Federal Reserve Bank of Chicago

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Abstract

Sales tax holidays (STHs) are the temporary suspension of state (and some local) sales taxes on selected retail items for a brief period of time. The policy has gained popularity in recent years, beginning in one state in 1997and growing to twenty by 2008. Despite the increased frequency with which states use STHs, little research has been conducted to study how households respond to this temporary tax manipulation. Our paper offers the first household-level, micro-econometric evaluation on the effect of STHs on household consumption patterns. We find that on STHs, households increase the number of clothing and shoes bought by over 49 percent and 45 percent, respectively, relative to what they buy on average. Further, we find that this increase in consumption is limited to children's apparel and that the wealthiest households and households consisting of married parents and young children have the largest, statistically significant response to STHs; for example, households with incomes over $70,000 increase the number of children's clothing items purchased by 136 percent, while households that consist of married parents and young children increase the amount spent on children's clothing and shoes by 117 and percent and 295 percent, respectively.

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I. Introduction

It is common for policymakers to temporarily manipulate tax rates to incentivize consumer behavior. Sales tax holidays (STHs)—the suspension of sales taxes levied on targeted retail goods for a set period of time—have grown in popularity over the past two decades. The first sales tax holiday was instituted in 1997 in the state of New York to help clothing retailers compete against stores in neighboring New Jersey, where clothes are not subject to the sales tax. By 2008, STHs had expanded to 20 states to cover goods ranging from fanny packs to refrigerators. The number of states with sales tax holidays declined to 17 in 2008 and 2009, reflecting the worsening fiscal health of many states.[1] However, this number is set to grow in 2010, with Florida reinstating its STH for the first time since 2007 and Illinois recently passing its first STH. With nearly 100 million people living in a state with an STH in 2009, STHs can potentially have a large impact on households, retailers, and state governments.

While the stated purposes for state tax holidays are varied, they are generally justified to accomplish three goals. First, by eliminating the state-level sales tax, the STH lowers the final sales price of retail goods to consumers. Further, the dates for STHs are often chosen to coincide with periods of high seasonal demand, such as back-to-school shopping periods, with the intention of providing relief to lower-income, liquidity-constrained households or those otherwise deemed worthy of tax relief by policymakers. In justifying Illinois's 2010 holiday, the lead sponsor said, "[w]orking families with kids going back to school, we want to give them a break." (Associate Press, 2010) Second, lowering sales tax rates helps retailers lower prices without reducing profits. And relatedly, STHs can help retailers compete better against their counterparts in bordering states with lower sales tax rates. Third, by targeting specific items for tax exemption, policymakers can encourage the consumption of specific goods that they believe

[1] We are included the District of Columbia as one of the "states" with a sales tax holiday.

have inherit social benefits—such as goods needed during the hurricane season in Florida or computers in Vermont.

Despite the growing popularity of the STH, little formal evaluation has been conducted to determine whether they actually accomplish policymakers' stated goals. There are a number of reasons why instituting an STH may be ineffective, or why doing so may be considered bad public policy. First, while the sales tax is eliminated for a brief period of time, consumers would not see any benefit if retailers increased the pre-tax price of items; the degree by which prices may be lowered depends on the incidence of taxation. Second, even if after-tax prices do drop consumers may not purchase any more of the targeted item—the degree of change in consumer response depends on the elasticity of demand for the eligible targets. Third, the temporal nature of the STH may cause consumers to shift planned consumption over time. Fourth, because the STH is available to all consumers, unintended recipients, such as wealthy households or those without children, may also take advantage of the holiday or may even have the means to take better advantage of the STH than the intended beneficiaries. In particular, this may be too blunt a policy instrument for subsidizing the consumption of targeted groups. Fifth, there have been complaints of onerous compliance costs for retailers who are forced to participate in an STH.[2]

The purpose of this paper is to test both the economic and policy implications of the STH, and will focus on how consumers are affected. Through our analysis, we hope to address a number of concerns. Does the STH actually encourage consumers to increase consumption of both covered goods and ineligible items? How successful is the STH at targeting different types of households, as well as different members within households? Is it the lower-income households that are taking advantage of the STH or wealthier households? And within families, are parents using the STH to purchase items for their children or themselves? Lastly, do

[2]For further criticisms, see Hawkins and Mikesell (2001).

consumers increase overall spending or simply shift intended consumption across time so that it occurs during an STH? Or do STHs cause consumers to shift consumption from ineligible items to eligible ones?

We organize the remainder of our paper as follows. In section II, we provide background information: a brief history of the STH, along with a review of relevant literature. In section III, we summarize the data sources we use. We provide an overview of our econometric approach in section IV. In section V, we present our findings. And we give our conclusion in section VI.

II. Background

Brief History of Sales Taxes and the STH

Sales taxes are levied on almost every tangible good and a number of services—the exceptions being a few necessity goods such as food and prescription drugs. The tax applies at the retail level, is ad valorem, and is remitted by vendors. Sales taxes are levied by different levels of government; 45 states have some type of state-level sales tax, with counties, cities, and even transportation authorities levying additional sales taxes. In 2010, the average state-level sales tax was 5.6 percent and the median was 6.0 percent, with a range of 2.9 percent in Colorado to 8.25 percent in California. Just under a quarter of state own-source revenues are derived from the general sales tax. Sales taxes affect the vast majority of Americans almost every day of the year.

