

The Economic Impact of Florida's Smoke-free Workplace Law

June 25, 2004

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I. Introduction

On November 5, 2002, Florida voters amended Article X, Section 20, of the Florida Constitution by barring tobacco smoke in most enclosed indoor workplaces.¹ This amendment took effect January 7, 2003, and the Legislature subsequently amended the Florida Clean Indoor Air Act to reflect its provisions. Full implementation and enforcement of the Florida Clean Indoor Air Act took effect on July 1, 2003.

The Florida Clean Indoor Air Act prohibits smoking in indoor working places such places as restaurants, hotel lobbies, bars for which more than ten percent of gross revenue is derived from sales of food, and bars and restaurants having an open connection to one another. Places such as stand-alone bars, restaurants' open outdoor patios, hotel guest rooms designated as smoking, and designated lounges in airports for international travelers are exempt from the smoke-free law. Employers in violation of the smoke-free law risk a civil penalty of no less than \$250 and no more than \$750 for the first violation. Every subsequent violation results in a civil penalty of no less than \$500 and no more than \$2,000. The individual smokers violating the smoke-free law also will be fined up to \$100 for the first violation and up to \$500 for each subsequent violation.

The objective of this study is to assess the economic impact of Florida's smoke-free workplace law on hotels, restaurants and tourism. In particular, the study evaluates the effect of the smoke-free workplace law on sales of restaurants and bars and on employment levels in the leisure and hospitality industry.

¹ Amendment Six, entitled "Protect People from the Health Hazards of Second-hand Tobacco Smoke by Prohibiting Workplace Smoking."

II. Methods

1. Data

Data on gross sales reported for six percent sales and use taxes, by county and by kind of business, were obtained from Florida Department of Revenue. The data covers the period from January 1990 through April 2004, for all sixty seven counties in Florida. For the purpose of this study, they were aggregated to fourteen metropolitan statistical areas (MSAs), as defined by the U.S. Census Bureau. Table 1 - Table 3, respectively, show the annual gross sales at restaurants, lunchrooms and catering services; those at taverns, night clubs, bars and liquor stores; and those from recreational admissions for state of Florida and for fourteen MSAs for calendar years 1999 to 2003.²

Table 1
Annual Gross Sales at Restaurants, Lunchrooms and Catering Services 1999-2003
(in millions)

| MSA | 1999 | 2000 | 2001 | 2002 | 2003 |
|------------------|-------------|-------------|-------------|-------------|-------------|
| Daytona Beach | \$604.6 | \$566.3 | \$553.7 | \$580.6 | \$623.1 |
| Ft Lauderdale | \$1,895.8 | \$2,136.8 | \$2,152.5 | \$2,202.1 | \$2,451.2 |
| Ft Myers | \$543.2 | \$592.7 | \$647.7 | \$675.2 | \$747.3 |
| Gainesville | \$297.8 | \$310.7 | \$322.7 | \$333.6 | \$343.1 |
| Jacksonville | \$1,358.3 | \$1,413.7 | \$1,563.5 | \$1,534.8 | \$1,593.1 |
| Lakeland | \$416.0 | \$423.1 | \$420.8 | \$448.3 | \$446.8 |
| Melbourne | \$517.5 | \$494.0 | \$507.5 | \$536.7 | \$537.5 |
| Miami | \$2,416.2 | \$2,707.1 | \$2,945.9 | \$2,868.5 | \$3,227.9 |
| Orlando | \$2,801.8 | \$2,987.2 | \$3,088.6 | \$3,282.0 | \$3,467.1 |
| Pensacola | \$380.4 | \$393.1 | \$410.8 | \$452.2 | \$457.0 |
| Sarasota | \$715.8 | \$810.6 | \$827.7 | \$838.8 | \$851.3 |
| Tallahassee | \$328.0 | \$349.9 | \$364.1 | \$390.0 | \$391.2 |
| Tampa | \$3,691.7 | \$2,713.3 | \$2,864.0 | \$3,073.6 | \$3,010.6 |
| West Palm Beach | \$1,486.0 | \$1,660.3 | \$1,779.4 | \$1,798.0 | \$2,040.7 |
| State of Florida | \$21,696.0 | \$22,167.8 | \$23,238.1 | \$24,162.4 | \$25,501.5 |

² The business classification code is 08 for restaurants, lunchrooms, and catering services; 09 for taverns, night clubs, bars, and liquor stores; 59 for admissions to recreational facilities (theaters, rides, pool rooms, dances, ball games, etc.); and 100 for total retail sales.

