



Review of

Economic Impact of Oklahoma's

Smoke-Free Air Policies on Restaurants

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Summary

A comparison of sales tax and employment data from before and after the new statewide secondhand smoke laws took effect on March 1, 2006, finds that both revenue and employment levels have increased for Oklahoma restaurants since imposition of the new rules. Furthermore, comparing revenue and employment levels across states, with Kansas, and controlling for changes in overall economic activity, shows that Oklahoma has done relatively better than Kansas, since imposition of the new law. Kansas had no similar change to its restaurant smoking rules, which still largely permitted smoking, during the study timeframe. (For more details, see "Conclusions" on page 10 of this Review.)

Background

With the adoption of expanded smoking restrictions in 2003 (SJR21), Oklahoma further limited smoking inside many public places and indoor workplaces, including restaurants. The law became effective September 1, 2003, but the restaurant provisions did not take effect until March 1, 2006, which was the transition date from smoking to primarily nonsmoking in restaurants.

Many restaurants are fast food establishments, and almost all of these were smoke-free by 2004. A survey by the Oklahoma State Department of Health conducted 18 months prior to the transition revealed that 32% of all restaurants, including fast food establishments, allowed indoor smoking in designated smoking areas. SJR21 allowed for restaurants to continue to allow smoking as long as fully enclosed and specially ventilated smoking rooms were installed. After the March 1, 2006 transition, only 1-2% of restaurants chose this option and the proportion of Oklahoma restaurants allowing smoking thus plummeted by approximately 95%.

Despite support of SJR21 by the Oklahoma Restaurant Association, one of the arguments of opponents of this legislation, including many restaurant owners, was that if the state required restaurants to be smoke-free, restaurants would lose a significant amount of business.

Dozens of studies on the economic impact of smoking restrictions implemented in other places --- studies using archival revenue data, employment data, and even data on the sales prices of restaurant business --- have all shown such smoking restrictions to have essentially no economic impact on hospitality industries.¹ Being first to be affected by laws limiting smoking, the restaurant industry has been the most thoroughly studied, yielding a great deal of confidence that no adverse impact should be expected on the revenues of restaurants or employee levels of restaurants in states or communities that pass smoke-free restaurant laws.

The present study examines archival data on sales tax collections and employment levels to measure the economic impact on Oklahoma restaurants of the March 1, 2006 transition to modified smoke-free policies. Restaurant sales are compared for the 24 months prior to the transition and the 24 months following. These sales are also compared as proportions of the "gross domestic product," measured by total state sales tax collections, for the state. Data for employment levels in Oklahoma restaurants for these periods are similarly compared. And all of these data are compared side by side with corresponding data from the neighboring "control" state of Kansas, a state which, unique among Oklahoma's neighbors, did not have a major statewide change in tobacco control policy or demographics during the study timeframe.

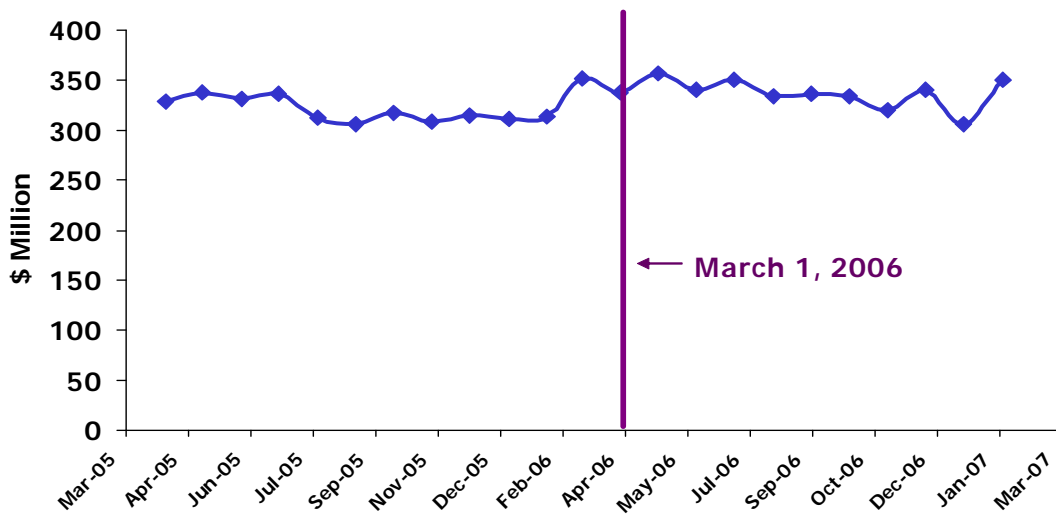
¹ These econometric studies have almost always shown a slight positive but not "statistically significant" economic impact on restaurants with the one study using business sales prices for restaurants (Alamar B and Glantz SA, 2004, "Smoke-free ordinances increase restaurant profit and value," *Contemporary Economic Policy*, v22:520-5.) showing a stronger and statistically significant positive impact.

