

TAXATION AND INTERSTATE COMPETITION IN MIDWEST CASINOS

PRESENTATION TO
FTA REVENUE ESTIMATION & TAX RESEARCH CONFERENCE
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WHAT WE'RE DOING

Model

- Estimating casino revenue model.

Data

- Using casino tax variation in IL to examine the impact of casino tax increases.

Control

- Isolate impact of tax rates on casino revenue.

Result

- Estimate rate elasticity of the casino tax base.

BACKGROUND: WAGERING TAX



% of adjusted gross (gaming) receipts (AGR).

$AGR = [Handle] - [Winnings]$.

Flat rate or graduated rate structures.

Dominant revenue producer among casino taxes.

BACKGROUND: ADMISSION TAX



\$ per person entering casino.

Flat rate or graduated rate structures.

Smaller revenue producer among casino taxes.

SCALE OF CASINO TAX REVENUE

State	2010 Casino Tax Revenue (millions)
Pennsylvania	1,328.0
Indiana	874.9
Nevada	835.4
Louisiana	572.0
New York	503.5
Subtotal	4,113.7
Remaining 17 States	3,476.3
Grand Total	7,590.0

Source: American Gaming Association, *State of the States: The AGA Survey of Casino Entertainment, 2011*.

MOTIVATION



— Accounting: $R=t \times B$

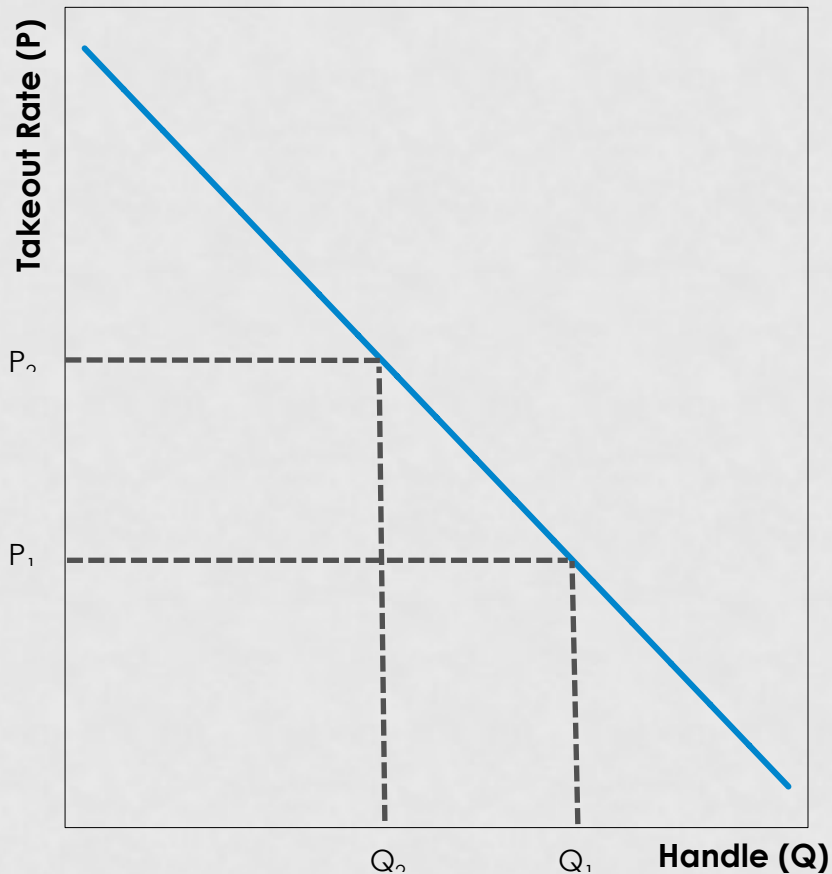
— Economic: $R=t \times B(t)$

- Newton's Apple.
- Industry Scope.
 - 22 states.
 - 483 casinos.
 - 341,000 employees.
 - \$13.3 billion in wages.
 - \$34.6 billion in AGR.
- Tax Estimates.
 - \$7.6 billion in gaming taxes.

Source: American Gaming Association, *State of the States: The AGA Survey of Casino Entertainment*, 2011.

Source: Mikesell, J. L. (1999). *Fiscal Administration: Analysis and Applications for the Public Sector* (5th Ed.).

