

**Testimony of Julie Heath, PhD, Director
University of Cincinnati Economics Center**

Before the Senate Ways & Means Committee

February 17, 2016

Chairman Peterson, Vice-Chair Beagle, Ranking Member Tavares, and members of the Committee, my name is Julie Heath and I am appearing today in my capacity as Director of the University of Cincinnati's Economics Center. As way of background, most of the Economics Center's projects are contract research, focused on providing economic analysis to help answer the real world questions of business and community leaders.

Back in 2013, Focus on Ohio's Future, the research arm of the Ohio Council of Retail Merchants, asked the Economics Center to examine the impacts of a proposed back-to-school sales tax holiday over the course of one weekend in August. Ultimately, legislation was enacted into Ohio law which led to Ohio's first Sales Tax Holiday. The holiday was conducted from Friday, August 7 through Sunday, August 9, 2015.

I am here today to provide an overview of the Economics Center's just-completed research which analyzes the results of Ohio's first sales tax holiday.

The first step in analyzing the impact of the sales tax holiday is to estimate what level of sales and sales tax collections would have occurred in August 2015 in the absence of the holiday. The challenge in conducting any kind of forecast is to get as true a signal as we can, which means eliminating as much noise as possible. We used a model which incorporates the actual monthly sales data from January of 2000 to June of 2015 from the Ohio Department of Taxation. These data were adjusted for both inflation and seasonality. We then introduced some control variables to reflect macroeconomic conditions, such as the unemployment rate and the national level of retail sales. Controlling for the possible change in consumer disposable income due to an improving labor market and/or larger retail influences such as falling gas prices allows us to minimize the noise in the forecast so as to achieve a more accurate forecast for what retail sales would have been in August of 2015 without the sales tax holiday.

Because retail sales are reported monthly, it was necessary to impute the amount of sales that occurred during the three-day holiday period. The Massachusetts Department of Revenue reports a ratio of 10.11%, meaning that roughly 10% of the month's revenue was generated during their two-day sales tax holiday period. An obvious imputation from this ratio is to increase it by 50% to account for a three-day, as opposed to a two-day holiday. Given that

Friday, a work day, was included in Ohio's holiday period, a more conservative approach was to decrease that increment by half. The result is that of Ohio's August 2015 sales revenue, the Economics Center attributed 12.64% to the three-day holiday period. Applying the model and the estimated proportion of the sales that would occur within the three-day holiday period, the Center estimated that there would be \$46.75 million of tax-exempt sales made on eligible back-to-school goods.

When we compared the actual retail sales data from August 2015 to what was forecast for that month, we determined that sales were 6.48% higher than what the model predicted, resulting in a gross increase of \$8 million in sales tax collections. This was offset by \$3.3 million in tax revenue from exempted items that was lost, leading to a net gain of \$4.7 million of additional tax revenue. Note that the \$3.3 million offset in state sales tax collections represents a gain to consumers in sales tax savings.

