



The Effect of the Smoke Free Illinois Act on Riverboat Casino Adjusted Gross Receipts Tax in Illinois, a Quasi Experimental Approach for Practitioners

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Disclaimer

The results, thoughts, and opinions expressed in this presentation are those of Hans Zigmund and in no way constitute an official position of the Illinois Department of Revenue.

Topics for Discussion

- Introduction and Literature
- Legislative History
- Preliminary results and our “under the gun” estimate
- Modeling and Analysis
- Results and Comparison to Garrett and Pakko (2009)

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**INTRODUCTION AND
LITERATURE REVIEW**

Introduction

- Currently, 18 states have 100% bans on smoking in workplaces, restaurants, and bars.*
- Although the impetus for restrictions on indoor smoking is out of concern for public health, secondary effects take place as smokers change behavior in response to smoking restrictions.
- Smoking bans in three states (Illinois, Delaware, and Colorado) include casinos.

Literature

- Mandel, Alamar, and Glantz (2005) modeled the Delaware indoor smoking ban impact on average revenue per gaming machine. Found no statistically significant impact of the smoking ban.
- Pakko (2006) corrected data errors and modified the technique used by Mandel, Alamar, and Glantz. Pakko's model estimated average monthly revenue declines of 15.8 percent at Delaware Park, 8.6 percent at Dover Downs and 12.1 percent at Harrington.

Literature

- Thalheimer and Ali (2008) found a 16 percent decline at the three Delaware Racinos based on a system of slot machine demand equations.

Literature

- Garrett and Pakko (2009) modeled the Illinois Smoking Ban using a method very similar to Pakko (2008) but adjusted the coefficients for the regional markets.
- Differenced smoking ban dummy coefficient in IL with out of state casinos in the same market.
- Estimated declines in AGR ranging from a low of 9.4 percent at East Peoria to a high of 23.5 percent at Harrah's Metropolis.
- Total AGR decline for Illinois state level regression estimated as 20.4 percent.

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LEGISLATIVE HISTORY

Reasons for Smoke Free Illinois Act Public Act 095-0017

- A 2006 Surgeon General's report that states there is no risk free level of exposure to second hand smoke.
- Environmental Protection Agency claim that ventilation cannot reduce second hand smoke to safe levels in businesses.
- Link between second hand smoke and: heart disease, stroke, cancer, sudden infant death syndrome, low-birth-weight in infants, asthma and exacerbation of asthma, bronchitis and pneumonia in children and adults.

Provisions of Smoke Free Illinois Act Public Act 095-0017

- Smoking in public places, places of employment, and governmental vehicles prohibited
- No person shall smoke in a public place or in any place of employment or within 15 feet of any entrance to a public place or place of employment
- Smoking is prohibited in indoor public places and workplaces unless specifically exempted by Section 35
- Illinois' nine riverboat casinos were not included as an exemption

Fiscal Note on SB500

- Cigarette excise and use tax receipts was forecast to decline by \$24 million to \$60 million
- Retailer's occupation and use tax was forecast to decline \$3.5 million to \$8.5 million due to reduced cigarette consumption.
- Secondary effects of the act – such as the effect on riverboat casino gaming and associated tax on adjusted gross receipts and admissions – were not considered.
- An attempt was made to exclude casinos from the ban. That attempt failed.

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**PRELIMINARY RESULTS,
“UNDER THE GUN”**

