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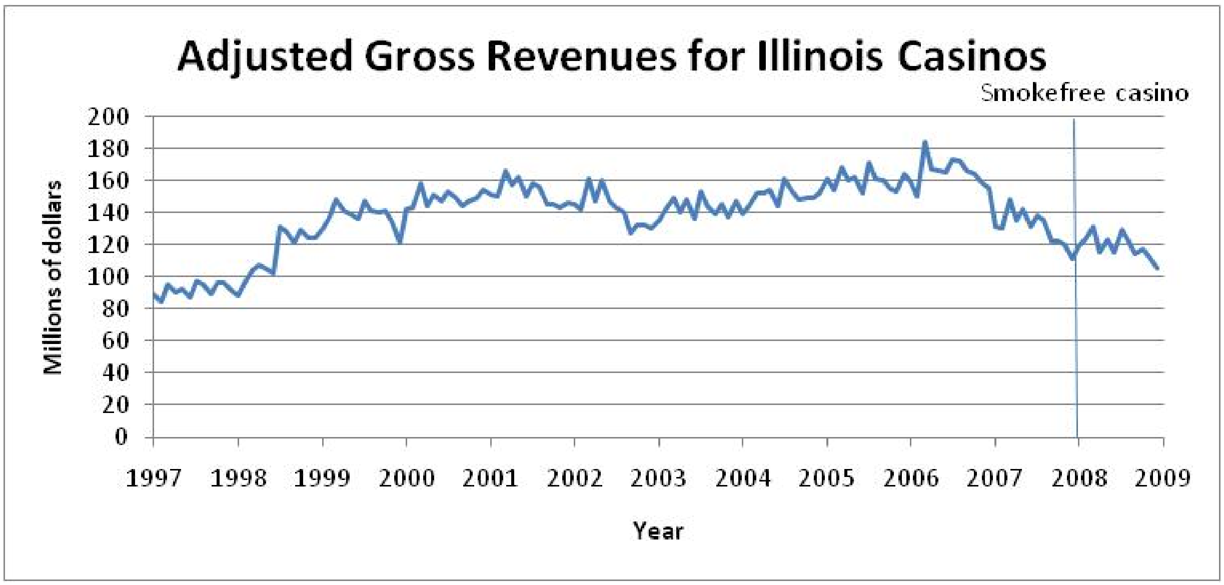
Adjusted Gross Revenues Improved following Implementation of Illinois' Smoke Free Casino Law

Thomas Garrett and Michael Pakko[1] recently published a statistical analysis of casino revenues in Illinois and surrounding states that concluded that the Illinois smokefree law was associated with a large drop in casino revenues. This conclusion is a consequence of an inaccurate formulation of their statistical model, not the law.

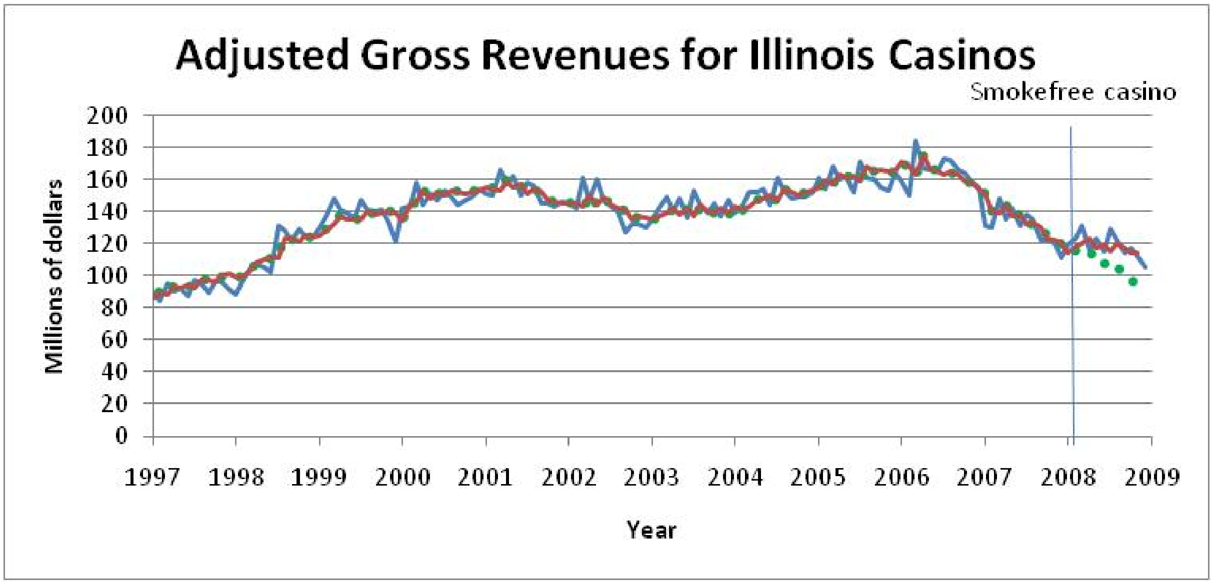
The figure below (the same data as Garrett and Pakko's Figure 2) shows that casino revenues in Illinois started to decline in early 2006, 2 years *before* the law went into force.