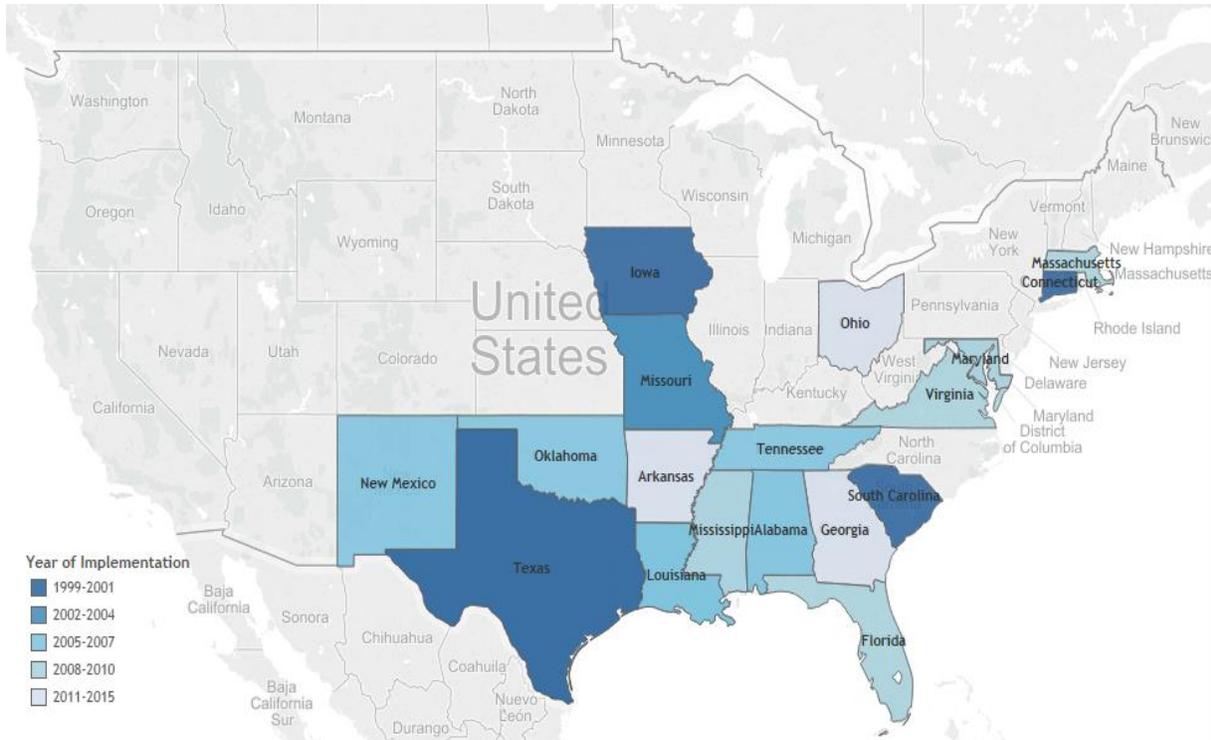
Remember that we estimated that 12.64% of August's sales could be attributed to the three-day holiday period. Anecdotally, Friday—the first day of that three-day window—appeared to have experienced a fairly high volume of sales, suggesting that our estimates may have been too conservative.

There are several factors that could influence the impact of a sales tax holiday, including one that was predicted in our 2013 study—that consumers would alter the timing of their purchases, spending more in August, but less in July and/or September. However, there were no appreciable reductions in retail activity in the months bookending the sales tax holiday, indicating that this spending transfer did not occur.

Another explanation for the higher-than-anticipated revenue collections could be that consumers increased their expenditures on non-exempt items as a result of the effective increase in their disposable income. While we could not quantify this effect directly, it conforms to economic theory and is an expected result.

Online sales and tax collections could be an additional outside factor affecting sales tax revenue during the three-day holiday period. After examining the tax revenues before and after the application of taxes to online sales, and evaluating the tax revenues and year-over-year increases for the past five years, we conclude that there is little to no effect on the behavior of consumers during the sales tax holiday.

Finally, as you can see, the incidence of sales tax holiday is primarily concentrated in the southern tier of states, extending up to the Mid-Atlantic states. What is notable about this map is the virtual island that is Ohio.



As with technological change, the first adopter often enjoys a competitive advantage for the period of time they are the lone occupant of a market. That certainly seems to be the case here, as there is a differential effect of the sales tax holiday on sales tax revenue by county. Those counties that border other states that do not have a sales tax holiday experienced a 15.48% increase in county sales tax collections, compared to an increase of 4.56% in non-border counties.

I will conclude by saying that while we were surprised by the strength of the positive effect of the sales tax holiday on tax revenues, we do not know if the trend will continue. It could be the case that consumers experienced an “exuberance” of sorts in this first year, and subsequent years will be characterized by a more educated, experienced consumer. On the other hand, as consumers become more accustomed to the sales tax holiday, it could take on a Black Friday aspect, representing an anticipated event, continuing to drive additional sales on non-exempt items and pulling customers from surrounding states.

Chairperson Peterson, I appreciate the opportunity to appear before you today, and I am happy to answer any questions you may have.

