

## BRIEF REPORT

## Smoke-free law did not affect revenue from gaming in Delaware

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**Objective:** To determine the effect of the Delaware smoke-free law on gaming revenue.

**Methods:** Linear regression of gaming revenue and average revenue per machine on a public policy variable, time, while controlling for economic activity and seasonal effects.

**Results:** The linear regression showed that the smoke-free law was associated with no effect on total revenue or average revenue per machine.

**Conclusion:** Smoke-free laws are associated with no change in gaming revenue.

Smoke-free policies reduce cigarette consumption,<sup>1</sup> which translates into lost tobacco industry revenue. Because of its lack of public credibility, the tobacco industry has used its allies in the hospitality industry, including the gaming industry,<sup>2</sup> to act as surrogates in the fight against smoke-free workplaces.<sup>3</sup> Despite the claims of the tobacco industry and its allies in the hospitality industry,<sup>3</sup> it has been shown that smoke-free ordinances have no effect or a positive effect on restaurant and bar revenues,<sup>4</sup> bingo revenue,<sup>5</sup> and restaurant values.<sup>6</sup>

In response, opponents of smoke-free workplaces have claimed that smoke-free laws still negatively affect gaming revenue. In 2003, the gaming industry in Delaware was continuing to blame the November 2002 Delaware Clean Indoor Air Law for reduced revenue and layoffs.<sup>7–8</sup> In May 2003, a gaming executive from Park Place Entertainment, which operates gaming facilities in Delaware (Dover Downs) and New Jersey, testified against a proposed smoke-free law at a New Jersey State Senate Health Committee hearing. The executive claimed that the Delaware Clean Indoor Act had a negative effect on gaming revenue and that her concerns for New Jersey were “supported by the results that happened in Delaware”.<sup>9</sup> The executive claimed that Dover Downs, a racino that includes video slot machines and horse racing, had experienced a 25% drop in revenue and already reduced its staff by 100 workers since the Clean Indoor Air Act. She stated that Dover Downs would continue to reduce staff by as much as double what they already had if revenue continued to decrease, a trend she claimed would continue as long as the casinos were forced to be smoke-free. The executive admitted that factors such as other economic variables and weather may have played a role in the decrease in revenue, but concluded on behalf of the Casino Association of New Jersey, that “we would expect significant pressure on a business as a result of the enactment of this [proposed New Jersey smoke-free] bill”.<sup>9</sup>

The executive failed to mention that Park Place Entertainment’s first quarter Securities and Exchange Commission (SEC) filing stated that the 7% decrease in revenue for its three casinos in Atlantic City and the management fees from Dover Downs was mainly caused by

inclement weather.<sup>10</sup> The online summary of the filing did not mention the smoking restrictions as a reason revenue was down from the first quarter of the previous year.<sup>10</sup>

In 1994, Delaware passed legislation that allowed each of the state’s three racetracks to have slot machine-like video lottery terminals. Delaware Park and Dover Downs have operated machines since December, 1995 and Harrington Raceway has operated machines since August, 1996.<sup>11</sup> As of May 2004, Delaware Park operated 2475 machines and Dover Downs operated 2500 machines, and the Harrington Raceway operated 1435 machines.

On 27 November 2002 the state of Delaware implemented the Delaware Clean Indoor Air Act, a comprehensive state wide smoke-free law that made virtually all of Delaware’s public places and workplaces smoke-free, including the three racinos.<sup>12</sup>

## METHODS

Regression analysis was used to test for the effects of the smoke-free law on the gaming industry in Delaware. Data on gaming revenue by establishment and number of machines per establishment from January 1996 (Delaware Park and Dover Downs) and from August 1996 (Harrington) to May 2004 (for all three facilities) were obtained from the Delaware Video Lottery.<sup>13</sup> The revenue data were then inflated to May 2004 dollars using the Chained Consumer Price Index (CPI) published by the US Bureau of Labor Statistics.<sup>14</sup> The revenue and machine data were used to calculate the average revenue per machine on a total basis.

Estimates of annual personal income are published quarterly for the MidEast region by the US Bureau of Economic Analysis.<sup>15</sup> The data were interpolated to create monthly estimates. These monthly estimates of income were used as a control for economic activity. To further control for any economic or other changes not accounted for by the income, a time variable with 1996 set to 0 and increasing by one for each month was included in the regression equation. The time variable was tested for both linear and quadratic effects with the quadratic specification providing a better fit. The better fit for the quadratic time specification is likely due to the maturing, and thus slowing growth, of gaming in Delaware. Seasonal dummy variables were also tested in the models with winter defined as December, January, and February; spring defined as March, April, and May; and summer defined as June, July, and August. Only winter was found to be significant, thus only the results with winter are reported.

