

**Assessing the Economic Impact of Eliminating Secondhand Smoke in Northern Nevada  
Workplaces**

**Final Report**

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## **Executive Summary—In Brief**

Estimating the economic impact of a smoking ban on casino gaming is challenging since many factors are likely to simultaneously change. These may include: individuals who currently smoke that spend less time and money at the casino; individuals who do not smoke that spend more time and money at the casino; economic conditions; and gaming opportunities in other states or at new casinos within the state.

Based on comparing several jurisdictions that implemented a smoking ban with others that did not, our analysis suggests that the impact of smoking bans ranges from having no impact to a substantial negative impact. There is no widespread evidence of a positive impact following a smoking ban. In our analysis, the largest negative impact, at nearly 20%, is found in Illinois. Illinois faces substantial competition from casinos in nearby states where smoking is still permitted. Colorado, in contrast, shows no significant long-term impact from the smoking ban. Colorado is a jurisdiction where few competing casinos in surrounding areas exist and likely a more health-conscious state. The impact in New Orleans is between Illinois and Colorado.

These results suggest that providing a specific, precise estimate of the impact of a smoking ban on casino performance is fraught with danger. Consequently, when estimating the economic impact of a smoking ban we presented estimates over a range of values from a positive 5% (given that we did find some estimates where revenue in non-smoking casinos fell more than the smoking-ban casinos), to a negative 20%, the most dramatic negative impact. Under each scenario, economic impacts estimated include changes in the following: employment; output (value of production); labor income; total value added (value added by production, i.e., Gross Regional Product); and other estimated fiscal impacts.

There are two important caveats to this analysis. First, the economic impact estimates presented here are short-term rather than long-term estimates. Our results suggest that there is likely to be a negative short-term impact on casino revenue and employment as a result of a smoking ban. The longer-term impact on casino revenue and employment is much more difficult to predict as economic conditions, smoking rates, and gambling opportunities (e.g. online and mobile gambling) will all change. Secondly, the economic impact estimates do not incorporate any health benefits resulting from a smoking ban. Improved worker productivity, and fewer sick days as well as improved health of non-smoking casino patrons are important considerations not factored into our estimates.

## Executive Summary—Key Findings

- Pritsos, Pritsos and Spears (2008) show that the smoking rate in Nevada casinos is not statistically different from the general population in Nevada. Petry and Oncken (2002) show that smokers gambled more and spent more on gaming than non-smoking gamblers.
- Several studies examined the economic and fiscal impact of smoking bans in different states. Revenue losses are largely due to a drop in out-of-state visitors. There is a wide range of estimated losses from no significant effect to a 20% decline in total casino revenue.
- The economy in Washoe County is more diversified and significantly less reliant on gaming compared to Clark County. While the share of employment in gaming declined in both counties, the share in Clark County (16.3%) is more than twice as high as the share in Washoe County (7.6%).
- Most of the states with casino or racetrack gaming have either a smoking ban or only allow smoking in designated and ventilated areas.
- Smoking is unrestricted in 5 states. Nevada, Indiana, Kansas, New Jersey, and New Mexico are the only states with commercial casinos that allow unrestricted smoking in casinos, meaning no ban or legal mandate to be in designated areas.
- Illinois, Colorado, Ohio, Massachusetts, Maryland, South Dakota, Maine, New York and Washington prohibit smoking in casinos.
- States switching from smoking permitted to smoking prohibited provide insight into the potential impacts on casino revenue from implementing a smoking ban.
- We have collected data from several states and in this study provide descriptive results for Colorado and Illinois. We also provide descriptive results for New Orleans.
- For Colorado and Illinois we compare casino revenue eight years before and after the smoking ban with revenue for other states that allow smoking.
- Descriptive evidence suggests that revenue decreases after the implementation of the smoking bans in these states (January 2008), but the decline is not solely attributable to the ban as other states experience decreases in revenue over this time period.
- When analyzing the impact of a smoking ban on casino revenue, it is important to consider other factors, such as overall economic conditions, general trends in revenue prior to the ban, and structural changes in the industry, such as changes in competition or the number of casinos.
- Smoking bans implemented by casinos range from having no impact to a substantial negative impact. There is no widespread evidence of a positive impact following a smoking ban.

- The largest negative impact, at nearly 20% is found in Illinois. Negative results were also found in New Orleans as well, although the negative impact, at approximately 10%, is smaller than in Illinois. Colorado, in contrast, shows no significant long-term impact from the smoking ban.
- When estimating the economic impact of a smoking ban we provide estimates over a range of values ranging from a positive 5% (given that we did find some estimates where revenue in smoking casinos fell more than the smoking ban casinos), to a negative 20%, the most dramatic negative impact. Specifically, we provide estimates for a +5%, -5%, -10%, and -20% impact on gaming resulting from a smoking ban.
- We don't see any negative long-term tax revenue impact in Colorado or Illinois in the period following smoking bans. While there is a decreasing trend in alcohol, tobacco and gasoline taxes, that trend seems to have started long before the smoking bans. It is also important to note that revenue trends in Colorado and Illinois do not seem to be significantly different from the trends in other states that didn't enact smoking bans.
- Economic impacts from the proposed indoor smoking ban in Washoe County are estimated using the modeling software, IMPLAN. The model is calibrated using 2017 employment and output data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages.
- Estimated impacts to each economic measure are reported by direct, indirect, induced, and total effects, and are also measured as the percentage change from the base.
- A -5% shock to Gaming Sector revenue would decrease total employment in Washoe County by 527 jobs, or -0.12%, and a symmetric +5% shock would increase employment by 527 jobs, or 0.12%. A -10% shock would decrease total employment 1,044 jobs, or -0.36%, and a -20% shock would decrease total employment by 2,087 jobs, or -0.72%.
- A -5% shock to Gaming Sector revenue results in approximately \$21.6 million lower labor income, or -0.14%, and a +5% shock results in an increase by the same amount. A -10% shock to Gaming Sector revenue leads to a decrease of \$43.3 million in labor income, or -0.28%, and a -20% shock leads to a decrease of \$86.6 million, or -0.56%.
- The estimated direct impacts to the Gaming Sector of the negative shock scenarios represent -1.92% to -7.56% fewer jobs, 2.13% to -8.50% less labor income, -1.95% to -7.82% less Total Value Added, and -1.95% to -7.79% less Output.
- The economic impact estimates do not incorporate any health benefits resulting from a smoking ban. Improved worker productivity, and fewer sick days as well as improved health of non-smoking casino patrons are important considerations not factored into our estimates.

## 1. Introduction

There is extensive literature on the effects of smoke-free laws. Studies examined different aspects of these laws with a particular focus on the economic impacts. Pritsos, Pritsos and Spears (2008) show that the smoking rate (about 21%) in casinos is not statistically different from the general population in Nevada. Petry and Oncken (2002) show that smokers gambled more and spent more on gaming than non-smoking gamblers.

Several studies examined the economic and fiscal impact from a smoking ban due to drop in out-of-state visitors. For Illinois, Garrett and Packo (2010) show that casino revenue declined by more than 20% (over \$400 million) and total admissions declined by about 10%. Total casino tax revenue declined by about \$200 million. Garrett and Packo (2010) do not have estimates of public health benefits. Tauras, *et al.*, (2018) uses more recent data and find no significant impact of the Smoke-free Illinois Act of 2008 on per-capita casino admissions and per capita gross receipts. However, the results from that study are also not reliable since it is not conducting a difference-in-differences analysis. It is not considering a control group of states that are similar to Illinois but didn't have an indoor smoking ban. Another paper by Packo (2005) showed about 13% decline in gaming revenues after Delaware's Clean Indoor Air Law in 2002.

A fiscal impact statement on a bill introduced in Indiana uses a 5-10% reduction in attendance and 10-20% reduction in gaming revenue in its impact calculations. The statement also notes potential decreases in sales and excise tax revenues due to reductions in alcoholic beverage and other sales. There is also a potential negative impact from additional state/local government spending for smoking ban enforcement. A study on a smoking ban in Wisconsin by Glonek (2013) shows no significant employment effect in restaurants but there is a negative and significant effect on bar employment.

There are also studies that examined the potential health impact of smoke-free laws in Nevada. For example, Shen and Rathi (2017) note that residents of Mesquite, Nevada would save about \$2.6 million in medical spending per year if a smoke-free policy was adopted. They also indicate that most of the cost savings would come from lower hospitalizations related to coronary and respiratory health problems. In another study on Nevada, Pritsos, Packham and Yang (2013) find a statistically significant decrease in hospitalizations related to acute myocardial infarction (AMI) and stroke in response to the Nevada Clean Indoor Air Act which became effective in 2007. They estimate the cost savings as \$92.1 million for AMI and \$48.4 million for stroke.

### 1.1.Potential Impacts of Indoor Smoking Ban

Based on the literature we have examined so far, we can summarize the potential negative and positive impacts as follows:

#### **Potential Negative Impacts:**

- Loss of economic activity and fiscal revenue due to drop in out-of-state visitors

- Decrease in other economic activity and revenue (e.g. drop in sales tax revenues) in other places visited by out-of-state visitors (restaurants, bars, convenience stores, etc.)
- Loss of economic activity and fiscal revenue due to drop in local visitors
- Decrease in economic activity and fiscal revenue due to less time spent in casinos and other places subject to indoor smoking ban
- Negative impact from additional state/local government spending for smoking ban enforcement
- Larger negative impact in smaller casinos than larger resort casinos

**Potential Positive Impacts:**

- New economic activity and fiscal revenue due to new out-of-state visitors attracted to Northern Nevada, e.g., convention visitors
- New economic activity and fiscal revenue due to local visitors attracted to casinos
- Health benefits from less smoking in Northern Nevada casinos: health benefits to smokers and non-smokers who gamble regularly
- Productivity increases in businesses from better health outcomes due to smoking ban

**2. Changes in Washoe County Economy**

**2.1. Economic diversity in Washoe County and other Nevada counties**

Diversity in a regional economy protects it during recessions by hindering unemployment. It can be measured in different ways, but typically diversity of employment or establishments is an indicator of overall economic diversity. Different diversity indices will not result in the same measurement because each of them measures a different aspect of the economy. For example, some businesses have proportionally more employees than others even within the same sector, so diversity measured by the share of employment in a sector is not necessarily equal to diversity measured by the share of business establishments in it. (Watson and Deller, 2017)

Available data on employment by sector is often censored to avoid disclosure of data that could be used to identify individual people. This typically occurs in cases where one or very few establishments in a sector exist in a given region, and occurs more frequently in less populated regions like rural counties. Establishments are not subject to this type of censoring, making establishment diversity more accurate than employment diversity, but both measures are informative.

The diversity index is calculated in such a way that the minimum possible value is 0 and the maximum is 1. Higher values of the index indicate more diversity in the region. An index of 0

would represent a perfectly concentrated economy with all employment or establishments in a single sector, and an index of 1 would represent a perfectly diverse economy with an equal number of employees or establishments in all sectors.<sup>1</sup>

Table 1 shows the economic diversity of each county in Nevada as measured by employment and establishments in 2017. Washoe County had the highest employment diversity in the state at 0.804, which is also higher than the U.S. average of 0.628. Carson City and Clark County are the next highest with 0.75 and 0.741, respectively. The counties with the lowest employment diversity are Esmeralda, Lander, and Eureka with 0.034, 0.177, and 0.184, respectively. It should be noted, however, that these counties have the most instances of censored employment which makes the diversity index lower than it truly is.

The diversity of Washoe County's establishments in 2017 was 0.775, which was only slightly above the state average of 0.755, and below the national average of 0.779. Clark County had a slightly lower establishment diversity index of 0.751.

Another way to show economic diversity in an area is to examine the location quotients. The location quotient based on employment is calculated by comparing the employment for a given industry in an area such as a county to employment in the same industry for a larger area such as the entire country. It is calculated by dividing a sector's share of employment in total employment in one county by the same sector's share of employment in total employment in the U.S. When the location quotient is greater than one in an area, that area has a greater concentration in that industry compared to the country.

Table 2 shows location quotients for Nevada counties for 2016. We see that eleven Nevada counties have greatest concentration in natural resources and mining sector. Leisure and hospitality is the sector with the highest location quotient in both Clark and Washoe counties but it is much more dominant in Clark County with a location quotient of 2.78 compared to 1.6 in Washoe County. Washoe County has location quotients greater than one for leisure and hospitality, construction, trade, transportation and utilities, and professional and business services.

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<sup>1</sup> Equation 1: Shannon-Weaver Diversity Index

$$D_i = \frac{\sum_{i=1}^N \left(\frac{e_i}{e}\right) \ln\left(\frac{e_i}{e}\right)}{\ln\left(\frac{1}{N}\right)} \quad D_i = \frac{\sum_{i=1}^N \left(\frac{e_i}{e}\right) \ln\left(\frac{e_i}{e}\right)}{\ln\left(\frac{1}{N}\right)}$$



## **2.2. Comparison of Gaming and Other Top Growth Sectors in Washoe County and Clark County**

Gaming has historically been a large contributor to the economy of Washoe County and the State of Nevada. However, for several years the percentage of employment in the Gaming Sector<sup>2</sup> has been declining. Figure 1 compares the percentages of employment in the Gaming Sector with the three sectors that had the largest increase in percentage of employment in Washoe County: Professional and Technical Services Sector, Transportation and Warehousing Sector, and Healthcare and Social Assistance Sector.

Since 2001, employment in the Gaming Sector has declined from 15% of employment to 7.6% in 2017. Over the same period, Healthcare and Social Assistance Sector grew from 9.3% to 12.5% of employment, Professional and Technical Services Sector grew from 6.1% to 8.4%, and Transportation and Warehousing Sector grew from 5.7% to 7.6%. This shows that Washoe County has become less specialized in Gaming, and the most recent data shows it has become equally specialized in Gaming and Transportation and Warehousing.

For comparison, Clark County has also become less specialized in Gaming over from 2001 to 2017. Figure 2, shows the percentages of employment in Gaming and the three sectors that increased in percentage of employment the most in Clark County. Gaming in Clark County declined from 23.4% of employment in 2001 to 16.3% in 2017 which still left Clark County about twice as specialized in Gaming as Washoe County.

The growth sectors in Clark County from 2001 to 2017 were Healthcare and Social Assistance, Administration and Waste Management, and Management of Companies and Enterprises. Healthcare and Social Assistance grew from 6.4% to 9.7% of employment, Administration and Waste Management grew from 7.2% to 8.5%, and Management of Companies and Enterprises grew from 1% to 2.3%. Clearly, Washoe County is not as dependent on Gaming for employment as it once was, nor was it as dependent as Clark County was in 2017.

## **3. Indoor Smoking Ban in the U.S. and Effects on Casino Revenue and Tax Revenue in Selected States**

### **3.1. Smoking Bans in U.S. States**

As shown in Figure 3, Indiana, Kansas, Nevada, New Jersey and New Mexico are the only states with unrestricted smoking laws in commercial (non-Indian) casinos, meaning that there is no law either banning smoking or requiring it be in designated areas. Figure 3 also shows that several states, notably Illinois, Colorado, Delaware, Ohio, Massachusetts, Maryland, South Dakota, Maine and New York have banned smoking in casinos completely. Of these, only Illinois,

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<sup>2</sup> The Gaming Sector is defined as NAICS 7132 Gambling Industries and NAICS 72112 Casino Hotels.

Colorado, Delaware, and South Dakota switched from allowing smoking to banning smoking. The other states have banned smoking since inception. This is important because the states changing laws allow us to estimate the impact of smoking ban on casino revenue, unlike states where no change in the law occurs and we have no means to estimate what revenue would have been under a different regulatory structure. Figures 4 and 5 show states with indoor smoking regulations for racetracks and bingo halls, respectively. We see a similar pattern where there are many more states with a smoking ban or a provision that smoking is allowed in designated areas or in separate ventilated areas than states where smoking is allowed by law.

### **3.2. Relative Total Casino Revenue in Selected States (before and after smoking ban)**

In this section we describe the data we have collected and, for two of these states, Colorado and Illinois, present a descriptive analysis. These two states were chosen because Colorado has a casino industry with few competing casinos nearby. In this regard, Colorado is similar to Washoe County in that competing casinos are not nearby. Excluding Carson City, which does not have casinos of the same scale as Washoe County, the nearest competing casinos where smoking is allowed are near Sacramento, approximately a two hour drive. It should be acknowledged, however, that the scale of casinos in Colorado is much smaller than Washoe County. Illinois, in contrast, has several competing casinos nearby, often across the state border (e.g., East St. Louis and Alton Illinois and St. Louis, Missouri).

Figure 6 below presents relative, inflation-adjusted casino revenue over the period 2000-2016 for Colorado, Indiana, Iowa, and Mississippi. All revenue has been adjusted for inflation (real 2016 dollars) and is reported relative to December 2007, the month prior to the smoking ban going into effect. Thus, for all states, relative revenue in December 2007 equals 1. Values greater than one indicate revenue exceeded the value in December 2007, whereas values less than 1 indicated lower values of revenue. For example, in June 2016 the value for Colorado is 0.97, implying that revenue in Colorado was lower in June 2016 than December 2007 by approximately 3%. Iowa's value is 1.02, implying approximately 2% higher revenue in June 2016 than December 2007. Computing relative revenue, i.e., creating an index number, was necessary to compare revenue across the various states, all of which differ in size.

Figure 6 shows that casino revenue in these states is seasonal, varying month to month, and generally exhibits a flat or declining trend. Exact reasons for this are not clear, but likely reflect the impact of the recession and a maturing industry.

Figures 7 through 9 compare Colorado to each state separately to allow a clearer illustration. A few noticeable features stand out in these graphs. First, revenue in Colorado declines immediately following the smoking ban. Also notable, however, is that other states also decline over this period. For example, both Indiana and Mississippi experienced decreases in revenue near or shortly after January 2008. Indiana, for example, had relative revenue that was below Colorado early in the sample, approximately 2000-2003, performed comparable to Colorado for the period 2004 to 2012 (the two lines approximately overlap), before falling below Colorado beginning around 2013. In the case of Iowa, revenue growth is minimal, but no notable

decrease in revenue is evident. What is evident is that prior to the smoking ban relative revenue in Colorado was above Iowa, whereas after the smoking ban the two states are much more similar in the magnitude of relative revenue.

Colorado provides an interesting case study, for while the casinos are much smaller than casinos in Washoe County, it does represent a case study where gamblers visiting the casino do not have an alternative casino that allows smoking nearby. What can be made of these results? While it is important not to read too much into this visual presentation, it does show that the decline in Colorado following the smoking ban is not unique to Colorado. Other factors, notably the recession, are also likely responsible for some of the decline as evidenced by the decline in other states, particularly Indiana and Mississippi. While some of the decline in Indiana may be due to casinos opening in Ohio (which is non-smoking), Mississippi experienced no dramatic change in competition in the region.

