p. 333)

### *B. Critiques of Prior Studies*

Studies on the economic impact of smoking bans on hospitality industry firms have been performed for numerous regions (e.g., states and cities in the United States) and time periods throughout the world (Scollo and Lal, 2008). Prior

studies rely on either survey data or a time series of financial performance in order to reach their conclusions. Studies relying on survey data typically utilize surveys of hospitality industry owners or managers on the actual or expected impact of a smoking ban on their business (e.g., Dunham and Marlow, 2000; Dunham and Marlow, 2003). Within the category of research utilizing financial data, sales data has been the most frequently used outcome measure but other measures such as employment, bankruptcies, and the number of establishments have also been used (Scollo and Lal, 2008). Critiques of both types of studies have been raised and the perceived shortcomings giving rise to these critiques are inherent with the data employed. As I explain below, use of stock price data does not face these perceived shortcomings. Results from the use of stock price data are therefore not susceptible to the prior criticisms.

Critics of those studies utilizing survey data question the usefulness of data that does not directly measure the sales or profits of firms in the hospitality industry. Scollo, Lal, Hyland, and Glantz (2003) argue that the survey data employed to study smoking bans amounts to “unverifiable” predictions and is “subjective.” Glantz (2007) argues that lobbying by the tobacco industry that smoking bans adversely impact hospitality industry profitability distorts public perception and causes a downward bias in reported effects on sales from surveys. Eriksen and Chaloupka (2007) assert that business owners and managers may have a tendency to answer surveys inaccurately by blaming a smoking ban for disappointing financial performance rather than their own shortcomings.

For the alternative category of studies that rely on sales data (or other metrics such as employment), several potential problems exist which should cause one to question the conclusions reached. Many such studies do not attempt to econometrically adjust for other factors that may have impacted the economic performance of hospitality industry firms and, instead, simply compare the economic performance of hospitality industry firms facing a smoking ban with firms in another time period or region not facing such a ban (e.g., Dresser, 1999; Engelen, Farrelly, and Hyland, 2006). This approach cannot reliably assess the impact of a smoking ban on hospitality industry firms because it cannot distinguish financial changes due to smoking bans from those due to factors unrelated to a smoking ban.

Based on their study of a sample of restaurants in California, Fleck and Hanssen (2008) raise an additional specific critique of prior econometric studies using sales data to examine the effects of smoking bans in the hospitality industry. For their sample, the authors find that restaurant sales growth is associated with the adoption of local smoking bans (cities adopting smoking bans tend to have greater sales growth rates than those that do not). Thus, a failure to control properly for pre-existing sales trends can produce spurious results. Since many prior studies either do not attempt to control for trends or estimate one trend

variable for firms subject to a smoking ban and those not subject to a smoking ban, this calls into question the results of many prior studies utilizing financial data.

Additional criticisms have been raised. Dunham and Marlow (2000) argue that those studies that combine a heterogeneous sample of firms may show no net effect even though particular individual firms suffered reduced sales or profits. Additionally, it has been argued that studies relying on revenues should more appropriately rely on profits (Dunham and Marlow, 2000).

Thus, although the literature studying the effects of smoking bans on the hospitality industry is very large, important critiques have been raised which are inherent with the data used in these studies. For those studies utilizing survey data, critics have characterized the data as a “subjective” measure and question its ability to accurately measure actual sales or profits. For the alternative category of studies using a time series of financial data, the primary criticisms are a failure to account for the many potential factors impacting financial performance, inappropriately accounting for sales trends, inappropriately combining heterogeneous firms, and examining sales instead of profits.

### **III. EMPIRICAL ANALYSIS**

#### *A. Why an Event Study for Indian Firms is a Promising Approach*

An event study is a well established method which examines the impact on the stock market value of a firm or firms from an informational “event,” i.e., a revelation of new information expected to impact the future profitability of the firm or firms under study. An event study does not appear to have been employed by *any* of the over 150 studies described by Scollo and Lal. This is unfortunate because, given the proper circumstances, an event study is capable of overcoming all of the substantial criticisms levied against the prior studies.