Cole (2008) presents a historical synopsis of the STH. Briefly, the first STH occurred in 1997 in New York and was enacted to help the city's retailers compete with their tax-free competitors in neighboring New Jersey. Lasting seven days, the holiday exempted general use clothing and footwear priced under $500 from the statewide 4 percent sales tax. The STH then

spread to Florida in 1998 and Texas in 1999; by 2007, 20 states had instituted at least one STH, offering over a third of the U.S. population a brief respite from the sales tax. STHs are state level policies although in a number of cases, localities have also suspended their sales tax during the state holiday. The duration of the STH, the type of exempted items, the ceiling below which these items could be purchased tax-free, and even the number of STHs offered each year are all parameters set by the state legislative bodies; in a given year, no two STHs have been identical.

Previous research on the STH

There has been little academic research conducted on the consumer responses to STHs. A wider body of literature has analyzed how prices respond to different tax rates and changes in tax rates more generally. Besley and Rosen (1998) look at the prices of a bundle of consumption goods across municipalities and use the heterogeneity in sales tax rates to estimate the degree to which the tax burden is shifted to retailers or consumers. Their findings are mixed, with the tax burden being shifted completely to consumers for some goods (for example, Big Macs, eggs, Kleenex, and Monopoly games), while the tax is less than fully shifted to consumers for other goods (for example, bananas, bread, Crisco, milk, shampoo, soda, and boys underwear). Doyle and Samphantharak (2008) look at the how gasoline prices shift during a gas tax moratorium. Analyzing prices at the station level throughout the Midwest and aggregating prices to the state level, they find that 70 percent of the tax suspension and 80 percent to 100 percent of the reinstatement is shifted to consumers. Fullerton (1987) analyzes the aggregate shifts in consumption resulting from changes in the sales tax rate in Idaho, and finds that the shift in the sales tax rate from 4.5 percent to 4.0 percent induces a deviation from consumption's long-term

trend between $3 to $4 million. In other words, the decline in the sales tax led to an increase in consumption.

One of the first studies to actually analyze an STH is Harper et. al (2003). They sample prices on bundles of goods exempt from the sales tax before and during the 2001 Florida STH and compare price dynamics for these same bundles to those in neighboring Mobile, Alabama which did not have a STH and consequently experienced no change in the sales tax rate. They find that, on average, prices of tax exempt items in Florida fall by 80 percent of the sales tax rate during the STH. Mogab and Pisani (2007) survey shoppers at a shopping mall in Texas during the 2004 STH to discern their attitudes and perceptions concerning the STH, and find that it plays an important role in deciding whether or not to shop.

Cole (2009a) presents the first fully specified econometric evaluation of an STH. In Cole (2009a), the author estimates how an STH affects the prices and quantities of computers and find weak evidence that the sales tax savings is either fully passed through or mildly overshifted to consumers during the STH (most of his estimates are not statistically significant). Cole (2009a) simulates the aggregate quantity of computers that would have been consumed absent an STH, and compares this counterfactual to the actual numbers to estimate the impact of the STH on the quantity purchased. His main findings are that an STH induces consumption of between 6 and 17 additional computers per 10,000 people and that the timing of purchases to coincide with an STH can account for between nearly 40 percent and 90 percent of the increases in purchases in states with STHs over a 30-week period. Cole (2009b) analyzes the fiscal impact of these tax holidays, and finds that there is about a 4 percent reduction in states' sales and use tax collection in the months with an STH.

The previous literature suggests that retailers will decrease the final sales price of items in response to an STH and that an STH in at least one state played a significant role in consumers' decision to go shopping. In addition, the effects of STHs on an aggregate level imply that they are successful in encouraging consumption of computers (although without a great deal of statistical certainty) and that in general, sales tax receipts fall during months that have an STH. It remains to be seen, however, how households directly respond to the lower prices that occur during a STH.

III. Data

Our empirical approach to exploring STH effects on consumption relies on merging a data set on daily household consumption with a census of STHs, which contains information on dates for STHs, the corresponding states that instituted them, and the items that were tax-exempt during these STHs. The micro data on household consumption are from the Diary portion of the U.S. Bureau of Labor Statistics' (BLS) *Consumer Expenditure Survey* (CEX) from 1997 to 2008; and the STH data are from Cole (2008).

The Diary Survey tracks the spending patterns of households for two weeks. Households use diaries to track spending on detailed items. The data from the Diary Survey are used in conjunction with the data from the better known Interview survey to generate the market baskets used in the construction of the Consumer Price Index (CPI). The purpose of the Diary survey is to gather detailed information on purchases made very frequently. The CPI relies on Diary data for the measurement of all home food consumption, all footwear purchases, and most clothing purchases. However, the Diary Survey itself covers all purchases and expenses. From the Diary Survey, we know the date of a given purchase, the type of item purchased, the state where the

household resides, and the after-tax cost.[3] The CEX also includes detailed household and person level socio-demographic data.

Households are instructed to record pre-tax prices for items purchased during their sample period, after which the BLS calculates and subsequently publishes the after-tax cost. The CEX does not take into account STHs when adding the sales tax -- sales taxes are added during data processing for items that are temporarily exempt from the sales tax. Hence, we have had to remove the sales tax from the all the eligible items purchased during STHs. Because we cannot identity geographic locations beyond the state of residence, we can only remove the state-level sales taxes in our analysis. Hence, our analysis of the dollar amount spent on items exempted from sales taxes during STHs may be slightly biased upward, since we are unable to remove local sales taxes in those cases when the local sales tax is also suspended.