The Data

The following pages present a graph of actual Oklahoma restaurant revenues plus six additional graphs showing comparisons between Oklahoma and Kansas restaurant industry performance, for periods both before and after the new Oklahoma smoking laws came into effect. The new Oklahoma smoking laws were passed in 2003 and became effective for Oklahoma restaurants on March 1, 2006.

Data are from the Oklahoma Tax Commission, the Kansas Department of Revenue, and the U. S. Bureau of Labor Statistics. State sales tax rates for restaurants were constant in both Oklahoma and Kansas over the period studied. Restaurant sales are calculated by dividing the restaurant state sales taxes collected by the state sales tax rate.

Graph 1: Oklahoma Restaurant Revenues 1 Year Before and 1 Year After March 1, 2006

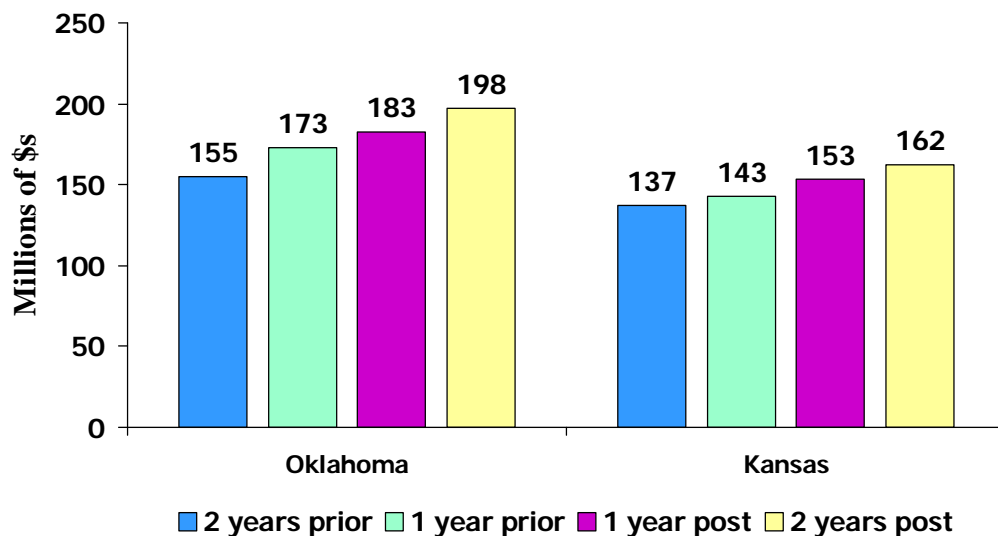


Sales by Oklahoma restaurants,² shown in Graph 1 for the 12 months preceding the March 1 transition and for the twelve months following it, show no discernable impact from the implementation of the new laws. Indeed, on an annualized basis, taxable restaurant sales in Oklahoma were \$4.06 billion in the year following the transition, compared to \$3.84 billion in the year before, an increase of \$216.6 million or 5.63%.

² Standard Industrial Code (SIC) group 5812. Oklahoma Tax Commission reports sales tax filings by SIC codes, and group 5812 is restaurants, including restaurants with bars. To calculate total restaurant revenues, the reported sales taxes paid for each month to the state are divided by the 4.5%, the Oklahoma state sales tax rate, yielding total tax-reported revenues.