**Economic Analysis on the Effects
Of Back-to-School Sales Tax Holiday in Ohio**

Prepared for

Focus on Ohio's Future

February 2016

EXECUTIVE SUMMARY

| Background

In 2015, 18 states provided a sales tax holiday. In most of these states, clothing, footwear, and school supplies were exempt from sales tax for a short time at the end of summer, during what is traditionally referred to as the back-to-school shopping season. Proponents of these tax holidays believe that sales tax holidays benefit consumers and retailers alike. They contend that while consumers save money due to a reduced tax burden, retailers benefit from increase in traffic to their stores thereby expanding economic activity. They also claim that if nearby states offer a sales tax holiday, a state without a tax holiday misses out on business when its residents leave the state to purchase tax exempt items. Opponents argue that states lose valuable tax revenue when otherwise-taxable items are exempt from the sales tax, even for a short amount of time. Focus on Ohio's Future engaged the Economics Center to study these claims and estimate the impact of the back-to-school sales tax holiday that occurred in the state of Ohio in August 2015.

| Highlights

- The Economics Center determined that consumers have saved approximately \$3.3 million in taxes on purchases of back-to-school goods totaling \$46.75 million.
- Overall retail sales in Ohio increased by 6.48 percent in August 2015. The three day holiday period from August 7-9, 2015 generated a gross increase in sales tax collections of about 9%, which could be attributed to the fact that consumers increase purchases of non-exempt items while shopping for tax-exempt items. This may have helped offset the decline in sales tax revenue due to the holiday. The Economics Center estimates that the State of Ohio experienced an increase of about \$8 million in sales tax collections while foregoing taxes of \$3.3 million on exempted goods during the sales tax holiday period, resulting in a net increase of \$4.7 million. The State is estimated to have collected sales tax of \$100 million during this three-day period.
- One of the objectives of a sales tax holiday is to increase economic activity in a state by attracting consumers from neighboring states. In the case of Ohio, the Economics Center determined that counties on the border with neighboring states saw a higher increase in tax collections as compared to non-border counties which could be attributed to consumers entering from neighboring states. While the State experienced increases in sales tax collections of 6.48 percent, border counties received an increase in county collections of 15.48 percent and non-border counties received an increase in county collections of 4.56 percent.
- In Ohio, the Economics Center determined that the sales tax holiday did not reduce sales during the months prior to and subsequent to the sales tax holiday. Hence, consumers did not shift their purchases from one month to the other to take advantage of the sales tax holiday.

- Based on prior studies, the Economics Center expects that in the long run, there would be some shift in the timing of purchases of exempt goods from other periods to the sales tax holiday period. Therefore, a sales increase of 6.48 percent during the first year may not directly reflect future years should another sales tax holiday be instituted.
- The Economics Center determined that there was limited to no overall additional sales tax collection due to the introduction of tax collections by online retailers. This was determined by calculating the post-recession year-over-year increases in sales for individual months and evaluating the average increase in contrast to the increases in 2015.
- A previous study conducted for New York¹ found that sales tax holidays do not result in an overall increase in sales as consumers shift timing of their purchases which causes a spike during the holiday period and reduction in sales during other time periods. However, another study conducted by the Washington Economics Group for Florida Retail Foundation determined that the 2010 sales tax holiday in Florida increased both sales and tax revenues.² The implementation of a sales tax holiday is prominent in particular US regions. Currently, no state that borders Ohio has a sales tax holiday, although Pennsylvania law does not apply sales tax to the purchases of clothing. If a state neighboring Ohio were to implement a sales tax holiday, the economic impacts may be different.³

¹ The Temporary Clothing Exemption, November 1997

² Economic Impact Analysis of the 2010 Back to School Sales Tax Holiday, February 2011

³ See Appendix B for a map of sales tax holidays in the United States

| Introduction

Sales Tax Holidays (tax holidays) have come a long way since their introduction in New York in 1997. In 2015, 18 states announced tax holidays in order to boost sales and help consumers save money on taxes. With a few exceptions, most of the sales tax holidays occur in the southern tier of the United States, extending up to the Mid-Atlantic States. Additionally, none of Ohio's border states have annual sales tax holidays.⁴ Appendix A shows a table of all the states that implemented tax holidays in 2015.

Proponents of tax holidays believe that eliminating the sales tax reduces the final price of goods for consumers without affecting the profits of retailers. They contend that a reduction in tax collections is almost insignificant given the increase in out-of-state purchases, and an increase in purchases of non-exempt items by consumers during the tax holiday period. However, critics of tax holidays believe that they do not bring about any significant increase in sales since consumers merely alter the timing of their purchases. The Economics Center reviewed a number of articles that explore the fiscal impact of tax holidays including: *Sales Tax Holidays: Timing Behavior and Tax Incidence* (A.J. Cole, 2009), *Economic Impact Analysis of the 2010 Back to School Sales Tax Holiday* (Washington Economics Group, 2009), and *The Effect of Sales Tax Holidays on Household Consumption Patterns* (Nathan Marwell & Leslie McGranahan, Federal Bank of Chicago, July 2010). The Economics Center encourages readers to review these articles to understand the fiscal impacts of tax holidays in greater detail.