The STH data contain information on every STH that occurs between 1997 (the year of the original STH) and 2008. The STH data contain information on the states, the dates, the items exempt from the sales tax, and the price ceiling for tax-exempt items (under which consumers do not have to pay the sales tax). Cole (2008) contains data on all the STHs between 1997 and 2007. For the year 2008, we use data from the Federation of Tax Administrators[4]. The five most popular items that are exempt from sales tax during an STH are clothing, shoes, clothing accessories, computers, and school supplies. The modal price ceilings at which these items are exempt is $100 for clothing, shoes, and clothing accessories; $2,500 for computers; and $75 for school supplies. As stated earlier, the dates for STHs are chosen to coincide during periods of high seasonal demand, the most popular being back-to-school season. The STH data reflect this

[3] The Diary survey asks for respondents to report the pre-tax price. Sales tax is applied to expenditure items by the BLS before the data are transmitted to the data users. The state of residence is available in the public use microdata for most households. It is omitted or recoded for some households. We only use those households whose state of residence we are certain of.

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

claim, with 65 percent of all STHs beginning in August. In addition, 48 percent of STHs begin on Friday and many only last for a weekend.

Using the merged Diary–STH data, we measure spending on a given day by a household. We separately tabulate spending for a number of different categories of expenditure and focus on the categories for which states have enacted sales tax holidays. Our unit of analysis is a "household- date": on a given date some households live in states where there is a sales tax holiday, while other households live in states where sales taxes remain unchanged. Conceptually, our identification strategy is to use consumption patterns among individuals living in a state without a sales tax holiday on a given date as a control for consumption patterns among individuals living in states where there is a sales tax holiday. Because sales tax holidays have been concentrated in clothing, shoes, accessories, computers, and school supplies, we focus on those categories of expenditure in our analysis. Our resulting merged data set tracks the daily purchasing decisions of just under 50,000 households, with over 600,000 household-date observations.

Summary statistics from the merged data are presented in Table 1. The table shows the daily means of household expenditures for all items as well as for items traditionally tax-exempt during an STH. We show expenditure data in three ways—total dollar amount spent, the number of items purchased, and the percentage of days in which any purchase is made in a given category. On an average day, households spend $136 on all expenditures. Of this total, $11.80 is spent on food purchased for home use, and $115 on other items not tax-exempt during STHs, leaving $8.35 spent on items that are traditionally tax-exempt during STHs. This amount accounts for only 6.14 percent of all daily spending. Similarly, only 4.74 percent of all items purchased on an average day are items that are tax-exempt during STHs. Of the goods that are

typically tax-exempt during an STH, clothing constitutes the bulk of the purchases; over 50 percent of both the amount spent on and the number of items purchased of traditionally tax-exempt items are devoted to buying clothing.

Not only do STHs only pertain to a small percentage of daily expenditures, but they only affect a small percentage of days each year. Table 2 shows the frequency of STHs in the CEX data. While our data set consists of over 600,000 household-date observations, only 2,241 of them fall on an STH (0.37 percent). STHs that exempt clothing from tax are the most popular, applying to 0.33 percent of our observations, followed by shoes (0.27 percent) and school supplies (0.17 percent). STHs are revealed again to only affect a sliver of household consumption activity. The combination of the minimal share of daily consumption devoted to tax-exempt items on STHs and the infrequent occurrence of STHs suggest that STHs have a relatively small window for influencing household consumption.

Table 2 also shows variable means for the demographic variables we include as controls in our analysis of consumption patterns.

IV. Model

Our econometric analysis seeks to identify the consumer response to a sales tax holiday. Briefly, our econometric model is as follows:

$$y_{ist} = \beta_0 + \beta_1 * STH\_Day_{ist} + \boldsymbol{\gamma} * \boldsymbol{X_i} + \delta_s + \theta_t + \varepsilon_{ist} , \quad (1)$$

where y_{ist} is an outcome measuring the purchases by household *i* in state *s* on day *t*. STH_Day_{ist} is an indicator variable equal to 1 if there is a sales tax holiday on date *t* in the state *s* where household *i* lives. $\boldsymbol{X_i}$ is a vector of the household-level controls of age, sex, and race of

reference person; marital status; household composition; and household income. δ_s and θ_t are state and time fixed effects, respectively, and ε_{ist} is a household-level error term. Our time fixed effects are calendar dates (for example, Jan 5, 2006). As a result of our including these fixed effects, we are assessing whether individuals living in states with sales tax holidays on a given date have purchasing patterns that differ from otherwise similar individuals living in states without STHs evaluated on the exact same date. Because we include state and time fixed effects, our model estimates the average treatment effect that experiencing an STH has on a variety of outcome measures.