With regard to criticisms related to the “subjective” nature of survey responses, an event study approach obviously does not rely on survey data but instead uses objective data on stock market returns. With regard to the inherent difficulties of using time series measures to properly account for trends and economic factors influencing financial performance outside of a smoking ban, an event study approach can theoretically overcome these as well. Event studies are often useful in that, given rationality in a given stock market, the expected effects of a clear event will often be immediately reflected in the stock price of a firm. In this case, the impact of an event on the expected future profits (and, therefore, current market value) of a publicly traded firm can be assessed by examining a short period of stock price changes on or surrounding an event date. This is in contrast to studying ex-post financial data which may require many months or

years of observations (MacKinley, 1997). The use of a long time series of financial data necessitates properly controlling for the variables that can importantly impact financial performance which is an inherent difficulty for all smoking ban studies using such data. The event study I perform below examines stock market impacts on a single day and therefore overcomes the need to assess trends and variables that can affect economic performance over time.<sup>2</sup>

With regard to criticisms related to aggregating disparate firms, an event study can be performed for individual firms as well as a portfolio of industry firms, allowing one to examine any potential issues related to aggregation. Finally, an event study examines market value which implies examining profitability. This avoids any perceived shortcomings of examining only sales.

Event studies are not without their own limitations, however. An important such limitation is that they require the identification of a proper “event.” In other words, they rely on the identification of a clear time period in which new information was revealed to the marketplace that had the potential of substantially impacting a firm or firms being studied. This limitation presents a hurdle that may appear difficult to overcome to study smoking bans. First, information that a particular ban will go into effect will likely already be well known to the market by the time it is implemented. One can contemplate several potential events including the date a ban is proposed and the date it is passed by a legislative body but these may also be old news to the marketplace by the time they occur. Second, publicly traded firms in the hospitality industry will typically have numerous locations spanning a large geographic area but smoking bans are often local. Thus, a local smoking ban may not have an impact on a publicly traded firm that is large enough to be detected by an event study.

The Indian hospitality industry is a promising avenue for overcoming the potential difficulties of performing an event study examining the impact of a smoking ban. Unlike in the United States and many other countries, the smoking ban proposed in India was national. In February 2001, the Indian Prime Minister’s cabinet introduced the “Cigarettes and Other Tobacco Products Bill,” which, among other things, proposed to outlaw smoking in public places including hotels, restaurants, and bars (Chaly, 2007). Cigarette smoking is not the most prevalent form of smoking in India and other tobacco products such as the “bidi” (a filterless tobacco product) are more prevalent (Chaly, 2007). The proposed bill outlawed all forms of public smoking of tobacco.

In addition, it is possible to identify a clear event date. While the impact on the market value of the hospitality industry (or individual firms) is theoretically uncertain, the expected impact on tobacco manufacturers is quite clear. *Ceteris paribus*, the expected profitability and market value of tobacco

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<sup>2</sup> As explained below, the relationship between the stock return under study and an appropriate measure of overall market returns is controlled for.

manufacturers should be reduced by a smoking ban. On February 7, 2001, Reuters reported that Indian tobacco stock prices declined from 8.0 percent to 11.7 percent “after the government said it will introduce legislation to ban smoking in public places and tobacco companies from sponsoring sporting and cultural events.” (Reuters, 2001) This sharp reaction of Indian tobacco stocks provides a prospective event date worthy of consideration.