In July 2013, the Economics Center conducted a preliminary study⁵ on the impact of a tax holiday in the state of Ohio; this analysis concluded that if Ohio were to have a tax holiday:

- Retail volumes would increase by 4.8 percent in the month when a tax holiday occurs;
- Sales during the months preceding and following the month of tax holiday would reduce due to consumers shifting the timing of purchases
- State sales tax collections would not decrease by a statistically significant amount.

In this report, the Economics Center analyzes the economic impact of the **August 2015** back-to-school sales tax holiday in the state of Ohio.

| Ohio Sales Tax Holiday

The State of Ohio held a three-day back-to-school tax holiday for the first time in August 2015. The tax holiday exempted clothes priced up to \$75 and school supplies and instruction materials priced up to \$20 from sales tax for both in-store and online purchases. The objective of the tax holiday was to help parents and guardians save money on purchases of school supplies and goods made during the holiday. The holiday was not expected to reduce tax collections significantly due to an increase in the sale of non-exempt goods.

⁴ However, Pennsylvania law does not allow for taxation on purchases of clothing.

⁵ <http://economicscenter.org/media/534519/SalesTaxHoliday2013.pdf>

Impact Analysis

The Economics Center estimates that Ohioans spend approximately \$528 million on back-to-school purchases based on the Monthly Consumer Survey undertaken by the National Retail Federation.⁶ According to this survey, 70 percent of Ohio families make back-to-school purchases in the month of August, i.e. families expend \$370 million on such purchases in August alone. To determine the amount of expenditure incurred during the tax holiday period, the Economics Center relied on the ratio of a sales in tax holiday period relative to monthly sales. Based on research by the Massachusetts Department of Revenue ('MASS DOR') using credit card expenditure data, 10.11 percent of monthly spending occurred during a two-day weekend tax holiday period in 2005. In Ohio, the tax holiday was effective for three days including a Friday. The Economics Center adjusted the ratio to 12.64 percent to arrive at the amount of sales made during the three-day tax holiday, weighing Friday shopping at one-half of the impact of a weekend day. In this way, the Economics Center estimated the tax exempt sales during the tax holiday to be \$46.75 million.⁷ The Economics Center estimated the gross sales to be \$14.79 billion for the month of August (taxable sales⁸ + tax exempt sales).

The amount of actual gross sales made during the year was compared to the sales amount that would have been made had there been no tax holiday. The Economics Center used an ARIMA model for forecasting the sales that would have occurred without tax holiday while controlling for macroeconomic trends. Based on this comparison, the Economics Center determined that the tax holiday yielded a 6.48 percent increase in sales as compared to sales that would have occurred had the tax holiday not been instituted.

The Economics Center determined that the tax holiday generated tax savings of about \$3.3 million for consumers. The Economics Center further found that there was no decrease in sales during the months prior to and after the August 2015 Ohio tax holiday which indicates there were no shifts in timing of purchases by consumers. All in all, the State experienced an increase in sales tax collections in August 2015. The State generated an increase of \$8 million in sales tax which indicates that the State may have benefitted from the tax holiday. Additionally, the Economics Center determined there were limited to no increases in sales tax collections associated with the introduction of online retailers and tax collections. This was determined by evaluating the year-over-year increases in collections with respect to the introduction of the additional taxable goods sold through Amazon and other online retailers. The increase in sales tax collections may be due to an increase in the sale of non-exempt goods during the tax holiday as consumers may increase purchases of non-exempt goods with the cost savings while