Including the calendar date controls is crucial for our identification strategy because STHs are intentionally positioned to occur during periods of high seasonal demand—for example, weekends during back-to-school shopping season (August). If we did not compare households shopping on the exact same calendar date, we would not be able to take into account the increase in demand that occurs on weekends and in August. By including the calendar date controls, we are able to net out the shared seasonal preference shocks that affect all households, isolating the effect of the STH.[5]

For the majority of our empirical work, we use daily data on purchasing behavior, using outcome variables such as the total amount spent and number of units purchased on day *t* by household *i* in state *s*.. We investigate spending for a number of different expenditure categories. When using these outcome variables, we use an ordinary least squares (OLS) regression, clustering standard errors at the household level. In a few instances, we are also interested in seeing how an STH affects the probability of purchasing an item. For these circumstances, we use a linear probability model.

[5] One concern with this procedure is that sales tax holidays are placed at periods of high seasonal demand specific to a given state. We address this concern in the robustness section that follows our results.

V. Results

Baseline Results

Table 3 presents our baselines results of running model (1) for five different items frequently exempt from sales taxes during STHs: clothing, shoes, clothing accessories, computers, and school supplies. For each item category, we employ three different outcome variables: the dollar amount spent on the item on a given day, the total number of items in that category purchased on a given day, and an indicator variable equal to 1 if an item was purchased and equal to 0 if no items in that category were purchased. Our baseline results reveal that STHs have a statistically significant and economically meaningful impact on household consumption decisions. Specifically, we find sizeable effects on the amount spent, the number of items purchased, and the likelihood of making a purchase during STHs that exempt clothing, shoes, and school supplies from the sales tax. On days that have an STH, households increase the quantity of clothing purchased on average by an additional 0.083 items and the quantity of shoes by 0.013 items. Similarly, the probability that a household will purchase clothing and shoes increases by 1.4 percentage points and 1.0 percentage points respectively, on days that have an STH. Consumption of school supply items also increases by 0.055 items on days with a STH. The purchasing of clothing accessories and computers do not appear to be affected by an STH. Most of the point estimates are negative and imprecisely estimated.[6]

While the point estimates for the increased consumption of clothing and shoes on days that have an STH are small and may appear economically meaningless, when compared with average daily consumption they actually represent a significant increase in economic activity. The bottom row of Table 3 displays the ratio of the coefficients of *STH_Day* to their

[6] We observe a negative and statistically significant coefficient for the number of computers purchased. Given the relative infrequency with which people purchase computers and the rarity of computer STHs, we think there is too much noise to take this coefficient seriously.

corresponding daily means. Relative to average daily consumption, days that have an STH result in a sizeable increase in the number of shoes and clothing purchased. On an STH, the number of clothing items purchased by households rises almost 50 percent; the probability that they will purchase any clothing item rises 21 percent; and the amount they spend on clothing goes up 26 percent. Similarly, on STHs, the number of shoes purchased by a household increases 45 percent and the probability that they will make any shoe purchase rises 44 percent. The amount of school supplies purchased increases the most on STHs; household purchase over 60 percent more school supply items on days with an STH than on days without one.

Given that our initial results show that STHs increase the consumption of both clothing and shoes, we next want to explore how this increased consumption is distributed within households. Specifically, we are interested in seeing whether STHs cause an increase in the consumption for adults or children.[7] A significant political motivation behind STHs is the need to provide children with new apparel; children, though, rely on their parents to fulfill their consumption needs. Examining whether parents respond to an STH by increasing their children's consumption or their own shows us whether STHs are effective as a policy mechanism to increase consumption of targeted goods.[8]

Table 4 disaggregates the clothing and shoe items into those purchased for men, women and children.[9] The results reveal that the increases found in consumption of clothing and shoes on days that have an STH are limited solely to children's items; somewhat surprisingly, men's and women's apparel exhibit no statistically significant increase on STHs in either the amount

[7] It is not possible to disaggregate school supplies in a similar manner. Further, in households with children, purchase of school supplies are likely made on their behalf

[8] The difficulty for retailers to determine whether an item is explicitly meant for children is likely the predominate reason why STH rules do not simply make only children's apparel eligible for tax exemption.

[9] The breakdown between men's, women's and children's purchases is based on for whom the item was purchased by the household. The children category includes infant apparel.

spent or quantity purchased. On average, households increase the amount spent on children's clothing by $0.91, and they increase the quantity purchased by 0.068 clothing items and 0.010 shoe items. These results amount to substantial increases in consumption relative to the daily means; the amount spent on children's clothing and the number of children's clothing items purchased increased 91 percent and 129 percent, respectively, and the number of children's shoes purchased increased 130 percent. On STHs, there is also an increase in the likelihood of any purchase of children's apparel being made; on average, households are 63 percent and 125 percent more likely to purchase any children's clothing and any children's shoes, respectively, on dates that are STHs compared with dates that are not. Given these household responses, state tax holidays appear to support policymakers' stated objective of helping families with school-age children, often right before the academic year begins.

Heterogeneous Households

To justify the enactment of state tax holidays, policymakers focus their political rhetoric not only on the consumption needs of children, but also on the hardships of lower-income, working class households. While policymakers might want to target the tax relief of STHs to households of certain income levels, this has proven to be very difficult, if not impossible, given the current designs of STHs. Since retailers cannot charge different sales tax rates on the same items to households based on their income levels (or based on whether or not they have children), there is little policymakers can do to incentivize households of different backgrounds differently. Further, there are many reasons why lower-income households may be less likely to reap the benefits of STHs. In fact, households with more financial resources may be better able to take advantage of STHs. This would be consistent with the findings in Blattberg et al. (1978).