While Garrett and Pakko's complex model allowed for underlying economic conditions, a quadratic time trend, snowfall and numerous "shocks" (listed on pages 26 and 27 of their report), surprisingly, they did not account for the decline in casino revenues that started in 2006, two years before Illinois' smokefree casino law took effect. Essentially, the model that Garrett and Pakko used attributed much of the decline in revenues in 2006 and 2007 to the law that went into effect in 2008.

[1] Thomas A Garrett and Michael R. Pakko, The Revenue Performance of Casinos after a Smoking Ban: The Case of Illinois, Working Paper 2009-027B,. June 2009 Revised March 2010. Available at http://research.stlouisfed.org/wp/2009/2009-027.pdf (accessed May 1, 2010).

A better model would be one that accounts for the decline in casino revenues that started in 2006 (and underlying economic conditions), then tests whether the law was associated with a change from this trend.[2]



This simple analysis leads to the conclusion that the Illinois law was associated with a statistically significant *increase* in casino revenues that flattened out the downward trend that started in 2006 (red line).[3] The dotted green line shows what would have happened had the trend that started in 2006 continued through 2008. The Illinois smokefree law had a substantial positive effect on business because it arrested the decline that had started two years earlier.

The smokefree casino law was associated with about a $130 million increase in revenues.

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[2] Following Garrett and Pakko, we use the natural logarithm of casino Adjusted Gross Revenues, AGR, as the dependent variable. We predict ln(AGR), the natural logarithm of casino adjusted gross revenues, as a function of time (year, including month), lagged ln(AGR) to avoid serial autocorrelation in the residuals, IL-CEAI, the Illinois state-level index of coincident economic activity (from the Federal Reserve Bank of Philadelphia, as used by Garrett and Pakko), Since2006 = u(2006)(Year-2006), which allows the slope of the time trend to change in 2006, and Since2008=u(2008)(Year-2008), which allows the slope of the ln(AGR) curve to change in 2008, when the smokefree casino law took effect. ($u(t_0)$ is the unit step function, which equals 0 for $t < t_0$ and 1 for $t \geq t_0$.) The variable Since2008 quantifies the effect of the Illinois smokefree casino law on casino revenues. The detailed results of the analysis are:

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Predictor       Coef   SE Coef      T      P
Constant     -19.720     5.529  -3.57  0.000
Year        0.014499  0.003159   4.59  0.000
LagLnAGR     0.40363   0.07771   5.19  0.000
IL-CEAI     0.013588  0.002235   6.08  0.000
Since2006   -0.18819   0.02773  -6.79  0.000
Since2008    0.21787   0.05886   3.70  0.000

S = 0.0560848   R-Sq = 89.7%   R-Sq(adj) = 89.3%

Durbin-Watson statistic = 2.17279
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[3]Had Garrett and Pakko accounted for the downturn in casino revenues that started in 2006, their more complex analysis would also have led to a conclusion that the law was associated with a *significant positive* effect on casino revenues.