National implementation of the Smoking and Other Tobacco Products Act did not occur until many years after the initial bill in 2001 and some have questioned the ability of the government to strongly enforce the ban. However, for appropriate use of an event study, it is the expectation of a ban that is of critical importance. The strong reaction of Indian tobacco stocks (reinforced by the event study results presented below) establish that there was an expectation of a substantial probability that a ban would be implemented and enforced, making an event study an appropriate method for examining this event. Moreover, several stories in the press at that time are consistent with an expectation that the legislation would go into effect.<sup>3</sup>

## B. *Empirical Analysis*

The first step in conducting an event study of the Indian hospitality industry is to determine whether an appropriate event date or dates exist and, if so, the proper time period of the event window. This can be determined by performing an event study of the major Indian tobacco manufacturers around the public announcement of the intent to impose a smoking ban. The three most prominent publicly traded Indian tobacco stocks are ITC, Godfrey Philips Limited, and VST Industries with ITC being the largest (e.g., Reuters, 2001). I perform an event study on these stocks using the market model with the Bombay Stock Exchange Sensex 30 as the market index. The Sensex 30 is a widely used index comprised of 30 stocks accounting for approximately a fifth of the value of the Bombay stock exchange. It has also previously been successfully employed as a market index in the event study context (Gupta and Goldar, 2005).

The following OLS regression was run for each of the three tobacco firms<sup>4</sup>:

$$(1) \quad r_{it} = \alpha_i + \beta_i r_{mt} + \gamma_i d + \varepsilon_{it}$$

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<sup>3</sup> For example, a February article in the medical publication BMJ stated that “the decision to introduce the bill...is being viewed as a signal that the government is moving to carry out longstanding pledges aimed at curbing the use of tobacco” (Mudur, 2001). A December 2001 article in the publication Business Line refers to “reservations voiced by the restaurant associations over the ban...” (Business Line, 2001).

<sup>4</sup> See, e.g., Karafiath (1988) for an explanation of the dummy variable approach to calculating abnormal returns using the market model.

Where  $r_{it}$  is the percentage daily return (with stocks priced in rupees) to firm  $i$  on date  $t$ ,  $r_{mt}$  is the percentage return on the Sensex 30 (priced in rupees) on date  $t$ ,  $d$  is a dummy variable equal to one on the event date under consideration and zero otherwise, and  $\varepsilon_{it}$  is a random disturbance assumed to be independent of the market return and  $d$ , serially uncorrelated, and distributed multivariate normal with zero mean and constant variance. The coefficient on  $d$ ,  $\gamma_i$ , measures the abnormal stock return on day  $t$ . The market model parameters were calculated over the period January 1, 2000 through January 31, 2001. With the inclusion of the return on the event day under consideration this yielded 271 total possible daily returns used for estimation. Complete daily return data was available for ITC while the number of available returns for Godfrey Philips and VST were 136 and 236, respectively.

Table 1 below shows the results. As shown, each of the three firms experienced negative and statistically significant returns (at 5% for ITC and VST and at 10% for Godfrey Philips) on February 7, 2001 but did not experience a statistically significant abnormal return in the trading days immediately preceding or following this news date. This establishes February 7, 2001 as the event date with which to examine the impact of this news on the Indian hospitality sector.

**TABLE 1**  
**Abnormal Returns to Indian Tobacco Companies**  
**(t-statistics in parentheses)**

FIRM	DATE		
	2/6/2001	2/7/2001	2/8/2001
ITC	-2.2% (-.7)	-9.1% (-3.1)	2.2% (.7)
Godfrey Philips	-6.2% (-1.5)	-7.8% (-1.9)	-2.2% (-.08)
VST	3.3% (1.0)	-7.8% (-2.4)	-2.3% (-.7)

Note: Abnormal returns calculated using the market model with the Sensex 30 as the market index and the event study parameters calculated over the period from January 1, 2000 through January 31, 2001.

I identified publicly traded firms in the hospitality sector in India by searching Bloomberg using their equity screening function under the Industry Classification Benchmarks “Hotels” and “Restaurants and Bars.” Many of these firms had limited trading data. All firms not showing a traded price on both February 6 and February 7, 2001 were excluded. Table 2 below lists the nine remaining firms. All firms operate hotels in India and, with the exception of Royale Manor HTL, also own or operate one or more restaurants and one or more bars. Table A3 in the Appendix provides a brief overview of the operations of each of the firms in the sample. As opposed to many prior studies, the sample of

firms in this study are relatively homogenous and subject to the same expected ban.