Figures 10-13 provide a similar analysis for Illinois. The smoking ban in Illinois also went into effect January 2008. Here, too, several noticeable patterns are evident. Most obvious, perhaps, is the notable decrease in revenue in Illinois following the smoking ban, a decrease more dramatic than experienced by Colorado. In addition, prior to the smoking ban revenue in Illinois can be characterized as experiencing a flat or slightly negative trend. The decline in revenue is more pronounced after the smoking ban and during the years of the recession before revenue growth flattens out again beginning around 2012.

A comparison with other states (Indiana, Iowa, and Mississippi), however, suggests that the decline experienced in Illinois is not exclusively due to the smoking ban and that the recession or other factors are partly responsible. For example, while there is a notable gap in relative revenue between Illinois and Indiana immediately following the smoking ban, later in the sample relative revenue is more similar between the two states due to decreased revenue in Indiana. Similarly, Illinois and Mississippi experience similar decreases in revenue following the smoking ban. The fact that relative revenue in Illinois was generally above Mississippi prior to the smoking ban but below afterward suggests that the smoking ban did have some negative impact, but that all of the decline experienced in Illinois is not attributable to the ban.

### **3.3. Slot Revenues and Casino Revenue Per Admission**

Estimating the impact a smoking ban will have on casino gaming is complicated. Will gamblers that smoke stop going to the casino? Will gamblers that smoke spend less time at the casino or less time gaming if they must go outside the casino to smoke? How will any impacts be split between local residents and tourists? Alternatively, will non-smokers who gamble visit the casino more frequently or spend longer gaming? Similarly, will non-smokers who currently do not visit the casino due to smoking visit the casino and gamble once a ban is established? All of these may be possible and occur simultaneously. In addition, changes in the economy, gaming

opportunities in other states or at new casinos within the state may also occur. All of these factors make estimating the impact of a smoking ban challenging.

Ideally we would compare casino revenue and visitation in Washoe County with a smoking ban with casino revenue and visitation in Washoe County without a smoking ban over the same time period. Of course, we cannot do this since one must always be unknown. Obviously if a smoking ban is passed we will never know what revenue and visitation would have been without the smoking ban and, vice versa, we cannot know what casino revenue and visitation in the past would have been with a smoking ban.

Fortunately, there are methods to estimate what impact might occur based on the experiences of other jurisdictions that have implemented smoking bans and comparing them with jurisdictions where no ban is in place. This section describes those methods intuitively and discusses our estimated impacts which are then used for the complete economic impact analysis.

### ***Selected Communities for Comparison***

We select three jurisdictions that have implemented a smoking ban: Illinois, Colorado, and New Orleans. Illinois and Colorado both implemented smoking bans beginning January 2008. New Orleans implemented a ban that went into full effect May 2015. These three jurisdictions were selected for the different economic settings of the casino industry and smoking ban.

Illinois has 10 casinos statewide, most of which are located near the borders of other states, specifically Missouri, Iowa, and Indiana. Those states also have casinos located on their borders. This makes for a very competitive environment and frequently casinos in different states are located in very close proximity to one another (e.g., East St. Louis, Illinois and St. Louis, Missouri; Alton, Illinois and Maryland Heights, Missouri; Rock Island, Illinois and Bettendorf/Davenport, Iowa). None of the states surrounding Illinois have a smoking ban, so we suspect that any impact of a smoking ban to be greatest in Illinois. Note that this impact could be negative if Illinois gamblers who smoke travel to other states, or positive if non-smokers in Illinois or the surrounding states visit Illinois casinos.

Colorado has numerous, small casinos located in three mountain resort communities: Black Hawk, Central City, and Cripple Creek. Central City and Black Hawk are within an hour drive of Denver whereas Cripple Creek is approximately two hours away. Colorado has two Indian casinos, but these are between five and seven hours away from the commercial casinos. The lack of competing smoking casinos near Colorado casinos leads us to expect that any impact of a smoking ban will be minimized as smokers have few alternatives. It is important to note that while the individual casinos in Colorado are small, the industry as a whole is comparable in size to Washoe County. For calendar year 2017 gaming revenue in Washoe County was \$611 million whereas in Colorado it was \$828 million.

Lastly, we analyze New Orleans. New Orleans provides an interesting case study in that it is one of the few cities to implement a ban where there is no corresponding statewide ban. In addition, New Orleans has a single casino and is a major tourist destination.

While no jurisdiction that has implemented a smoking ban is an exact match for Washoe County containing multiple casinos that draw numerous tourists, our three selected jurisdictions provide insight into the effect of a smoking ban in a variety of economic contexts.

We compare slot machine revenue in Illinois and Colorado before and after the smoking ban with casino revenue over the same period in Indiana, Iowa, Connecticut, and Mississippi. Since casinos and states vary in the size of their industry we restrict our comparison to slot revenue per slot machine. This allows us to control for the size of the industry in each state by comparing revenue “per unit” and is a standard industry metric of performance. Moreover, slot machine revenue accounts for over 80% of all casino revenue, so is nearly identical to the performance of total casino revenue.

For New Orleans and other casinos in Louisiana we have data on the number of admissions to the casino as well as revenue, but do not have data on the number of slot machines. Thus, for New Orleans we compare total casino revenue per admission with revenue per admission in Baton Rouge (a nearby city that did not implement a smoking ban during our time period of analysis, although a smoking ban was implemented in June 2018) and Kenner, a city geographically closer (approximately 13 miles) to New Orleans with a single casino that does not have a smoking ban.

### *Illinois*

To compare the impact of a smoking ban in Illinois with other jurisdictions that did not implement a smoking ban we use a technique known as difference-in-differences. This involves comparing the change in slot revenue per slot machine in Illinois (treatment) before and after the smoking ban with the change in slot revenue per slot machine in the smoking (control) jurisdictions over the same time period. The tables reporting the results of this analysis are presented in the appendix. Here we provide graphs to better visualize the impacts.

Revenue in Illinois decreases dramatically following the implementation of the smoking ban. However, it is important not to attribute all of this decline to the smoking ban. Revenue had been declining prior to the smoking ban and the ban was implemented during the Great Recession. Slot revenue per slot machine decreased in other jurisdictions as well, however the decline in Illinois is noticeably large (See Figure 14). Depending on the specific factors accounted for, slot revenue per slot machine decreased between 11% and 21% more in Illinois after the smoking ban than the control jurisdictions. There are no other obvious competitive

changes during this time, i.e., no new casinos, which suggests that the smoking ban had a significant negative impact on casino revenue.

### *Colorado*

The change in Colorado is much less dramatic. While casino revenue in Colorado declined slightly following the smoking ban, it later stabilized (See Figure 15). Estimates of the impact on slot revenue per slot machine compared to our sample of states that did not implement a smoking ban range from no impact (0%), meaning that the decline in Colorado was identical to those states, to a positive 11%, meaning slot revenue per slot machine decreased more in other states. This is noticeable in Figure 15 when comparing Colorado with Indiana and Connecticut. Comparing total revenue and slot revenue for these states (as opposed to slot revenue per slot machine) also reveals that the change in revenue in Colorado following the smoking ban was statistically not different than the other states. This suggests that the smoking ban in Colorado had no long term impact on revenue.

### *New Orleans*

For New Orleans we do not have data on the number of slot machines, but we do have data on the number of admissions to the casino. This is a count of people passing through turnstiles to enter the casino. Consequently, we examine both casino revenue per admission as well as the number of admissions. When comparing revenue per admission before and after the smoking ban with revenue per admission over the same period for Kenner and Baton Rouge we find that, while revenue declined in all jurisdictions, the decline in New Orleans was approximately 9% to 14% greater than Baton Rouge and Kenner, respectively (see Figure 16). Revenue per admission begins declining in Baton Rouge in 2017 (see Figure 16) and we are not certain why. Given there is no noticeable decline in Kenner during that period, however, we are confident that the decline is unique to Baton Rouge and not something impacting the broader area.

The results for admissions are more varied. As with revenue, the number of admissions to casinos decreased in all jurisdictions that we analyze. In comparison to Kenner, admissions to the New Orleans casino decreased by approximately 8% more after the smoking ban. In contrast, compared to Baton Rouge, there was no statistical difference in the decrease in admission between New Orleans and Baton Rouge. These changes are visibly evident in Figure 17. Also evident in Figures 16 and 17 is the greater number of admissions and lower revenue per admission in New Orleans than the other jurisdictions. This likely reflects a greater number of tourists in New Orleans who may visit the casino for purposes other than gaming.

Finally, on November 30, 2016 New Orleans opened a “smoking lounge”, an outdoor area containing slot machines where people can legally smoke. We also analyzed the impact of the lounge opening and found no impact on revenue or admissions.

### **3.4. Changes in Tax revenues in Illinois, Colorado, Connecticut, Indiana, Iowa, and Mississippi**

As we mentioned before in the potential impacts of smoking bans, there may be a fiscal impact through tax revenue decreases following smoking bans due to a potential decrease in incomes and consumption. To understand such fiscal impacts, we also examined tax revenues in Illinois, Colorado and other comparison states over the period 1969-2017. We are showing total tax revenue, general sales tax revenue, corporate income tax revenue, alcohol tax revenue, tobacco tax revenue, and gasoline tax revenue in Figures 18-23. In Figure 18, we see an overall increasing trend in real per capita tax revenue in all states except during periods when the economies were contracting due to recession. In all states, including Illinois and Colorado, there has been a decrease in real per capita tax revenue during the recession that started in 2008, which is followed by an increase after 2010. There is a similar pattern for the general sales tax in Figure 19, and to some extent the corporate income tax in Figure 20. The pattern is different for the gasoline taxes, alcohol taxes and the tobacco taxes in Figures 21-23. We see mostly a decreasing trend in real per capita tax revenue for these excise taxes except during certain periods. For example, we see in Figure 23 a fairly sharp increase in tobacco tax revenues following significant tax rate increases in the early 2000s.

We don't see any negative long-term tax revenue impact in Colorado or Illinois in the period following smoking bans. While there is a decreasing trend in excise taxes, that trend has started long before the smoking bans. It is also important to note that revenue trends in Colorado and Illinois do not seem to be significantly different from the trends in other states that didn't enact smoking bans.

## **4. Economic Impact of Smoking Ban in Washoe County**

Economic impacts from the proposed indoor smoking ban in Washoe County are estimated using the modeling software, IMPLAN. The model is calibrated using 2017 employment and output data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages. This enables us to perform economic impact analyses for various possible shock scenarios which we inform using our analysis of the effects of indoor smoking bans on casino revenues from other states.

Based on our findings described above, we perform four separate impact scenarios using the following initial shocks: a 5% increase, 5% decrease, 10% decrease, and 20% decrease in Gaming Sector revenues in Washoe County. Each scenario estimates economic impacts to employment, output (value of production), labor income, and total value added (value added by

production, aka Gross Regional Product); and estimated fiscal impacts to dividends, social insurance tax, business tax, corporate profits tax, and personal tax. Each scenario simulates economic activity in Washoe County resulting from the shock over a single year beginning when the shock occurs.

Unforeseen negative and positive shocks can and do occur in reality which make the actual performance of the county economy as a whole impossible to accurately predict. Therefore, the estimated impacts assume that no other shocks to the Washoe County economy exist and are the isolated effects of only the gaming revenue shocks.

Estimated impacts to each economic measure are reported by direct, indirect, induced, and total effects (see Appendix for explanation), and are measured as the percentage change from the base. Based on our previous analysis, we believe the +5% scenario is a best case scenario in which the indoor smoking ban is a net draw for gaming tourists, and the -20% scenario is a worst case in which Gaming Sector revenue losses are similar to those of Illinois.

Figure 24 and Table 3 show the estimated impacts of each shock scenario in both quantity changes and percentage changes to employment in Washoe County. A -5% shock to Gaming Sector revenue would decrease total employment in Washoe County by 527 jobs, or -0.12%, and a symmetric +5% shock would increase employment by 527 jobs, or 0.12%. A -10% shock would decrease total employment 1,044 jobs, or -0.36%, and a -20% shock would decrease total employment by 2,087 jobs, or -0.72%.

Estimated impacts to labor income in Washoe County are shown in Figure 25 and Table 4. A -5% shock to Gaming Sector revenue results in approximately \$21.6 million lower labor income, or -0.14%, and a +5% shock results in an increase by the same amount. A -10% shock to Gaming Sector revenue leads to a decrease of \$43.3 million in labor income, or -0.28%, and a -20% shock leads to a decrease of \$86.6 million, or -0.56%.

Figure 26 and Table 5 show the estimated impacts to Total Value Added in Washoe County. A -5% shock to Gaming Sector revenue would lead to a \$37.6 million decrease, or -0.15%, and a +5% shock leads to an increase by the same amount. A -10% shock to Gaming Sector revenue causes Total Value Added to fall \$75.2 million, or -0.30%, and a -20% shock causes it to fall \$150.5 million, or -0.59%.

In Figure 27 and Table 6, we show the estimated impacts to Output in Washoe County. A -5% shock to Gaming Sector revenue causes Output to fall by \$63.3 million, or -0.15%, and a +5%



shock would increase output by an equal amount. A -10% shock to Gaming Sector revenue causes Output to fall by \$126.7 million, or -0.30%, and a -20% shock decreases Output by \$253.4 million, or -0.60%.

The direct effect of each shock is the estimated impact to the Gaming Sector specifically. Thus, impacts from a +5% revenue shock would lead to an estimated 1.92% increase in the number of jobs, a 2.13% increase in Labor Income, a 1.95% increase in Total Value Added, and a 1.95% increase in Output in the Gaming Sector. The impacts from -5%, -10%, and -20% revenue shocks represent, respectively, a 1.92%, 3.79%, and 7.56% decrease in the number of jobs; a 2.13%, 4.25%, and 8.50% decline in Labor Income; a 1.95%, 3.91%, and 7.82% drop in Total Value Added; and a 1.95%, 3.89%, and 7.79% drop in Output in the Gaming Sector.

We report the total effects of the fiscal impacts by government revenue account for State and Local governments combined, and for the Federal government. State and Local tax accounts are collected into dividends (interest on investments such as pension funds), business taxes (e.g. sales tax, business license fees, etc.), and personal taxes (e.g. property tax, motor vehicle license fees, hunting fees, etc.). Federal accounts are collected into social insurance taxes (e.g. Social Security, Medicare), business taxes (e.g. excise tax, customs duty, etc.), corporate profits tax, and personal tax (e.g. income tax).

The estimated fiscal impacts to State and Local governments are shown in Figure 28 and Table 7. A -5% shock to Gaming Sector revenue reduced State and Local tax revenue by about \$3 million, or -0.01%, and a +5% shock increase tax revenue by an equal amount. A -10% shock to Gaming Sector revenue caused State and Local tax revenue to fall by about \$6 million, or -0.02%, and a -20% shock reduced tax revenues by \$12.1 million, or -0.05%. The estimated fiscal impacts to the Federal government tax revenue, shown in Figure 29 and Table 8, were proportionately small with the -20% shock reducing tax revenue by \$20.4 million, or -0.00062%.

## **5. Summary of Results and Concluding Remarks**

The analysis above suggests that smoking bans implemented by casinos range from having no impact to a substantial negative impact. There is no widespread evidence of a positive impact following a smoking ban. In our analysis, the largest negative impact, at nearly 20% is found in Illinois, a jurisdiction with substantial surrounding competition from casinos in states where smoking is still permitted. Negative results were also found in New Orleans as well, although the negative impact, at approximately 10%, is smaller than in Illinois. Colorado, in contrast,

shows no significant long-term impact from the smoking ban. Colorado is a jurisdiction where few competing casinos in surrounding areas exist and likely a more health conscious state.

These results suggest that specifying a specific, precise estimate of the impact of a smoking ban on casino performance is fraught with danger. Consequently, when estimating the economic impact of a smoking ban we provided estimates over a range of values ranging from a positive 5% (given that we did find some estimates where revenue in smoking casinos fell more than the smoking ban casinos), to a negative 20%, the most dramatic negative impact. Specifically, we provided estimates for a +5%, -5%, -10%, and -20% impact on gaming resulting from a smoking ban.

Economic impact estimates vary significantly by the above scenario. For example, a -5% shock to Gaming Sector revenue would decrease total employment in Washoe County by 527 jobs, or -0.12%, and a symmetric +5% shock would increase employment by 527 jobs, or 0.12%. A -10% shock would decrease total employment 1,044 jobs, or -0.36%, and a -20% shock would decrease total employment by 2,087 jobs, or -0.72%.

When examining other taxes, we don't see any negative long-term tax revenue impact in Colorado or Illinois in the period following smoking bans. While there is a decreasing trend in alcohol, tobacco and gasoline taxes, that trend seems to have started long before the smoking bans. It is also important to note that revenue trends in Colorado and Illinois do not seem to be significantly different from the trends in other states that didn't enact smoking bans

Lastly, there are two other important considerations. First, the economic impact estimates presented here are short-term rather than long-term estimates. Our results suggest that there is likely to be a negative short-term impact on casino revenue and employment as a result of a smoking ban. The longer-term impact on casino revenue and employment is much more difficult to predict as economic conditions, smoking rates, and gambling opportunities (e.g. online and mobile gambling) will all change. Secondly, the economic impact estimates do not incorporate any health benefits resulting from a smoking ban. Improved worker productivity, and fewer sick days as well as improved health of non-smoking casino patrons are important considerations not factored into our estimates.

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## **Appendix**

Economic impacts are "The net changes in new economic activity associated with an industry, event, or policy in an existing regional economy" (Watson et. al., 2007). To calculate economic impacts, an input-output framework is used. Input-output analysis uses a matrix of inter-industry transactions to show how outputs from one industry become inputs for another. The columns of the matrix represent expenditures for each industry and the rows represent revenues for each industry. This framework facilitates tracing of supply chains between industries by calculating proportions of industry sales and purchases to every other industry. A dollar of expenditure in one industry is also necessarily a dollar of revenue in another, and that industry then spends a portion of that dollar on its own business expenses such as payrolls and materials, which ultimately leads to more than a dollar of economic activity. This rippling of economic activity is known as the multiplier effect. The multiplier effect consists of three components: Direct, Indirect, and Induced effects. The direct effect is the initial expenditure of that first dollar. The indirect effect is the subsequent expenditure of that dollar by the business that received it. The induced effect is the expenditure that employees of all affect businesses make as a result of that dollar passing through the economy. The total economic contribution is the sum of direct, indirect, and induced effects. The analysis is conducted using the software, IMPLAN, which automates the input-output method. IMPLAN uses the transaction matrix and accompanying employment figures to calculate the ultimate effect of a change in economic activity in an area.