To provide more detail, Graphs 2 through 7 show (1) annualized data for a longer period before and after the transition, (2) how restaurant sales fared compared to the overall economy, (3) how restaurant employment was affected, and (4) how these economic performances compared to those for restaurants in Kansas.

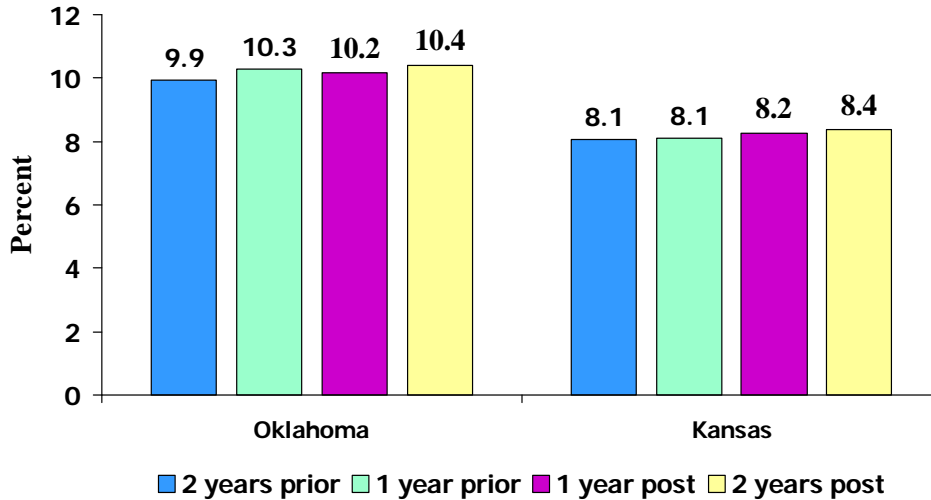
**Graph 2: Restaurant Tax Revenues,
Oklahoma vs Kansas, Before and After March 1, 2006**



Graph 2 shows the annual sales tax receipts from restaurants in the states of Oklahoma and Kansas, beginning 2 years before the new Oklahoma laws went into effect (3/1/04) and ending 2 years after they went into effect (2/29/08). For the state of Oklahoma, these reflect sales tax revenues for SIC 5812. For Kansas, this is NAIC 722³. Oklahoma receipts are higher because Oklahoma is a more populous state with 28% more people than Kansas in 2000. We see a moderate to strong upward trend in both states.

³ North American Industrial Code (NAIC) 722 includes restaurants, restaurants with bars, and free-standing bars. Although the closest comparison to SIC 5812 available within the 3-digit NAIC classification system used for reporting by the Kansas Department of Revenue, this NAIC 722 category is a slightly broader group than SIC 5812 reported in Oklahoma, in that it also includes free-standing bars. These bars, however, make up only about 15% of the establishments in NAIC 722, and their revenues are typically about 5% or less of the NAIC 722 total.

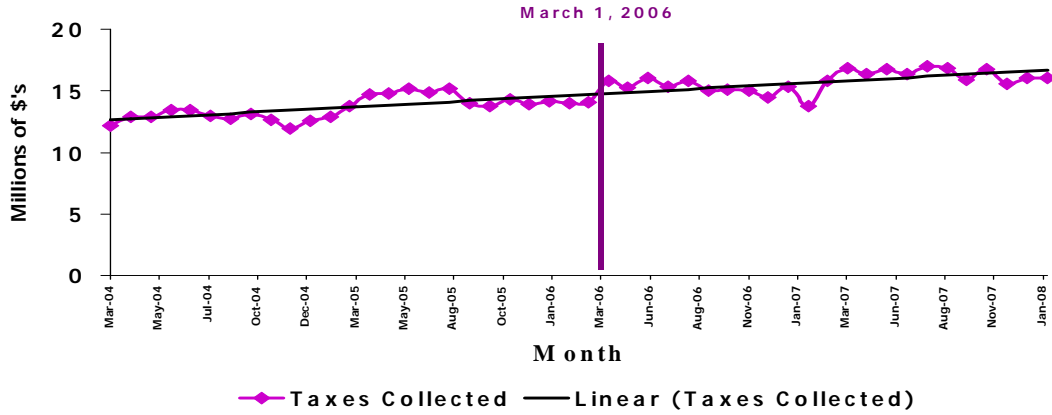
Graph 3: Restaurant Tax Revenues to “GDP”
 Oklahoma vs Kansas, Before and After March 1, 2006



