weg | The Washington Economics Group, Inc.

AN ANALYSIS OF THE COSTS AND BENEFITS OF A BACK TO SCHOOL SALES TAX HOLIDAY IN THE STATE OF WASHINGTON

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I. EXECUTIVE SUMMARY

- The Washington Retail Association retained WEG to quantify the economic impacts of a proposed Back to School Sales Tax Holiday in the State of Washington. WEG studied a proposed three-day holiday that would occur in August covering clothing items priced at less than $75 and school supply items priced at less than $10.

- WEG finds that the Holiday would have a positive economic impact in Washington State, increasing economic activity by $113 million (Table 3, page 11). This increase in economic activity would have an overall positive fiscal impact to state and local governments of $12.6 million (Table 4, page 12).

- The positive impact of the Holiday would be distributed widely across the state, with county-level benefits proportionate to the size of the county's school age population. For the month of the Holiday, county level sales would increase from 4.5 percent for smaller rural counties to about 8.5 percent for the larger urban counties. The largest impact would be for King County, which would have a sales increase in excess of $70 million during the month of the Holiday (Table 3, page 11).

- Additional impacts of the Holiday include:
  - Creation of 1,555 jobs – 83 percent in the retail sector and the rest distributed over the economy as a whole.
  - A $46 million increase in labor income (earned income) – About 74 percent in retailing and the rest distributed over the economy as a whole.
  - A ***net increase*** in state and local taxes of $12.6 million.

- The methodology used by The Washington Economics Group in this Study follows standard economic theory that consumers react positively to lower prices and that the enthusiasm generated by Sales Tax Holidays through advertising and other means provides a further boost to sales. It also reflects the highly competitive nature of retailing: Retailers react to a potential increase in shopper traffic by offering additional discounts. Therefore, this analysis of the economic impacts of a Back to School Sales Tax Holiday reflects the important supply and demand shifts that affect the prices and the quantities of the goods that are sold**.**

  This state-of-the-art methodology is in contrast to static fiscal impact methodsthat assume, incorrectly, that consumers do not react to lower prices. The static methods

often conclude, also incorrectly, that the only effect of a Sales Tax Holiday is the loss of sales tax revenue from an unchanged level of sales.WEG also notes that there is no sales tax in the State of Oregon, a neighboring state, or in Montana, which is in close proximity to eastern Washington. This places special importance on the impact of a sales tax in shaping consumer choices.

A real-life experience confirms the validity of WEG's methodology. The Florida Legislature approved a Sales Tax Holiday for August, 2010. The static fiscal impact models predicted a loss of up to $44 million in sales taxes. A follow-up study of actual results found that gross sales of goods in the categories covered by the Sales Tax Holiday actually increased by $390 million and, of that increase, $115 million were taxable.[1] The result was an increase in sales tax revenues of $7 million, rather than the predicted loss of $44 million**.**

- According to the National Retail Federation, retail in Washington *directly* and *indirectly* supports 1 in 4 jobs and is responsible for 17 percent of the state's Gross Domestic Product. WEG methodology reflects the importance of the retailing sector in generating *direct, indirect* and *induced* economy-wide impacts stemming from the Sales Tax Holiday. For instance, a sales tax holiday *directly* increases sales of items that remain taxable by increasing shopping traffic to retail establishments significantly. *Indirectly*, the Sales Tax Holiday increases state and local taxes because it increases Labor Income. *Induced* effects occur when a large portion of this income is, in turn, spent, generating additional sales and excise taxes.

> ***This Study uses 2010 as the base year for all of its projections. 2010 is the latest year for which complete data was available at the time of completion of this Study.***

[1] Florida's tax holiday exempted goods up to a certain price per item. Therefore, taxable sales occurred in the exempted categories. For example, goods of up to $50 per item were excluded. An item sellingfor more than $50 was fully taxable.

According to the Federation of Tax Administrators,[2] 17 states had a Back to School Sales Tax Holiday in 2011, as illustrated in Table 1 below.

Table 1. Current Back to School Sales Tax Holidays

State and Information Links	Days	Items Included	1st Year	2011* Dates
Alabama	3	clothing - $100, computers-$750, school supplies-$50, books-$30	2006	August 5-7
Arkansas	2	clothing - $100, school supplies	2011	August 6-7
Connecticut	7	clothing and footwear - $300	2001	August 21-27
Florida	3	school supplies - $15, books, clothing-$75	2010[3]	August 12-14
Iowa	2	clothing - $100	2000	August 5-6
Louisiana	2	all TPP - $2,500	2007	August 5-6
Maryland	7	clothing & footwear - $100	2010	August 14-20
Massachusetts	2	all TPP - $2,500	2008	August 13-14
Mississippi	2	clothing & footwear - $100	2009	July 29-30
Missouri	3	clothing - $100, computers-$3,500, school supplies-$50	2004	August 5-7
New Mexico	3	clothing - $100, computers-$1,000, school supplies-$15	2005	August 5-7
North Carolina	3	clothing - $100, school supplies-$100, instructional material-$300, computers-$3,500, other comp-$250, sports equip-$50	2001	August 5-7
Oklahoma	3	clothing - $100	2007	August 5-7
South Carolina	3	clothing, school supplies, computers, other	2000	August 5-7
Tennessee	3	clothing - $100, school supplies-$100, computers-$1,500	2006	August 5-7
Texas	3	clothing, backpacks and school supplies- $100	1999	August 19-21
Virginia	3	clothing - $100, school supplies-$20	2006	August 5-7

The most common month for the holiday is August with only Mississippi having the holiday in July. Some states, including Texas and Florida, have had sales tax holidays since the late 1990's. While there is ample variability in the items exempted and the amount of the exemption, almost all of the states exempt clothing, footwear and school supplies. Generally the exemption is for

[2] http://www.taxadmin.org

[3] Florida had a back to school sales tax holiday starting in 1998. However, it ceased in 2007 and was re-enacted for 2010.

individual items priced at $100 or less. Some states also exempt computers, with ranges from $1,000 to $3,500 per item. South Carolina has no limits on clothing, shoes, school supplies, computers printers, blankets, bedspreads and linens, bath cloths, bath towels, bath rugs and mats, shower curtains, pillows and pillow cases.