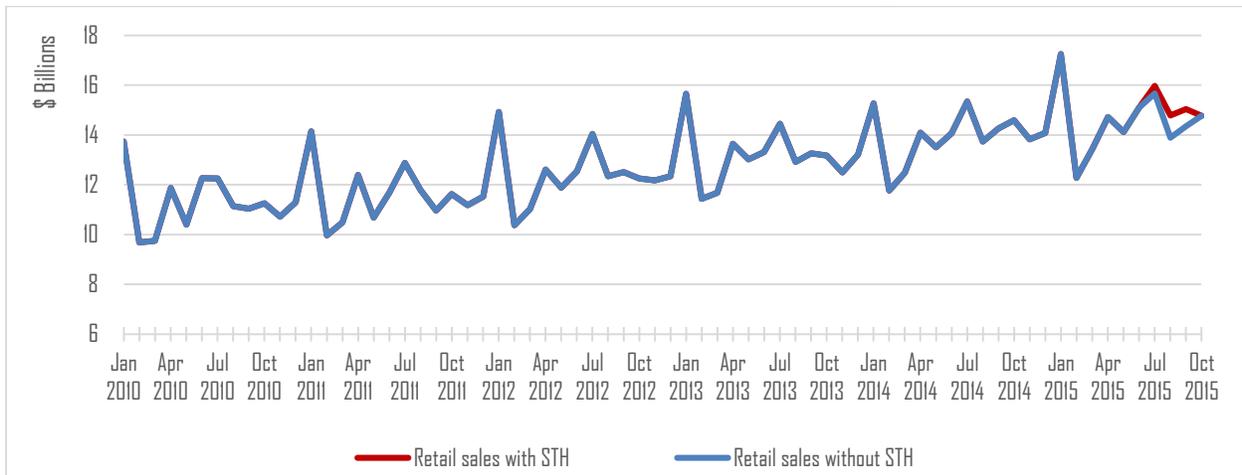
⁶ <https://nrf.com/sites/default/files/NRF%20BTS%202015.pdf>. According to the survey, every family incurs \$433 on clothing, shoes and school supplies (other than laptops that did not qualify for the tax holiday). There are about 1.2 million families with children less than 18 years of age in Ohio. Therefore, back-to-school expenditure is estimated to be \$528 million.

⁷ The Center assumed that the back-to-school eligible goods purchased by families and sold during the tax holiday were tax exempt.

⁸ http://www.tax.ohio.gov/tax_analysis/tax_data_series/sales_and_use/publications_tds_sales.aspx

shopping for eligible goods. The following chart plots the Actual Sales against Sales that would have occurred without the tax holiday.

Sales that would have occurred with and without the Sales Tax Holiday



The increase in sales could also be attributed to an influx of consumers from neighboring states since none of the neighboring states currently have a tax holiday. In fact, the Economics Center finds that the counties in Ohio bordering other states saw a higher increase in county sales tax collections (resulting from higher increase in taxable sales) as compared to non-border counties, 15.48 percent and 4.56 percent respectively, suggesting a spillover effect from the neighboring states.

Given prior studies on the impact of tax holidays generally, and the inexperience of the people of Ohio with sales tax holidays, there may be additional purchases by consumers as they shop to maximize tax holiday benefits, sometimes with error or non-eligibility of goods. However, in the future, consumers may begin to shift purchases from months preceding and following the tax holiday to better take advantage of savings. This could in turn work to offset increases in sales during the month of the tax holiday. Therefore, sales increases, such as 6.48 percent in 2015, may not be as great in the years to come, should a tax holiday be permanent.

APPENDIX A: STATES WITH SALES TAX HOLIDAYS IN 2015⁹

State	Number of days	Items Included / Maximum Cost	1 st Year	2015 Dates
Alabama	3	severe weather preparedness generators - \$1,000 supplies - \$60	2012	February 20-22 (Friday-Sunday)
Alabama	3	clothing - \$100 computers - \$750 school supplies - \$50 books - \$30	2006	August 7-9 (Friday-Sunday)
Arkansas	2	clothing - \$100 clothing accessory/equipment-\$50 school supplies	2011	August 1-2 (Saturday-Sunday)
Connecticut	7	clothing and footwear - \$300	2001	August 16-22 (Sunday-Saturday)
Florida	10	school supplies - \$15 clothing - \$100 PC-\$750	2010 ¹⁰	August 7-16 (Friday-Sunday)
Georgia	2	school supplies - \$20 clothing - \$100 computer - \$1,000	2012 ¹¹	July 31-August 1 (Friday-Sunday)
Georgia	3	energy and water efficient products - \$1,500	2012 ¹²	October 2-4 (Friday-Sunday)
Iowa	2	clothing - \$100	2000	August 7-8 (Friday-Saturday)
Louisiana	2	all tangible personal property - \$2,500	2007	August 7-8 (Friday-Saturday)
Louisiana	2	hurricane preparedness items - \$1,500	2008	May 30-31 (Saturday-Sunday)
Louisiana	3	firearms, ammunition and hunting supplies	2009	September 4-6 (Friday-Sunday)
Maryland	3	energy star products	2011	February 14-16 (Saturday-Monday)
Maryland	7	clothing & footwear-\$100	2010	August 9-15 (Sunday- Saturday)
Massachusetts	2	all tangible personal property - \$2,500	2008	August 15-16 (Saturday-Sunday)
Mississippi	2	clothing & footwear - \$100	2009	July 31-August 1 (Friday-Sunday)
Mississippi	2	Firearms, ammunition, and hunting supplies	2015	September 4-6 (Friday-Sunday)