**Table 1: 2017 Shannon-Weaver Diversity Index of Employment and Establishments**

<b>Region</b>	<b>Employment</b>	<b>Establishments</b>
Churchill County	0.726	0.820
Clark County	0.741	0.751
Douglas County	0.648	0.777
Elko County	0.715	0.824
Esmeralda County	0.034	0.603
Eureka County	0.184	0.658
Humboldt County	0.624	0.832
Lander County	0.177	0.766
Lincoln County	0.495	0.776
Lyon County	0.781	0.827
Mineral County	0.359	0.751
Nye County	0.679	0.812
Pershing County	0.415	0.774
Storey County	0.343	0.727
Washoe County	0.804	0.775
White Pine County	0.574	0.821
Carson City County	0.750	0.796
State Average	0.531	0.755
U.S. Average	0.628	0.779

Source: Bureau of Labor Statistics Quarterly Census of Employment and Wages.

**Table 2. 2016 Employment Location Quotients for Nevada counties.**

COUNTY	NMR	C	M	TTU	I	FA	PBS	EHS	LH
Carson	0.13	0.83	1.02	0.73	0.44	0.72	0.47	0.96	1.11
Churchill	3.18	1.31	0.67	1.23	0.61	0.52	0.50	0.80	1.18
Clark	0.07	1.24	0.27	0.95	0.60	0.88	1.01	0.63	2.78
Douglas	0.53	1.43	1.02	0.76	0.46	0.70	0.66	0.52	2.98
Elko	7.59	1.48	0.09	1.04	0.34	0.43	0.40	0.48	2.41
Esmeralda	43.57	NA	NA	0.15	NA	NA	NA	NA	NA
Eureka	NA	NA	NA	0.17	NA	NA	0.02	0.02	0.05
Humboldt	21.02	0.81	0.38	0.96	0.44	0.25	0.35	0.25	1.30
Lander	46.21	NA	NA	0.67	NA	0.11	0.05	0.04	0.53
Lincoln	3.86	NA	NA	0.93	NA	0.56	0.14	0.37	0.73
Lyon	5.39	1.30	2.17	0.99	0.17	0.43	0.50	0.29	1.20
Mineral	3.80	NA	NA	0.42	NA	NA	NA	0.07	0.97
Nye	8.57	1.04	0.17	0.87	0.45	0.39	1.26	0.53	1.66
Pershing	26.12	NA	NA	0.56	NA	0.21	NA	0.09	0.74
Storey	1.00	2.14	2.22	2.94	0.43	0.04	0.20	NA	0.24
Washoe	0.16	1.41	0.70	1.16	0.50	0.84	1.01	0.78	1.60
White Pine	21.83	0.47	0.06	0.66	0.20	0.34	0.17	0.26	1.16

Source: Bureau of Labor Statistics (2017) and Nanda and Tosun (2018).

Note: The highest industry-specific location quotient for each county is highlighted.

NMR – Natural Resources and Mining, C – Construction, M – Manufacturing, TTU – Trade, Transportation, and Utilities, I – Information, FA – Financial Activities, PBS – Professional and Business Services, EHS – Education and Health Services, LH – Leisure and Hospitality, PS – Private Sector, GP – Goods Producing, SP – Service Providing

**Table 3: Impacts to Employment in Washoe County by Shock Scenario and Effect Type**

	+5%		-5%		-10%		-20%	
	Jobs	%	Jobs	%	Jobs	%	Jobs	%
Direct Effect	353	0.12	-353	-0.12	-696	-0.24	-1,392	-0.48
Indirect Effect	106	0.04	-106	-0.04	-212	-0.07	-424	-0.15
Induced Effect	68	0.02	-68	-0.02	-135	-0.05	-271	-0.09
Total Effect	527	0.18	-527	-0.18	-1,044	-0.36	-2,087	-0.72

**Table 4: Impacts to Labor Income in Washoe County by Shock Scenario and Effect Type**

	+5%		-5%		-10%		-20%	
	\$	%	\$	%	\$	%	\$	%
Direct Effect	14,323,279	0.09	-14,323,279	-0.09	-28,646,558	-0.18	-57,293,116	-0.37
Indirect Effect	4,267,986	0.03	-4,267,986	-0.03	-8,535,971	-0.06	-17,071,942	-0.11
Induced Effect	3,063,374	0.02	-3,063,374	-0.02	-6,126,748	-0.04	-12,253,495	-0.08
Total Effect	21,654,639	0.14	-21,654,639	-0.14	-43,309,277	-0.28	-86,618,553	-0.56

**Table 5: Impacts to Total Value Added in Washoe County by Shock Scenario and Effect Type**

	+5%		-5%		-10%		-20%	
	\$	%	\$	%	\$	%	\$	%
Direct Effect	24,406,438	0.10	-24,406,438	-0.10	-48,812,875	-0.19	-97,625,750	-0.39
Indirect Effect	8,212,329	0.03	-8,212,329	-0.03	-16,424,657	-0.06	-32,849,314	-0.13
Induced Effect	5,001,883	0.02	-5,001,883	-0.02	-10,003,765	-0.04	-20,007,530	-0.08
Total Effect	37,620,649	0.15	-37,620,649	-0.15	-75,241,297	-0.30	-150,482,594	-0.59

**Table 6: Impacts to Output in Washoe County by Shock Scenario and Effect Type**

	+5%		-5%		-10%		-20%	
	\$	%	\$	%	\$	%	\$	%
Direct Effect	41,204,417	0.10	-41,204,417	-0.10	-82,408,832	-0.20	-164,817,664	-0.39
Indirect Effect	14,028,031	0.03	-14,028,031	-0.03	-28,056,062	-0.07	-56,112,124	-0.13
Induced Effect	8,106,537	0.02	-8,106,537	-0.02	-16,213,073	-0.04	-32,426,146	-0.08
Total Effect	63,338,984	0.15	-63,338,984	-0.15	-126,677,967	-0.30	-253,355,934	-0.60

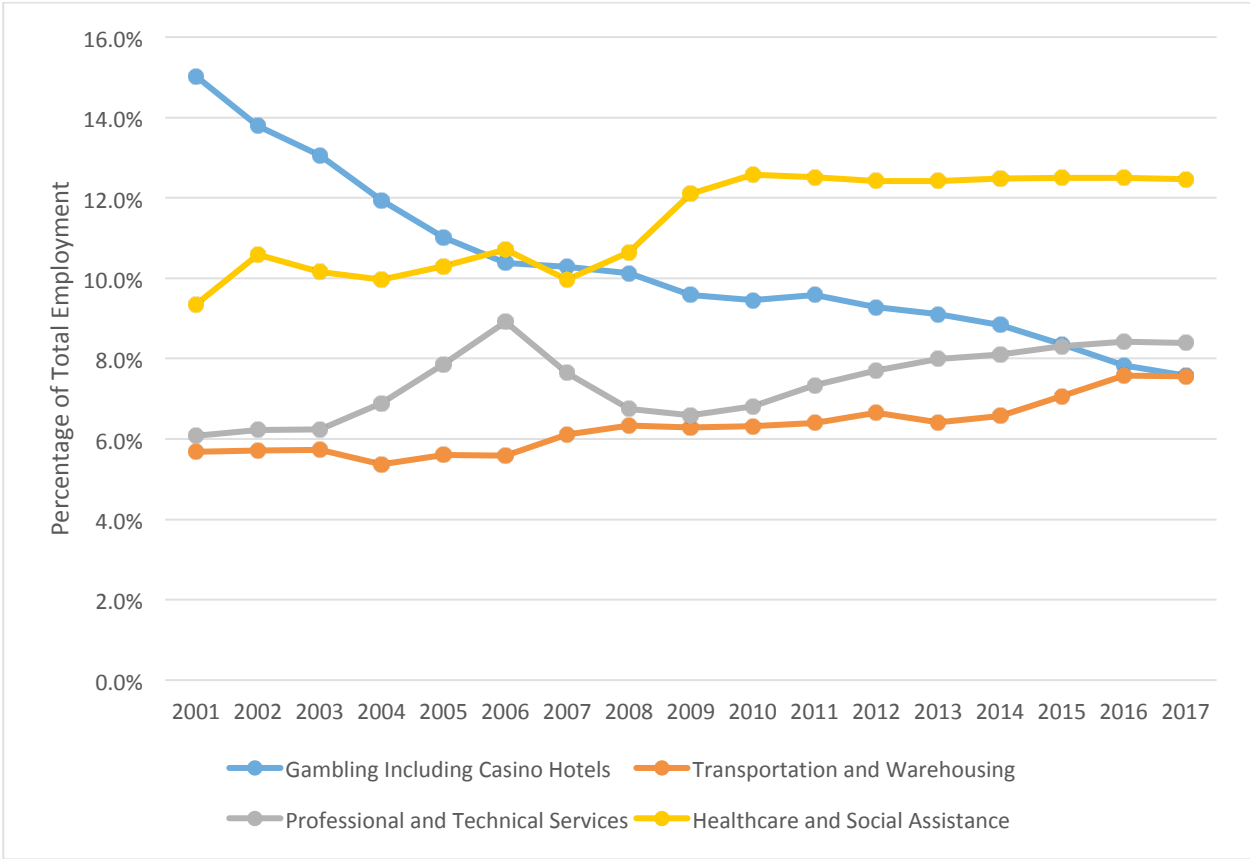
**Table 7: Fiscal Impacts to State and Local Government Revenues from Washoe County by Shock Scenario and Account**

	+5%		-5%		-10%		-20%	
	\$	%	\$	%	\$	%	\$	%
Dividends	8,595	0.00003	-8,595	-0.00003	-17,190	-0.00007	-34,380	-0.00013
Business Tax	2,883,983	0.01098	-2,883,983	-0.01098	-5,767,964	-0.02195	-11,535,930	-0.04391
Personal Tax	121,505	0.00046	-121,505	-0.00046	-243,011	-0.00092	-486,020	-0.00185
Total	3,014,083	0.01147	-3,014,083	-0.01147	-6,028,165	-0.02295	-12,056,330	-0.04589

**Table 8: Fiscal Impacts to Federal Government Revenues from Washoe County by Shock Scenario and Account**

	+5%		-5%		-10%		-20%	
	\$	%	\$	%	\$	%	\$	%
Social Insurance Tax	2,379,000	0.00007	-2,379,000	-0.00007	-4,758,001	-0.00014	-9,516,002	-0.00029
Business Tax	308,573	0.00001	-308,573	-0.00001	-617,146	-0.00002	-1,234,293	-0.00004
Corporate Profits Tax	453,904	0.00001	-453,904	-0.00001	-907,808	-0.00003	-1,815,616	-0.00006
Personal Tax	1,969,764	0.00006	-1,969,764	-0.00006	-3,939,528	-0.00012	-7,879,055	-0.00024
Total	5,111,241	0.00015	-5,111,241	-0.00015	-10,222,484	-0.00031	-20,444,967	-0.00062

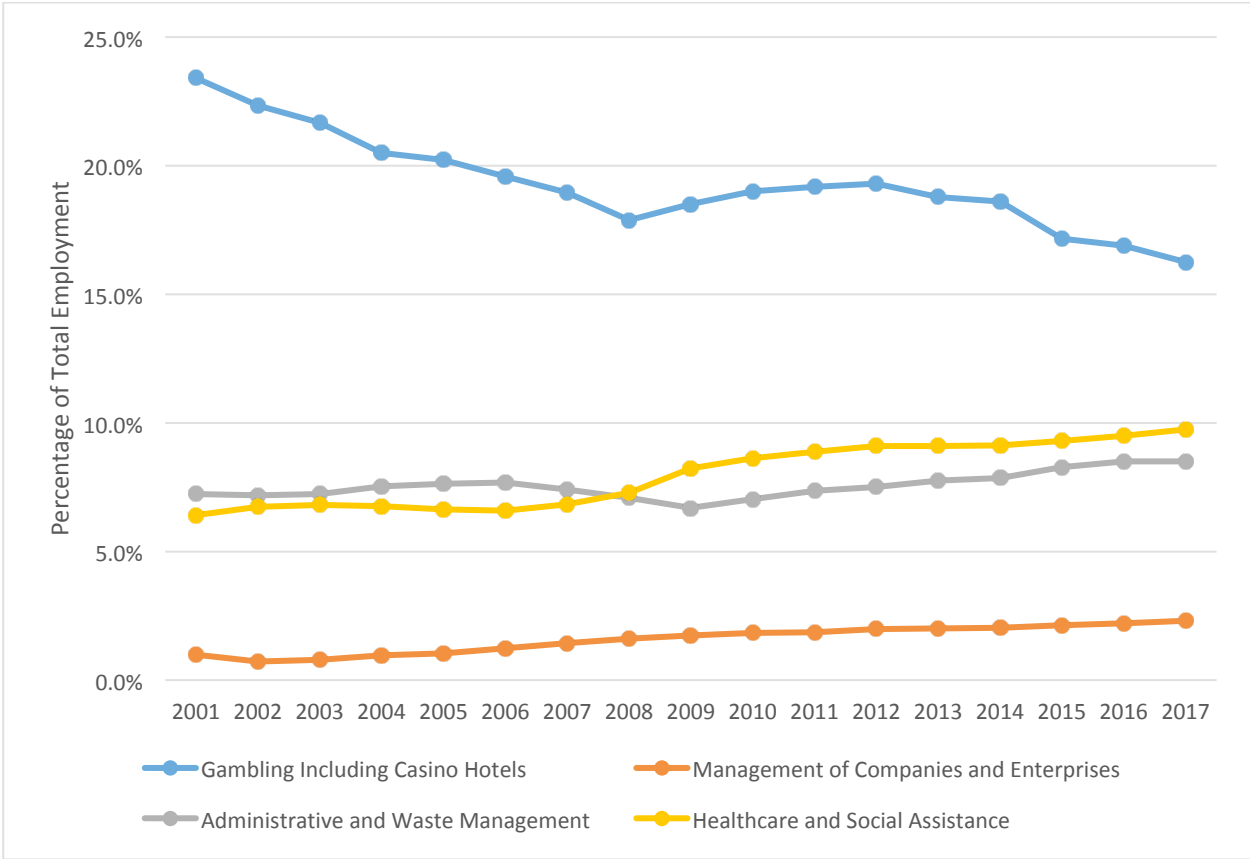
**Figure 1: Gaming and Top 3 Growth Sectors in Washoe County**



Source: Bureau of Labor Statistics Quarterly Census of Employment and Wages.

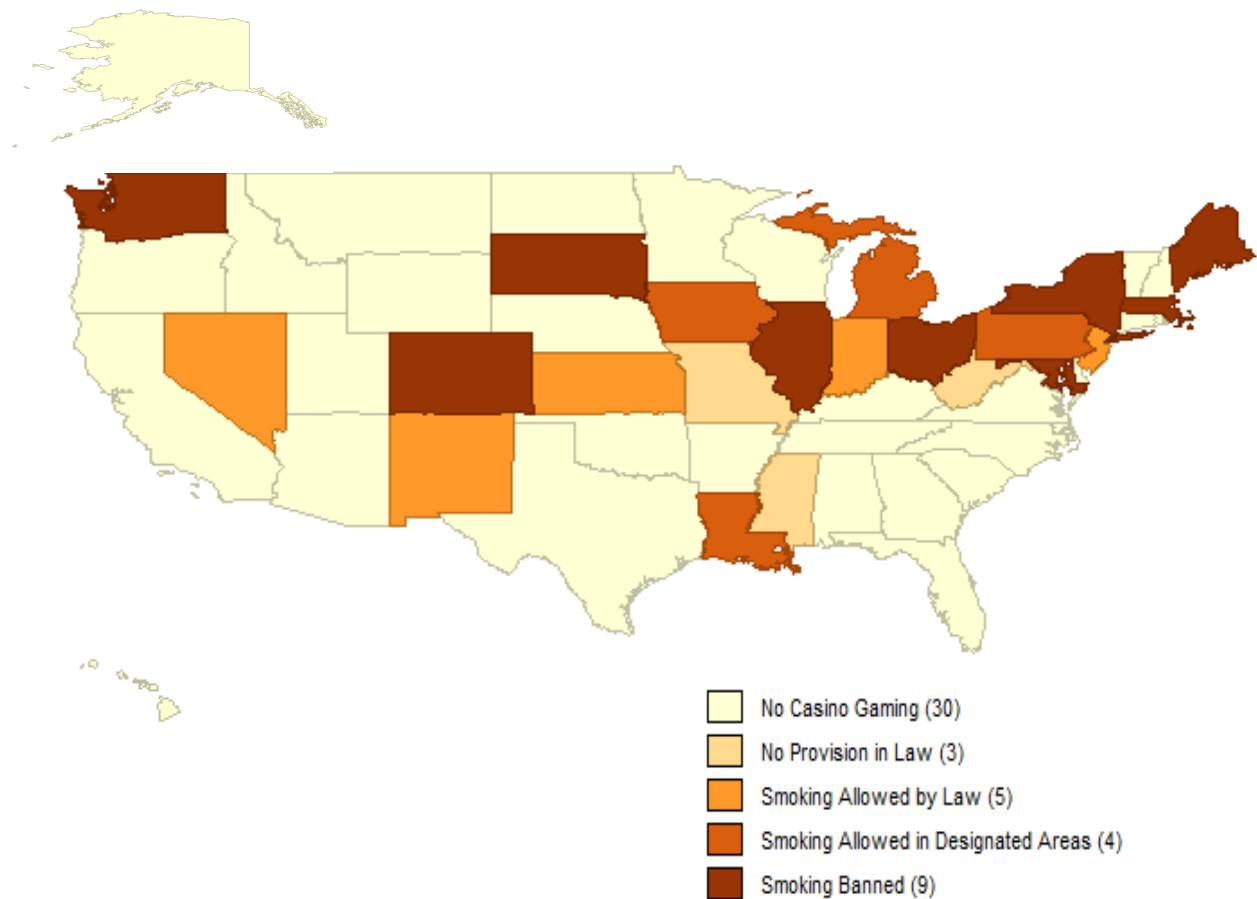


**Figure 2: Gaming and Top 3 Growth Sectors in Clark County**



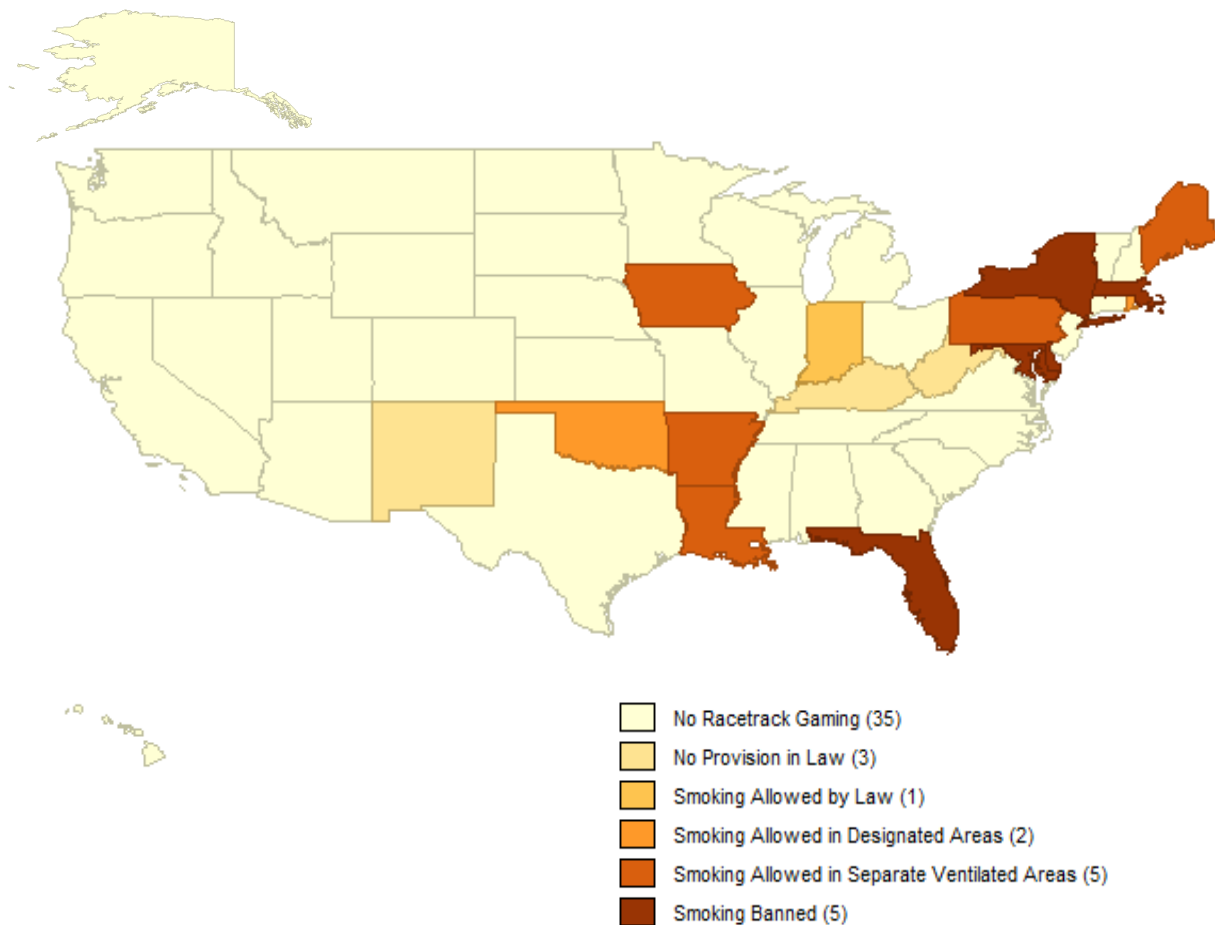
Source: Bureau of Labor Statistics Quarterly Census of Employment and Wages.