DEMAND FOR GAMBLING



Source: Suits, D. B. (1979). The Elasticity of Demand for Gambling. *The Quarterly Journal of Economics*, 93(1): 155-162.

- Handle = AGR + Winnings
- Takeout Rate = $\frac{AGR}{Handle}$
- $\frac{\Delta Handle}{\Delta Takeout Rate} < 0$
- Thalheimer & Ali (2003), Landers (2008):
 - Estimate casino gaming demand functions.
 - Estimate the price elasticity of casino gaming.
 - Range: -.75 to -.99

TAX RATE ELASTICITY

Tax rate elasticity estimates

- No published empirical estimates of elasticity.

Price elasticity estimates

- Not necessarily reflective of tax rate elasticity.
- Check Illinois experience.

Illinois experience

- 49% tax increase between FY 2002 and FY 2004.
- Increase in takeout rate not sufficient to offset tax increase.
- Reduced operating cost – operating hours, customer service, promos.

CONNECTIONS

- Barzell (1976)
 - Over-shifting of cigarette tax increases to consumers.
 - Potential explanation:
 - Product improvements instituted after tax increase.
 - Price increase offsets tax increase and cost of product improvements.
- Metters et al. (2008)
 - Explained Harrah's "Total Rewards" card program.
 - Incentives given to customers for card use.
 - Customers provide purchasing/marketing information via the reward card.
 - Free play, meals, other amenities provided to customers based on customer willingness to pay for composite gaming good.

STUDY

Subjects and Sample

- Illinois – aggregated data from 9 casinos.
- Monthly casino and other data – 144 months from 1997-2008.

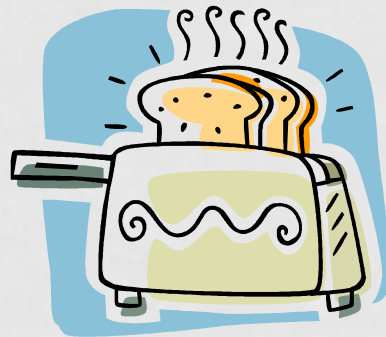
Estimates

- Fluctuation in AGR due to casino tax rate variation.
- Fluctuation in admissions due to casino tax rate variation.

Controls

- Trend, EGDs, table games, economic activity index.
- Dummies for continuous boarding, smoke free law, months.

SIDE NOTE ON MARKETS



ILLINOIS CASINO TAX CHANGES

Time Period	Top Wagering Tax Rate	Admission Tax [^]	Horse Racing Subsidy ^{**}
Thru 6/99	20%*	\$2	N/A
7/99 to 6/02	35%	\$2	N/A
7/02 to 6/04	50%	\$3	N/A
7/04 to 6/05	70%	\$3, \$4, \$5	N/A
7/05 to 6/06	50%	\$2, \$3	N/A
Beginning 7/06	50%	\$2, \$3	3%