⁹ http://itep.org/itep_reports/Sales%20Tax%20Holidays%202015.pdf

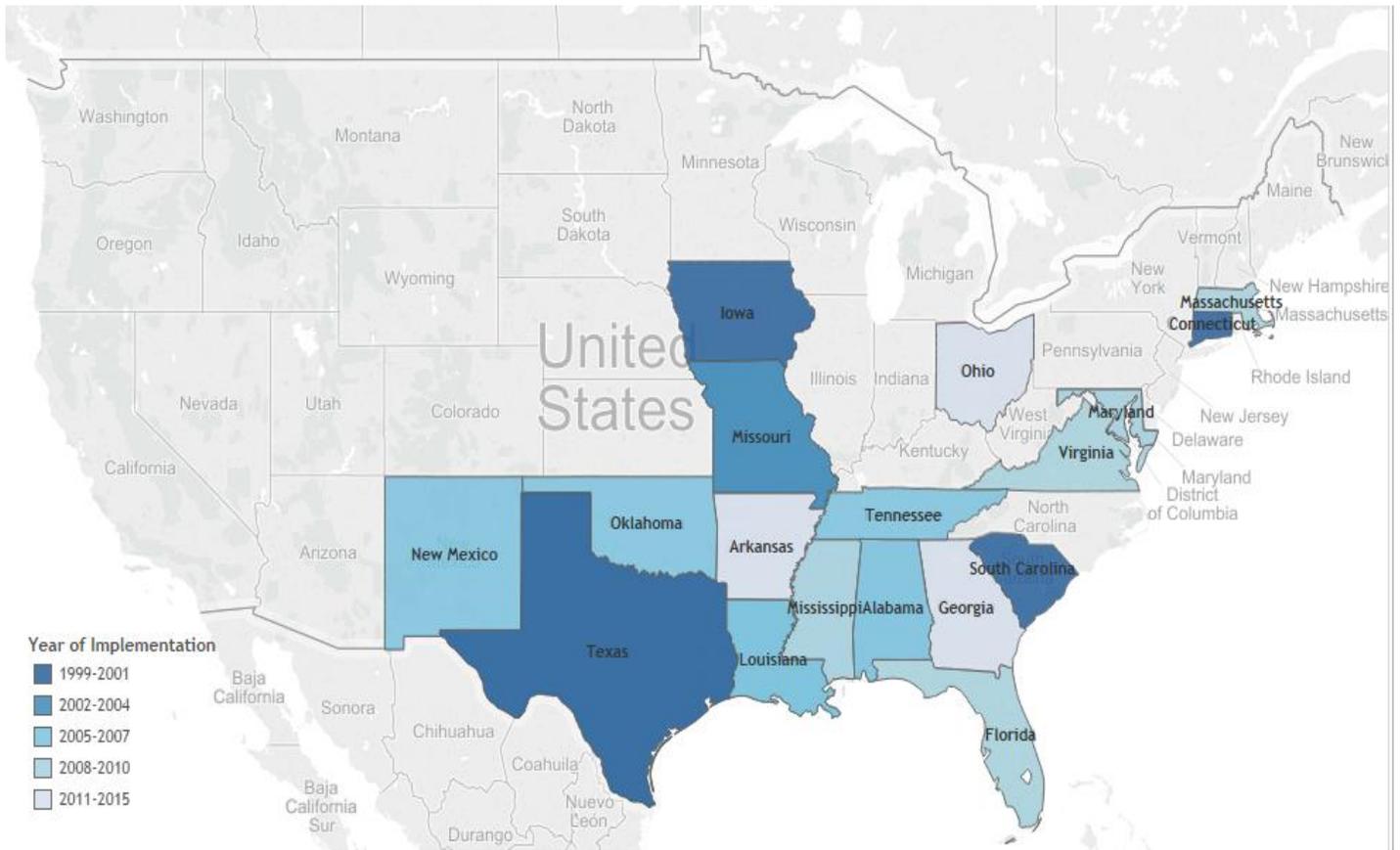
¹⁰ Florida first held a sales tax holiday for school supplies in 2007. This was not re-enacted in 2008-09.