Table 2
Annual Gross Sales at Taverns, Night Clubs, Bars and Liquor Stores for 1999-2003
(in millions)

| MSA | 1999 | 2000 | 2001 | 2002 | 2003 |
|------------------|-------------|-------------|-------------|-------------|-------------|
| Daytona Beach | \$76.4 | \$76.2 | \$80.9 | \$82.7 | \$82.3 |
| Ft Lauderdale | \$215.8 | \$223.7 | \$230.1 | \$226.4 | \$220.3 |
| Ft Myers | \$103.9 | \$110.1 | \$118.8 | \$121.2 | \$117.6 |
| Gainesville | \$31.1 | \$33.1 | \$39.9 | \$40.1 | \$40.7 |
| Jacksonville | \$153.2 | \$158.4 | \$170.1 | \$169.1 | \$171.0 |
| Lakeland | \$42.1 | \$71.6 | \$42.8 | \$37.8 | \$39.2 |
| Melbourne | \$69.0 | \$71.0 | \$78.0 | \$76.2 | \$74.1 |
| Miami | \$235.0 | \$261.7 | \$273.1 | \$325.0 | \$323.3 |
| Orlando | \$223.1 | \$247.0 | \$325.4 | \$252.2 | \$264.5 |
| Pensacola | \$92.9 | \$70.1 | \$96.8 | \$98.9 | \$64.2 |
| Sarasota | \$111.9 | \$118.1 | \$117.1 | \$96.9 | \$97.9 |
| Tallahassee | \$41.6 | \$38.5 | \$42.8 | \$48.6 | \$51.0 |
| Tampa | \$449.3 | \$370.9 | \$389.1 | \$397.4 | \$383.5 |
| West Palm Beach | \$176.0 | \$191.3 | \$194.6 | \$197.9 | \$194.3 |
| State of Florida | \$2,722.7 | \$2,773.3 | \$2,973.7 | \$2,942.1 | \$2,853.9 |

Table 3
Annual Gross Sales from Admissions for 1999-2003
(in millions)

| MSA | 1999 | 2000 | 2001 | 2002 | 2003 |
|------------------|-------------|-------------|-------------|-------------|-------------|
| Daytona Beach | \$78.8 | \$83.6 | \$82.8 | \$97.3 | \$110.0 |
| Ft Lauderdale | \$289.2 | \$309.2 | \$309.3 | \$327.2 | \$297.8 |
| Ft Myers | \$108.7 | \$126.1 | \$137.3 | \$150.2 | \$166.7 |
| Gainesville | \$22.5 | \$23.5 | \$21.9 | \$25.5 | \$27.9 |
| Jacksonville | \$210.7 | \$209.8 | \$218.4 | \$225.2 | \$246.6 |
| Lakeland | \$66.2 | \$68.1 | \$63.5 | \$64.4 | \$64.6 |
| Melbourne | \$53.0 | \$47.7 | \$47.8 | \$56.6 | \$57.5 |
| Miami | \$338.7 | \$390.2 | \$376.8 | \$417.8 | \$460.5 |
| Orlando | \$2,668.0 | \$3,029.8 | \$2,892.0 | \$2,596.2 | \$2,871.8 |
| Pensacola | \$37.2 | \$37.9 | \$36.9 | \$36.9 | \$38.1 |
| Sarasota | \$106.8 | \$121.0 | \$125.4 | \$131.6 | \$134.9 |
| Tallahassee | \$32.6 | \$36.3 | \$32.4 | \$33.3 | \$34.0 |
| Tampa | \$621.4 | \$651.2 | \$869.5 | \$732.3 | \$758.2 |
| West Palm Beach | \$332.9 | \$385.5 | \$406.8 | \$412.1 | \$432.5 |
| State of Florida | \$5,784.2 | \$6,430.6 | \$6,569.9 | \$6,326.8 | \$6,780.1 |

Data on employment by MSA and by industry were obtained from the Current Employment Statistics (CES) provided by Florida's Agency for Workforce Innovation from January 1993 through March 2004. The CES are generated through an annual benchmark and monthly sample link procedure. Annual universe counts or benchmark levels are generated primarily from administrative records on employees covered by unemployment insurance tax laws. These annual benchmarks established for March of each year are projected forward for each subsequent month based on the trend of the sample employment. Florida estimates are derived from a sample of approximately 16,000 business establishments.³

Employment data in leisure and hospitality industry are available for fourteen MSAs, but employment data for accommodation and food services are available only for the following MSAs: Ft Lauderdale, Jacksonville, Miami, Orlando, Tampa-St. Petersburg-Clearwater, West Palm Beach-Boca Raton. These six MSAs, however, account for almost seventy percent of the total nonagricultural employment in the state of Florida. Table 4 and Table 5, respectively, show the average monthly employment in leisure and hospitality industry and in accommodation and food services for state of Florida and for the aforementioned MSAs from 1999 to 2003.