**Figure 3. Indoor Smoking Regulations in States with Commercial Casinos**



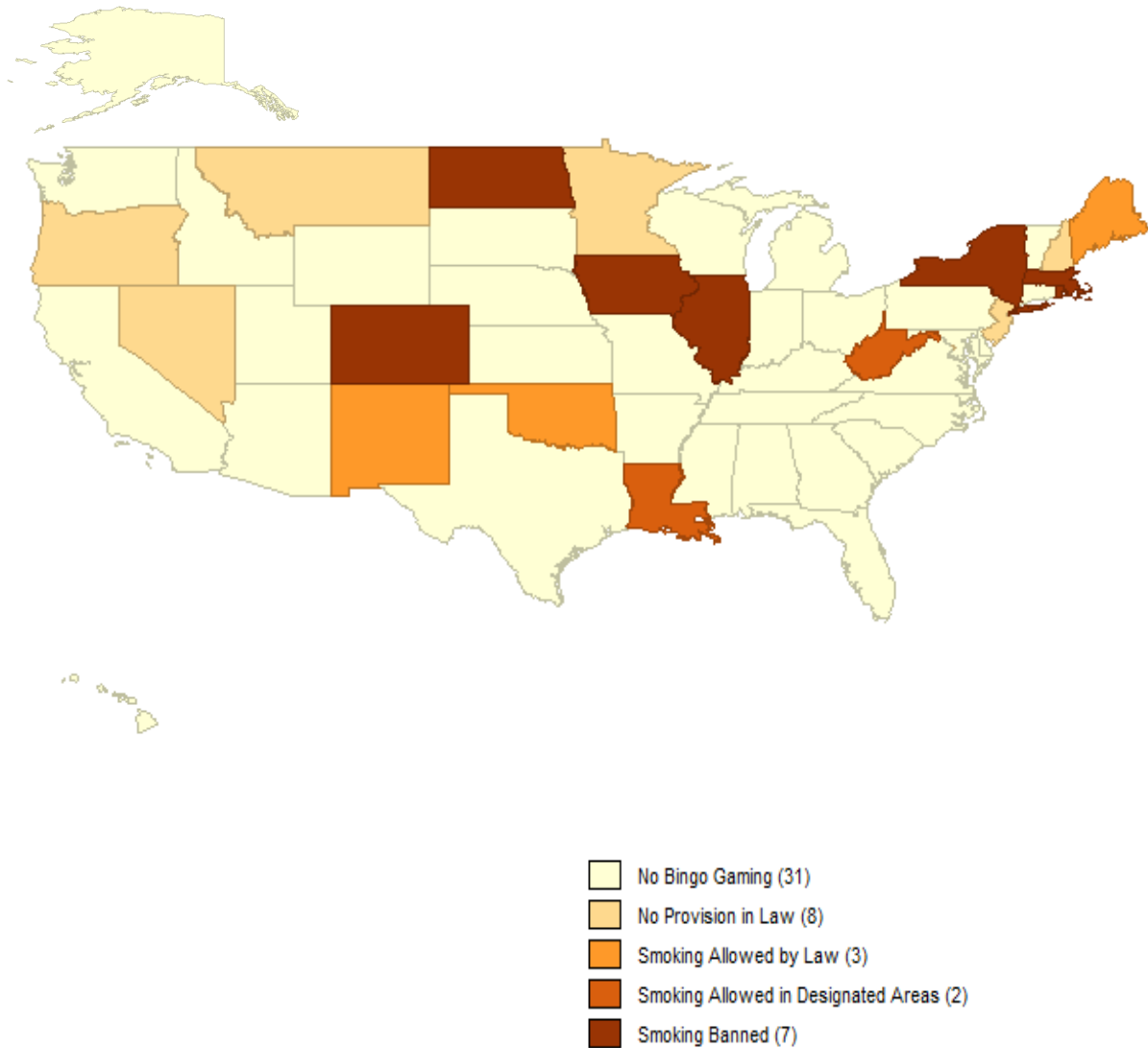
Source: Centers for Disease Control and Prevention. State Tobacco Activities Tracking and Evaluation (STATE) System. Available at: <http://www.cdc.gov/statesystem>.

**Figure 4. Indoor Smoking Regulations in States with Racetracks**



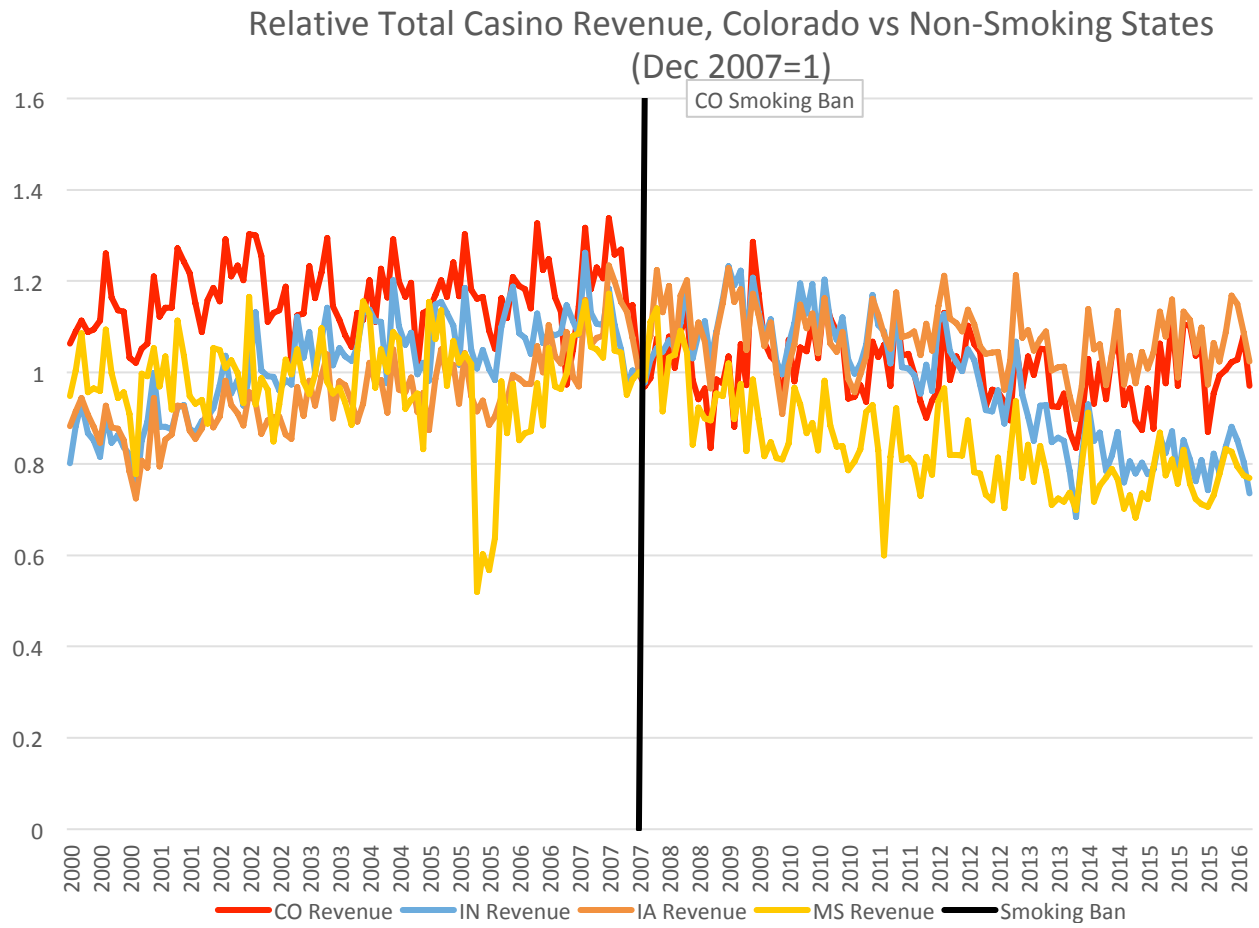
Source: Centers for Disease Control and Prevention. State Tobacco Activities Tracking and Evaluation (STATE) System. Available at: <http://www.cdc.gov/statesystem>.

**Figure 5. Indoor Smoking Regulations in States with Bingo Halls**



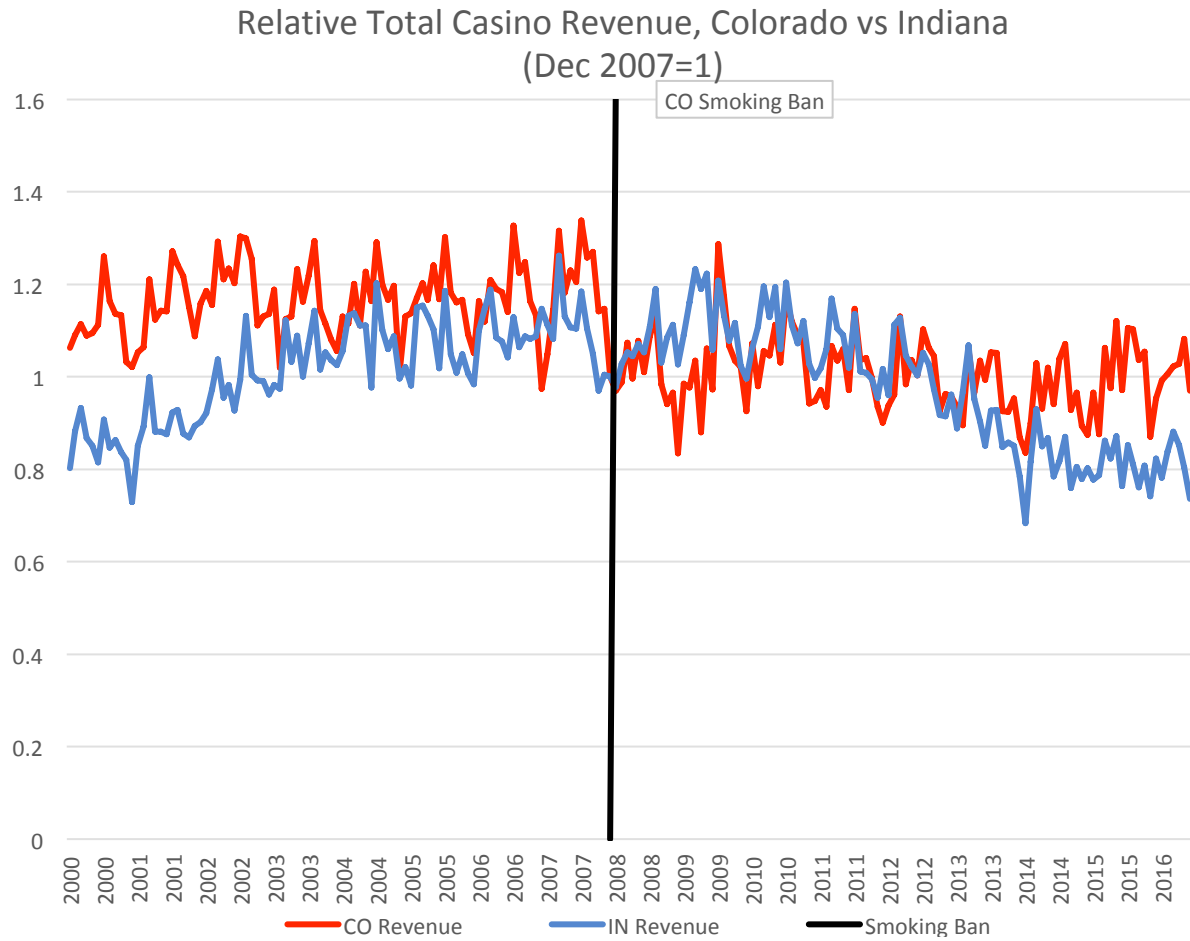
Source: Centers for Disease Control and Prevention. State Tobacco Activities Tracking and Evaluation (STATE) System. Available at: <http://www.cdc.gov/statesystem>.

**Figure 6. Relative Total Casino Revenue, Colorado vs. Non-Smoking States**



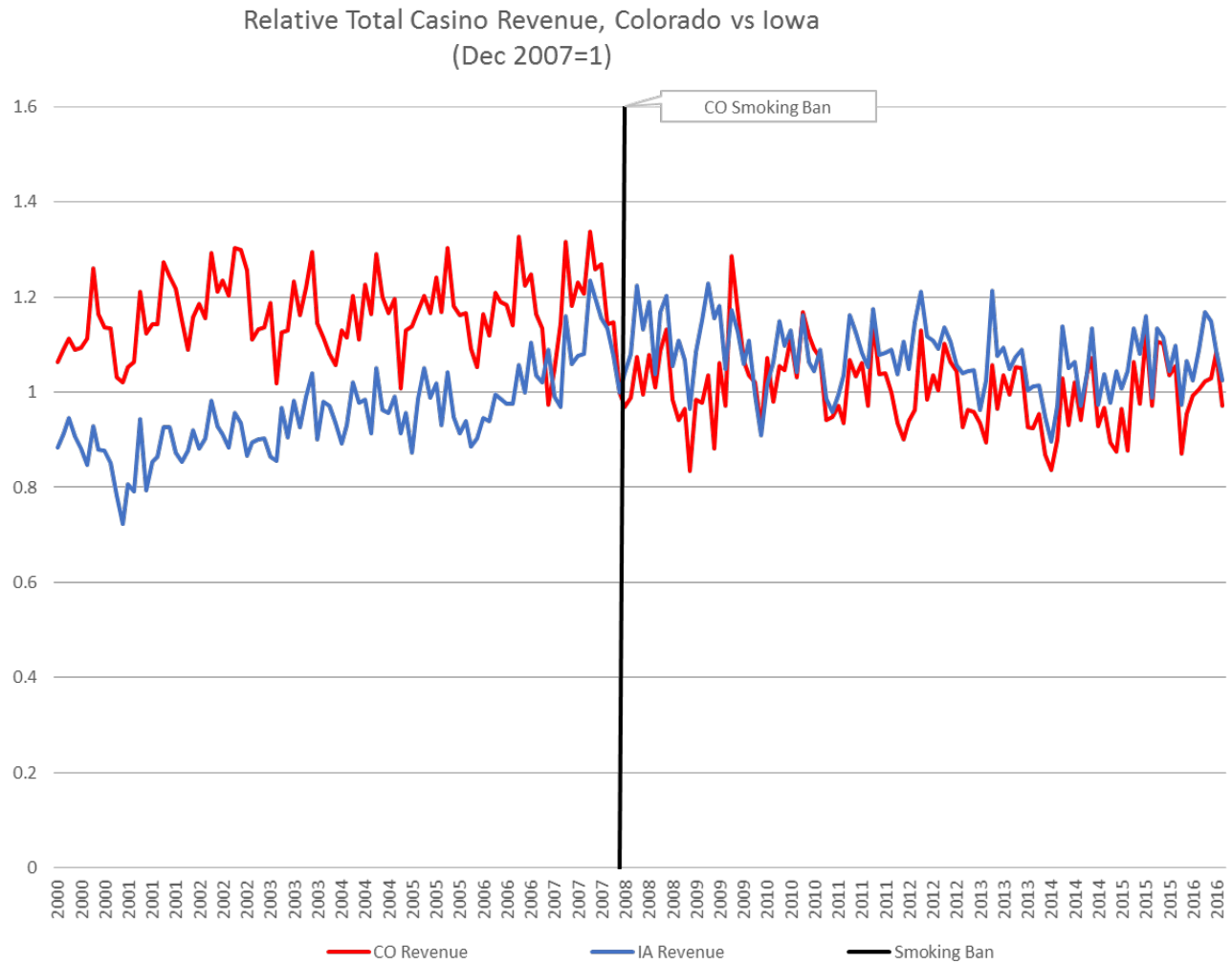
Source: Various State Gaming Control Boards.