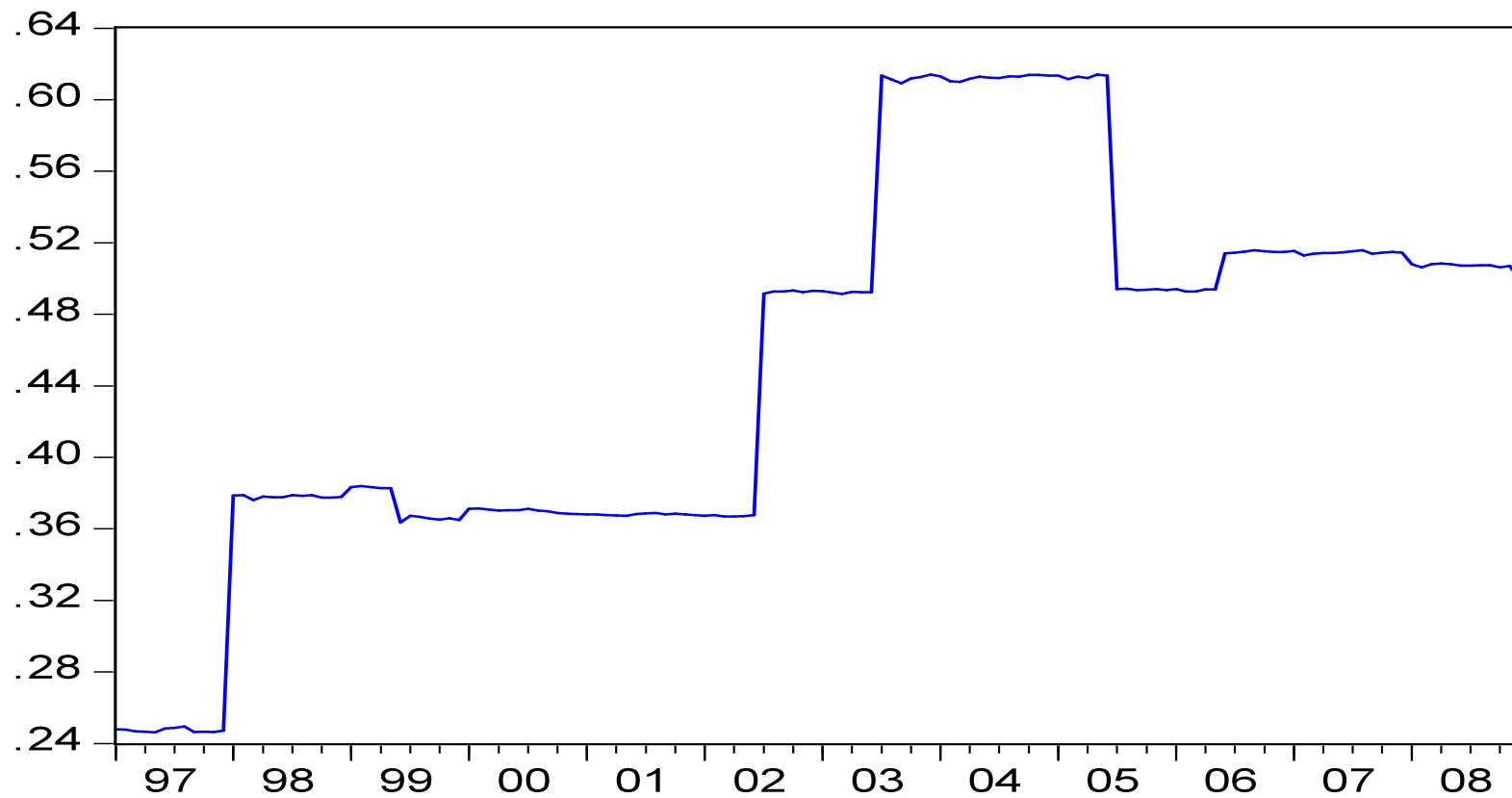
*Flat rate tax. Subsequent years is a graduated tax rate structure.

**Paid only by largest four casinos.

[^]Graduated admission tax based on scale of admissions.

COMPOSITE TAX VARIATION

Casino Tax Rate



AGR MODEL

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
Constant	16.333 ***	16.026 ***	13.194 ***
Trend	0.015 ***	0.013 ***	0.013 ***
Trend Squared	-0.00004 ***	-0.00004 ***	-0.00004 ***
EGDs + tables		0.00003	
Log(EGDs + tables)			0.347
Log(Casino tax rate)	-0.235 ***	-0.222 ***	-0.220 ***
Econ activity index	0.006 ***	0.007 ***	0.007 ***
IL Smokefree	-0.194 ***	-0.191 ***	-0.192 ***
IL Continuous boarding	0.194 ***	0.184 ***	0.183 ***
Adjusted R-squared	0.973	0.973	0.973

*, **, and *** denote significance at 0.10, 0.05, and 0.01, respectively.

Dep. Var. = Log(AGR).

ADMISSIONS MODEL

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
Constant	12.290 ***	12.428 ***	13.694 ***
State Trend	0.005	0.006	-0.006
Squared state trend	-0.00002 **	-0.00003 **	0.00003 **
EGDs + Tables		-0.00001	
Log(EGDs + Tables)			-0.155
Log(casino tax rate)	-0.226 ***	-0.233 ***	-0.234 ***
Econ activity index	0.008 ***	0.008 **	0.007 **
IL Smokefree	-0.029	-0.030	-0.030
IL Continuous Boarding	0.300 ***	0.305 ***	0.305 ***
Adjusted R-squared	0.892	0.891	0.890

*, **, and *** denote significance at 0.10, 0.05, and 0.01, respectively.

Dep. Var. = Log(Admissions).

ADDITIONAL WORK



Model tweaks.



Endogenous tax rate variable.



Panel modeling at individual casino level using IL, IA, IN, & MO casinos.