³ The classification code for the leisure and hospitality industry is 70000000; the classification code for accommodation and food services is 70720000; the classification code for accommodation only is 70721000; and the classification code for drinking and eating places only is 70721000.

Table 4
Average Monthly Employment in the Leisure and Hospitality Industry for 1999-2003 (in thousands)

| Areas | 1999 | 2000 | 2001 | 2002 | 2003 |
|------------------|-------|-------|-------|-------|-------|
| Daytona Beach | 20.4 | 20.9 | 21.1 | 21.5 | 21.6 |
| Ft Lauderdale | 67.3 | 69.4 | 71.7 | 72.4 | 73.8 |
| Ft Myers | 18.8 | 20.5 | 21.4 | 22.6 | 23.2 |
| Gainesville | 11.6 | 11.6 | 12.1 | 11.9 | 11.6 |
| Jacksonville | 48.7 | 49.8 | 50.7 | 52.1 | 52.1 |
| Lakeland | 14.4 | 14.9 | 15.1 | 15.8 | 15.6 |
| Melbourne | 18.2 | 18.1 | 18.6 | 18.6 | 18.6 |
| Miami | 89.2 | 92.4 | 94.6 | 90.4 | 92.1 |
| Orlando | 176.9 | 177.0 | 170.6 | 165.0 | 169.9 |
| Pensacola | 14.7 | 14.1 | 15.7 | 15.7 | 16.0 |
| Sarasota | 25.4 | 26.4 | 27.0 | 27.8 | 28.6 |
| Tallahassee | 11.6 | 11.5 | 12.4 | 12.7 | 13.1 |
| Tampa | 100.1 | 103.1 | 105.6 | 106.9 | 108.1 |
| West Palm Beach | 53.9 | 56.5 | 59.7 | 60.6 | 60.6 |
| State of Florida | 757.6 | 772.9 | 794.1 | 797.4 | 808.5 |

Table 5
Average Monthly Employment in Accommodation and Food Services for 1999-2003 (in thousands)

| Areas | 1999 | 2000 | 2001 | 2002 | 2003 |
|------------------|-------|-------|-------|-------|-------|
| Ft Lauderdale | 56.4 | 58.5 | 61.3 | 61.9 | 63.1 |
| Jacksonville | 42.1 | 42.6 | 44.4 | 45.5 | 45.8 |
| Miami | 77.2 | 80.3 | 82.3 | 79.0 | 80.8 |
| Orlando | 115.0 | 113.5 | 109.3 | 107.6 | 111.9 |
| Tampa | 83.9 | 87.2 | 87.6 | 89.1 | 89.3 |
| West Palm Beach | 41.6 | 42.8 | 46.1 | 46.9 | 47.4 |
| State of Florida | 606.6 | 614.3 | 631.3 | 637.3 | 651.3 |

2. Econometric Method

This study employed multivariate regression analysis to estimate the impact of Florida's smoke-free workplace law on sales and employment levels of Florida's leisure and hospitality industry. The study used a fixed effect panel data framework in which

data of fourteen MSAs in Florida were pooled. A fixed effect variable for each MSA is used to control for area-specific factors affecting sales and employment levels in leisure and hospitality industry for each MSA that do not vary significantly over time such as the number of tourist destinations. By pooling the data of the fourteen MSAs, the study assumes the percentage impact of the smoke-free law is the same across MSAs.