Table 2 shows the number of available daily returns for each firm in the sample from January 1, 2000 through January 31, 2001, their stock market capitalization on January 31, 2001, their stock market return on February 7, 2001, and their abnormal return with t-statistic on February 7, 2001. Table A1 in the Appendix shows additional summary statistics for the nine firms in the sample.

**TABLE 2**  
**Summary Statistics and Abnormal Returns for Sample Indian Hospitality Firms**

FIRM	Number of Available Daily Returns <sup>1</sup>	Stock Market Capitalization <sup>2</sup> (\$ millions)	Return on 2/7/2001	Abnormal Return on 2/7/2001 (t-statistic in parentheses) <sup>3</sup>
EIH Limited	270	\$242.4	-3.8%	-3.4% (-1.2)
Indian Hotels Company Limited	270	\$245.7	-4.4%	-3.9% (-1.7)
Hotel Leelaventure Limited	270	\$31.6	-2.8%	-2.2% (-.6)
Asian Hotels Limited	230	\$42.2	-4.0%	-3.9% (-1.2)
Viceroy Hotels Limited	236	N/A	-5.0%	-5.0% (-.9)
Kamat Hotels India Limited	209	\$2.6	-4.6%	-3.7% (-.9)
EIH Assoc Hotels <sup>4</sup>	73	\$4.5	-2.4%	-3.1% (-.6)
Sayaji Hotels	174	\$.8	3.7%	4.0% (.3)
Royale Manor HTL	185	\$1.3	-6.9%	-5.8% (-.5)

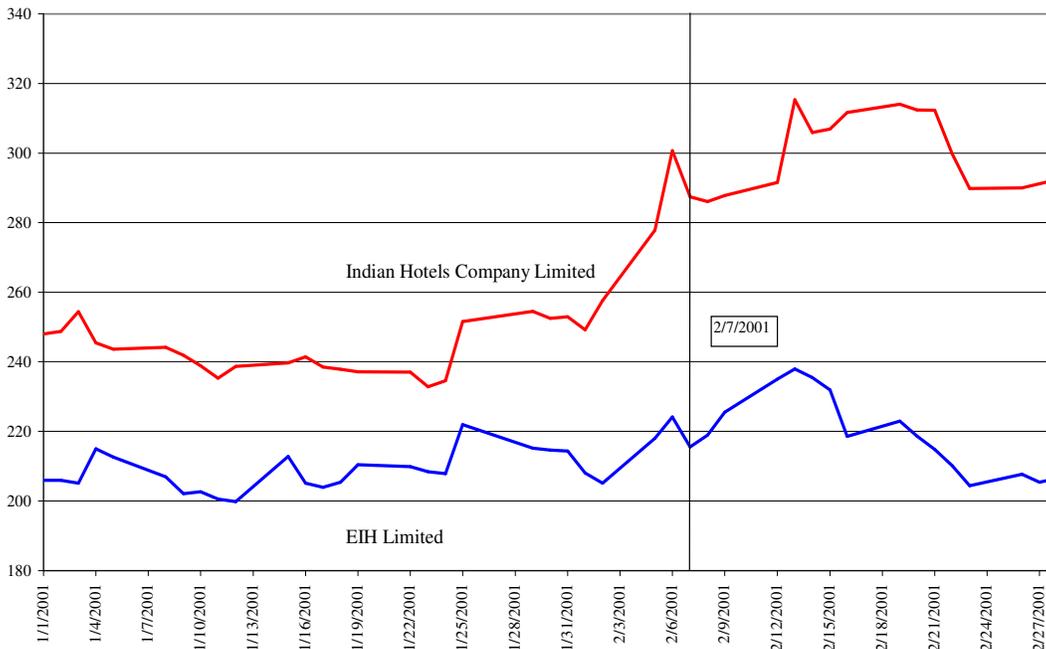
Notes:  
<sup>1</sup>Over the period January 1, 2000 through January 31, 2001. There are 270 total trading days in this period.  
<sup>2</sup>On January 31, 2001.  
<sup>3</sup>Abnormal returns calculated using the market model with the Sensex 30 as the market index and the event study parameters calculated over the period from January 1, 2000 through January 31, 2001.  
<sup>4</sup>Separately traded from EIH Limited.