Back to School Sales Tax Holidays are enormously popular with taxpayers. Historically the holidays were explained as tax relief to families struggling to outfit their children for the new school year.

Later, state legislators realized that the holidays would provide an economic stimulus.[4] For example, in South Carolina, the Back to School Sales Tax Holiday is the third busiest shopping period of the year, surpassed only by the weekend after Thanksgiving and the weekend before Christmas. In Texas, the Back to School Sales Tax Holiday is second only to the weekend just before Christmas.

Most recently, state legislators and tax authorities have recognized that, in addition to the tax relief and stimulus effects, the holidays actually produce positive fiscal effects for state and local governments. In states where holidays have been considered in the last two years, the focus has been on how much holidays can generate rather than what they cost.

There is a scarcity of literature documenting the economic impact of sales tax holidays, due in part to their relatively recent inception and the lingering effects of outdated fiscal analyses. WEG's review of available literature reveals that most of what is written is editorial opinion or anecdotal narrative. There is a small body of more serious analysis, which this Study summarizes. This Study also describes a sound model to quantify empirically the economic effects of the Back to School Sales Tax Holiday. Finally, it discusses the findings and implications from the results of the empirical model.

A. Sales Tax Holidays: The Existing Evidence

Beyond the opinions expressed in countless editorial pieces, the analytical evidence documents the following:

> A lower local sales tax, relative to surrounding communities, tends to be associated with increased consumer spending.[5] This finding is consistent with economic theory that lowering prices will increase the quantity demand for a product. For example, there is evidence that in

[4] J.W. Mogab, M.J. Pisani; "Shoppers' Perceptions of the State Sales Tax Holiday: A Case Study"; *American Journal of Business; Fall 2007.*

[5] Luna, L. 2004 "Local Sales Tax Competition and the Effects on County Governments' Tax Rates and Tax Bases" *The Journal of The American Taxation Association* 26(1):43-61.

2011 Georgia, which did not have a tax holiday, lost sales tax revenues to Tennessee during that state's tax holiday.[6]

> The benefits of sales tax holidays tend to be shared between consumers and retailers, with consumers receiving the lion's share. About 80 percent of the tax relief remains with consumers while only about 20 percent goes to retailers[7]. This finding is also consistent with economic theory. In a highly competitive sector such as retailing, most of the effect of a policy change on the final price of a product is passed on to the consumer. Further, because the benefits of the tax exemption apply to all retailers covered by the Holiday, retailers will add promotions to drive customer traffic to their stores, rather than run the risk that consumers will shop their competitors.

> While consumers as a group benefit, the benefits of the Sales Tax Holiday may be unevenly distributed among consumers, with middle class consumers, families, females and Hispanics benefiting the most.[8,9]

> The sales tax holiday is very popular with shoppers.[10] "This is largely consistent with the conventional wisdom expressed in the general media."[11]The reduction in the overall price shoppers pay results in greater amounts of goods purchased, both tax exempt and non-exempt, during the Sales Tax Holiday— just what we would expect utilizing microeconomic consumer behavior theory.[12]

> Sales Tax Holidays increase store traffic. Most shoppers view the tax break as an important incentive to shop. A mall intercept survey of shoppers during a Back to School Sales Tax Holiday in Texas revealed that 80 percent of shoppers said the tax holiday was very important in their decision to shop.[13] In most of the states that have a Back to School Sales Tax Holiday, this period has become the second or third most important sales weekend, after the weekend before Christmas and the day after Thanksgiving.

> Consumer response goes beyond what could be expected from the price discounts alone, according to Professor Peter Goldberg of New York University Stern School of Business. Consumers respond favorably because it "becomes a social thing and community activity, something to talk about at work, with friends and family."[14] This is what economists call the "Bandwagon Effect" of consumer demand. Retailers often respond to the sales tax break by adding additional discounts and discounting non-exempt merchandiseto take advantage of the

[6] Newton, Dreanne "Georgians Prepare To Cross Into Tennessee For Back to School Tax Holiday Specials…Again." August 4, 2011. WDEF News 12. In WDEF.com.
[7] Harper, R.K, R.R. Hawkins, G.S. Martin, and R. Sjolander. 2003. Price effects around a sales tax holiday: An exploratory study. *Public Budgeting and Finance* 23(4):108-113.
[8] Brunori, D. 1999. Sales tax holidays – Real relief or political gimmicks. *State Tax Notes* (December 6):1521-1523.
[9] J.W. Mogab, M.J. Pisani; "Shoppers' Perceptions of the State Sales Tax Holiday: A Case Study"; *American Journal of Business; Fall 2007.*
[10] Kathy Lhor (2009); Some States Cancel Sales Tax Holidays; NPR August 3, 2009.
[11]J.W. Mogab, M.J. Pisani; op.cit.
[12] Ibid.
[13]Ibid.
[14] As quoted in J.W. Mogab, M.J. Pisani; op.cit.