In that paper, the authors present a model on household buying behavior that identifies characteristics related to cost parameters as playing the most important roles in determining the consumption response to promotions for household items. Their empirical results indicate that variables reflecting household resources, such as homeownership and automobile ownership, are important predictors of households that are prone to take advantage of promotions. Given their results, we may expect lower-income households to be less likely to take advantages of STHs.

To see how the consumption response to STHs may differ among households with different familial and economic makeups, we segment our sample by household composition and income groups, and run model (1) separately for each household type. The eight different sample segments we investigate are households consisting of one parent with children; households consisting of a married couple with no children, with young children (any children under or equal to seventeen), and with old children (all children older than seventeen); households consisting of single adults; "other" households;[10] and households with annual incomes of under $30,000, between $30,000 and $70,000, and over $70,000.[11] When we run model (1) on segments defined by household's composition we include the income controls. When we define the segments by income, we include the family composition controls.

The results of the regressions are displayed in Table 5. Each entry in the table represents the result from a separate regression. We find a number of notable trends in the output. First, with the exception of an increase in the number of shoes purchased by single households, there is no discernable pattern concerning the change in spending among households without children or among single parent households. For these groups, some of the point estimates are negative,

[10] "Other" households are those most likely consisting of non-married partners.

[11] These dollar delineations were kept constant for every CEX survey between 1997 and 2008; for example, the group consisting of households earning below $30,000 includes both households earning below $30000 1997 dollars for the 1997 CEX and households earning below $30,000 2007 dollars for the 2008 CEX In other words, these are nominal rather than real break points..

some are positive and almost all of the effects are imprecisely estimated. Second, of all the different types of household compositions, the only ones that consistently increase their consumption on STHs consist of married couples with young children. STHs cause these households to increase the amount spent on the daily consumption of clothing by $6.12 and the number clothing and shoe items purchased by 0.277 and 0.057, respectively. These increases account for approximately a doubling of the dollars spent and number of items purchased. For married households with older children, the point estimates suggest an increase in clothing and school supply purchases, but these effects are imprecisely estimated.

When we break down households by income group, we find that there is that there is no statistically significant change in consumption for the lowest-income households. However, most of the point estimates are positive and large. For the middle income group, we observe significant increases in the number of clothes and school supplies purchased. Households earning between $30,000 and $70,000 increase the quantity of clothing purchased during STHs by 0.091, constituting a 54 percent increase relative to what these households spend on an average day. These households also increase their number of school supply items purchased by 0.135 units, a quantity over 160 percent larger than what they purchase on average. Similarly, households earning over $70,000 increase the number of clothing items purchased by 0.119 items, representing a 48 percent increase. The point estimates for the other categories of expenditure are also positive (with the exception of money spent on school supplies), but are imprecisely estimated.

We next breakdown spending on clothing and shoes based on the household member for whom the items were purchased. We only perform these breakdowns for the three main groups where we observed statistically significant increases in expenditure during STHs – married

couples with young children, families with income $30,000-$70,000, and families with income >$70,000. The results are displayed in Table 6, and we show that the largest and only statistically significant and positive increases in consumption are restricted to children's apparel.

Up to this point, our analysis has focused on the marginal effects of STHs on households' consumption behavior. We find large marginal effects for consumption of children's clothes and among higher income households and households consisting of married parents and young children. It should be noted, however, that sales tax holidays also subsidize the consumption of eligible items when households do not make any *additional* purchases as a result of the STH. Tabulating the composition of household types that purchase eligible items during STH periods is important in understanding who benefits from this tax subsidy. Table 7 presents the average August daily expenditures on clothing, shoes, and school supplies and the sum of these for nine population groups. We perform these tabulations for households in states without an STH and on non-STH days for households in states with an STH. We choose to look at August expenditure because it is the most popular month for STHs. We do not include STH dates to isolate average spending independent of the influence of a tax holiday. In the final column of the table, we calculate the average tax saving that would correspond to this expenditure had it been tax free.[12] The purpose of this table is to illustrate the amount of money different households would save during a STH in absence of any additional spending spurred by the STH. As the table shows, there exists a large amount of variation in economic activity by household composition.

Perhaps expectedly, the amount spent on STH eligible items increases monotonically in income, with the households earning under $30,000 spending on average $3.94 while households earning over $70,000 spend $12.0. If households were not to increase their spending in any way during a sales tax holidays, the wealthiest households would save over twice as much in sales

[12] This calculation is based on the tax rate of the state where the households live.

taxes as the poorest households. The other household type that spends the most on STH items in August are households with children; households with both young and old children spend almost the same amount on the tax-exempt items – a little over 12 dollars – although the former households spend more on apparel while the latter spend more on school supplies. Another interesting trend we observe is that while households that increase their spending on days with a STH also spend more on eligible items in general, the reverse is not true: high average spending does not necessarily translate into increased *additional* spending. For example, households consisting of one parent spend nearly as much on household apparel as households with married parents and young children ($8.83 versus $9.74), yet we do not observe them increasing consumption in response to STH.

Table 7 illustrates that even in the absence of any stimulative effect, sales tax holidays are only partially effective at helping subsidize policy makers the intended recipients. While households with children shop the most during the period when STHs occur, lower income households are among those that spend the least.