**Figure 7. Relative Total Casino Revenue, Colorado vs. Indiana**



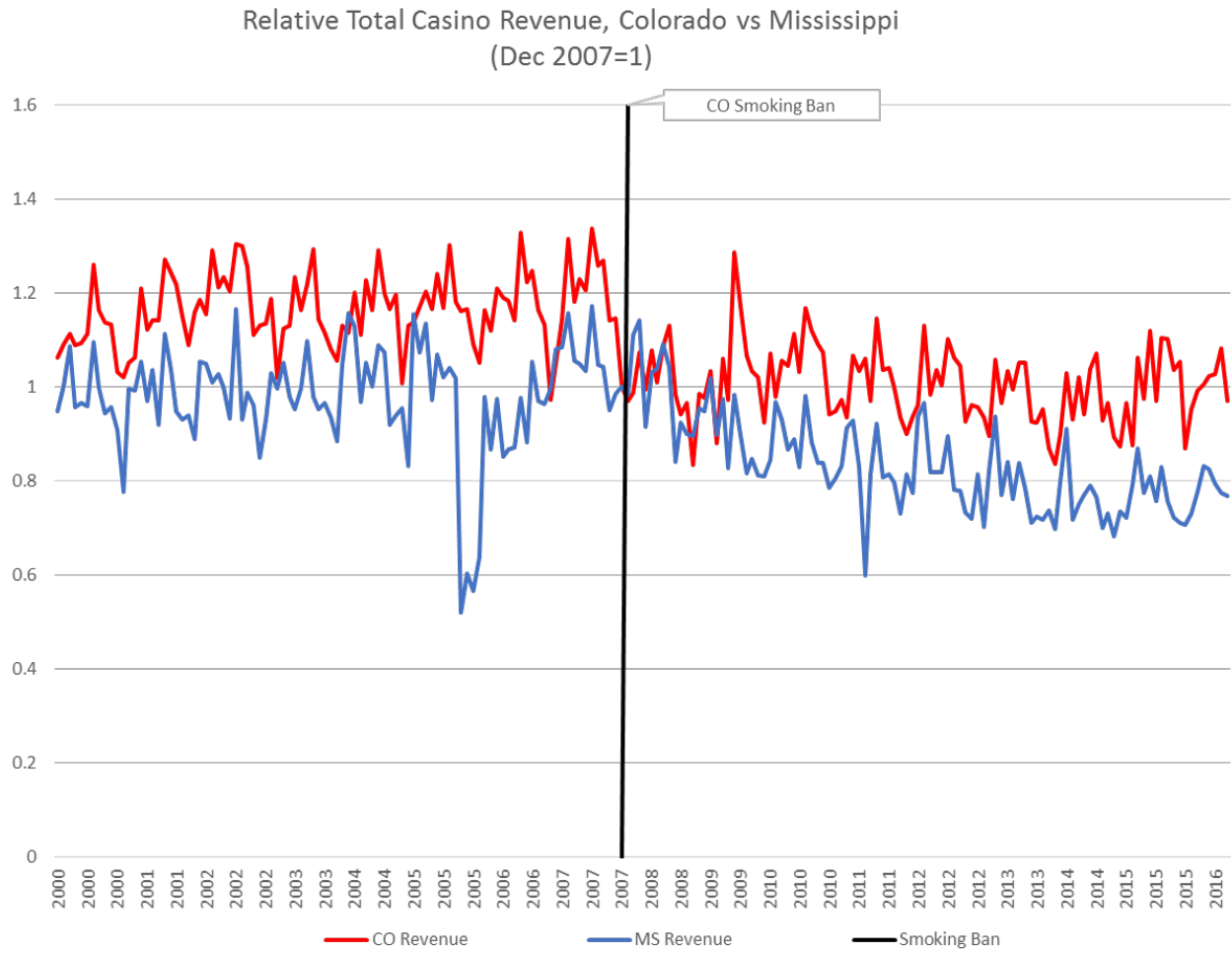
Source: Various State Gaming Control Boards.

**Figure 8. Relative Total Casino Revenue, Colorado vs. Iowa**



Source: Various State Gaming Control Boards.

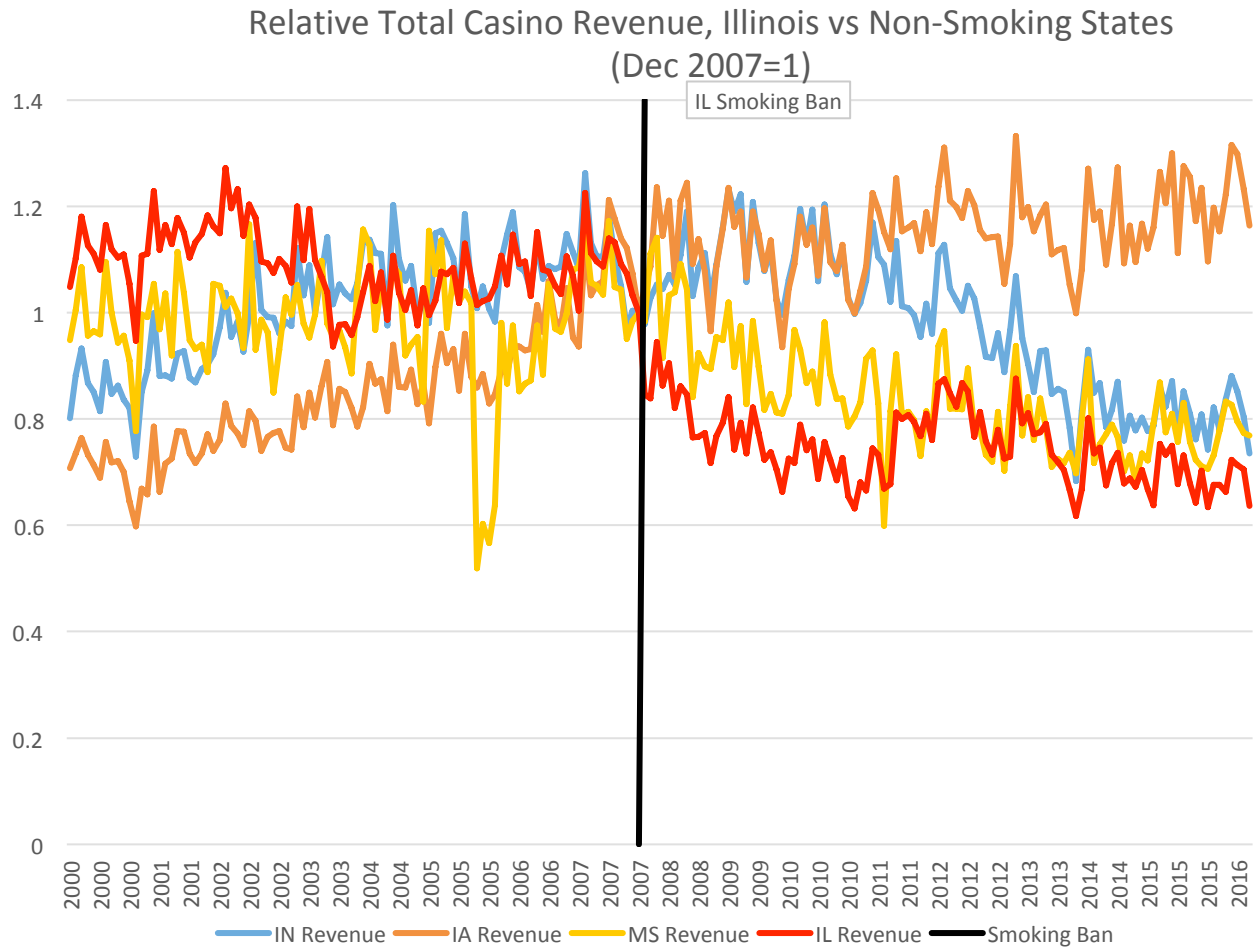
**Figure 9. Relative Total Casino Revenue, Colorado vs. Mississippi**



Source: Various State Gaming Control Boards.

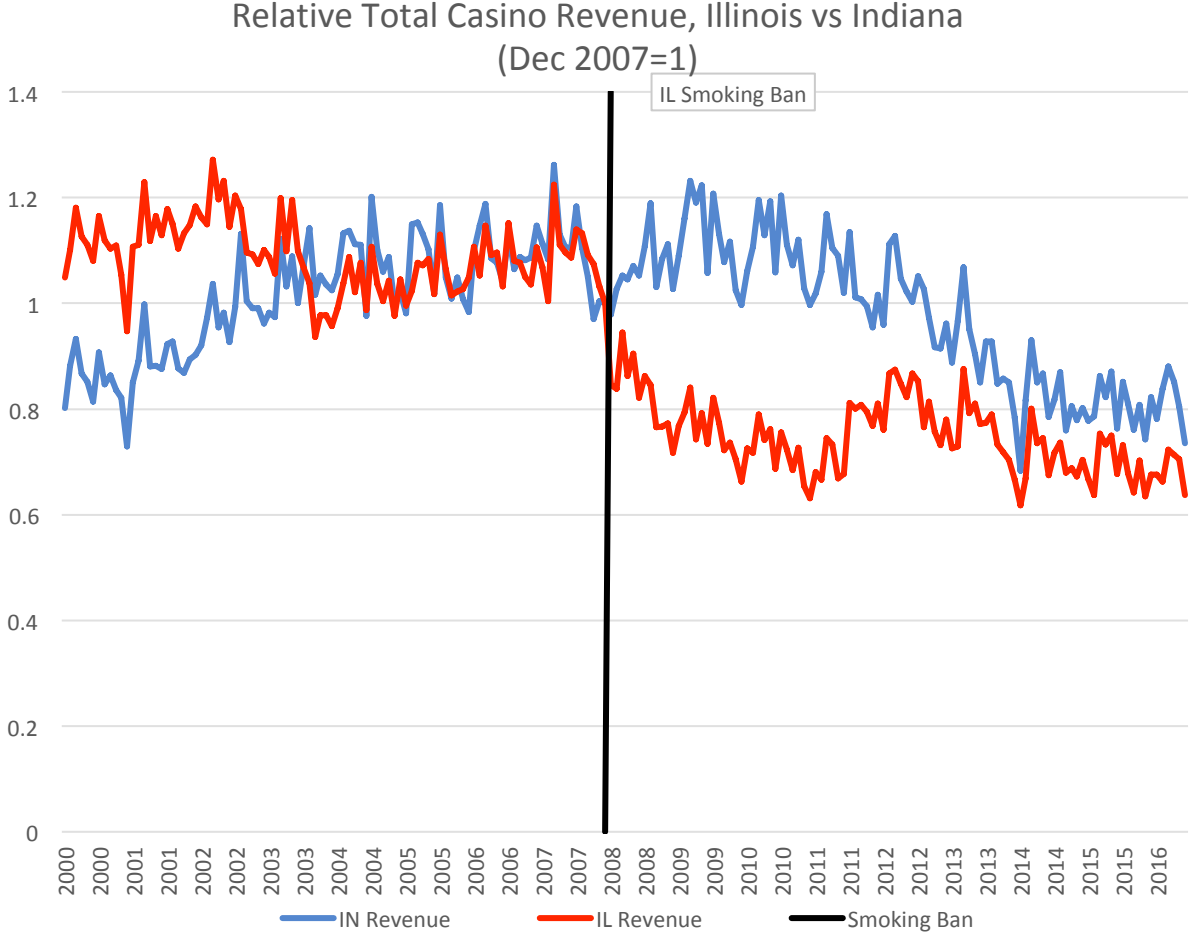


**Figure 10. Relative Total Casino Revenue, Illinois vs. Non-Smoking States**



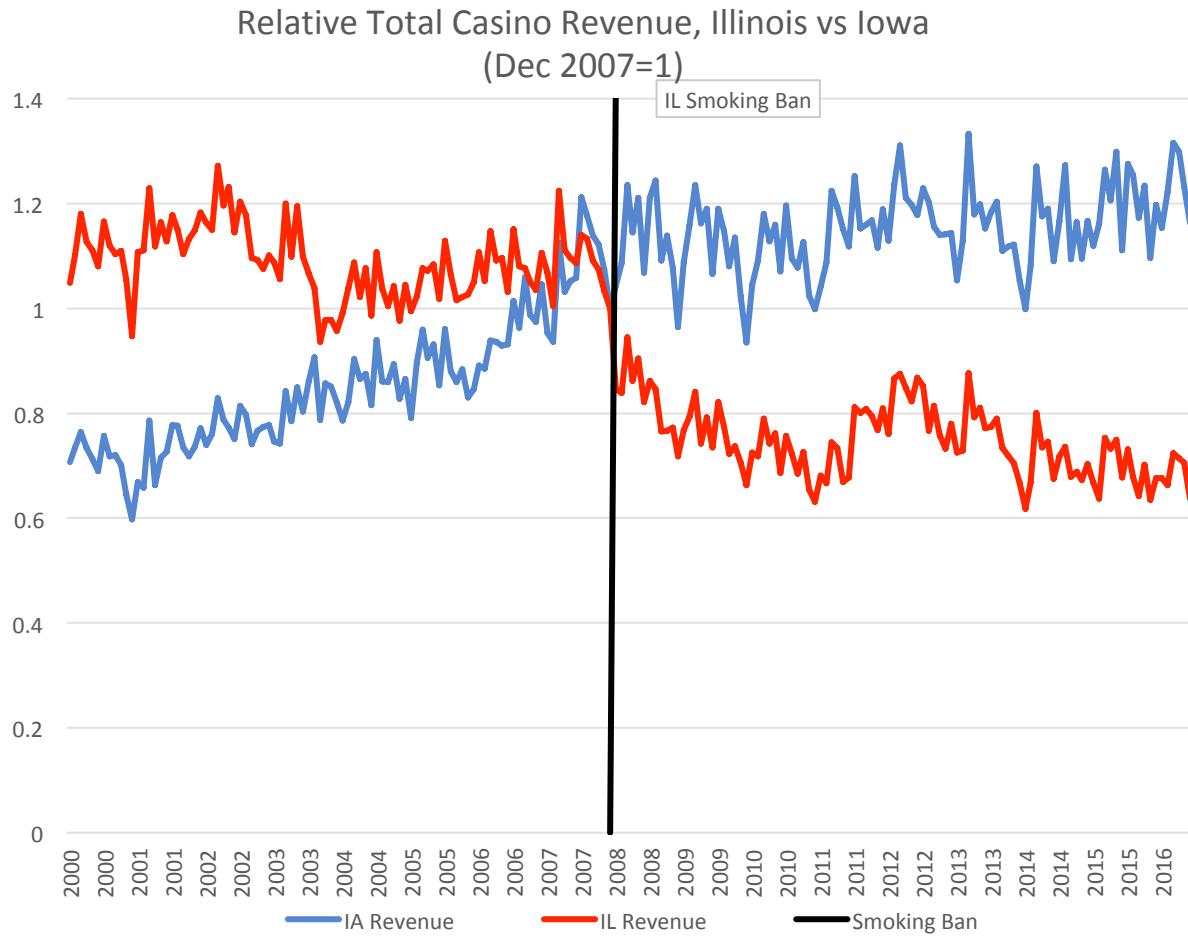
Source: Various State Gaming Control Boards.

**Figure 11. Relative Total Casino Revenue, Illinois vs. Indiana**



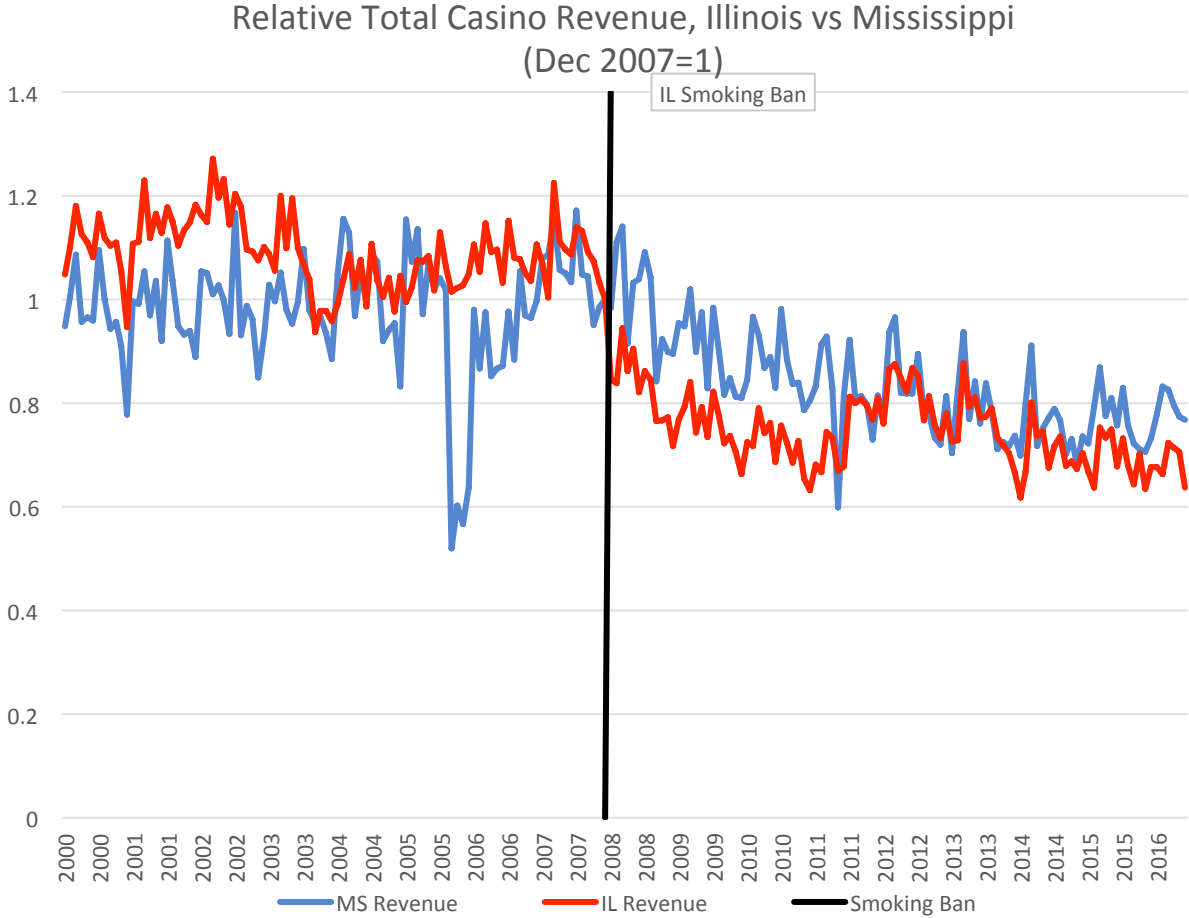
Source: Various State Gaming Control Boards.