increased customer traffic. This is consistent with economic theory that predicts retailers will compete with each other to capture the consumer dollar in expectation of increased traffic.[15]

> Sales tax revenues ***increase***. While this may seem counterintuitive at first glance, the additional store traffic actually generates people to come out to buy not only those items that are tax free, but other items as well. A WEG study documenting Florida's experience with its 2010 Back to School Sales Tax Holiday found that tax revenue went up during the month of the two-day holiday. Further, the Study did not find evidence of significant "time-shifting." In Texas, Ronnie Volkening, President and CEO of the Texas Retailers Association, noted that total sales taxes collected go up in August, even though there is a tax-free period during an entire weekend.[16]

> Plausible explanations for the observed sales tax revenue increases reflect standard economic theory. First, lower prices on some goods causes an increase in demand for other goods. This effect has two components, a "substitution effect" and an "income effect." Most items that are tax exempt during the Back to School Sales Tax Holiday are income inelastic. What this means is that the demand for these goods changes less than proportionally to a change in income. Sales discounts on these goods have a positive "income effect," i.e. consumers buy more in response to a lower price, but the increase in demand is less than the drop in prices. For this reason, the Sales Tax Holiday increases demand for items that are not just in the tax-exempt category. More importantly, the additional economic activity generated by the Sales Tax Holiday increases tax revenues from other sources through *direct*, *indirect* and *induced* effects.

> The Tax Foundation[17] is a long-time critic of Sales Tax Holidays and other targeted tax programs. The Foundation argues that sales tax holidays do not increase overall demand because consumers only shift purchases from the non-tax exempt period to the tax holiday period. It also contends that, because the tax holiday is restricted to a limited period of time, any economic stimulus is also restricted. Finally, The Tax Foundation argues that retailers raise prices in response to increased consumer demand, thereby negating any benefit to consumers.

> The Tax Foundation's arguments are contrary to standard economic theory. The retailing industry is highly competitive and any shifts in supply (i.e. changes in the cost of sales) will be mostly passed down to consumers. The sales tax cut will be reflected in lower prices paid by consumers. There is significant evidence that retailers add substantial discounts on top of the tax cuts. Otherwise, consumers would not react so positively, year after year, to the Sales Tax Holidays—an undeniable fact. Indeed, The Foundation's own report cites evidence that "retailers absorbed up to twenty percent" of the tax benefit. This means that consumers absorbed at least eighty percent.

> The error in The Tax Foundation's analysis is assuming that retailers will not increase inventories in anticipation of the tax holiday and thereby create scarcity during this period. A more realistic chain of events, based on the economic structure of the retailing sector, is that

[15] DeGross, R. 2002. Shoppers take a break from sales tax. *Shopping Center World* 31(5):32-33.
[16] As quoted in "Nation's largest tax free weekend gets underway in Texas". Reuters 8/19/2011.
[17] "Sales Tax Holidays: Politically Expedient but Poor Tax Policy", The Tax foundation Special Report # 193, July 2011, Washington, D.C. Alicia Hansen, ed.

retailers will increase inventories and promote heavily by adding other discounts in anticipation of the Holiday. In response to substantially lower prices consumers will buy more, even if total expenditures were to remain constant. This creates what economists call "Consumer Surplus", i.e. consumers get more value per dollar.

> The Tax Foundation next argues that, because the Sales Tax Holiday is a time-limited event, consumers will time-shift purchases and that overall consumer expenditures will not increase over a longer period of time. This conclusion rests on one critical assumption—that overall consumer income is fixed. Indeed, if a person's income is fixed, then any dollar spent during the holiday is a dollar that can't be spent at any other time. This assumption is an economic fallacy.

> While incomes may remain fixed for some individuals, for many others, incomes will vary. On the aggregate the Sales Tax Holiday will increase incomes through *direct, indirect* and *induced* economic effects. In sum, if incomes do not remain fixed over the longer run, even if consumers rationally time-shift some purchases, on the aggregate the tax holiday will increase the overall level of sales.

> The data cited by The Tax Foundation indicate that overall sales increase. The study cites a report from the New York Department of Taxation and Finance reporting a quarter-to-quarter increase of 2.9 percent for the quarter of the sales tax holiday for the first year of the holiday (1997.) A query of the New York Department of Taxation and Finance sales tax data reveals that, for that same year, there was an increase of 3.3 percent in sales and use tax collection.[18] Thus, the data cited by The Foundation is clearly opposite to their conclusion.

B. The Effect of the Sales Tax Holiday on Economic Activity—A Model for the State of Washington

While the existing evidence and common sense suggest that Sales Tax Holidays provide a stimulus to the economy, the size of the stimulus, its impacts on the economy, and the effect on tax revenues are just beginning to be quantified. So far, most analyses of the impacts of the Back to School Sales Tax Holidays are, methodologically, quite crude. They incorrectly assume static consumer and retailer behavior with no spill-over effects. These analyses are what legislators are often presented with when discussing the possibility of enacting Sales Tax Holiday legislation.

The Econometric Model

A major objective of this Study is to posit an empirical model that combines econometric estimation and input-output modeling to quantify the effects of a Sales Tax Holiday. The econometric model used in this analysis will estimate the marginal effect of the tax holiday on

[18] http://www.tax.ny.gov/research/collections/fy_collections_stat_report/2007_08_annual_statistical_report_of_ny_state_tax_collections.htm.

overall sales. This marginal effect is then used as the input for the input-output analysis which, in turn, will produce estimates of the effects on economic activity, employment and tax revenues.