Figure 1 shows the daily stock prices around the announcement of the smoking ban of the two largest firms by market capitalization in the sample, Indian Hotels Company Limited and EIH Limited. Although both stocks show a clear decline upon the announcement of the proposed smoking ban, this line graph

alone does not clearly indicate whether these declines represent substantial departures from typical daily variability in the stock prices of the firms. This is the goal of the event study approach. As shown in Table 2, the event study results show that eight of the nine firms experienced a negative abnormal return upon the announcement of an impending ban on public smoking.

**FIGURE 1**

**Daily Closing Share Prices (Rupees) of Indian Hotels Company Limited and EIH Limited**



None of the individual abnormal returns are statistically significant at conventional significance thresholds but this is not surprising given the standard deviation in daily returns of the individual firms as shown in Table A1. As shown, some of the firms in the sample have a very high standard deviation of daily returns with the standard deviation of Sayaji Hotels exceeding 12%. It is common to combine the firms under study into a portfolio. This can reduce the “noise” inherent in daily return data and lower the standard deviation of daily returns. As shown in Table A2 in the Appendix, the portfolio of firms I assemble have lower standard deviations of daily returns than those of individual firms (with one exception).

I examine six portfolios of industry firms.<sup>5</sup> As shown in Table 2, only three of the firms in the sample have price data on each day during the period in which the market model parameters are calculated and two of these three firms (EIH Limited and Indian Hotels Company Limited) have a stock market capitalization that is substantially larger than the other firms in the sample. Thus, one clearly important portfolio is comprised of the three well traded stocks with complete pricing data. On February 7, 2001 the value weighted portfolio of these three firms fell by more than 4%. This portfolio experienced a decline of this magnitude in only 3 of the 270 trading days used to estimate the market model (and only 5 out of 270 days for the equal weighted portfolio). From Table 3, the equal and value weighted returns to this portfolio of firms is -3.2% and -3.7%, respectively, and the abnormal returns to the value weighted portfolio are statistically significant at the 5% level.<sup>6</sup>

**TABLE 3**  
**Portfolio Abnormal Returns to Publicly Traded Firms in the Indian Hospitality Industry on February 7, 2001**

Portfolio <sup>1</sup>	Abnormal Return <sup>2</sup> (t-statistic)
Equal weighted portfolio of firms with complete trading data.	-3.2% (-1.5)
Value weighted portfolio of firms with complete trading data.	-3.7% (-2.1)
Equal weighted portfolio of firms with at least 200 trading days of data.	-3.8% (-2.2)
Value weighted portfolio of firms with at least 200 trading days of data.	-3.7% (-1.9)
Equal weighted portfolio of all hospitality firms.	-3.2% (-1.2)
Value weighted portfolio of all hospitality firms.	-3.4% (-1.5)
Notes: <sup>1</sup> "All" hospitality firms are all firms in Table 2 except for EIH Assoc; firms with at least 200 trading days are EIH Limited, Indian Hotels Company, Hotel Leelaventure, Asian Hotels, Viceroy Hotels, and Kamat Hotels; full data firms are EIH Limited, Indian Hotels Company and Hotel Leelaventure. <sup>2</sup> Abnormal returns calculated using the market model with the Sensex 30 as the market index and the event study parameters calculated over the period from January 1, 2000 through January 31, 2001. Value-weighted returns use stock market capitalizations on January 31, 2001 as the weights.	

<sup>5</sup> The coefficient on the Sensex 30 market index is highly statistically significant in the regressions for the portfolios of firms with all data and those with at least 200 trading days of data. It is significant at 10% and 5%, respectively, for the equal and value weighted portfolios of "all" firms. This supports the use of the Sensex 30 index in the market model.