**Figure 12. Relative Total Casino Revenue, Illinois vs. Iowa**



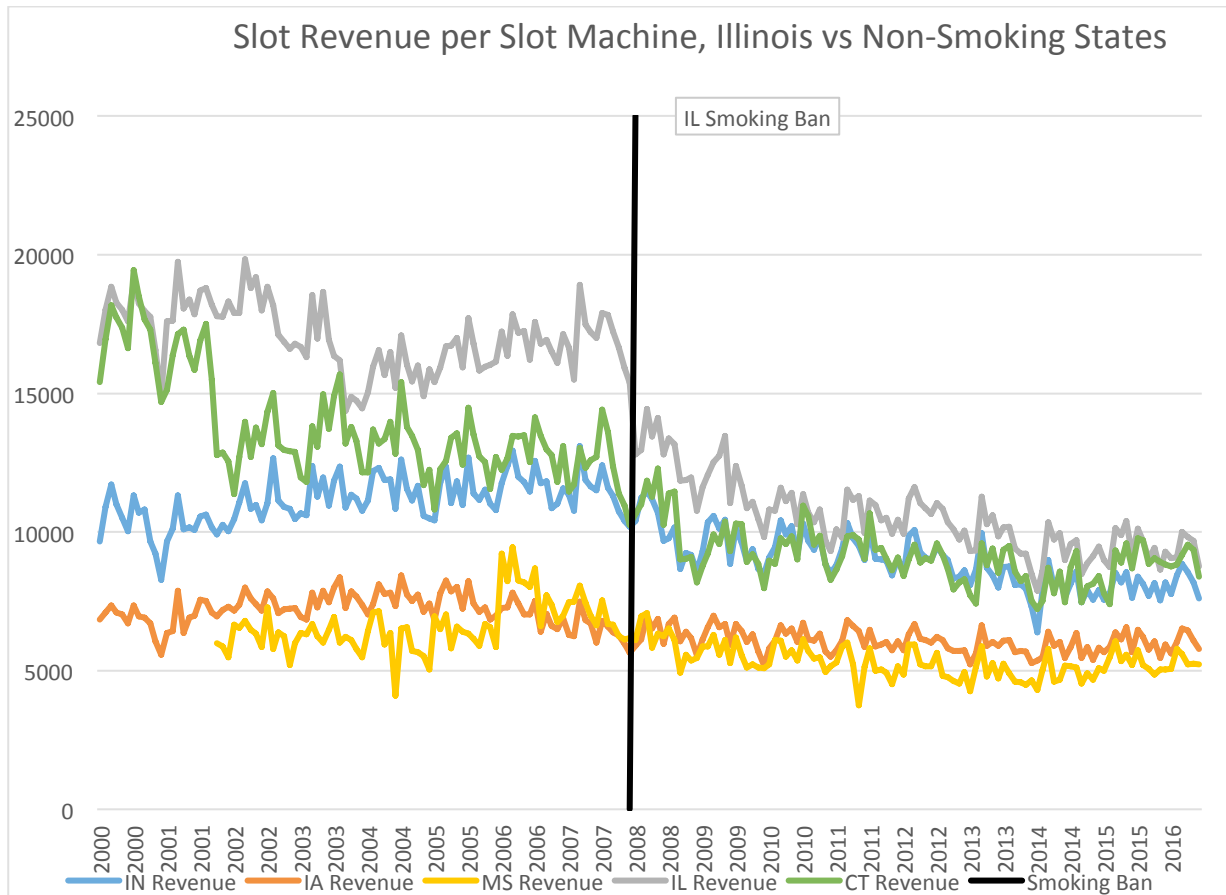
Source: Various State Gaming Control Boards.

**Figure 13. Relative Total Casino Revenue, Illinois vs. Mississippi**



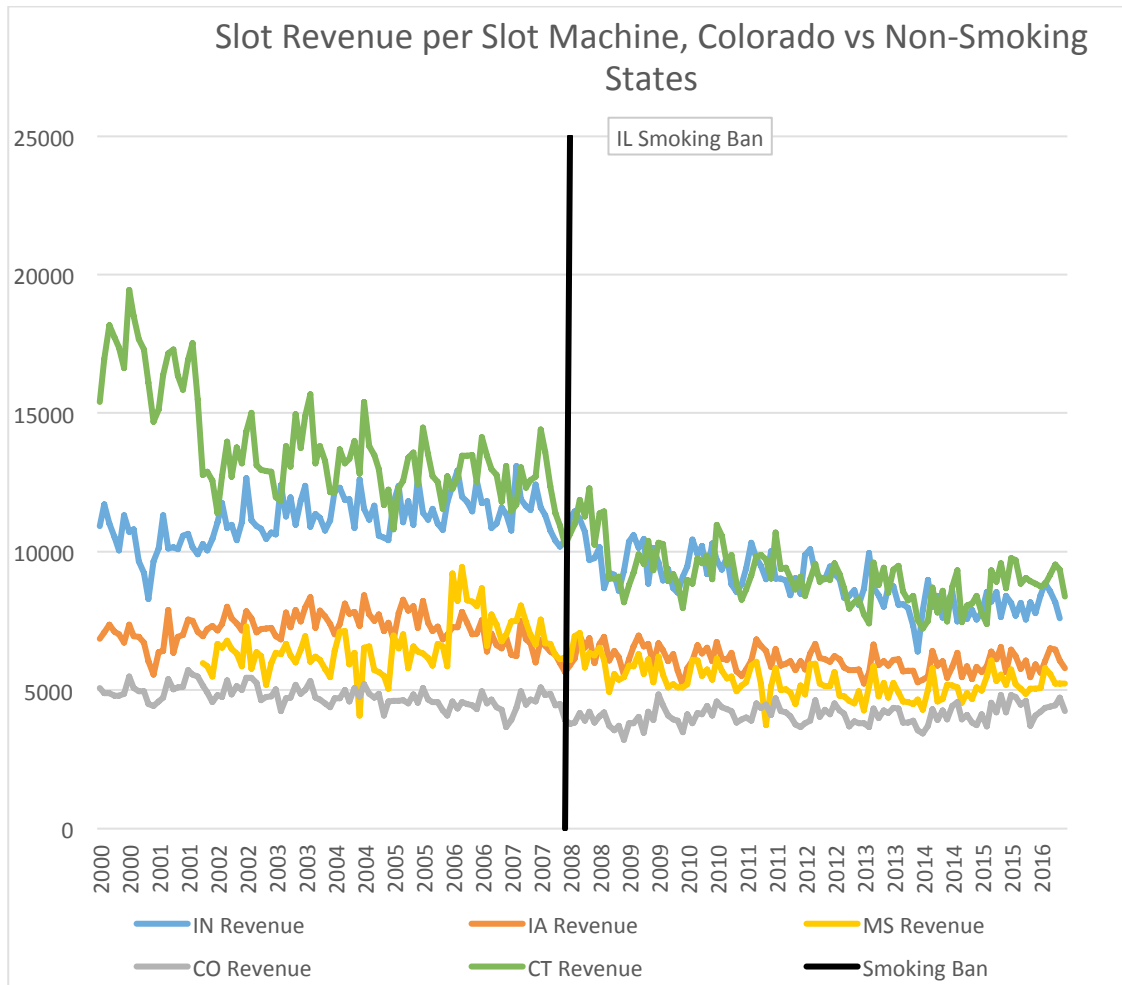
Source: Various State Gaming Control Boards.

**Figure 14. Slot Revenue per Slot Machine, Illinois vs. Indiana, Iowa, Mississippi, and Connecticut**



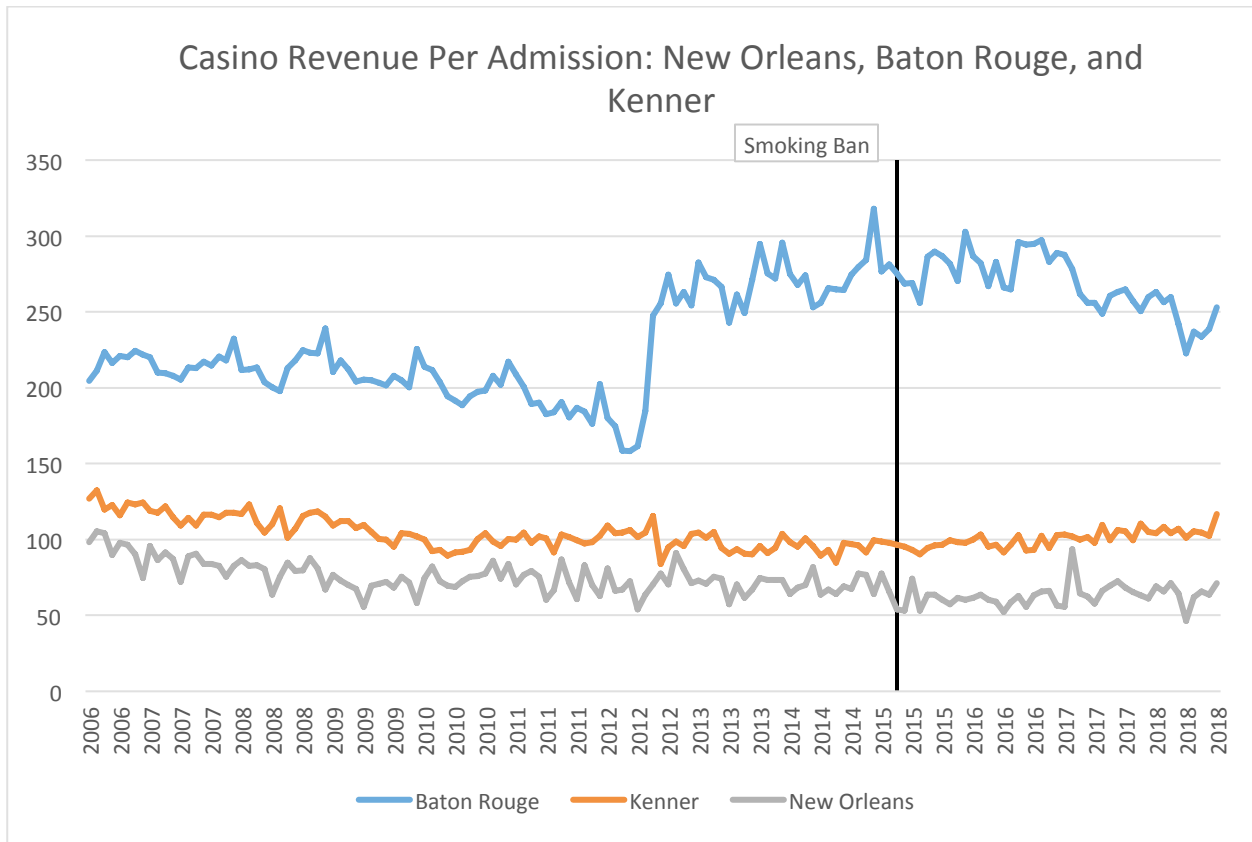
Source: Various State Gaming Control Boards.

**Figure 15. Slot Revenue per Slot Machine, Colorado vs. Indiana, Iowa, Mississippi, and Connecticut**



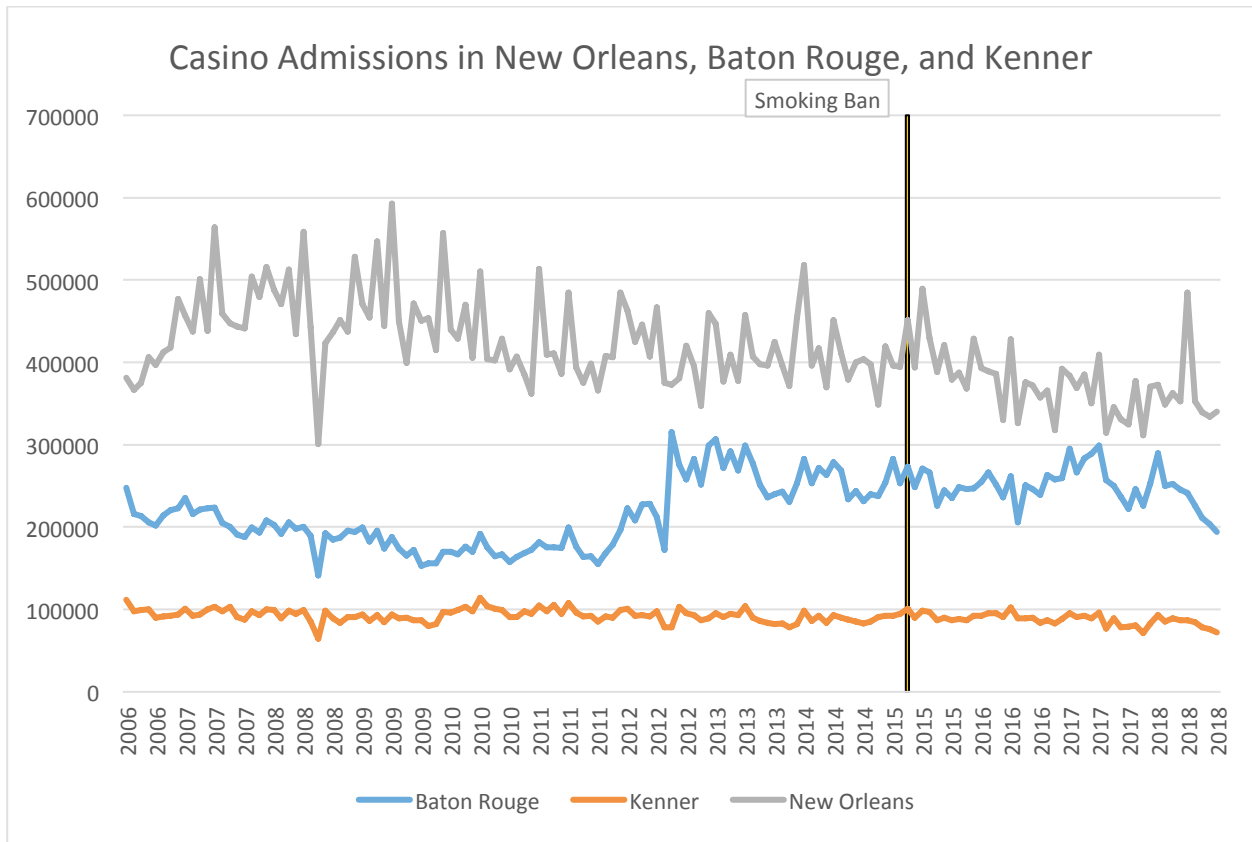
Source: Various State Gaming Control Boards.

**Figure 16. Revenue per Admission, New Orleans vs Baton Rouge and Kenner.**



Source: Various State Gaming Control Boards.

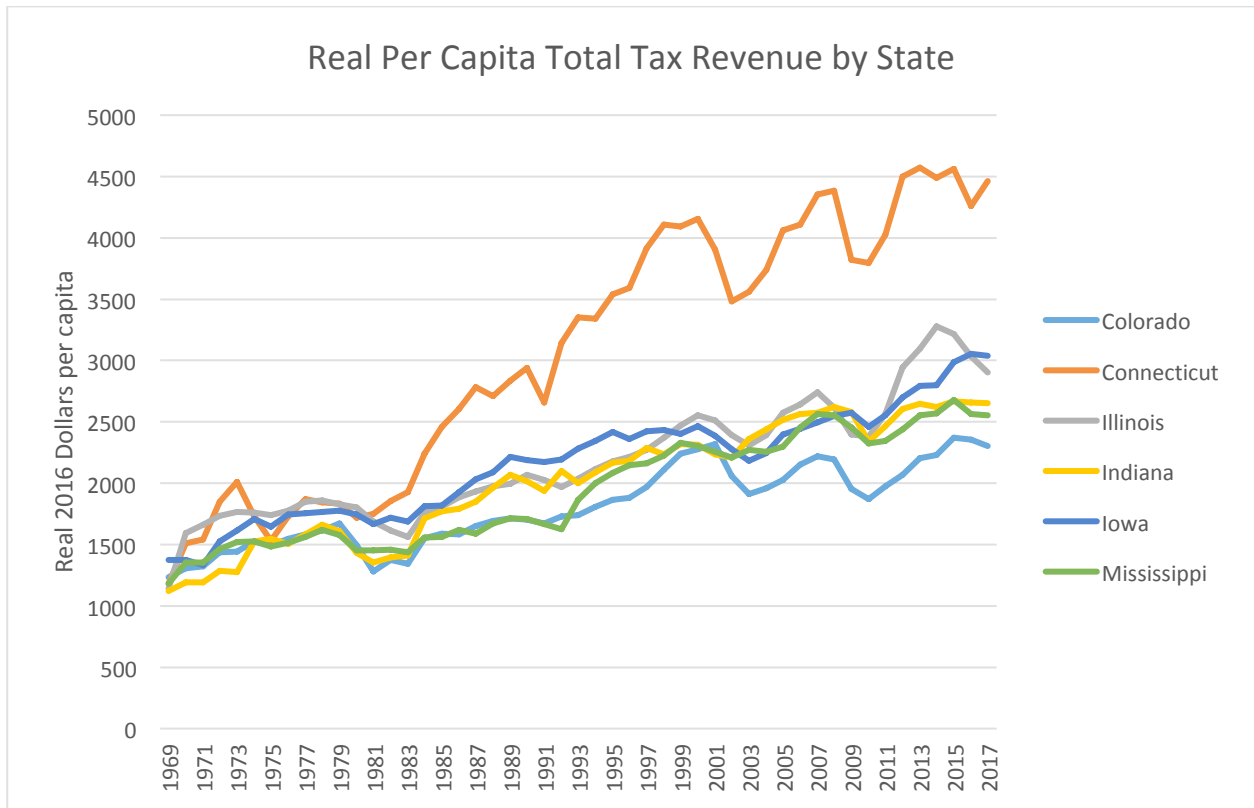
**Figure 17. Casino Admissions, New Orleans vs Baton Rouge and Kenner.**



Source: Various State Gaming Control Boards.