The econometric model is based on quarterly county-level taxable sales data. Gross sales were measured using quarterly gross sales data reported to the Washington Department of Revenue by type of store using NAICS codes. These data are reported by Kind Code, which is a code that captures the main line of business of the reporting establishment. For the purposes of this Study, only codes that are likely to be impacted directly by the Holiday were considered. For example, the Kind Codes referring to "Industrial Machinery" or "Feed and Feed Stores, Retail Nurseries", or "Automobile Dealers" were not considered.On the other hand, Kind Codes such as "General Merchandise" or "Bookstores" or "Apparel & Accessory Stores" were considered. Thus, the sales figures referenced in this Study refer to sales for establishments that are directly or partially affected by the Holiday.

The econometric model also assumes that the level of sales for a specific type of store in a given county during a particular month is related to:

- The size of the economy of the county,
- The size of the population of the county,
- Average per capita income of the county,
- The historic volume of sales for the type of store in the county,
- The month of the year,
- Other factors specific to the county,

A-priori it would be expected that more affluent, higher population counties with historically higher sales volumes by type of store would have higher future sales levels. Also, we would expect some months to have higher sales levels. December, for example, has sales that are higher than any other month.

There are also factors that may be specific to a particular county that influence sales levels. For example, urban counties may, by way of attracting customers from surrounding rural counties, have higher sales levels. Counties with high tourism or those that are international shopping destinations may experience higher sales.

The results of the estimation of the econometric model are in keeping with economic theory expectations: Larger income, population and historic sales levels are associated with current and future sales levels. The technical details of the estimation of the model with the underlying data are presented in Appendix I.

Table 2 below shows the marginal effects of the included variables on sales levels.

Table 2. Marginal Effects of Selected Variables on Sales-Statewide

Variable	Marginal Effect
Income per capita (long-run adjusted)	0.774
Population (long-run adjusted)	0.849
Back to SchoolSales Tax Holiday	0.105
Total StatewideEstimated Direct Impact of a 2010 Back to School Sales Tax Holiday in the State of Washington	$70 million
Total Statewide Estimated Direct, Indirect and Induced Impact of a 2010 Back to School Sales Tax Holiday in the State of Washington	$113 million

Source: The Washington Economics Group (WEG).

The marginal effects in Table 2 above show that a one percent increase in income per capita increases sales by .77 percent, and a one percent increase in population increases sales by .849 percent. These effects are confined to stores that are likely to be directly or partially impacted by the tax holiday—for example, general merchandise stores or bookstores, but not car dealers or seed and feed stores. The effects of income per capita and population are long-run effects. These variables grow gradually over time. The coefficients shown display the long-run adjusted effects.

There is no historic data in Washington on which an estimate of the specific marginal effect of a Back to School Sales Tax Holiday can be based since Washington has not had a previous Sales Tax Holiday. The Florida experience, however, can be used as a proxy to represent this specific effect while using the per capita and population effects based on historical Washington data. Other differences would reflect seasonal demand patterns and the school age population of each county.

In addition to the *direct* effects described above, the econometric model also considers *indirect* effects that result from increased economic activity. For example, increased employment leads to increased sales of all items and an increase in tax revenues. These effects are discussed in the next section of this Study.

III. THE ESTIMATED POSITIVE ECONOMIC IMPACTS OF A BACK TO SCHOOL SALES TAX HOLIDAY IN THE STATE OF WASHINGTON

The economic impacts that will result from the added retail sales are important to overall economic growth, labor income and consumer purchases in the State of Washington. The State of Washington IMPLAN input-output model was used in this analysis to estimate the economic impacts on the state generated by a Back to School Sales Tax Holiday. Input-output models are statistical models that quantify relationships among economic sectors or industries. These models use the historical relationships of economic interaction among industries to forecast the associated distribution of jobs and wages. For example, when consumers spend money on apparel, the model identifies the sectors that are directly impacted such as retail, apparel distribution and apparel manufacturing. These are called *direct* effects. Apparel distribution and manufacturing in turn consume other inputs such as fuel, transportation stock and textiles. These are called *indirect* effects. Finally, as workers in the *directly* and *indirectly* impacted sectors spend their earnings, they create demand for other goods. These last are called *induced* effects.

It is apparent that the Back to School Sales Tax Holiday creates *direct, indirect* and *induced* effects. Not all of these effects remain in the state however. To the extent that the economy of the State of Washington is integrated nationally and internationally, some of these effects spillover to other states and overseas. Likewise, spending stimulus taking place in other economies would have effects in Washington.

To measure the *direct, indirect* and *induced* effects of a Back to School Sales Tax Holiday, WEG Economists used the IMPLAN input-output model. IMPLAN is an input-output model that was developed by the U.S. Government. The basic input to the model is the estimated increase in consumer spending produced by the Back to School Sales Tax Holiday. This has been estimated by the econometric model at $188 million for the month when the Holiday is held. A total estimated 1,555 jobs - hourly equivalent full time positions- for state residents will result from the proposed Sales Tax Holiday. Most of the employment gains are in the retail sector, 80 percent.

Table 3 on the next page summarizes the economic impacts that would result if a Back to School Sales Tax Holiday was established in the State of Washington. The total number of jobs that will be created is 1,555. In addition to 1,283 *direct* jobs, *indirect* and *induced* activities will add about 316 jobs. *Indirect* jobs are in industries that are part of the supply chain for the retailing sector; *induced* jobs result from the earnings that accrue to labor from the Sales Tax Holiday. These *induced* jobs can be in any sector of the economy. In addition to the 1,555 jobs, $46 million in

increased labor income for workers is estimated to result from a Back to School Sales Tax Holiday in the State of Washington.