¹¹ Georgia first held a school supply holiday in 2004 and energy efficiency holiday in 2006. They were not re-enacted in 2010-11.

¹² See footnote 11.

Missouri	7	energy star products - \$1,500	2009	April 19-25 (Sunday-Saturday)
Missouri	3	clothing - \$100 computers - \$3,500 school supplies - \$50	2004	August 7-9 (Friday-Sunday)
New Mexico	3	clothing - \$100 school supplies - \$30 instructional material - \$100 computers - \$1,000 computer peripherals-\$500 Handheld calculators-\$200	2005	August 7-9 (Friday-Sunday)
Ohio	3	clothing - \$75 school supplies - \$20 instructional material - \$20	2015	August 7-9 (Friday-Sunday)
Oklahoma	3	clothing - \$100	2007	August 7-9 (Friday-Sunday)
South Carolina	3	clothing school supplies computers bed and bath items	2000	August 7-9 (Friday-Sunday)
Tennessee	3	clothing - \$100 school supplies - \$100 computers - \$1,500	2006	August 7-9 (Friday-Sunday)
Texas	3	energy star products air conditioners - \$6,000; other - \$2,000	2008	May 23-25 (Saturday-Monday)
Texas	3	clothing, backpacks and school supplies- \$100	1999	August 7-9 (Friday-Sunday)
Virginia	3	hurricane preparedness items - \$60 generators - \$1,000 clothing - \$100 school supplies - \$20 energy star products - \$2,500	2008	August 7-9 (Friday-Sunday)

APPENDIX B: STATES WITH SALES TAX HOLIDAYS AND YEAR IMPLEMENTED¹³



¹³ http://itep.org/itep_reports/Sales%20Tax%20Holidays%202015.pdf

APPENDIX C: METHODOLOGY

In order to estimate the sales that would have occurred in absence of a tax holiday, the Economics Center conducted a time series forecast. The following steps were followed:

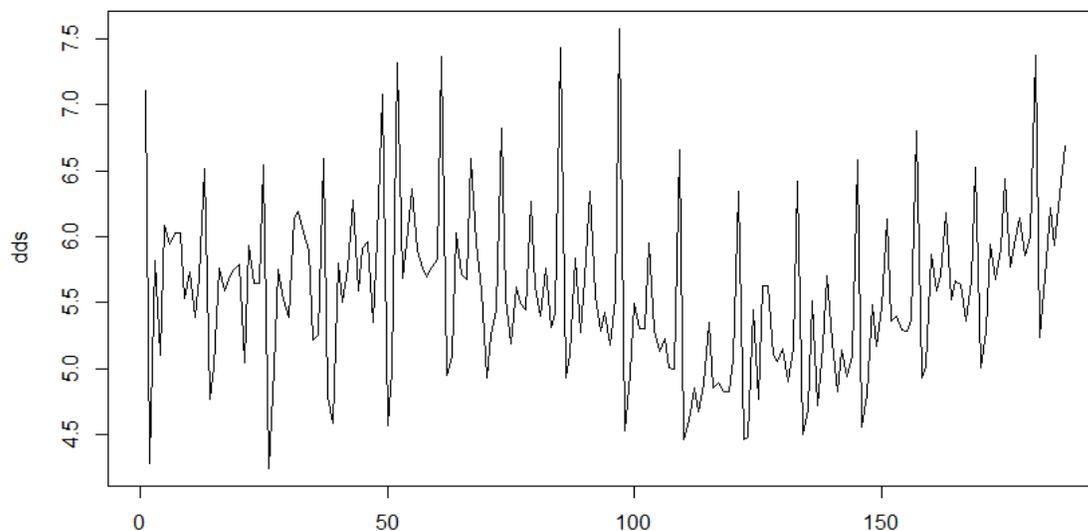
- The Economics Center determined the amount of taxable sales made during the months Jan 2000 to June 2015 from the Ohio Department of Taxation website. These amounts were adjusted for inflation based on the monthly Consumer Price Index (CPI). The US retail sales were also adjusted for inflation.
- Then the Economics Center checked to see if the time series data were stationary. A stationary time series has a constant mean and variance. Though taxable sales and US retail sales were stationary after adjusting for inflation, unemployment rate time series was non-stationary. Hence, the Economics Center differenced unemployment twice (monthly and annually) to make it stationary and non-seasonal.
- Taxable sales in Ohio and US retail sales displayed seasonality, thus we differenced it by a 12 month period before conducting a forecast.
- Finally, the Economics Center performed a forecast using the ARIMA i.e. "Auto-Regressive Integrated Moving Average" model to forecast the sales that would have occurred without the sales tax holiday. We controlled for macroeconomic trends by using US retail sales and unemployment rates as input variables. US retail sales capture most of the underlying trends in the retail sector while unemployment captures local economic conditions that may influence expenditures.