Consumption Shifting: Non-Exempt Items

In addition to seeing whether households respond to STHs by increasing consumption of items exempt from sales tax, we are also interested in seeing how STHs may affect households' other consumption decisions. Specifically, we hypothesize two distinct ways in which households may change their normal shopping behavior to take advantage of an STH. First, they may shift consumption away from items that are not exempt from sales tax. If households devote a set amount of time or money for consumption every day, then consumers that spend

more time or money purchasing items that are exempt from sales tax may subsequently have less time our money to purchasing items that are not. Alternatively, they may increase their consumption of other items because they are already out shopping. This is one of the justifications for the Illinois sales tax holiday—that the consumption of "other items pulled off shelves while Mom's in the store" will also increase. (Associated Press, 2010) To investigate, we run model (1) with two small changes. First, we replace our dependent variable to two different non-exempt items: food for home consumption and all other non-exempt items. Second, instead of running the regressions separately for the STHs that exempt different items from sales tax, we group all the STHs together, resulting in our treatment variable equal to 1 if any item is temporarily exempt from the sales tax in the state where the household lives. The results are shown in Table 8. On STHs, we do not find any statistically significant response to consumption of either food for home use or non-exempt items. Further analysis that disaggregates the non-exempt category into separate consumption categories does reveal some statistically significant decreases in consumption (for example, in purchases of home supplies, non-prescription drugs, and entertainment). This limited evidence supports the claims that STH are more likely to reduce rather than increase consumption of non-exempt items, although further analysis is needed to determine the magnitude of this effect.

Temporal Shifting of Consumption

Households may also adapt their consumption behavior to take into account an STH by reducing their consumption of items that are tax-exempt on STHs in the periods preceding or following an STH. Most STHs are annual events, and there are often many advertisements and

significant press coverage in the days and even weeks before an STH.[13] The ephemeral nature of STHs provides households with the incentive to defer the consumption of items that will be tax-exempt during an STH.

In the marketing literature, there exists a large body of work on households delaying consumption in advance of sales promotions that has similar application in the STH context. Given that the items that are tax-exempt are storable goods, consumers may also engage in stockpiling behavior that would depress consumption following an STH. Hendel and Nevo (2004) provide a literature survey on stockpiling behavior in response to promotions, and conclude that there exists evidence of such behavior. Further, Hendel and Nevo (2006) apply a model of consumer inventory holding to scanner and household-level data and find that when households make purchases during sales they are more likely to postpone their next purchase.

In order to test whether households reduce consumption in periods before and after the STH, we estimate the following model:

$$y_{jist} = \beta_0 + \sum_r \beta_r * STH\_Pre_{jist} + \beta_t * STH\_Day_{jist} + \sum_l \beta_l * STH\_Post_{jisl} + \boldsymbol{\gamma} * \boldsymbol{X_i} + \delta_s + \theta_t + \varepsilon_{ist} \quad (2)$$

Model (2) is nearly identical to model (1), but the model (2) includes indicator variables denoting time periods either preceding (STH_Pre) or following (STH_Post) an STH. These time periods consist of consecutive days. The identification strategy is same as that used in model (1); by still including the calendar date fixed effects, the variables STH_Pre and STH_Post examine the consumption patterns of households on the same calendar dates in states that have an STH with

[13] An exception to this was the first STH in Massachusetts, when the STH began two days after the state legislature passed the legislation.

those in states that do not—the only difference is that instead of focusing on STH dates, we now extend our analysis to other dates.

For our main specification, the time periods we analyze are the dates two weeks and three weeks before and after an STH.[14] We do not look at consumption in the period a week before and a week after the STH, dropping these observations for households in states with STHs because we are concerned about recall bias. If some households do shop on a STH but report their purchases as occurring on a non-STH, we may observe an increase in consumption in the days occurring around a STH, artificially *increasing* our estimates of household behavior before or after a STH. This week long recall window is based on the belief that while households may not remember the exact day of their purchases, they will remember the exact week. In addition, by dropping these dates, we drop all the observations for non-STH days from weekly Diaries that contain at least one day that occurs on a STH . Because we do not employ a difference-in-difference model, this non-overlap between the treatment period and non-treatment period does not affect our estimation strategy.[15]

Table 9 presents the coefficients for STH_Pre, STH_Post, and STH_Day. Each column of the Table represents the results from one regression. Similar to the other tables, the dependent variables are daily expenditure categories. Our results provide mixed and unconvincing evidence of shifting behavior. In the period three weeks before the sales tax holiday, we observe depressed consumption in clothing, shoes, and school supplies. Further, a number of the coefficients are statistically significant at the 10 percent and one percent level, specifically in the consumption of clothing and shoes. These amounts all tend to be smaller than the subsequent increases seen on STH. By contrast, we observe positive coefficients in the week both before

[14] Other period lengths yield similar results.
[15] Recall bias would bias our main results down because some purchasing that occurred during an STH would be reported as occurring outside of it.

and after the recall period surrounding a STH, although nearly all of these are statistically insignificant. It is challenging to develop a theory as to why consumption would fall three weeks before an STH, but increase two weeks before and after. This suggests that different data are probably needed to address whether an STH causes consumption shifting[16].