Table 3.Summary of the Economic Impacts Created by a Back to School Sales Tax Holiday in the State of Washington

Impact On	*Direct*	*Indirect & Induced*	*Total Impacts*
Employment (Jobs)	1,238	316	1,555
Labor Income ($ Millions)	$32	$13	$46
Total Value Added ($ Millions)	$59	$26	$85
Federal, State and Local Fiscal Revenues ($ Millions)	---	----	$25
Total Economic Output ($ Millions)	$70	$43	$113

Source:The Washington Economics Group (WEG).

The increase to Washington's economic output ($113 million – see Tables 2 and 3) is somewhat smaller than the predicted increase in total taxable sales by Establishments Selling Tax Exempt Items ($188 million – see Table 5).

Table 4 that follows shows that the increased level of economic activity generates increases in federal, state and local tax revenues. Over $25 million in fiscal revenues (the taxes and fees collected by governments) will be generated by the Sales Tax Holiday in Washington each year. This total is divided almost evenly between the federal and state and local governments with $12.6 million, or 50 percent, flowing to the federal government, and the other $12.6 million flowing to state and local governments in Washington. This increase in state and local revenues is in sharp contrast to the predictions of losses in the static fiscal impact analyses often supplied to legislators and policy makers. Because a large portion of the increased economic activity is reflected in labor earnings, there is a significant increase in labor and household taxes at the federal level (FICA and income taxes mainly). Federal corporate and indirect business tax receipts also increase. These are mainly corporate profit taxes and use and excise taxes.

At the state and local levels, increases in labor taxes are relatively small compared to the federal portion. These taxes would include unemployment and workers compensation. Household and corporate taxes are also relatively minor. However, there are substantial indirect business taxes accruing to the state and local governments. These are mainly sales, excise and use taxes.

Table 4. Total Fiscal Impacts of a Back to School Sales Tax Holiday in the State of Washington($ in Thousands)

Taxes Paid By	*Federal Taxes*	*State/Local Taxes*	*Total Taxes*
Labor	$5,412	$8	$5,420
Capital	$182	$0	$182
Indirect Business Taxes (this includes Business & Occupation taxes)	$3,339	$12,392	$15,730
Households (this includes workers compensation, etc)	$2,807	$98	$2,905
Corporations	$922	$88	$1,011
Total:	***$12,662***	***$12,586***	***$25,248***

*Net of any tax losses on tax exempt items.
Source: The Washington Economics Group (WEG).

County Level Sales Impacts

As detailed in Table 5 below, the econometric model allows us to project the impact on sales at the county level. The level of sales in this model is a function of the size of the school age population. Table 5 shows the projected impact on gross sales of consumer items if a Back to School Sales Tax Holiday would have taken place in the State of Washington in 2010.

Table 5. Predicted Taxable Sales by Establishments Also Selling Tax Exempt Items

County	Population	School Age Population	Predicted Sales	Sales Increase Due to Holiday
Adams	18,300	4,632	$ 5,412,246	$ 288,845
Asotin	21,700	4,111	$ 3,475,564	$ 182,874
Benton	172,900	39,158	$ 81,069,755	$ 5,408,813
Chelan	73,300	15,577	$ 13,712,498	$ 836,141
Clallam	70,100	11,933	$ 23,823,605	$ 1,412,982
Clark	435,600	92,761	$ 120,106,724	$ 8,654,625
Columbia	4,150	765	$ 1,998,582	$ 83,857
Cowlitz	100,000	20,379	$ 32,991,509	$ 2,067,045
Douglas	38,500	8,600	$ 18,128,540	$ 1,038,003
Ferry	7,850	1,702	$ 1,941,044	$ 91,311
Franklin	75,500	19,318	$ 19,243,521	$ 1,199,263
Garfield	2,300	482	$ 1,182,508	$ 46,129
Grant	87,700	21,039	$ 35,458,057	$ 2,228,631
Grays Harbor	71,600	14,119	$ 22,171,068	$ 1,338,298
Island	81,100	15,272	$ 17,248,738	$ 1,049,637
Jefferson	29,300	4,422	$ 7,318,189	$ 388,424
King	1,933,400	331,476	$ 884,353,368	$ 70,648,486
Kitsap	248,300	51,018	$ 87,582,239	$ 5,987,070
Kittitas	40,500	7,691	$ 15,916,871	$ 900,210
Klickitat	20,500	4,188	$ 4,627,323	$ 244,017
Lewis	75,600	15,411	$ 30,133,572	$ 1,835,424

Lincoln	10,500	1,983	$ 5,537,864	$ 265,875
Mason	57,100	10,437	$ 13,397,487	$ 783,370
Okanogan	40,900	8,728	$ 19,026,951	$ 1,091,207
Pacific	22,100	3,648	$ 6,611,288	$ 342,885
Pend Oreille	13,100	2,665	$ 5,597,275	$ 279,197
Pierce	814,600	170,260	$ 273,446,990	$ 20,727,176
San Juan	16,500	2,404	$ 6,544,177	$ 322,164
Skagit	119,300	24,223	$ 57,225,868	$ 3,647,054
Skamania	10,900	2,229	$ 2,804,273	$ 136,711
Snohomish	711,100	148,103	$ 282,116,133	$ 21,142,329
Spokane	470,300	95,105	$ 181,347,145	$ 13,095,412
Stevens	44,300	9,919	$ 13,595,194	$ 790,595
Thurston	252,400	50,007	$ 97,235,309	$ 6,634,884
Wahkiakum	4,150	716	$ 1,380,687	$ 57,349
Walla Walla	59,600	12,179	$ 18,639,056	$ 1,107,866
Whatcom	195,500	38,934	$ 86,938,658	$ 5,797,277
Whitman	43,600	8,803	$ 18,349,148	$ 1,053,319
Yakima	239,100	56,605	$ 68,279,062	$ 4,711,482
TOTAL	**6,733,250**	**1,331,002**	**$ 2,585,968,087**	**$ 187,916,232**