3. Dependent Variables

The outcome measures are monthly gross sales of restaurants, lunchrooms and catering services, monthly gross sales of taverns, night clubs, bars and liquor stores, and those of recreational admissions, and monthly employment levels in the leisure and hospitality in each MSA. To control for changes in population and income growth, inflation, and changes in underlying economic conditions, the study used the fraction of gross sales from restaurants, bars, and admissions, and the fraction of employment level in leisure and hospitality industry. The fractions were computed – for each MSA i and period j – as follows:

$$S_{ij}^R = \frac{\text{Sales from Restaurants, Lunching Rooms, Catering Services}}{\text{Total Retail Sales}};$$

$$S_{ij}^T = \frac{\text{Sales from Taverns, Night Clubs, Bars, Liquor Stores}}{\text{Total Retail Sales}};$$

$$S_{ij}^{Ad} = \frac{\text{Sales from Admissions}}{\text{Total Retail Sales}};$$

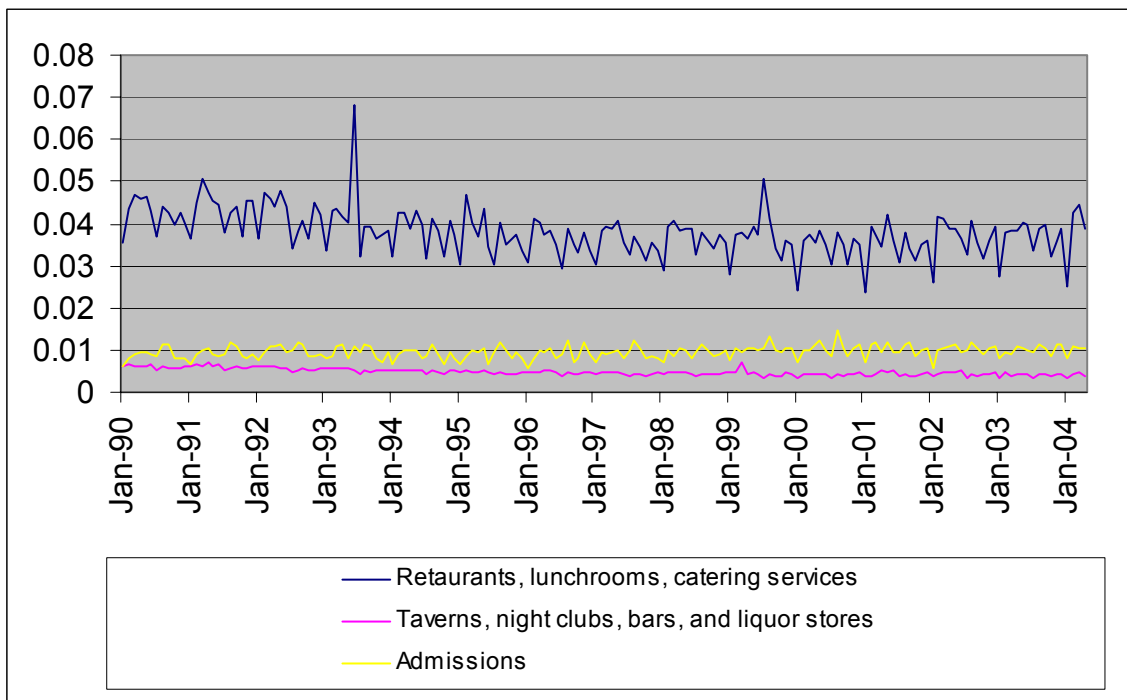
$$E_{ij}^L = \frac{\text{Employment in Leisure and Hospitality}}{\text{Total Employment Level}};$$

$$E_{ij}^{Ac} = \frac{\text{Employment in Accommodations}}{\text{Total Employment Level}};$$

and $E_{ij}^D = \frac{\text{Employment in Drinking and Eating Places}}{\text{Total Employment Level}}.$