<sup>6</sup> Returns for the value weighted portfolio were weighted by the stock market capitalization of the firms on January 31, 2001 because stock market capitalization data was not available on Bloomberg before May of 2000.

The remaining firms in the sample did not trade on all days in the estimation period. Not only does missing price data reduce the number of returns available for estimating market model parameters, the market model used to calculate abnormal returns can be misspecified for “thinly” traded stocks (Maynes and Rumsey, 1993). Moreover, as shown in Table A1, some of the firms in the sample have very low trading volume with Viceroy Hotels Limited showing only 10 traded shares on the event date. In addition to results for the portfolio of firms with complete return data, I examine abnormal returns for equal and value weighted portfolios of all firms (excluding EIH Assoc Hotels<sup>7</sup>) and those with at least 200 trading days of data.

As shown in Table 2, 7 of the 8 hospitality industry firms in the sample of “all” firms (once again, excluding EIH Assoc Hotels due to the small number of available returns) experienced a stock price that was greater than that of the market index and that exceeded 2%.<sup>8</sup> This occurred on only one other day of the 94 daily returns used to estimate abnormal returns. The equal weighted and value weighted returns for the portfolio of all firms are equal to -3.2% and -3.4%, respectively, although neither is statistically significant.

The lack of statistical significance for the portfolios of all firms is not surprising since the inclusion of firms with limited trading data reduced the number of daily returns available for estimation to 92 (from 271) and the two firms with the least amount of available data, Sayaji Hotels and Royale Manor HTL, have highly fluctuating daily returns (the standard deviation of daily returns exceeds 11% for each). Substantially more data (173 trading days) are available for calculating abnormal returns for the portfolio of six firms with at least 200 days of daily data.<sup>9</sup> As shown in Table 3, the equal weighted portfolio of firms with at least 200 trading days of data shows negative abnormal returns of -3.8% (statistically significant at 5%) and the value weighted portfolio of firms show negative abnormal returns of -3.7% (statistically significant at 10%).

In summary, 8 of the 9 publicly traded Indian hospitality industry firms with available data showed stock price declines exceeding that of the market index upon the February 7, 2001 announcement of the Cigarettes and Other Tobacco Products Bill. The only firm that did not have limited trading data and a highly fluctuating stock price with a standard deviation of daily returns exceeding 12%. All of the portfolios of firms in the Indian hospitality industry show

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<sup>7</sup> EIH Assoc Hotels has only 73 days of trading data for an average of over 3 days between trading data. This makes it a “thinly” traded stock according to the categorizations used by Maynes and Rumsey (1993) and inclusion of this firm in any of the portfolios would severely limit the returns available for estimating the market model parameters using equation (1).

<sup>8</sup> The Sensex 30 market index declined by 1.4% on February 7, 2001.

<sup>9</sup> A daily return observation was only included if all firms had a stock return available for that day. Hence, the number of trading days for the portfolio of firms is less than that available for individual firms.

negative abnormal stock returns. Moreover, the results for the equal weighted portfolio of firms with at least 200 trading days of data and the value weighted portfolio of firms with complete data are statistically significant. These results support the conclusion that an expected ban on public smoking in India reduced the market value of publicly traded firms in the hospitality industry.

#### **IV. SUMMARY**

Given that an event study does not utilize survey data or ex-post financial data, the method appears to be an obvious solution to the issues raised with many of the prior studies examining the economic impact of smoking bans on hospitality industry firms. However, an event study requires a clear “event” and a sample of publicly traded firms whose profitability would be potentially impacted substantially enough to be detected by an event study. While both requirements would appear to be difficult to meet for studying most smoking bans in the United States and across the world, they are met for the Indian hospitality industry. As shown, an event study on the Indian hospitality industry upon the announcement of the Cigarettes and Other Tobacco Products Bill supports the conclusion that a prospective ban lowered the market value of hospitality industry firms.