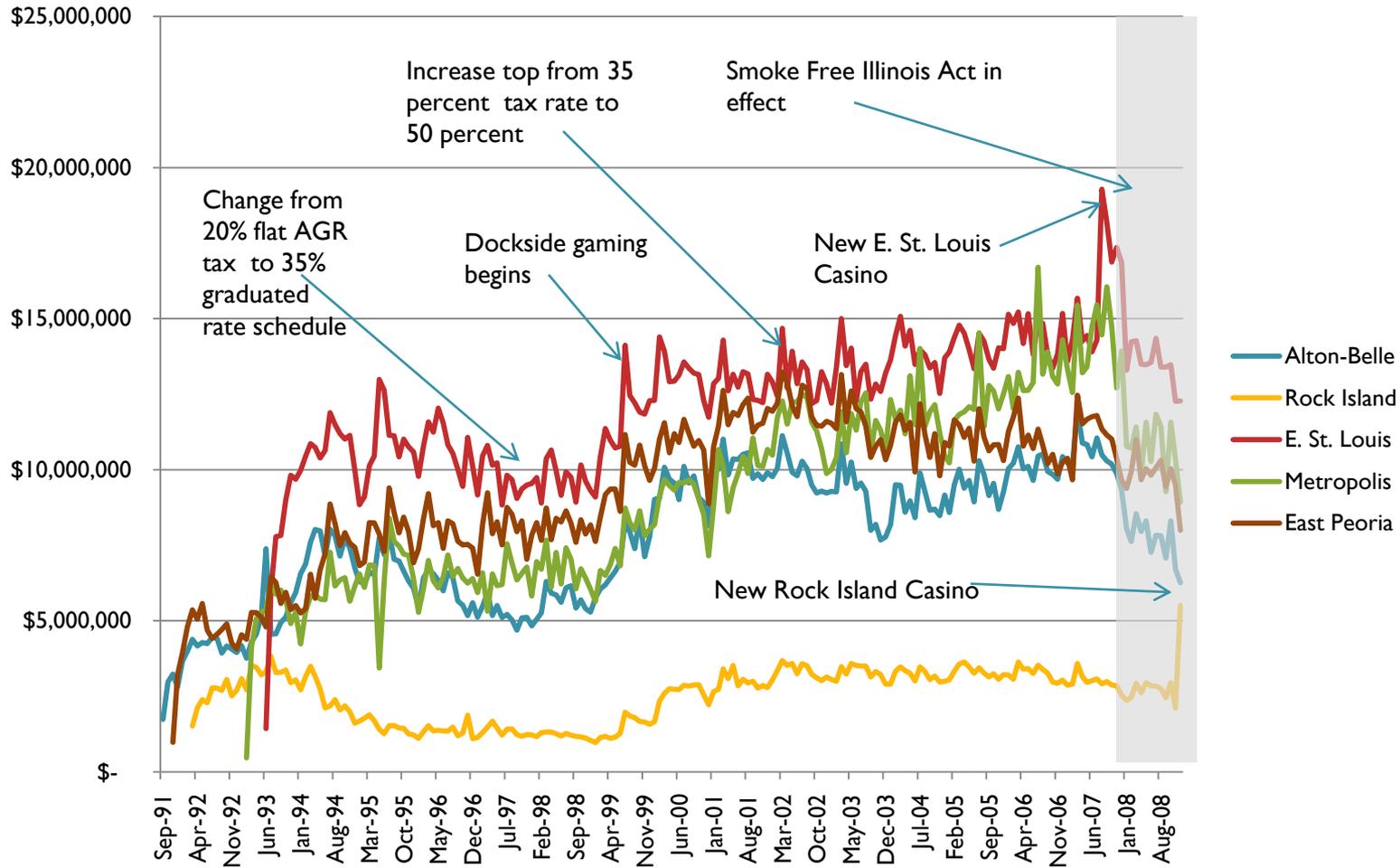
Regional Casino Map



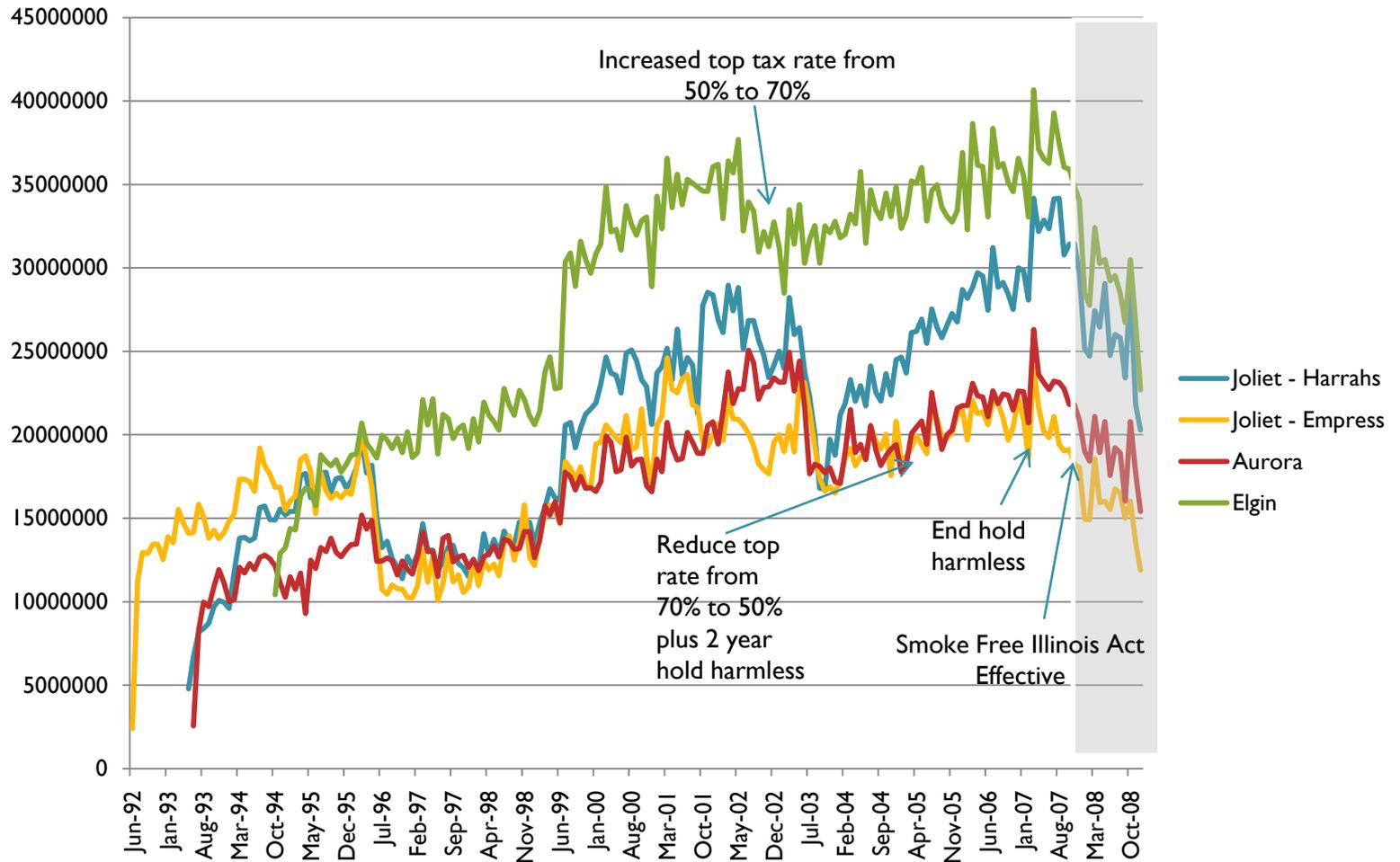
Year over Year decline in Adjusted Gross Receipts

<i>Month</i>	<i>Year over Year change in AGR</i>	<i>Year over Year change in Admissions</i>
January	-17.46%	-5.86%
February	-13.01%	+0.47%
March	-19.80%	-9.08%
April	-19.39%	-9.24%
May	-14.05%	-2.96%
June	-20.66%	-13.22%
July	-20.20%	-10.47%
August	-21.35%	-14.46%
September	-26.36%	-19.70%
October	-25.95%	-18.36%
November	-24.27%	-17.59%
December	-28.29%	-14.34%

Downstate Casino AGR



Chicago Market Casino AGR



Estimating the impact, “under the gun”

- Divided Illinois casinos into two groups, “Chicago Market” casinos and “Downstate” casinos.
- Calculated the mean change in AGR/Admission between the 12 month period prior to the smoking ban and the 12 month period following the smoking ban.

Estimating the impact, “under the gun”

- Selected a control group of five Indiana casinos that were at least 50 miles from any competing Illinois casino as a control group.
- Calculated the change in mean AGR/Admission between the 12 month period prior to the smoking ban and the 12 month period following the IL smoking ban.

Estimating the impact, “under the gun”

- Subtracted the change in AGR/Admission from the previous year, multiplied by 2007 admissions and applied the tax schedule and compared to the previous year (adjusted out base payments).
- Original estimated AGR tax loss = \$85.7 million
- Represents a statewide decline of -13.9 percent. Higher in Chicago treatment group.

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**MODELING AND
ANALYSIS**

Foundation of Analysis

- Our, “under the gun” analysis became the starting point of a broader evaluation of the impact.
- Divided Illinois into two treatment groups.
- Selected more regional control groups to test the reasonableness of the difference in difference methodology.