We tested for effects of the law on two variables: total revenues and average revenue per machine. We did this by using a dummy policy variable,  $P_{law}$ , that was set to zero pre smoke-free law and was set to one for every month the law was in effect.

$$\text{Total revenues} = \beta_{law} P_{law} + \gamma_{Time} \text{Time} + \epsilon_{time2} \text{Time}^2 + \alpha_{Machines} \text{Machines} + \chi_{Income} \text{Income} + \eta_{Winter} \text{Winter}$$

**Table 1** Estimated effects of the smoke-free law

| Variable                                     | Total revenues (\$million) |       |         | Average revenue per machine (\$/machine) |        |         |
|--|----------------------------|-------|---------|--|--------|---------|
|  | Estimate                   | SE    | p Value | Estimate                                 | SE     | p Value |
| $P_{law}$ (unit/month)                       | 4.582                      | 2.968 | 0.126   | 735                                      | 725.95 | 0.314   |
| Time (unit/month)                            | 0.562                      | 0.117 | <0.001  | 78.48                                    | 35.95  | 0.032   |
| Time <sup>2</sup> (unit/month <sup>2</sup> ) | -0.005                     | 0.001 | <0.001  | -0.849                                   | 0.259  | 0.001   |
| Machines (unit/machine)                      | 0.004                      | 0.002 | 0.017   | -2.424                                   | 0.445  | <0.001  |
| Income (unit/\$million)                      | 8.761                      | 1.734 | <0.001  | 12415                                    | 562.9  | <0.001  |
| Winter                                       | -4.653                     | 1.149 | <0.001  | -1405                                    | 315    | <0.001  |
| n  | 101                        |       |         | 101                                      |        |         |
| R <sup>2</sup>                               | 0.803                      |       |         | 0.622                                    |        |         |

The same specification as above was also used for average revenues per machine. The parameters were estimated using ordinary least squares.

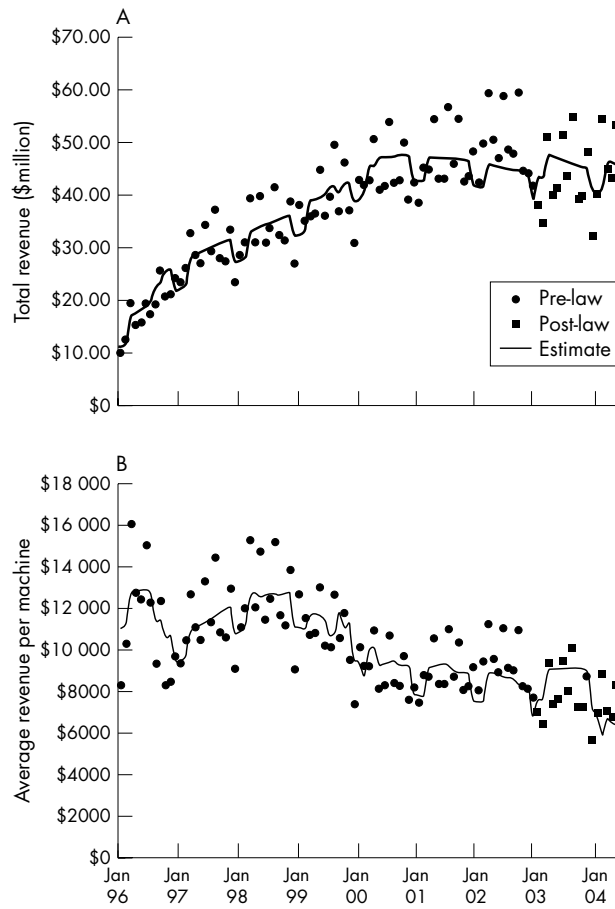
**RESULTS**

The estimates from the equation are reported in table 1 and fig 1. Both estimations show a good fit to the data with an R<sup>2</sup> of 0.803 for total revenues and an R<sup>2</sup> of 0.622 for average revenues per machine. Controlling for underlying economic conditions, the results show no significant effect of the smoke-free law for either total revenues (p = 0.126) or

**What this paper adds**

Many studies have previously examined the effects of smoke-free laws and ordinances on the hospitality industry and charitable bingo. These studies have found either a positive or no effect on restaurant values, revenues, and employment; bar revenues and employment; and on bingo revenues. No previous study, however, has examined the effects of a state wide smoke-free law on gaming revenue.

This study is the first to show no impact of smoke-free laws on gaming revenues. The paper tests for effects on both total revenues and average revenues per machine and finds no significant changes associated with the smoke-free law.



**Figure 1** (A) Total revenues increase from the creation of the racinos and then flatten out with the economic downturn. No significant relation between total revenues and the smoke-free law exist. (B) Average revenues per machine vary overtime and decrease with the downturn in the economy. No significant relation between average revenues and the smoke-free law exist.

average revenues per machine (p = 0.314). These results indicate that the smoke-free law had no effect on the total revenues (power to detect a 10% drop in revenues 0.98) or the average revenue per machine (power to detect a 10% drop in average revenues 0.97).

**DISCUSSION**

The smoke-free law had no detectable effect on total gaming revenue or the average revenue per machine. These results reject the argument that smoke-free laws hurt revenues from gaming. No effects were found on total revenue or average revenues per machine. Smoke-free laws do not harm racinos just as they do not harm restaurants, bars, or bingo parlours.<sup>4 5 6</sup>

Outside Delaware, casinos and other gaming facilities including bars, taverns, restaurants, and grocery stores with video gaming machines remain one of the last places that continue to be exempt from smoke-free ordinances. This type of gaming venue is the fastest growing sector within the gaming industry. Frank Fahrenkopf, one of the casino industry's top Washington DC based lobbyists and president of the American Gaming Association, predicted at his keynote speech at the 2003 American Gaming Summit in Las Vegas that the continued growth of racinos, not resort style casinos, will fuel the expansion of the gaming industry.<sup>16</sup> It is important that state legislatures and public health advocates in states considering allowing racinos know that despite the claims from opponents, smoke-free laws do not affect gaming revenue.

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