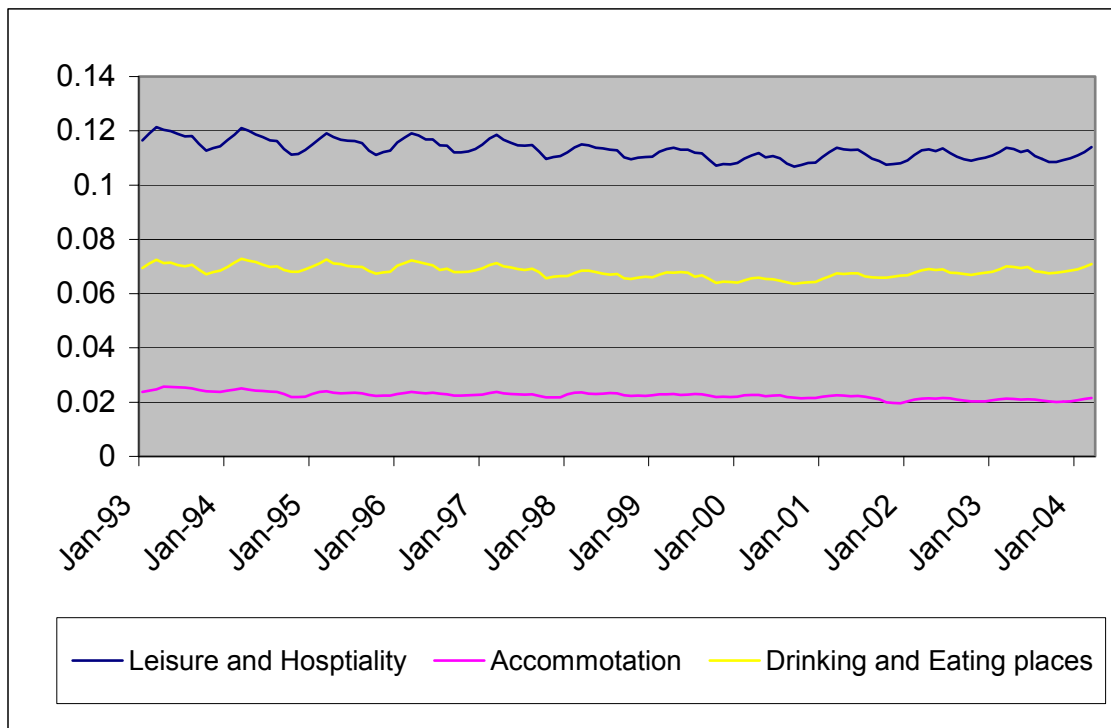
Figure 1 presents as fractions of the total retail sales the statewide gross sales of restaurants, lunchrooms, catering services; those of taverns, night clubs, bars, liquor stores; and those from admission, respectively. The employment in the leisure and hospitality industry, the employment in the accommodation industry, and the employment in drinking and eating places, respectively, as a fraction of the total nonagricultural employment are presented in Figure 2 for the state of Florida. None shows any obvious changes after the smoke-free law took effect.

Figure 1
The sales, by relevant industry, as a fraction of the total retail sales for Florida.



The absolute impact of the smoke-free law may not be the same for all MSAs. It may be greater in MSAs where the employment in and sales from the leisure and hospitality industry constitute a larger share of the MSA's total employment and retail sales. To illustrate our point, suppose sales from restaurants account for 10% of the total retail sales in MSA X but 1% of the total retail sales in MSA Y. If the smoke-free law reduces each restaurant's business by 10%, the fraction of sales from restaurants in X will drop to about 9% of the MSA's total retail sales while the fraction of sales from restaurants in Y will drop to about 0.9% of the MSA's total retail sales. Apparently, the absolute impact of the smoke-free law on the fraction of sales from restaurants is larger in X compared to that in Y. To address this issue, the study used the natural logarithm of the above variables as independent variables. By doing so, the study estimated the percentage

Figure 2.
Employment, by relevant industry, as a fraction of the total nonagricultural employment in Florida.



impact, instead of the absolute impact, for MSAs of the smoke-free law on gross sales and employment levels of the leisure and hospitality industry as a fraction of the total retail sales and a fraction of the total nonagricultural employment, respectively.

4. Independent Variables

The primary variable of interest was a dummy variable called LAW_j which was designed to capture the effect of the smoke-free law. The study assigned to LAW_j the value 1 for all months starting with July 2003 when the smoke-free law took effect, and zero for all the months before July 2003. The coefficient of LAW_j is expected to be negative, zero, or positive as the smoke-free law reduces, has no effect, or increases the employment levels or sales of the leisure and hospitality industry. This coefficient represents the average percentage impact of the smoke-free law across Florida's MSAs.