To adjust the comparisons so as to take into account the background influence of population growth and changes in the general levels of economic activity within each state, Graph 3 presents a reworking of these comparisons expressed as ratios of total restaurant sales taxes to all sales tax paid within each state. We see a very slight dip for Oklahoma in the year following the transition. Note, however, that this is not large and is corrected in the following year.⁴

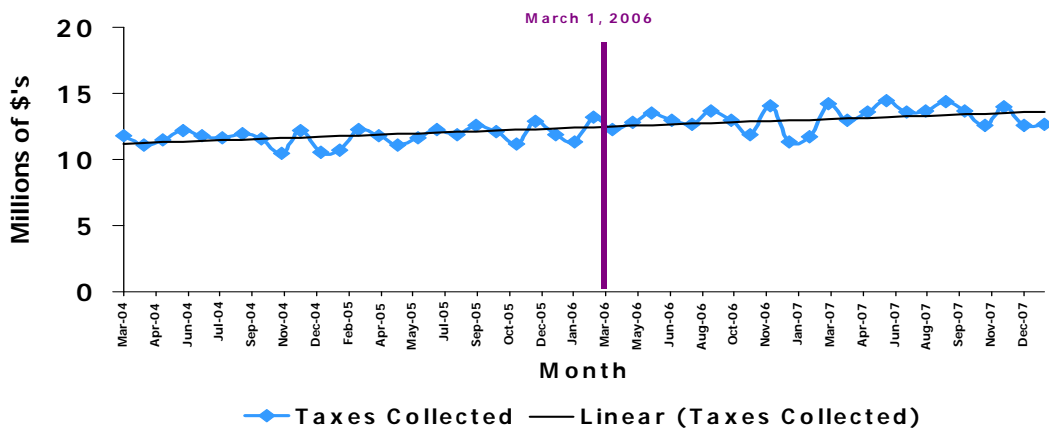
⁴ The fact that Oklahoma ratios are about two percent higher than those in Kansas is attributable to differences in which sales are subject to the sales tax in each state. The 0.1% dip in Oklahoma’s proportion of restaurant sales March 2006 to February 2007 is attributable to a relatively faster rate of growth in the Oklahoma state economy during that period of time, since the increases in restaurant revenue levels were nearly identical between the two states.

Graph 4: Tax Trend for Oklahoma Restaurants

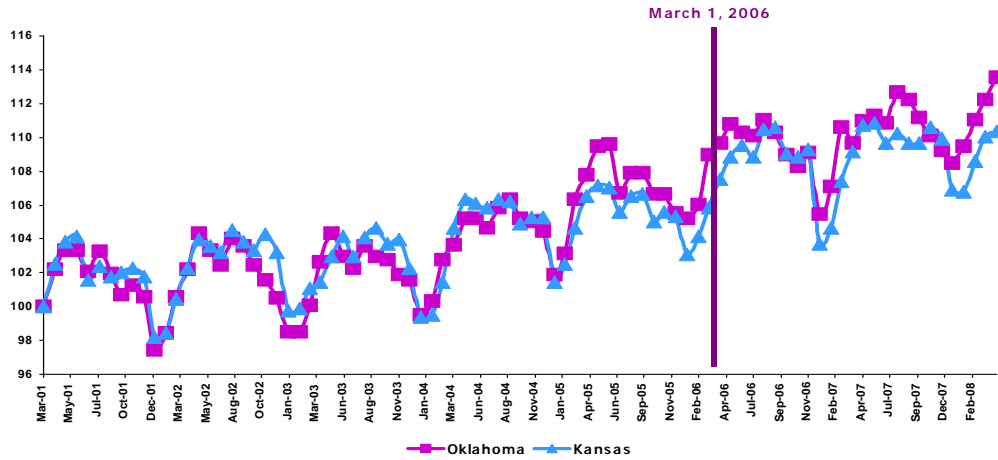


Graphs 4 and 5 plot monthly data on restaurant sales tax collections, against trend lines, for the two states spanning two years before and two years after the requirement that Oklahoma restaurants be either smoke-free or provide fully enclosed and specially ventilated smoking rooms. These data are not seasonally adjusted and, although we see some variation in levels from month to month, these data show no discernable impact to Oklahoma restaurants from the transition.