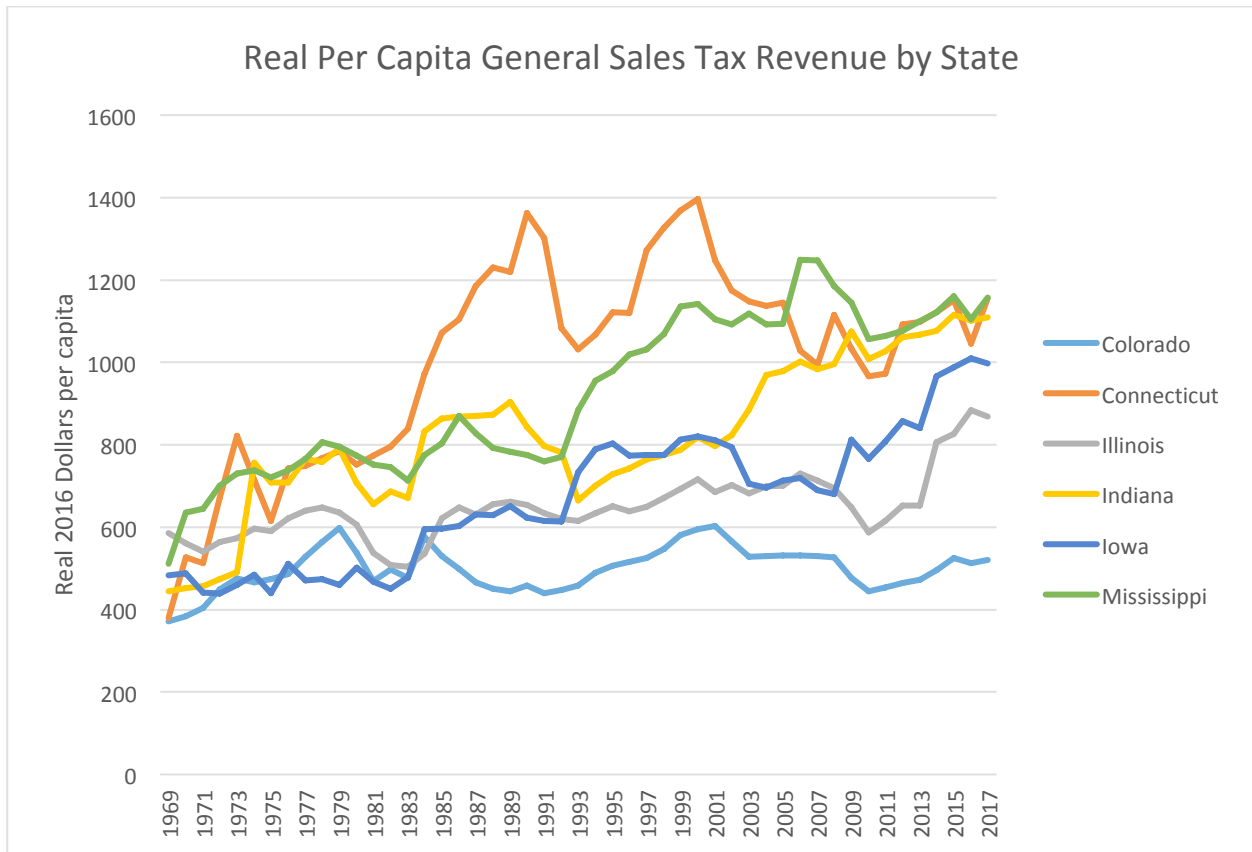


**Figure 18. Real Per Capita Total Tax Revenue**



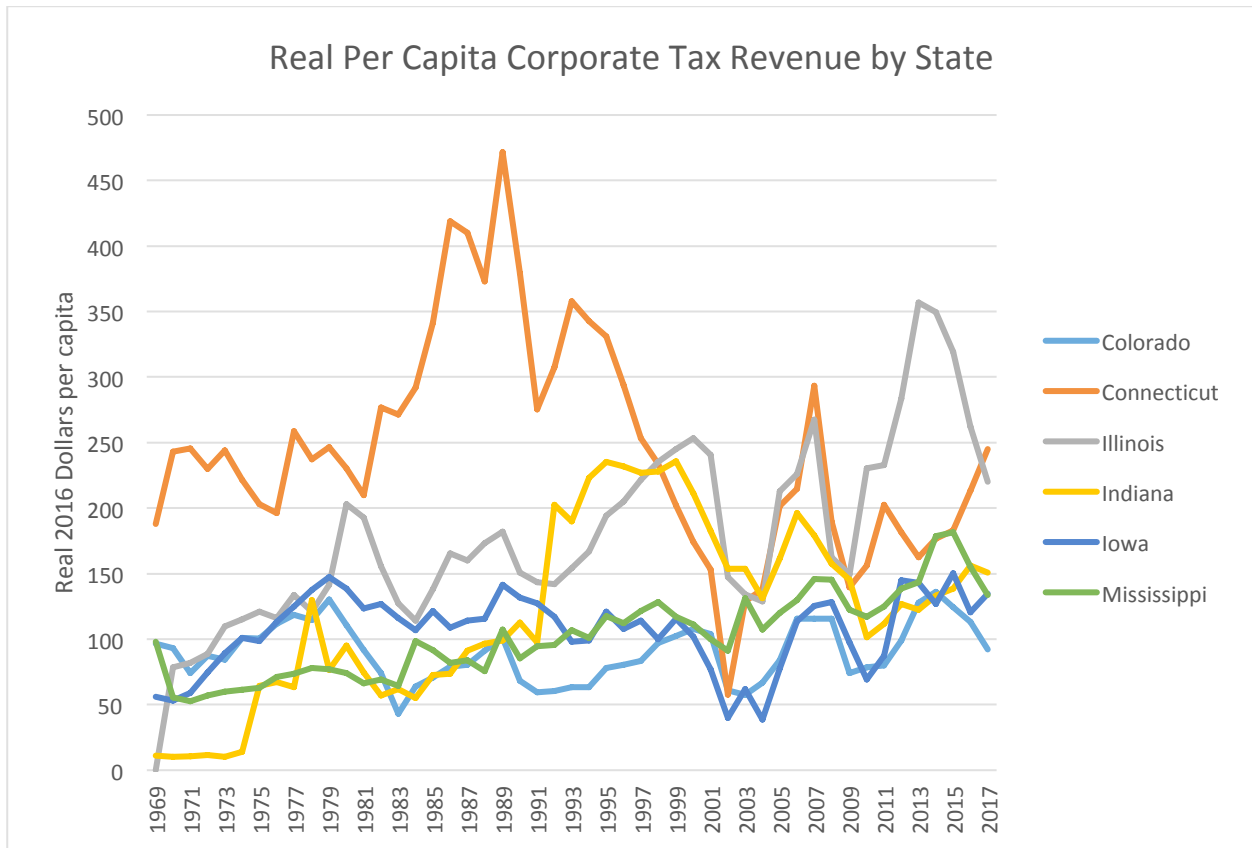
Source: U.S. Census Bureau – Governments Division. Database on Historical State Tax Collections.

**Figure 19. Real Per Capita General Sales Tax Revenue**



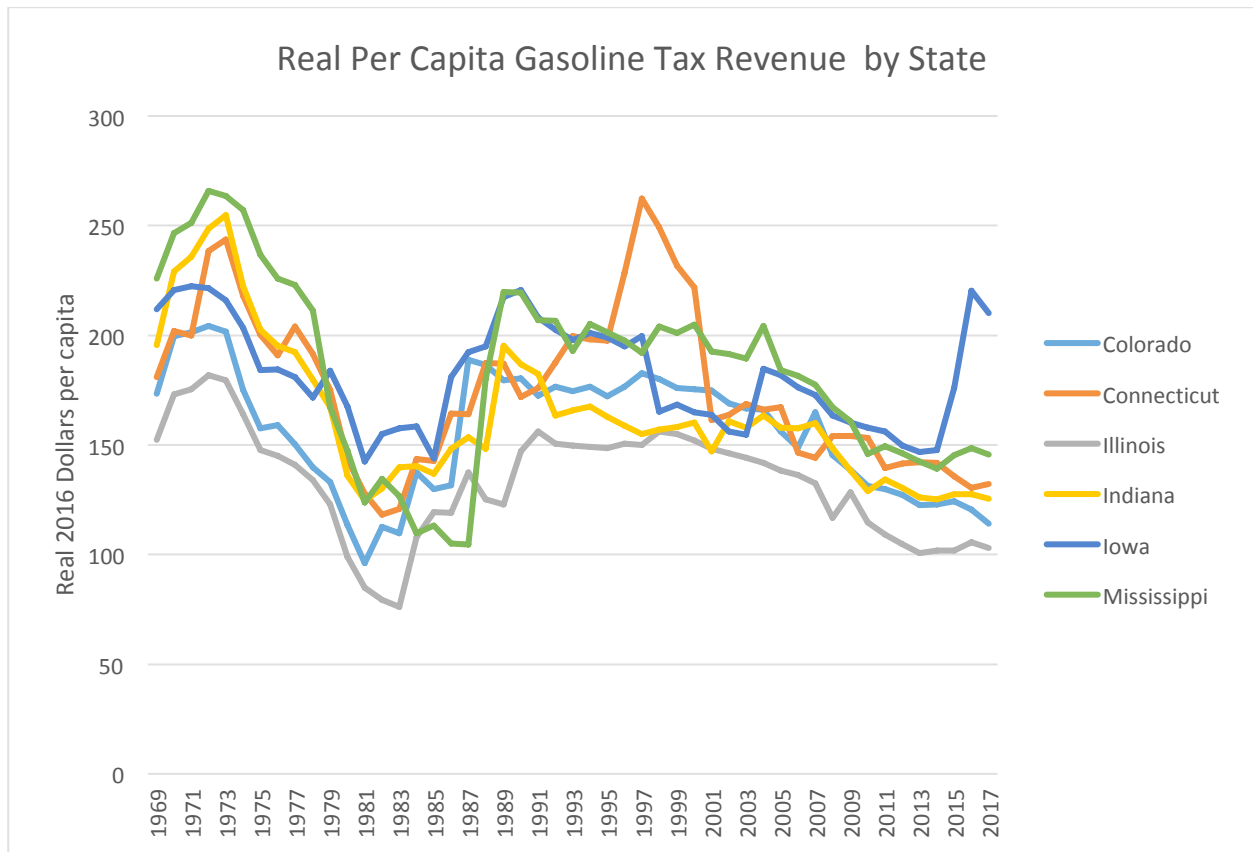
Source: U.S. Census Bureau – Governments Division. Database on Historical State Tax Collections.

**Figure 20. Real Per Capita Corporate Tax Revenue**



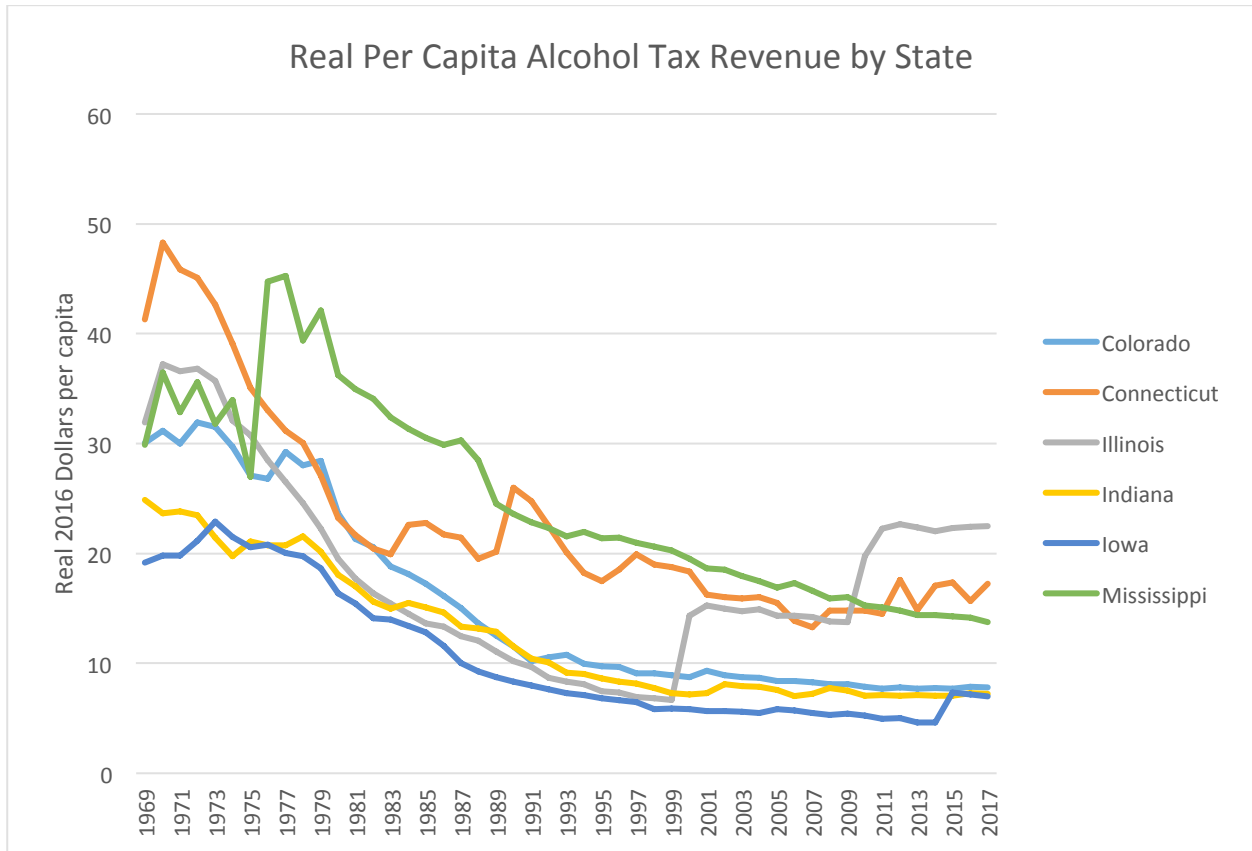
Source: U.S. Census Bureau – Governments Division. Database on Historical State Tax Collections.

**Figure 21. Real Per Capita Gasoline Tax Revenue**



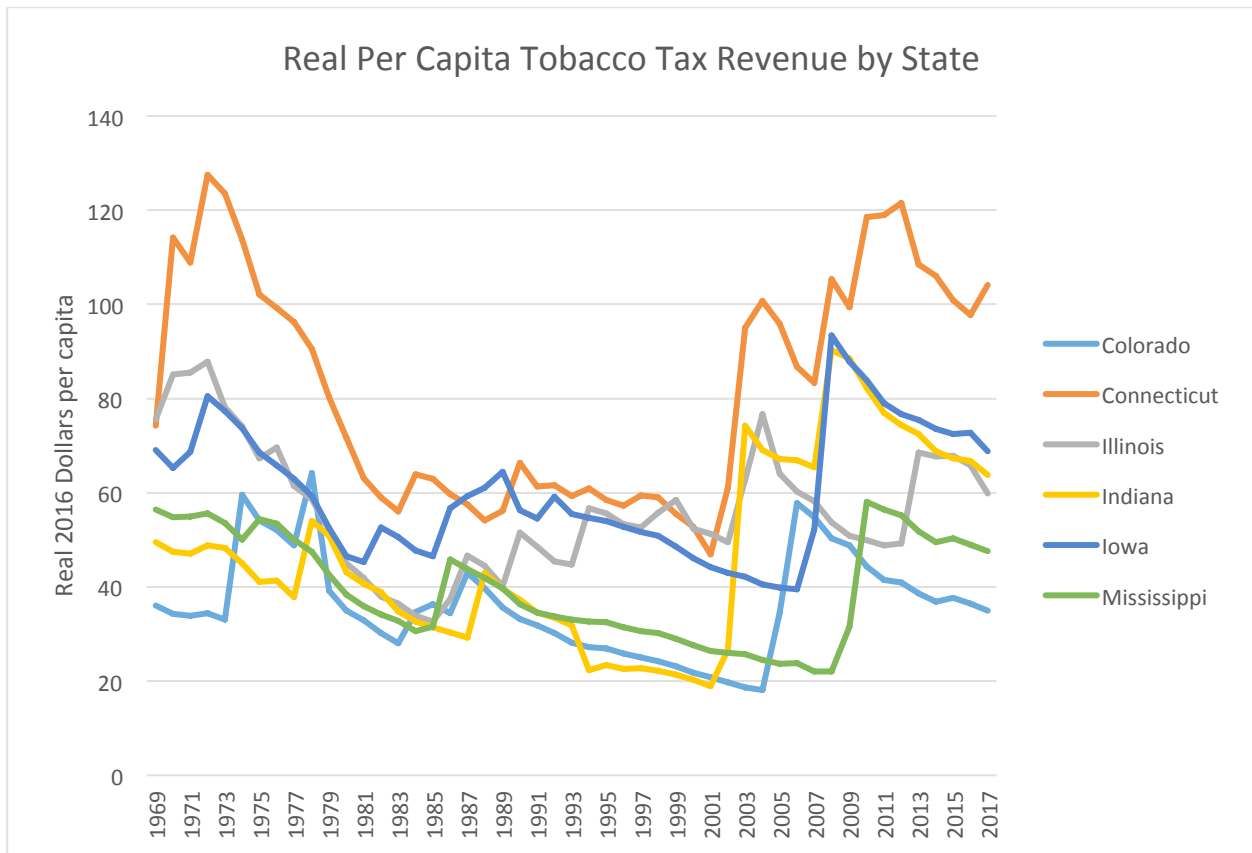
Source: U.S. Census Bureau – Governments Division. Database on Historical State Tax Collections.

**Figure 22. Real Per Capita Alcohol Tax Revenue**



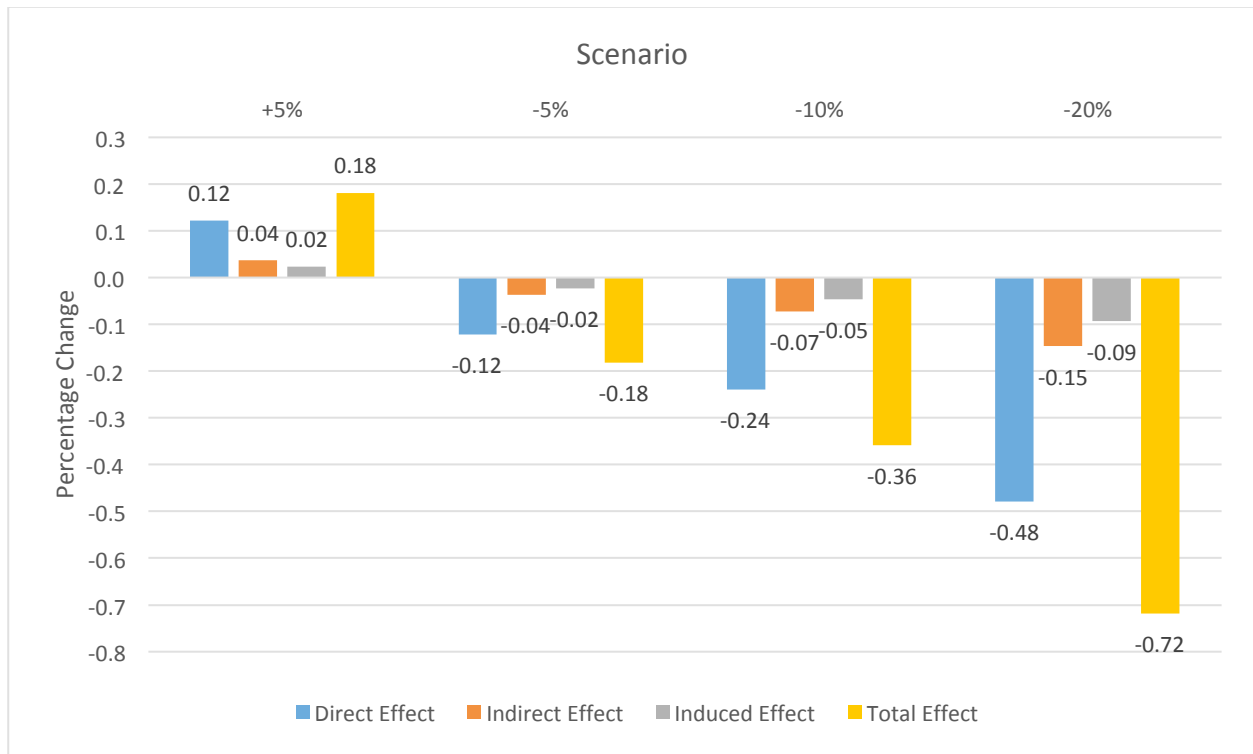
Source: U.S. Census Bureau – Governments Division. Database on Historical State Tax Collections.