The finding of negative abnormal stock returns to firms upon the announcement of a law expected to place a restriction on how they operate would normally not be a surprising result. However, as noted above, over 150 studies have been performed on the issue and the majority have concluded that smoking bans either have no economic impact or a positive economic impact on the hospitality industry.<sup>10</sup> Because this study utilizes a sample and method not subject to the primary criticisms of prior research, its findings should cause one to question the prior results.

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<sup>10</sup> A proper and complete social welfare analysis of the impact of smoking bans would include more than simply analyzing their impact on the profitability of the hospitality industry. Moreover, the results for this sample of firms may not apply to hospitality firms under different bans in different time periods.

## APPENDIX

**APPENDIX TABLE A1**  
**Additional Descriptive Statistics for Sample Indian Hospitality Firms**

Firm	Average Daily Return	Standard Deviation of Daily Return	Average Daily Trading Volume	Standard Deviation of Trading Volume	Trading Volume on 2/7/2001
EIH Limited	.07%	3.00%	234,388	318,339	535,590
Indian Hotels Company Limited	-.07%	2.40%	280,037	323,228	1,308,934
Hotel Leelaventure Limited	-.05%	3.80%	67,753	76,429	111,300
Asian Hotels Limited	.00%	3.20%	2,679	18,175	228
Viceroy Hotels Limited	.36%	5.40%	6,445	11,480	10
Kamat Hotels Limited	-.32%	4.30%	2,576	3,765	200
EIH Assoc Hotels	.51%	5.00%	N/A	N/A	N/A
Sayaji Hotels	.58%	12.20%	N/A	N/A	N/A
Royale Manor HTL	.24%	11.10%	N/A	N/A	N/A

Notes: Summary statistics for the period from January 1, 2000 through January 31, 2001. No trading volume was available on Bloomberg for EIH Assoc Hotels, Sayaji Hotels, or Royale Manor HTL.

**APPENDIX TABLE A2**  
**Average and Standard Deviation of Daily Returns for Portfolios of Indian Hospitality Firms**

Portfolio	Average Daily Stock Return	Standard Deviation of Daily Return
Equal weighted portfolio of firms with complete trading data.	-.02%	2.19%
Value weighted portfolio of firms with complete trading data.	-.01%	2.11%
Equal weighted portfolio of firms with at least 200 trading days of data.	.06%	1.82%
Value weighted portfolio of firms with at least 200 trading days of data.	-.07%	2.02%
Equal weighted portfolio of all hospitality firms.	.07%	2.70%
Value weighted portfolio of all hospitality firms.	-.27%	2.25%
Notes: For the period from January 1, 2000 through January 31, 2001. Portfolio definitions are from Table 3.		

**APPENDIX TABLE A3**  
**Overview of Operations of Sample of Indian Hospitality Firms**

Firm	Overview
EIH Limited	Owns and operates luxury hotels and resorts in India under the name “Oberoi.” Some hotel locations include one or more bars and one or more restaurants.
Indian Hotels Company Limited	“Operates approximately 60 luxury, leisure, and business lodging facilities in India; it has an additional 17 locations in other countries.” (Hoovers). Some hotel locations include one or more bars and one or more restaurants.
Hotel Leelaventure Limited	Owns, operates, and manages luxury resorts and business hotels in India. Some hotel locations include one or more bars and one or more restaurants.
Asian Hotels Limited	Operated the Hyatt Regency in Delhi in India at the time of the announced smoking ban in 2001. Added two additional hotels in India in 2003. All three hotels include at least one bar and one restaurant.
Viceroy Hotels Limited	Develops hotels and restaurants in the city of Hyderabad in India.
Kamat Hotels India Limited	Operates a chain of hotels and restaurants in India. Has “interests in family leisure and sports clubs.”
EIH Assoc Hotels	Part of the Oberoi Group of hotels. Owned two hotel properties in India before 2008 (and added six additional in 2008).
Sayaji Hotels	Owns and operates hotels in India
Royale Manor HTL	Owns and operates a hotel in the city of Ahmedabad in India.
Note: Compiled from Bloomberg, Hoovers, websites of the individual companies, and business related websites such as businessweek.com.	

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