Graph 5: Tax Trend for Kansas Restaurants



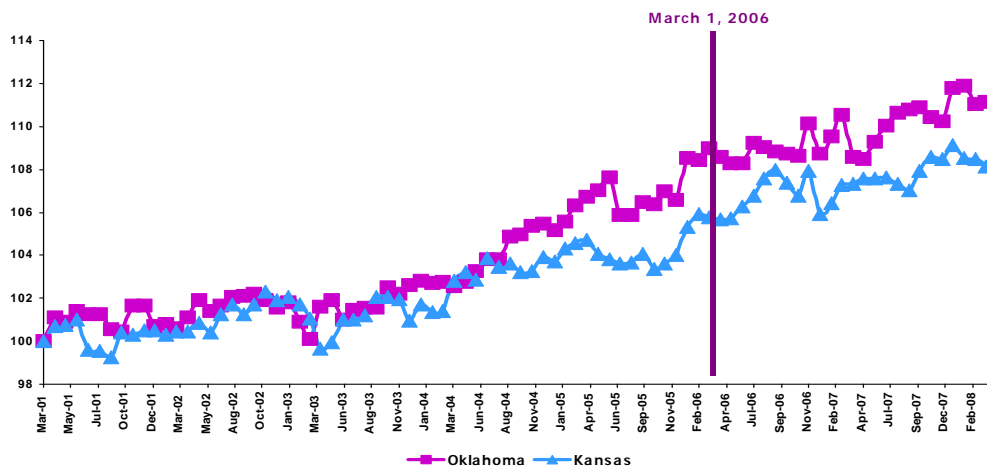
Graph 6: Restaurant Employment, Oklahoma versus Kansas



Note: Y-scale does not start at 0

Graphs 6 and 7 display the levels of Oklahoma and Kansas employment in food services and drinking places, the closest U.S. Bureau of Labor Statistics category to that of restaurant employment that is available for both states. Graph 6 compares monthly reports of the number of workers. Graph 7 looks at these same data after they have been adjusted for seasonal variation. Both series are normalized to values of 100 as of March 2001.

Graph 7: Restaurant Employment, Oklahoma vs Kansas w/ seasonal adjustments



Note: Y-scale does not start at 0

The data for both Graphs 6 and 7 run from March 2001 through May 2008. We did this because these labor data were easier to obtain and the March 2001 start date precedes the widely publicized public debate over restaurant smoking restrictions by approximately 1 year. Thus, it provides the reader with an idea of the trend in restaurant employment in the period before when the imposition of new smoking laws could likely have been even something that restaurateurs would have been considering or planning for.

After passage of the current laws, in May of 2003, and before the March 2006 implementation in restaurants, we see a small pulling away for Oklahoma restaurant employment, above the levels of Kansas restaurant employment. This pulling away continues in the post-transition period and is what is being detected in the statistical analysis that follows. Since, however, this is a relatively small effect that could be attributable to many factors other than the changes in smoking laws, this up-tick in Oklahoma restaurant employment could be attributable to other events.