Robustness—Seasonal Demand Peaks

One concern with these results is that we may be finding effects of STHs on consumption because states time sales tax holidays to match state specific periods of increased seasonal demand. If this is the case, our regressions are merely capturing the effects of seasonal demand spikes and not the tax incentives of the STH. We attempt to address this issue by comparing consumption patterns across states (some with STHs and some without) on the same dates. However, if seasonal demand peaks are heterogeneous across states, we could accidentally engage in an apples-to-oranges comparison of households experiencing different levels of seasonal demand occurring on the same dates. If indeed the timing of seasonal demand differs by state and policymakers place STHs on dates with peak seasonal demand, our results may be biased upward.

To investigate what role state-specific seasonal demand may have in interfering with our results, we run the following experiment. Focusing on the years before the first STH in New York, we analyze how individuals in a state behave on days that would eventually have an STH in their state. This experiment is valid if we assume that timing of state-specific demand shocks

[16] For example, data with longer panel periods so that one may observe household consumption behavior that occurs before, during, and after a STH.

is invariant across time. If we observe households increasing consumption on days that in later years would have a sales tax holiday, our main findings may be biased.

The main challenge of our approach is determining exactly when to project the simulated STH. STHs are never the on the exact same date but rather vary slightly year to year. We simulate sales tax holidays in two manners. First, we create a modal sales tax holiday for each state based on the modal month, week of the month, and week day of the month for the sales tax holidays enacted since 1997. For instance, for West Virginia, we determine that the modal sales tax holiday begins on the first Friday in August. (In fact all West Virginia STHs have begun on this date) [17]. We also use the modal length of STH in determining the simulated duration (although there is almost no variation in the lengths of STHs across time within a state). We label these "modal" sales tax holidays. Our second approach is to use the STH dates over the period 2006–08 and project them backwards based on the month, day of week and week of month when they occurred[18]. We label these "recent" STHs. We test the effects of these simulated STHs for the period 1994–1996. We are restricted to these dates because state identifiers are first introduced in the public use CEX in1994.

Table 10 summarizes the results of running model (1) on the simulated STHs. Column 1 reproduces the results from Table 3, and columns 2 and 3 show the coefficients of *STH_Day* for the two different experiments: one using the modal STH dates and the other using the most recent STH dates. The findings of this experiment suggest that our main results are indeed driven by the temporary suspension of sales taxes during STHs and not by the heterogeneity of seasonal demand across different states. In every instance where the coefficient of *STH_Day*

[17] Using the modal month, week of the month, and weekday of the month matches the actual STH 77 percent of the time.

[18] For example, Connecticut's 2008 STH occurred on Sunday, August 17th. The third Sunday of August in 1994 occurred on August 21st.

shows a statistically significant increase in the consumption of clothing and shoes during an STH, the regressions using the simulated STHs show no corresponding positive response. For example, compared with an increase of 0.068 items of children's clothing and 0.010 items of children's shoes purchased on an STH, in the absence of the STH, the coefficient on *STH_Day* is–0.022 (with a standard error of 0.015) for children's clothing and 0.002 (with a standard error of 0.005) for children's shoes when using the most recent STH dates—both statistically indistinguishable from zero. This difference, as well as the fact that they hold regardless of using the modal STH dates or the most recent STH dates, supports the evidence that STHs lead to increased consumption of tax-exempt items.

V. Conclusion

Our analysis of household consumption patterns during STHs reveals that the policy leads to a sizeable increase in the purchasing of apparel (clothing and shoes) and school supply items; our baseline findings show that on days that have an STH, households increase the number of clothing and shoes purchased by over 40 percent relative to what they normally buy. STHs that exempt either apparel accessories or computers from sales taxes do not lead to an increase in the amount spent, the number of items purchased, or the probability of making a purchase. Because policymakers are unable to target STHs to benefit specific types of households, the policy creates the potential for households of different economic and familial makeups to respond idiosyncratically. Indeed, we find that our baseline results vary both within and across different types of households, categorized by income and/or household structure. Within households, an STH causes increases in the purchases of only children's apparel: spending on children's clothing increases 91 percent, and the number of children's clothing and shoes purchased increases around 130 percent. Across different households, we find those

households consisting of married couples with young children and earning over $30,000 per year are the only ones that statistically significantly increase consumption during STHs. An aspect of STHs that critics raise is that they may lead to consumers to engage in distortionary behavior. Specifically, consumers may either shift consumption away from non-exempt items on days with STH, or may suspend planned consumption to occur on days with a STH. We find some evidence that both may occur, although they are based on results with little statistical accuracy. We conclude that more research needs to be conducted to fully address these criticisms of the policy, but our initial investigation does not find large distorting behavior.

One criticism of our approach may be that since states intentionally place STH during periods of increased seasonal demand, our estimation strategy my fail to account for heterogeneity of demand cycles that vary by state. We address this concern by simulating when STH would occur in the years before states institute them, and seeing whether or not we still observe an increase in consumption. Using two specifications, we find no such increase on days that would later have a STH, supporting our findings that it is indeed the STH that cause consumers to increase consumption and not simply the varied timing of state back-to-school shopping seasons.

As a policy that aims to accomplish multiple goals for disparate parties, the STH falls short of satisfying all of the policymakers' stated intentions. STHs are designed to fulfill three main goals: to provide monetary relief to lower-income families with children; to increase sales for retailers; and to promote the consumption of specific goods that have some inherit social value. Our main findings show that STH do lead households to increase the consumption of children's apparel and school supplies. However, our subsequent analysis reveals that it is only the wealthiest households that statistically significantly take advantage of STHs. The major

theme our analysis reveals is that the STH is too blunt a policy tool for addressing the many problems it seeks to resolve. As a method for stimulating economic activity for a limited number of goods, the STH is shown to be quite effective. As tool for providing economic relief to certain households, STH has fared quite poorly. Policymakers should be aware that the STH is not a panacea—especially when weighing its effects against the foregone tax revenue.