Casinos by Group

<i>Chicago Area Treatment Group</i>	<i>Downstate Treatment Group</i>	<i>Indiana Control Group</i>	<i>Iowa Control Group</i>	<i>Missouri Control Group</i>
Grand Victoria Elgin	East St. Louis Casino Queen	Grand Victoria Rising Sun	Terrible's Lakeside Casino	Harrah's
Aurora Hollywood	Belle	French Lick	Harrah's Council Bluffs Casino and Hotel	Ameristar
Empress	Pair a Dice	Caesars	Argosy's Sioux City Casino	Isle of Capri
Harrah's	Jumar's	Argosy Lawrenceburg	Ameristar Casino Council Bluff	
	Harrah's Metropolis	Belterra		

Before and After Smoke Free Illinois Act (\$AGR per Admission)

Pre - Post Treatment Difference in Means by Group

Down State Treatment Group	(\$6.94)
Area Treatment	(\$13.13)
Iowa Control Group	\$5.74
Indiana Control Group	\$1.86
Missouri Control Group	\$1.48

Difference in Difference in Means Illinois Groups vs. Control Groups (\$AGR per admission)

<i>Treatment Group</i>	<i>Iowa Control Group</i>	<i>Indiana Control Group</i>	<i>Missouri Control Group</i>
Down State Treatment Group	(\$12.67)	(\$8.80)	(\$8.42)
Chicago Area Treatment Group	(\$18.86)	(\$14.99)	(\$14.60)

Quasi Experimental (Difference in Difference) Approach

$$A_{i,1} - A_{i,0} = \alpha + \beta S_{i,1} + \pi D_i + \gamma S_{i,1} * D_i + \theta F_{i,1} + \rho N_{i,1} + \varepsilon_i$$

Where:

- $A_{i,1} - A_{i,0}$ is the difference between AGR per admission during the treatment period and AGR per person in the same month of the previous year before the Smoke Free Illinois Act
- α is a constant time effect
- $S_{i,1}$ is the treatment dummy and is coded 0 for observations in the control group and 1 for observations in the Illinois treatment group

Quasi Experimental Approach (continued)

- D_i is the distance from casino i to an alternate gaming option in another state with no smoking ban or equals 2000 if no smoking ban is present.
- $F_{i,l}$ is a dummy variable for the months casino i is impacted by the flooding.
- $N_{i,l}$ A dummy is coded 0 for observations where casino i conducted in the old gaming facility and 1 for observations conducted in the new gaming facility.

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**RESULTS AND
COMPARISON**

Using the regression results

- The coefficient for AGR per admission represents the loss per admission under the smoking ban.
- A simple difference in difference of means was conducted to estimate the change in admissions as a result of the smoking ban.
- AGR per admission in 2007 was reduced by the regression coefficient.
- 2007 admissions was reduced by the simple difference in difference in means.

Using the regression results

- The new AGR per admission was multiplied by the adjusted 2007 admissions to arrive at the 2008 AGR after the smoking ban for each casino, all else equal.
- Illinois tax rate structure is applied to each casino.
- The result is compared to actual 2007 tax receipts after backing out, “base payments.”

Illinois Casino Adjusted Gross Receipts Tax Schedule

<i>Tax Rate</i>	<i>AGR Range</i>
15%	\$0 to \$25,000,000
22.5%	\$25,000,000 to \$50,000,000
27.5%	\$50,000,000 to \$75,000,000
32.5%	\$75,000,000 to \$100,000,000
37.5%	\$100,000,000 to \$150,000,000
45%	\$150,000,000 to \$200,000,000
50%	Over \$200,000,000

2008 Tax Loss by Illinois Casino versus each control group (\$ in 000's)

<i>Casino</i>	<i>Indiana Control</i>	<i>Iowa Control</i>	<i>Missouri Control</i>	<i>Garrett and Pakko (2009)</i>
Empress, Joliet	\$ (16,075.94)	\$ (19,117.59)	\$ (18,383.81)	\$ (22,539.30)
Harrah's, Joliet	\$ (23,160.26)	\$ (27,572.43)	\$ (27,011.80)	\$ (40,197.45)
Hollywood, Aurora	\$ (14,420.28)	\$ (17,008.66)	\$ (17,289.90)	\$ (27,582.00)
Grand Victoria, Elgin	\$ (20,161.10)	\$ (23,528.16)	\$ (24,920.97)	\$ (43,824.17)
Alton Belle Par-A-Dice, East Peoria	\$ (5,371.31)	\$ (6,981.50)	\$ (6,239.51)	\$ (74,735.46)
Harrah's, Metropolis	\$ (5,209.11)	\$ (6,726.23)	\$ (6,156.97)	\$ (4,322.50)
Jumar's Rock Island	\$ (6,896.39)	\$ (8,627.71)	\$ (8,392.84)	\$ (16,646.81)
Casino Queen, East St. Louis	\$ (1,188.57)	\$ (1,579.95)	\$ (1,297.15)	\$ (1,604.29)
TOTAL	\$ (102,911.52)	\$ (124,745.78)	\$ (121,691.04)	\$ (182,141.65)