Statistical Analysis

The more advanced statistical techniques that one typically sees being used in policy assessments such as this have two fundamental purposes, to better describe outcomes than can be done with simple graphs and to generate inferences. The focus of most of the statistical analyses that have been done by academic economists to evaluate smoke-free air policies has been inferential, which is to say focused on proving or disproving hypotheses. Given data and standard assumptions, such studies estimate the confidence with which one can give credit for any changes in restaurant revenue or employment levels to specific policy changes (versus the extent to which changes in restaurant revenue and employment levels might simply reflect random luck, which has nothing to do with the policy change). By testing hypotheses, such studies assess the extent to which one would expect the experience of one state or municipality, which implemented smoke-free laws, to be repeated if a similar state or municipality copied the policy change. From this perspective, our analysis may be helpful to policy makers in Kansas, if they consider tighter smoking restrictions or totally smoke-free restaurants. Through small extrapolations of our results to consideration of stronger smoke-free air laws in Oklahoma, our analysis would also be helpful to Oklahoma policy makers who need a basis for estimating what kinds of economic impacts might reasonably be expected.

The secondary purpose for most statistical analyses of the economic impacts of smoke-free air laws is to provide a description or measurement of the effect that a policy change has had. The most straightforward way to look at and evaluate the impact that Oklahoma's new smoking laws actually had on Oklahoma restaurants is to look at the above graphs. These graphs report what happened and do so clearly. The statistical analysis we summarize here can be used to augment and supplement the above graphical presentation. The tools of statistics are useful for describing outcomes because we can use them to construct comparisons that are similar to the above graphs but that apply more sophisticated controls for the effects of overall economic activity and time trends than can easily be displayed on graphs.

Of note, the data available for this study, involving the comparison of just one state that implemented a near ban on restaurant smoking (one treatment state) against another state that did not change its law (one control state), are not ideal for generating inferential statistics (i.e., not

ideal for testing hypotheses). This is because, with just two states being compared, the analysis is vulnerable to various extraneous or unknown factors that might influence restaurant industry performance in a way that has nothing to do with the policy change but is correlated with implementation of the new policy. Such correlated extraneous factors can throw off or bias any inferential conclusions to be drawn. Thus, for those who might wish to draw conclusions from this analysis regarding what would likely be expected to happen if similar smoking restrictions were implemented in other states, we provide a note of caution. The stronger evidence on which to form judgments regarding the impact on restaurants of implementing a smoke-free air law is the evidence that is available in the extensive research that has been done in prior studies. This evidence is surveyed in published articles by Eriksen and Chaloupka (2007)⁵, Scollo, et al. (2003)⁶ and a working paper by Scollo and Lal (2008)⁷. The conclusion this large body of research supports is that restaurant industries are generally unaffected (or see small increases in revenue and employment levels) following adoption of smoke-free laws and that restaurants and bar revenues are very unlikely to be adversely affected in any significant way by such changes.

The details of our statistical analysis are somewhat technical and are thus not included here. These are available to interested parties in a working paper written up for this analysis that is available from the author. To summarize our analysis, what we estimate is the influence of the new smoking laws on restaurant tax receipts while controlling for changes in overall nonrestaurant economic activity in the state, seasonal variations at the monthly level, and while allowing for a time trend in restaurant sales tax revenues. We do this with a simple "ordinary least squares" procedure, which is the traditional econometric approach. We also do this with a more refined Prais-Winsten procedure that is more correct for this application because it takes into account that any random jumps that we see in restaurant sales levels of economic activity levels across the states of Oklahoma and Kansas are likely to fade gradually, over the course of months, and not necessarily within the span of any given month.

Our analysis compared monthly data from the two years prior to the March 1, 2006 enforcement of Oklahoma's smoke-free air law to the two years after this enforcement. Using the OLS method, we found an average increase of \$260,000 per month in restaurant sales tax collections to be associated with implementation of Oklahoma's law. That's to say, after controlling for the time trend in restaurant sales levels, monthly changes in overall economic activity, seasonal effects, and using Kansas as a control case, average per month SIC 5812 sales tax collections in Oklahoma for the 24 months after transition were \$260,000 higher than they were for the 24 month period before transition. Using the Prais-Winsten (PW) method, the estimated per month increase in restaurant sales tax collections for Oklahoma was \$240,000. Since average monthly restaurant sales tax collections in Oklahoma during the timeframe of this study were \$14.6 million, this is roughly a 1.7% increase. The impact on restaurant employment levels, likewise comparing two years prior to two years posterior to enforcement, was measured as a 1,120 increase in employment for

⁵ Eriksen M and Chaloupka F., 2007, "The economic impact of clean indoor air laws," *CA A Cancer Journal for Clinicians*, v57;367-378.