The fixed effect model in this study uses a dummy variable MSA_i for each MSA to control for the influence of MSA specific factors that do not vary over time, where MSA_i equals 1 for the i^{th} MSA and zero for all the other MSAs. General economic trends in each MSA were accounted for by including a time variable for each MSA, which is equal to the calendar year of the data. This study also includes a dummy variable $MONTH_n$ to control for seasonal influences on the employment levels and sales of the leisure and hospitality industry. $MONTH_n$ equals 1 for month n and zero for all the other months. With these variables, we use equation (1) to estimate the natural logarithms of $S_{ij}^R, S_{ij}^T, E_{ij}^L, E_{ij}^D$.

$$\ln M_{ij} = \beta_0 + \beta_1 LAW_j + \sum_{k=2}^{17} \beta_k \times MSA_i + \beta_{68} \sum_{k=18}^{33} \beta_k \times MSA_i \times YEAR + \sum_{k=2}^{16} \beta_k \times MONTH_n + \varepsilon \quad (1)$$

where j is an index of the time period, i is an index of MSAs ($k = 1, 2, \dots, 16$), and $\ln M_{ij}$ represents the natural logarithms of the dependent variables) for the i^{th} MSA at time period j . The β terms are the coefficients to be estimated, while the term ε represents random error. The statewide percentage monthly impact of the smoke-free law (denoted as $\% \Delta M$) can be calculated using the following formula: $\% \Delta M = (e^{\beta_1} - 1) \times 100\%$. Furthermore, the absolute monthly impact of the smoke-free law on a specific MSA i (denoted as ΔM_i) can be recovered using the following formula: $\Delta M_i = (e^{\beta_1} - 1) \times M_i$.

The terrorist attack on September 11th, 2001 has had a negative impact on the accommodation and tourism industries throughout the nation, perhaps especially in Florida. To account for this effect, equation (2) is used to estimate the effect of the smoke-free law on the gross sales of recreational admissions and the employment levels of the accommodation industry.

$$\ln H_{ij} = \beta_0 + \beta_1 LAW_j + \sum_{k=2}^{17} \beta_k \times MSA_i + \beta_{68} \sum_{k=18}^{33} \beta_k \times MSA_i \times YEAR + \sum_{k=34}^{45} \beta_k \times MONTH_n + \beta_{46} SEP11_j + \varepsilon$$

Let $\ln H_{ij}$ represents the natural logarithms of the dependent variables (S_{ij}^{Ad} and E_{ij}^{Ac}) for the i^{th} MSA at time period j . The dummy variable $SEP11_j$ is one for all the time periods after September 2001 and zero for all the other time periods. Both the percentage impact and absolute impact of the smoke-free law can be recovered from β_1 using formulas as presented earlier. Table 6 summarizes the variables used in these two equations.

Table 6
Regression Variables

| Variable | Definition |
|---------------|--|
| S_{ij}^R | The fraction of retail sales from restaurants, lunching rooms and catering services for the i^{th} MSA at time period j . |
| S_{ij}^T | The fraction of retail sales from taverns, night clubs, bars and liquor stores for the i^{th} MSA at time period j . |
| S_{ij}^{Ad} | The fraction of retail sales from admissions for the i^{th} MSA at time period j . |
| E_{ij}^L | The fraction of employment of the leisure and hospitality industry for the i^{th} MSA at time period j . |
| E_{ij}^{Ac} | The fraction of employment of the accommodation industry for the i^{th} MSA at time period j . |
| E_{ij}^D | The fraction of employment of drinking and eating places for the i^{th} MSA at time period j . |
| LAW_j | A dummy variable equals 1 for all the time period that the smoke-free law is in effect, and 0 for all the other time periods. |
| MSA_i | A dummy variable equals 1 for the i^{th} MSA and 0 for all the other MSAs, where $i = 1, \dots, 16$ |
| YEAR | A variable indicating the calendar year |
| $MONTH_n$ | A dummy variable equals 1 for month n , and 0 for all the other month. |
| $SEP11_j$ | A dummy variable equals 1 for all the time periods after September 2001 and is zero for all the other time periods |

III. Results

Tables 7 and 8 present results of the multivariate analysis, with the t-statistics in parentheses. A shaded cell indicates the correspondent variable is significant at least at the 0.05 level, i.e., we are at least 95% confident that the correspondent variable has an effect on the dependent variable. The regression equations are highly significant based upon the F-test,⁴ indicating the specified functional forms perform well in describing the relationship between the dependent variable and the independent variables on the left-

⁴ Where the F-test, here denoted by Prob > F, presents the probability that, given the F-statistic (omitted), the regression is statistically insignificant.

hand side of each equation. Additionally, the adjusted R^2 's indicate that the regression models are able to explain from 74% to 99% of the variation of the dependent variables.⁵

Table 7 summarizes the results for gross sales of restaurants, lunching rooms, and catering services as a fraction of the total retail sales (S_{ij}^R), gross sales of taverns, night clubs, bars, and liquor stores (S_{ij}^T), and gross sales from admissions as a fraction of total retail sales (S_{ij}^{Ad}). The coefficient of LAW in the first regression is 0.0711, which indicates that the fraction of the retail sales after the smoke-free law by restaurants, lunching room, and catering services increased by 7.37 percent, where the percentage increase is determined as follows: $(e^{-0.0711} - 1) \times 100\% = 7.37\%$.⁶ This increase is highly statistically significant, as is evident by the large t-statistic. Although the results show that the fraction of the retail sales by taverns, night clubs, bars, and liquor stores, and the fraction of retail sales from admission also increased after the smoke-free law took effect, these increases are not statistically significant.