Local Level Sales Impacts

Table 6 shows the impacts of the sales tax holiday on the ten largest municipalities in the State of Washington. The impacts at the municipal level were calculated based on the proportion of the county taxable sales generated within each municipality for the last year for which data was available (2010) for the municipality. This method implicitly incorporates existing shopping and commuting patterns.

Table 6. Predicted Taxable Sales by Establishments Also Selling Tax Exempt Items for the Ten Largest Municipalities

Rank	Municipality Name	County Name	Predicted Sales	Sales Increase Due to Holiday
1	Seattle	King	$307,713,029	$24,582,322
2	Spokane City	Spokane	$101,673,698	$7,342,045
3	Tacoma	Pierce	$97,458,151	$7,387,290
4	Vancouver	Clark	$68,470,224	$4,933,813
5	Bellevue	King	$108,085,750	$8,634,664
6	Everett	Snohomish	$58,859,183	$4,411,021
7	Spokane Valley	Spokane	$48,786,994	$3,522,999
8	Kent	King	$36,172,661	$2,889,731
9	Federal Way	King	$44,169,538	$3,528,579
10	Renton	King	$45,096,299	$3,602,616

IV. CONCLUSION

This Study applied professionally-accepted and widely-used methodology to find that establishing a Back to School Sales Tax Holiday would increase retail sales by $188 million in the State of Washington, providing an important economic stimulus.

The Holiday would produce an increase in state and local revenues of $12.6 million. This increase would occur from the additional $113 million in economic activity the Holiday would generate in the State of Washington.

This Study finds that, as an economic stimulus, establishing a Back to School Sales Tax Holiday in the State of Washington is a desirable policy option. The increased consumer expenditures would be distributed widely among all sectors of the economy. Sales Tax Holidays are extremely popular with taxpayers, particularly middle-income families, facing the economic challenge of raising children at a time of significant economic distress. The evidence shows that, due to the competitive nature of the retailing sector, price reductions during Sales Tax Holidays are substantially better than the sales exemption.

Back to School Sales Tax Holidays area win-win-win proposition for all parties involved. Consumers get a tax break that helps them at a time of high need, retailers get an economic boost, and states and municipalities see increases in revenues.

APPENDIX I:

ECONOMETRIC ESTIMATION DETAILS
ENGEL CURVE ANALYSIS

Following on standard economic theory, WEG economists modeled the demand for consumer goods using the **Engel Curve Analysis**. In economics, an **Engel Curve** shows how the quantity demanded of a good or service changes as the income level changes, holding all other factors constant. The effect of demand factors other than income shift the Engel Curve.

Unlike a demand curve, which is downward sloping—as prices go up, demand goes down, an Engel Curve is upward sloping—as income goes up demand increases. In a demand curve, income is considered a demand shifter, while in an Engel Curve, price is the demand shifter.

In particular, WEG economists hypothesized that aggregate sales at the NAICS code level are a function of income and that population, month of the year, consumer tastes and preferences and prices are shifters which increase or decrease demand.

To estimate the impact of the Back to School Sales Tax Holiday on sales WEG economists hypothesized that the Sales Tax Holiday acts as a temporary decrease in the prices of the items that become tax exempt and that the size of the benefit interacts with the number of school age children. Economic theory predicts that a price decrease for some goods will increase the demand for such goods as well as other goods because, to an extent, the price decrease is akin to an increase in income.

The model was empirically estimated using a double log specification, with the logarithm of aggregate sales by month and county for each "bucket" of NAICS codes[19] as the dependent variable and the following as the explanatory variables:

1. Time lagged logarithm of aggregate sales for the bucket by month and county.
2. The logarithm of per capita income for the county and month.
3. The logarithm of population for the county for the year.
4. A set of variables for the months of the year.

Since the model uses panel data, serial correlation is quite likely. If serial correlation is present, the estimation results can be inefficient. This means that estimates standard errors are biased downwards, which can lead to the incorrect conclusion that the estimation result is significant when in fact it may not be.

One way to reduce serial correlation and at the same time make the model dynamic is to use a lagged dependent variable. The lagged dependent variable model assumes that the effects of all variables, including unmeasured variables, have impacts that decrease exponentially. Further, using the lagged dependent variable allows this analysis to measure the long-term impacts of the causal variables. Nevertheless, even as the use of a lagged variable reduces serial correlation, it may not completely eliminate it.

[19] NAICS codes were aggregated into three "buckets" or categories depending on the impact that a back to school sales tax holiday may have on them. The three categories are "Direct Impact", "Partial Impact" or "Indirect Impact."