Smoking Ban Estimated Effect less Actual Decline in 2008

<i>Casino</i>	<i>Indiana Control</i>	<i>Iowa Control</i>	<i>Missouri Control</i>	<i>Garrett and Pakko (2009) Interpreted by Hans Zigmund</i>
Empress, Joliet	\$ 8,422.86	\$ 5,381.21	\$ 6,114.99	\$ 1,959.50
Harrah's, Joliet	\$ 14,377.88	\$ 9,965.71	\$ 10,526.34	\$ (2,659.31)
Hollywood, Aurora	\$ 9,193.48	\$ 6,605.10	\$ 6,323.86	\$ (3,968.24)
Grand Victoria, Elgin	\$ 23,956.61	\$ 20,589.55	\$ 19,196.74	\$ 293.54
Alton Belle	\$ 5,542.15	\$ 3,931.96	\$ 4,673.95	\$ 3,439.91
Par-A-Dice, East Peoria	\$ 1.02	\$ (1,516.10)	\$ (946.84)	\$ 887.63
Harrah's, Metropolis	\$ 8,762.48	\$ 7,031.16	\$ 7,266.03	\$ (987.94)
Jumar's Rock Island	\$ (930.84)	\$ (1,322.22)	\$ (1,039.42)	\$ (1,346.56)
Casino Queen, East St. Louis	\$ 943.58	\$ (2,231.41)	\$ (625.96)	\$ (6,579.45)
TOTAL	\$ 70,269.21	\$ 48,434.95	\$ 51,489.69	\$ (8,960.92)

Percent of 2008 Actual Decline Attributable to Smoking Ban

<i>Casino</i>	<i>Indiana Control</i>	<i>Iowa Control</i>	<i>Missouri Control</i>	<i>Garrett and Pakko (2009) Interpreted by Hans Zigmund</i>
Empress, Joliet	65.6%	78.0%	75.0%	92.0%
Harrah's, Joliet	61.7%	73.5%	72.0%	107.1%
Hollywood, Aurora	61.1%	72.0%	73.2%	116.8%
Grand Victoria, Elgin	45.7%	53.3%	56.5%	99.3%
Alton Belle	49.2%	64.0%	57.2%	68.5%
Par-A-Dice, East Peoria	100.0%	129.1%	118.2%	83.0%
Harrah's, Metropolis	44.0%	55.1%	53.6%	106.3%
Jumar's Rock Island Casino Queen, East St. Louis	461.2%	613.0%	503.3%	622.5%
	91.7%	119.6%	105.5%	157.9%
TOTAL	59.4%	72.0%	70.3%	105.2%

Decline attributable to “Other Factors”

<i>Casino</i>	<i>Indiana Control</i>	<i>Iowa Control</i>	<i>Missouri Control</i>	<i>Garrett and Pakko (2009) Interpreted by Hans Zigmund</i>
Empress, Joliet	34.4%	22.0%	25.0%	8.0%
Harrah's, Joliet	38.3%	26.5%	28.0%	-7.1%
Hollywood, Aurora	38.9%	28.0%	26.8%	-16.8%
Grand Victoria, Elgin	54.3%	46.7%	43.5%	0.7%
Alton Belle	50.8%	36.0%	42.8%	31.5%
Par-A-Dice, East Peoria	0.0%	-29.1%	-18.2%	17.0%
Harrah's, Metropolis	56.0%	44.9%	46.4%	-6.3%
Jumar's Rock Island	-361.2%	-513.0%	-403.3%	-522.5%
Casino Queen, East St. Louis	8.3%	-19.6%	-5.5%	-57.9%
TOTAL	40.6%	28.0%	29.7%	-5.2%

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