**Figure 23. Real Per Capita Tobacco Tax Revenue**



Source: U.S. Census Bureau – Governments Division. Database on Historical State Tax Collections.

**Figure 24: Impacts to Employment in Washoe County by Shock Scenario and Effect Type**

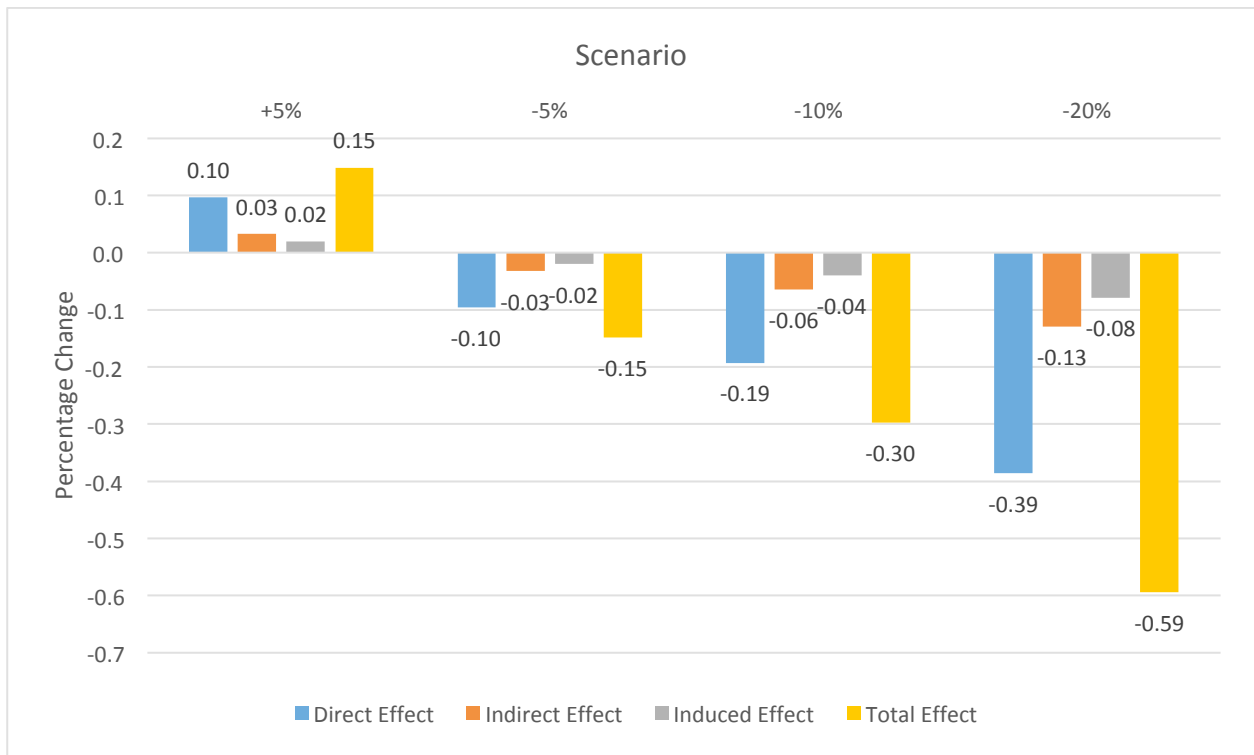


**Figure 25: Impacts to Labor Income in Washoe County by Shock Scenario and Effect Type**

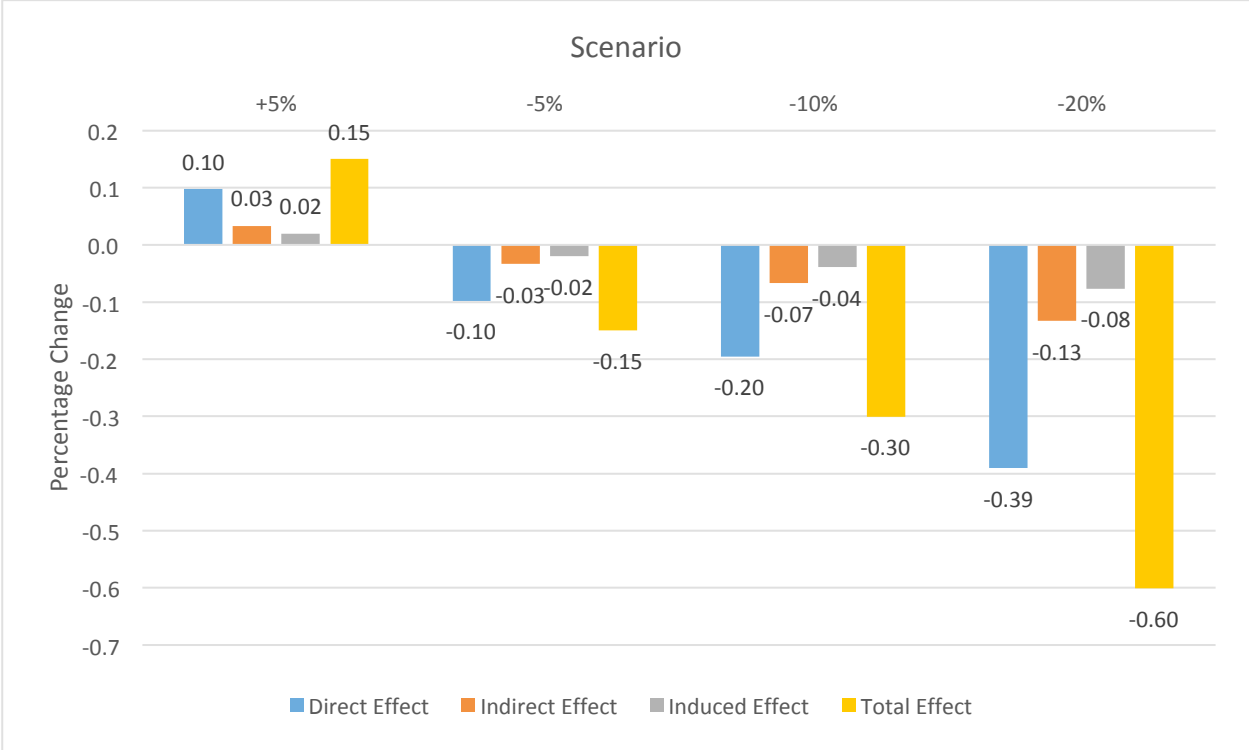




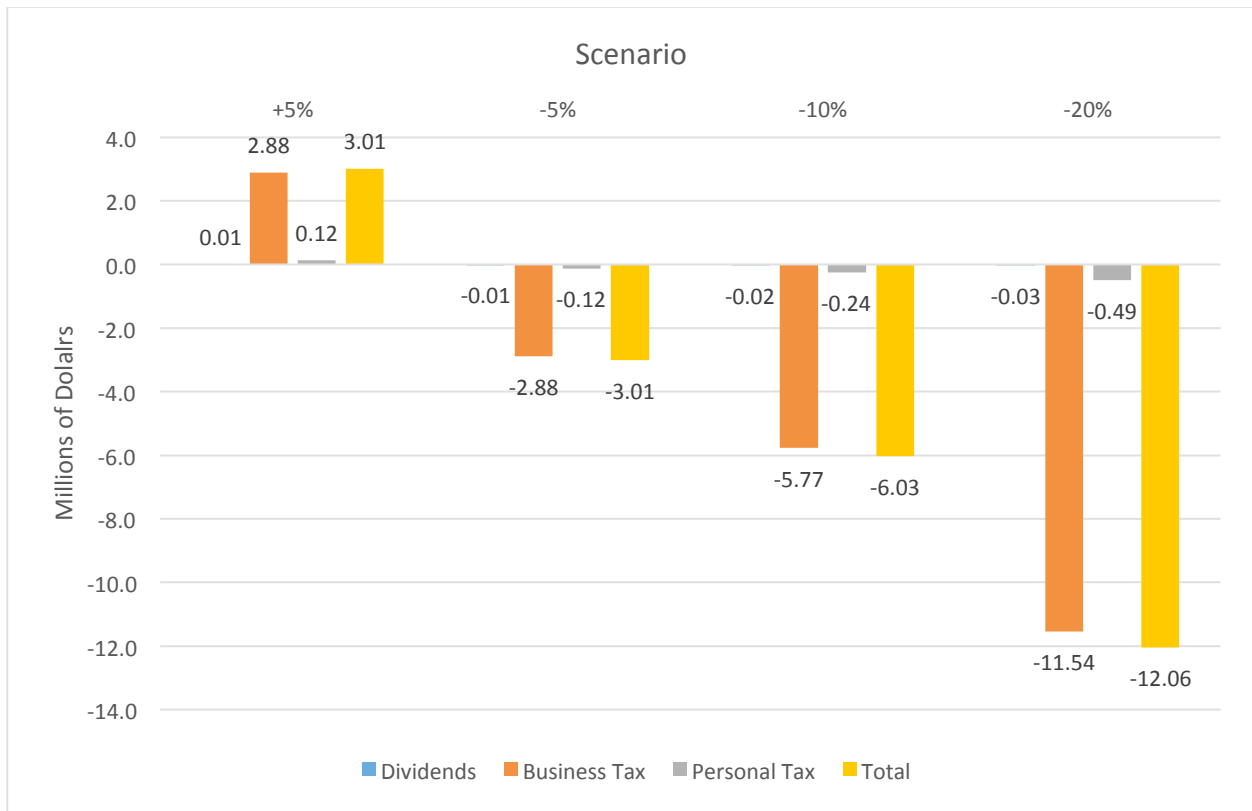
**Figure 26: Impacts to Total Value Added in Washoe County by Shock Scenario and Effect Type**



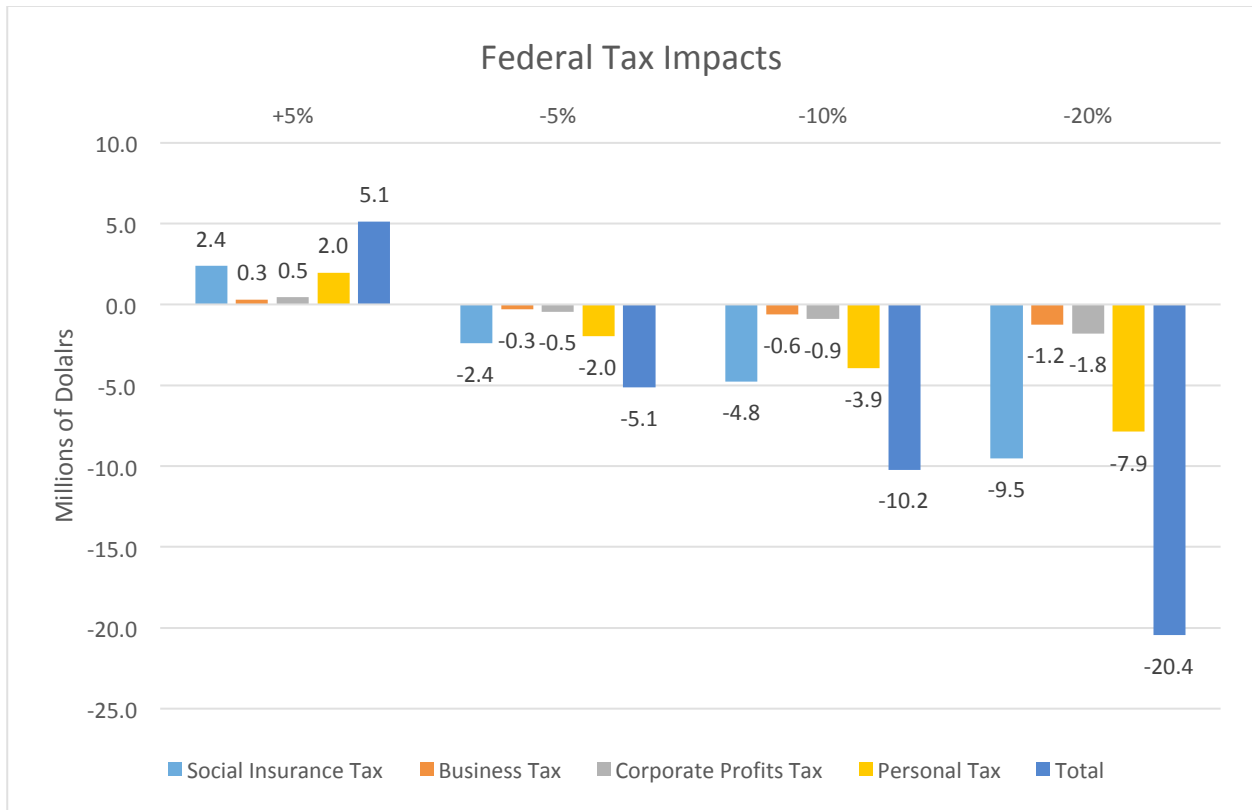
**Figure 27: Impacts to Output in Washoe County by Shock Scenario and Effect Type**



**Figure 28: Fiscal Impacts to State and Local Government Revenues from Washoe County by Shock Scenario and Account**



**Figure 29: Fiscal Impacts to Federal Government Revenues from Washoe County by Shock Scenario and Account**



**Appendix Tables (Difference-in-Differences Estimates)**

<b>(Log) Revenue per Admission (New Orleans v Kenner)</b>			
	<b>Before Smoking Ban</b>	<b>After Smoking Ban</b>	<b>Difference<sup>a</sup></b>
Control Casino (Kenner)	4.643118 (.0095652)	4.609378 (.0084205)	-0.033740** (.0159665)
New Orleans Casino	4.318045 (.012895)	4.136145 (.0175043)	-0.1819007*** (.0265347)
Difference in Differences			-0.148160*** (.028099)

<sup>a</sup>A \*, \*\*, and \*\*\* represent statistical significance at the 10, 5, and 1 % level, respectively. Standard errors in parentheses. Data are July 2006 to November 2018 in order to avoid potentially skewing estimates from impact of hurricane Katrina. Results are robust regardless. \*If include a trend and month dummies, or add year dummies, d-d is -.148.

<b>(Log) Revenue per Admission (New Orleans v Baton Rouge)</b>			
	<b>Before Smoking Ban</b>	<b>After Smoking Ban</b>	<b>Difference<sup>a</sup></b>
Control Casino (Baton Rouge)	4.564086 (.0111155)	4.474734 (.0174872)	-0.089351*** (.019881)
New Orleans Casino	4.318045 (.012895)	4.136145 (.0175043)	-0.1819007*** (.0265347)
Difference in Differences			-0.092548*** (.0356483)

<sup>a</sup>A \*, \*\*, and \*\*\* represent statistical significance at the 10, 5, and 1 % level, respectively. Standard errors in parentheses. Data are July 2006 to November 2018 in order to avoid potentially skewing estimates from impact of hurricane Katrina. Results are robust regardless \*If include a trend and month dummies, d-d is -.024; if add year dummies

-.026 and not statistically significant.

<b>(Log) Admissions (New Orleans v Kenner)</b>			
	<b>Before Smoking Ban</b>	<b>After Smoking Ban</b>	<b>Difference<sup>a</sup></b>
Control Casino (Kenner)	11.43647 (.0081237)	11.38096 (.0127024)	-0.055508*** (.0202291)
New Orleans Casino	12.96864 (.0113789)	12.82948 (.0163957)	-.1391565*** (.0262667)
Difference in Differences			-.0836479*** (.0256237)

<sup>a</sup>A \*, \*\*, and \*\*\* represent statistical significance at the 10, 5, and 1 % level, respectively. Standard errors in parentheses. Data are July 2006 to November 2018 in order to avoid potentially skewing estimates from impact of hurricane Katrina. Results are robust regardless. \*If include a trend and month dummies or year dummies, d-d is -.083.

<b>(Log) Admissions (New Orleans v Baton Rouge)</b>			
	<b>Before Smoking Ban</b>	<b>After Smoking Ban</b>	<b>Difference<sup>a</sup></b>
Control Casinos (Baton Rouge)	11.40417 (.0148892)	11.26452 (.0312162)	-0.139653*** (.030558)
New Orleans Casino	12.96864 (.0113789)	12.82948 (.0163957)	-0.1391565*** (.0206987)
Difference in Differences			.0.000497 (.0517627)

<sup>a</sup>A \*, \*\*, and \*\*\* represent statistical significance at the 10, 5, and 1 % level, respectively. Standard errors in parentheses. Data are July 2006 to November 2018 in order to avoid potentially skewing estimates from impact of hurricane Katrina. Results are robust regardless

\*If include a trend and month dummies, d-d is .128; if add year dummies .145, both significant at 1%, respectively.

<b>(Log) Slot Revenue per Slot Machine</b>			
<b>(Colorado v Indiana, Iowa, Connecticut and Mississippi)</b>			
	<b>Before Smoking</b>	<b>After Smoking</b>	
	<b>Ban</b>	<b>Ban</b>	<b>Difference<sup>a</sup></b>
Control Casinos	9.145412 (.0169253)	8.872537 (.0126595)	-.2728754*** (.0208563)
Colorado Casinos	8.466859 (.0080962)	8.314854 (.0082522)	-.1520049*** (.011578)
Difference in Differences			.1208705*** (.0415607)

<sup>a</sup>A \*, \*\*, and \*\*\* represent statistical significance at the 10, 5, and 1 % level, respectively. Standard errors in parentheses.

\*If include state dummies, month dummies, and state-specific trends, d-d is 0.015 and not statistically significant. (Without state-specific trends d-d is approx. 0.10 and is generally significant). Also, if estimate d-d on log of real slot revenue and log of real total revenue, d-d is -0.09 and -0.06; both are not statistically significant.

<b>(Log) Slot Revenue per Slot Machine</b>			
<b>(Illinois v Indiana, Iowa, Connecticut and Mississippi)</b>			
	<b>Before Smoking</b>	<b>After Smoking</b>	
	<b>Ban</b>	<b>Ban</b>	<b>Difference<sup>a</sup></b>
Control Casinos	9.145412 (.0169253)	8.872537 (.0126595)	-.2728754*** (.0208563)
Illinois Casinos	9.740424 (.0073278)	9.254592 (.0121874)	-.4858318*** (.0144355)
Difference in Differences			-.2129565*** (.0417885)

<sup>a</sup>A \*, \*\*, and \*\*\* represent statistical significance at the 10, 5, and 1 % level, respectively. Standard errors in parentheses. \*If include state dummies, month dummies, and state-specific trends, d-d is -0.116 and statistically significant at 1. Also, if estimate d-d on log of real slot revenue and log of real total revenue, d-d is -0.27 and -0.28; both are statistically significant.