The model was first estimated using Ordinary Least Squares (Table 6). It is known that when the model includes a lag of the independent variable, the Durbin-Watson Statistic (D-W) will be biased toward 2, suggesting that there is no serial autocorrelation, when in fact, it may be present. Therefore, the standard D-W is not a useful test for autocorrelation for this type of model. Instead, this analysis used a couple of alternatives: the Breusch-Godfrey Lagrange Multiplier test and the alternative Durbin "h" statistic[20]. Applying both tests yielded results suggestive of serial correlation.

It was further suspected that error terms may be correlated across counties, for this reason and to address the issue of serial correlation as an alternative, the Feasible Generalized Least Squares (FGLS) model using the Cochrane-Orcutt 2-step algorithm was estimated. FGLS are known to be asymptotically unbiased and efficient. The results of the OLS and FGLS estimations are listed in Table 6 and 7 respectively. FGSL coefficients are also unbiased and efficient. These were used to compute the elasticity and forecasts.The results of the OLS and FGLS estimation are listed in Tables 6 and 7 respectively.

Table 7. OLS Regression Results

	Un-standardized Coefficients		Standardized Coefficients		
Variable	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	0.675	0.064		10.514	0.000
Lagged sales[1]	0.954	0.002	0.953	404.180	0.000
Real income per capita[1]	0.007	0.007	0.001	1.034	0.301
Population[1]	0.044	0.002	0.044	18.543	0.000
January	-1.042	0.006	-0.190	-182.769	0.000
February	-0.434	0.006	-0.081	-78.778	0.000
March	-0.338	0.006	-0.063	-61.388	0.000
April	-0.569	0.006	-0.107	-102.985	0.000
May	-0.512	0.006	-0.096	-92.863	0.000
June	-0.589	0.006	-0.111	-106.969	0.000
July	-0.463	0.006	-0.087	-84.050	0.000
August	-0.418	0.006	-0.079	-76.007	0.000
September	-0.545	0.006	-0.102	-98.855	0.000
October	-0.842	0.006	-0.158	-152.704	0.000
November	-0.309	0.006	-0.058	-55.890	0.000
R Square	0.99				
Durbin-Watson	1.956				

Notes:
[1] The logarithm of the variable was used for estimation.
Binary variables were used to denote each of the months. Also a binary was used when the month was a back to school sales tax holiday month.

[20] 5Much of this discussion is based on Veerbek Marno (2008) "A Guide to Modern Econometrics", 3rd Ed. John Wiley and Sons. and Green, William H. 2003. Econometric Analysis, 5th Edition, Prentice Hall.

Table 8. FGLS COCHRAN-ORCUTT					
	Un-standardized Coefficients		Standardized Coefficients		
Variable	B	Std. Error	Beta	t	Sig.
(Constant)	0.039	0.008		4.616	0.000
Lagged sales[1]	0.907	0.004	0.919	217.782	0.000
Real income per capita[1]	0.072	0.004	0.079	19.400	0.000
Population[1]	0.079	0.010	0.011	8.291	0.000
January	-0.087	0.001	-0.125	-106.520	0.000
February	-0.041	0.001	-0.072	-61.779	0.000
March	-0.032	0.001	-0.068	-54.972	0.000
April	-0.053	0.001	-0.106	-85.739	0.000
May	-0.048	0.001	-0.097	-79.310	0.000
June	-0.056	0.001	-0.097	-82.032	0.000
July	-0.041	0.001	-0.077	-65.236	0.000
August	-0.040	0.001	-0.083	-67.465	0.000
September	-0.052	0.001	-0.103	-83.917	0.000
October	-0.067	0.001	-0.065	-61.365	0.000
November	-0.029	0.001	-0.048	-41.962	0.000
R Square	0.99				
Durbin-Watson	1.895				

Notes:
[1] The logarithm of the variable was used for estimation.

APPENDIX II:
DATA SOURCES

Preparing the data for the estimation presented some challenges because the Washington Department of Revenue censors when the number of reporting units is small. The reporting unit is an establishment. The raw data was downloaded from the State of Washington's Department of Revenue website:

http://dor.wa.gov/content/aboutus/statisticsandreports/TID/StatisticsReports.aspx?query=localsalesnaics

The State of Washington Department of Revenue uses the North American Industrial Classification System (NAICS). It "is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.[19]" NAICS begins with a two-digit system that divides businesses into 20 broad categories, such as construction, manufacturing and retail trade. These 20 categories are detailed with the third digit. Each three-digit category is, in turn, detailed with a fourth digit. Again, the four-digit codes are further detailed by a fifth, and finally, the five-digit NAICS is detailed with a sixth digit. There are nearly 1,200 categories of businesses at the six-digit level. Since the system is set with five different levels of specificity, data are often reported in multiple ways depending on the analyst's needs.

It is important to note that the business itself is classified. Taxable sales are provided by the NAICS codes. The result is the products being sold are not directly revealed. For example, pens sold at a supermarket are identified as supermarket sales; whereas pens sold by a ferryboat company could be identified as inland water passenger service.

As with many other entities, Washington State censors data with a small number of companies reporting. As the detail of specificity increases; the number of businesses under the specific NAICS code decreases; and therefore, the number of censored entries increases (censored data is also called "redacted data").

This logic is particularly true at the municipal level, and this factor represented a challenge to this project. The State of Washington reports taxable sales at the municipal and statewide levels, but not at the county level, and this study required aggregation at the county level.

Municipalities can be aggregated to the county level, but the censoring represented a problem if we wanted to use the more detailed six-digit NAICS code data. To resolve this issue, WEG economists devised an ad-hoc process to estimate the values for the censored data. This estimation process first works by using the statewide information to estimate the municipal and county level censored values.

[19] US Bureau of The Census.