⁵ Where adjusted R^2 captures the explanatory power of a regression, and the percentage of the dependent variable's variation explained equals $R^2 \times 100$

⁶ Please note that the percentage changes for all outcome measures are recovered in likewise manners.

Table 7
Regression Results of Retail Sales

| | $\ln S_{ij}^R$ | $\ln S_{ij}^T$ | $\ln S_{ij}^{Ad}$ |
|---------------------|-------------------|--------------------|--------------------|
| LAW | 0.0711 (5.76) | 0.0074 (0.42) | 0.0139 (0.59) |
| SEP11 | -- | -- | -0.0010 (-0.06) |
| MONTH ₂ | 0.2488 (19.8) | 0.0119 (0.66) | 0.2803 (12.59) |
| MONTH ₃ | 0.2728 (21.71) | 0.0058 (0.32) | 0.2628 (11.8) |
| MONTH ₄ | 0.2550 (20.29) | 0.0440 (2.42) | 0.2597 (11.67) |
| MONTH ₅ | 0.2622 (20.47) | 0.0012 (0.07) | 0.1706 (7.52) |
| MONTH ₆ | 0.1940 (15.14) | -0.0111 (-0.6) | 0.0427 (1.88) |
| MONTH ₇ | 0.0583 (4.56) | -0.1751 (-9.47) | 0.0377 (1.66) |
| MONTH ₈ | 0.1920 (15.01) | -0.0778 (-4.21) | 0.1752 (7.73) |
| MONTH ₉ | 0.1388 (10.85) | -0.1053 (-5.7) | 0.0643 (2.83) |
| MONTH ₁₀ | 0.0993 (7.76) | -0.0786 (-4.26) | 0.0384 (1.69) |
| MONTH ₁₁ | 0.1898 (14.84) | -0.0605 (-3.28) | 0.1426 (6.29) |
| MONTH ₁₂ | 0.1619 (12.66) | -0.0073 (-0.4) | 0.1911 (8.42) |
| Prob > F | 0.000 | 0.000 | 0.000 |
| Adjusted R^2 | 0.7379 | 0.7631 | 0.8493 |

Table 8 summarizes the results for the employment in the leisure and hospitality industry, the employment in the accommodation, and the employment in drinking and eating places, respectively, as a fraction of the total nonagricultural employment (E_{ij}^L ,

E_{ij}^D , and E_{ij}^{Ac} , respectively). The results indicate that the fraction of the employment in the leisure and hospitality industry went up by 1.98% after the smoke-free law took effect. This increase is very significant statistically. The fraction of the employment in drinking and eating places rose by 4.53% after the smoke-free law took place, and this increase is also highly significant. The results also show that the fraction of the employment in accommodation went down by 0.8% after the smoke-free law took effect, however, this decrease is not statistically significant.

Note the September 11th event did have a statistically significant negative effect on employment in accommodation. However, the effect of the September 11th event on sales from recreational admissions is not statistically significant. The regression results for the MONTH dummies show that there are significant seasonal effects in the leisure and hospitality industry in Florida, and the seasons do not coincide with the calendar quarters. This cautions against simply using calendar quarters to characterize the seasons for the leisure and hospitality industry as done in some of the previous studies on the economic impact of smoking regulations