APPENDIX D: VARIABLES USED

The following variables were used in the analysis:

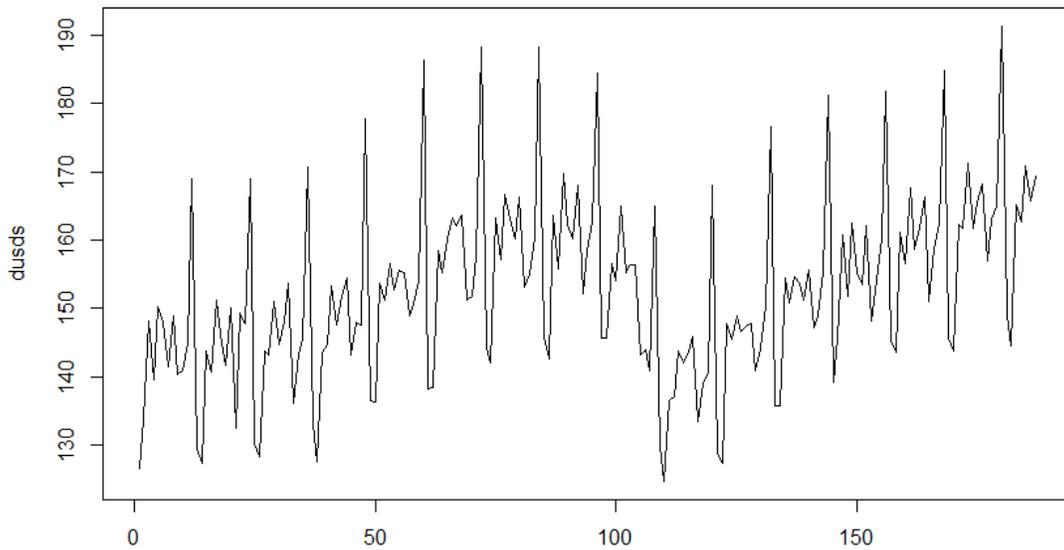
- Taxable sales in Ohio adjusted for inflation:
 - Source: Ohio Department of taxation.
 - We derived the taxable sales amount from Jan 2000 to June 2015 by dividing the tax collections by the sales tax rate.
 - We adjusted the taxable sales for inflation by dividing by the relevant monthly CPI obtained from Bureau of Labor Statistics.
 - The data displayed seasonality. (Refer the chart below). Hence, we differenced it by 12 month period to correct for seasonality.

Seasonality in taxable sales adjusted for inflation



- US retail sales adjusted for inflation:
 - Source: December 2015 Monthly Retail Trade and Food Services Report released by the United States Census Bureau.
 - We used the monthly total of retail sales from January 2000 to June 2015 not seasonally adjusted.
 - We adjusted the US retail sales for inflation by dividing by the relevant monthly CPI obtained from Bureau of Labor Statistics.
 - Since the data displayed seasonality, we differenced it by 12 month period.

Seasonality in US retail sales adjusted for inflation



- Differenced monthly Unemployment:
 - Source: Monthly Unemployment data was derived from the Bureau of Labor Statistics
 - Since the unemployment data time series was not stationary, we differenced it twice to make it stationary.