Statewide Aggregates: Estimating Six-Digit NAICS

The first step was to collect the quarterly data at the statewide level, for all NAICS codes (aggregated), by year and by quarter from 1994 to 2010. The Department of Revenue publishes quarterly data only for the period that starts in the first quarter 2005 to first quarter 2011. None of these data were redacted (censored).

Then the same statewide data was collected for the same time period, but aggregated at the two-digit NAICS code level. In this case, some of the data was redacted due to a small number of reporting entities for the given time period. For each time period, the value of all the known two-digit NAICS codes were aggregated and subtracted from the total known for the given time period in the first step. Any residual was split evenly to any unknown (redacted) two-digit code. The result is all two-digit codes are determined for each time period. For each time period, the calculations are as follows:

$$Determined\ Value_{Unknown\ 2\ Digit\ NAICS\ Code} = \frac{Total\ Value - \sum Value_{known\ 2\ Digit\ NAICS\ Code}}{Count_{Unknown\ 2\ Digit\ NAICS\ Codes}}$$

The same process was followed for the three-digit NAICS codes. In this case, the time periods and the first two digits of the NAICS code were calculated separately. So, for each time period and each two-digit NAICS code (*mn*) and third digit (x), the formula is:

$$Determined\ Value_{Unknown\ NAICS\ Code\ mnx} = \frac{Value_{NASICS\ mn} - \sum Value_{known\ NAICS\ Code\ mnx}}{Count_{Unknown\ NAICS\ Codes\ mnx}}$$

The subsequent determined values are likewise used to determine the value for all four-digit NAICS codes. Then the determined values of the four-digit NAICS codes are used to determine the value of the five-digit NAICS codes, which are used to determine the value of taxable sales at the statewide, 6 digit-NAICS codes level for each time period. The final formula is listed below:

$$Determine\ Value_{Unknown\ NAICS\ Code\ mnopqx} = \frac{Value_{NASICS\ mnopq} - \sum Value_{known\ NAICS\ Code\ mnopqx}}{Count_{Unknown\ NAICS\ Codes\ mnopqx}}$$

These give the estimated statewide taxable values for each six-digit NASICS code for each time period.

County Data: Solving for More Redacted (Censored) Values

Data at the county level are not directly available from the State of Washington's website http://dor.wa.gov/content/aboutus/statisticsandreports/TID/StatisticsReports.aspx?query=localsalesnaics; however, the data are available at the municipal (and unincorporated areas of each county) level. Each municipality's taxable sales data was downloaded for years 1994 through 2010 and quarters from first quarter 2005 through first quarter 2011. This data was extracted at the six-digit NAICS code level. Only the "Sales" tax data was extracted. ("Use" taxes were excluded.) All municipalities and unincorporated areas are included, but public transportation benefit areas (PTBA) were not included because they are already included within the municipalities and/or unincorporated area data.

The data includes a municipality code, a county code, the six-digit NAICS code, and the value of the taxable sales if known, and an identifier if the taxable sales value was redacted (unknown) for each time period.

Initially, these data are aggregated to include the sum of the value of known taxable sales and a count of the number of municipalities with redacted taxable sales values for each NAICS code and each time period. The value of the redacted taxable sales is calculated based on the total determined value calculated at the state level for each time period as follows:

$$Value_{Redacted\ Municipal\ NAICS\ Code} = \frac{Statewide\ Value_{NASICS\ Code} - \sum Value_{known\ NAICS\ Code}}{Count_{Redacted\ NAICS\ Code}}$$

In a few instances, there were no municipalities with redacted codes, but there was a difference in the statewide estimate and the total at the municipal level, or the sum of the known municipal taxable sales was greater than the statewide estimate. In these cases, adjustments were made to a nearby NAICS code for the given time period.

The value of redacted municipal taxable sales value for each six-digit NAICS code and time period is used with the initial county data to create a new worksheet. This new worksheet contains the six-digit NAICS code, the county code, the time period, and a summed value of taxable sales. The summed value of taxable sales is determined as:

$$\sum Taxable\ Sales_{County} = \sum Known\ Taxable\ Sales_{County} + Value_{Redacted} \times n\ redactions_{county}$$

Direct, Indirect and Partial Effects

A priori we know that different categories of goods will be affected differently by a Back to School Sales Tax Holiday. Therefore 1100 NAICS codes categories were grouped into three "buckets", depending on whether a Back to School Sales Tax Holiday would have a direct, an indirect, or a partial impact from the Sales Tax Holiday.

A business using a NAICS code classified as having a direct affect is one that is primarily selling products that would be included in a sales tax holiday, for example, general merchandise, apparel, school supplies, etc. A business using a NAICS code classified as having an indirect is one not likely to sell products that would be included in a sales tax holiday, for example, automobile dealers or animal feed stores. A business reporting under a NAICS code classified as having a partial affect means that this business might have a portion of their products included in a sales tax holiday, for example, some luggage stores sell backpacks that might be included as a sales tax holiday item.

County data was aggregated to the effect level. The resulting data set includes the county code, the effects code (direct, indirect, or partial), the time period (years 1994 through 2010 and quarters first quarter 2005 through first quarter 2011) and the aggregated taxable sales.

A final step derived quarterly data for the period 1994 through 2004. For this period the Department of Revenue provided only yearly totals. Our estimates of quarterly data were derived by applying to the yearly data the average shares observed from 2005 through 2010 for each quarter. Monthly data was derived by obtaining monthly shares within each quarter from a Washington time series comprising a similar period of time.