Table 8
Regression Results of Employment

| | $\ln E_{ij}^L$ | $\ln E_{ij}^{Ac}$ | $\ln E_{ij}^D$ |
|---------------------|--------------------|--------------------|--------------------|
| LAW | 0.0200 (5.34) | -0.0080 (-1.03) | 0.0453 (8.14) |
| SEP11 | -- -- | -0.0169 (-2.81) | -- -- |
| MONTH ₂ | 0.0167 (4.23) | 0.0194 (2.48) | 0.0132 (2.25) |
| MONTH ₃ | 0.0310 (7.85) | 0.0260 (3.32) | 0.0248 (4.22) |
| MONTH ₄ | 0.0274 (6.76) | 0.0206 (2.57) | 0.0158 (2.61) |
| MONTH ₅ | 0.0180 (4.45) | 0.0122 (1.52) | 0.0174 (2.89) |
| MONTH ₆ | 0.0151 (3.72) | 0.0126 (1.58) | 0.0109 (1.8) |
| MONTH ₇ | 0.0022 (0.54) | 0.0113 (1.41) | -0.0107 (-1.79) |
| MONTH ₈ | -0.0019 (-0.47) | 0.0008 (0.1) | -0.0065 (-1.08) |
| MONTH ₉ | -0.0152 (-3.77) | -0.0147 (-1.83) | -0.0189 (-3.14) |
| MONTH ₁₀ | -0.0228 (-5.65) | -0.0226 (-2.82) | -0.0262 (-4.35) |
| MONTH ₁₁ | -0.0144 (-3.57) | -0.0220 (-2.74) | -0.0178 (-2.96) |
| MONTH ₁₂ | -0.0120 (-2.98) | -0.0215 (-2.69) | -0.0104 (-1.72) |
| Prob > F | 0.000 | 0.000 | 0.000 |
| Adjusted R^2 | 0.9755 | 0.9927 | 0.8918 |

Table 9 summarizes the estimated coefficient of the LAW variable in each of the six regressions and its 95% confidence interval. The 95% confidence interval defines the range where we are 95% confident about the true value of the coefficient lies.

Coefficients whose confidence intervals including 0 (the number zero) are said to be not statistically significant at the given confidence level.

Table 9
Coefficient and Confidence Intervals of LAW
for Each Outcome Measure

| Outcome Measure | LAW | 95% Confidence Interval |
|-------------------|---------|-------------------------|
| $\ln S_{ij}^R$ | 0.0711 | [0.0469, 0.0953] |
| $\ln S_{ij}^T$ | 0.0074 | [-0.0275, 0.0423] |
| $\ln S_{ij}^{Ad}$ | 0.0138 | [-0.0325, 0.0602] |
| $\ln E_{ij}^L$ | 0.0200 | [0.0127, 0.0273] |
| $\ln E_{ij}^{Ac}$ | -0.0080 | [-0.0233, 0.0072] |
| $\ln E_{ij}^D$ | 0.0453 | [0.0344, 0.0563] |

IV. Discussion

This study examined gross sales and employment levels in Florida’s leisure and hospitality industry before and after Florida’s smoke-free workplace law took effect. We could not find a significant negative effect of the smoke-free law on sales and employment in the leisure and hospitality industry in Florida. Among the six measures of gross sales and employment levels studied, we found that the fraction of retail sales from restaurants, lunchrooms and catering services, the faction of the employment in drinking and eating places, and the fraction of the employment in leisure and hospitality industry as a whole went up after the smoke-free law took effect. The fraction of retail sales from taverns, night clubs, bars and liquor stores, the fraction of retail sales from recreational admissions, and the fraction of employment in accommodation have no significant changes.

This study analyzed separately sales data for restaurants, lunchrooms and catering services as one group, and taverns, night clubs and bars as another group, thus addressing a concern previous studies had using sales data of all eating and drinking places as a whole: If there is a migration of dining from restaurants to taverns and bars where smoking is still allowed under the smoke-free law, analysis using sales data of all eating and drinking places as a whole cannot detect any effect even if there is a sales reduction restaurants and a sales increase in taverns and bars. Results of this study show that, while the fraction of the sales of restaurants, lunchrooms and catering services went up after the smoke-free law took effect, there is no significant change in the fraction of sales of taverns, night clubs, and bars.

As in the case with many other studies, the analysis has limitations worth mentioning. One is the limited data for periods after the smoke-free law took effect. With our best effort, sales data were obtained up to April 2004 and employment data were obtained up to March 2004. With nine to ten month of data after the smoke-free law took effect, impacts from other random events that simultaneously affected the leisure and hospitality industry across Florida may not be accounted for. Furthermore, the study did not verify the enforcement of the smoke-free law. If the smoke-free law is not strictly enforced, its effect on the leisure and hospitality industry may not be apparent or might be significantly reduced. When feasible, future studies should include longer data series for periods after the smoke-free law and information on the compliance and enforcement of the smoke-free law.