⁶ Scollo M, Lal A, et al., 2003, "Review of the quality of studies on the economic effects of smoke-free policies on the hospitality industry," *Tobacco Control*, v12:13-20.

⁷ Scollo M and Lal A., "Summary of studies assessing the economic impact of smoke-free policies in the hospitality industry—includes studies produced to 31 January 2008," working paper at VicHealth Centre for Tobacco Control, Melbourne, Australia.

Oklahoma restaurants by OLS and 850 employee increase in employment by the PW method. This was roughly a 1% increase.

As for the control variables, we found a 1% increase in overall sales tax collections for the states of Oklahoma and Kansas to be associated with roughly a 0.5% increase in restaurant sales tax collections for both states. We also found an upward trend in restaurant sales tax revenues of about \$40,000 per month, for both states. The observed relationship between restaurant sales tax collections and overall sales tax collections highlights a limitation of the above graphical approach to displaying the impact on restaurants of Oklahoma's workplace smoking restrictions. Graph 3 plots the change in the ratio of restaurant sales tax revenues to total sales tax revenues. Since short-term fluctuations in overall economic activity, i.e., state GDP, lead to smaller and not proportionate short-term fluctuations in restaurant sales levels, an increase in state GDP will tend to cause the ratio of restaurant sales tax to total sales tax for a state to fall. This is what happened in 2007 for Oklahoma.

As for the inferential statistics, which are somewhat speculative given that this study is based on a comparison of just two states, our analysis does not provide 95% confidence that the positive impact on Oklahoma restaurant revenues that we observed would be replicated if a similar restaurant smoking law were enacted in another state. Given the natural level of random variation that was observed in Oklahoma and Kansas data, our estimates do support confidence of a similar positive impact at the 73% and 88% levels, for the OLS and PW estimation, respectively. All of this assumes that "all else is equal," meaning that whatever unknown background effects, which were correlated with our control variables and occurred in Oklahoma and Kansas during this timeframe of our study, would also occur in whichever state copied the Oklahoma policy. Our analysis does predict that the implementation of a law such as Oklahoma's would, with greater than 95% confidence, be expected to be associated with an increase in restaurant employment levels. We observed this small but "statistically significant" increase in restaurant employment levels using both the OLS and PW estimation methods.

Conclusions

We have assessed the impact on restaurants of Oklahoma's new statewide secondhand smoke laws by looking at changes in both restaurant sales tax receipts and restaurant sector employment levels. By both summarizing and plotting these data, and by statistical analysis which controls for variations in overall economic activity and trends, we have found that the restaurant industry in Oklahoma has done relatively well since implementation of the new smoking restrictions on March 1, 2006. Accounting for the growth in restaurant revenues that could have been expected given increases in the overall "GDP" of the state, and comparing the growth of Oklahoma's restaurant industry to that of the neighboring state of Kansas, which we use as a control, we find small but notable increases in both restaurant sales tax revenues generated (approximately 1.7%, in our statistical analysis) and employment levels (approximately 1% in our statistical analysis) that are associated with the implementation of Oklahoma's new smoking laws.

Given the relatively small scope of this study, comparing the revenue and employment histories of just two states, we recommend caution in applying the results of our study to infer or predict the expected impact that changes in restaurant smoking laws may have on other states. A better basis

for such inferences can be found in the extensive academic literature that exists, which assesses the impact on restaurants of state-level and municipal smoke-free laws implemented across the country. Our study supports and strengthens this growing body of literature that has consistently found that no negative impact on restaurants revenue levels or employment levels should be expected to result from a tightening of restaurant smoking restrictions, including 100% smoke-free restaurant laws. On the contrary, when comparing states and communities that have implemented smoking restrictions to those that have not, the sales revenue and employment levels for restaurants in smoke-free jurisdictions have consistently shown small increases, on passage of smoke-free laws, relative to the sales revenue and employment levels of restaurants in jurisdictions that have not taken this step.