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Table 1
Summary Statistics of Daily Expenditures (2008 Dollars)

Items	Category	Mean/Percent	Std. Dev.
Total	$ Spent	136.00	740.0
	# Purchased	6.67	10.70
	% Days	70.4 %	
STH Tax-Exempt			
Exempt Total	$ Spent	8.35	64.0
	# Purchased	0.32	1.18
	% Days	17.3 %	
Clothing	$ Spent	4.31	30.3
	# Purchased	0.17	0.84
	% Days	7.0 %	
Shoes	$ Spent	1.21	11.8
	# Purchased	0.03	0.21
	% Days	2.3 %	
Accessories	$ Spent	1.09	37.8
	# Purchased	0.03	0.22
	% Days	2.3 %	
Computers	$ Spent	0.72	29.4
	# Purchased	0.01	0.08
	% Days	0.5 %	
School Supplies	$ Spent	1.02	15.7
	# Purchased	0.09	0.46
	% Days	5.3 %	
STH Non-Exempt			
Food	$ Spent	11.80	31.4
	# Purchased	3.42	8.18
	% Days	33.9 %	
Other	$ Spent	115.00	729.0
	# Purchased	2.93	4.10
	% Days	65.6 %	

Table 2
Frequency of STH, Demographics

Frequency of STH	**Mean/Percent**
Any STH	0.37 %
Clothing	0.33 %
Shoes	0.27 %
Accessories	0.09 %
Computers	0.11 %
School Supplies	0.17 %
Demographics	
Age of Reference Person	48.3
	(17.1)
Reference Person is Male	51.3 %
Reference Person is White	82.8 %
Household Size	2.6
	(1.5)
Single Household	27.0 %
One Parent	6.0 %
Married – No Children	21.4 %
Married – Young Children	20.1 %
Married – Old Children	7.1 %
"Other" Household	18.3 %
Income: < 30,000	34.9 %
Income: 30,000-70,000	36.3 %
Income: > 70,000	28.8 %
Number of Observations	606,907
STH Observations	2,241

Table 3
The Effect of STH on the Amount Spent, Number of Items Purchased, and Percentage of Days Shopped

	Clothing			Shoes			Accessories		
	$ Spent	# Purchased	Days %	$ Spent	# Purchased	Days %	$ Spent	# Purchased	Days %
STH_Day	1.106*	0.083***	0.014**	0.281	0.013*	0.010**	0.039	-0.006	-0.004
	(0.655)	(0.029)	(0.007)	(0.317)	(0.007)	(0.005)	(0.539)	(0.008)	(0.006)
β/Mean	25.7 %	49.2 %	20.6 %	23.2 %	45.4 %	44.1 %	3.60 %	-20.7 %	-19.5 %

	Computers			School Supplies		
	$ Spent	# Purchased	Days %	$ Spent	# Purchased	Days %
STH_Day	-0.269	-0.003*	-0.003	0.328	0.055*	-0.000
	(0.305)	(0.002)	(0.002)	(0.304)	(0.032)	(0.007)
β/Mean	-37.5 %	-62.7 %	-62.0 %	32.0 %	63.5 %	-0.6 %

All regressions include controls for age, sex, and race of reference head, household composition and income controls, and state and calendar date fixed effects. Standard Errors clustered at the household level

Table 4
The Distribution of Intra-Household Consumption of Clothing and Shoes

	Clothing-Men			Clothing-Women			Clothing-Children		
	$ Spent	# Purchased	% Days	$ Spent	# Purchased	% Days	$ Spent	# Purchased	% Days
STH_Day	0.081	0.005	0.001	0.141	0.010	0.002	0.910**	0.068***	0.016***
	(0.270)	(0.008)	(0.003)	(0.342)	(0.012)	(0.005)	(0.394)	(0.020)	(0.005)
β/Mean	7.43 %	13.6 %	7.36 %	6.95 %	13.6 %	4.66 %	91.4 %	129 %	62.8 %

	Shoes-Men			Shoes-Women			Shoes-Children		
	$ Spent	# Purchased	% Days	$ Spent	# Purchased	% Days	$ Spent	# Purchased	% Days
STH_Day	-0.146	-0.001	-0.001	0.107	0.003	0.003	0.319	0.010**	0.008**
	(0.123)	(0.002)	(0.002)	(0.174)	(0.004)	(0.003)	(0.207)	(0.005)	(0.003)
β/Mean	-36.7 %	-8.03 %	-12.3 %	19.1 %	25.0 %	28.0 %	126 %	130 %	124.9 %

All regressions include controls for age, sex, and race of reference head, household composition and income controls, and state and calendar date fixed effects. Standard Errors clustered at the household level

Table 5
Heterogeneous Household's Consumption of Clothing and Shoes

STH_Day	Clothing		Shoes		School Supply	
Household Composition	$ Spent	# Purchased	$ Spent	# Purchased	$ Spent	# Purchased
One Parent	0.155	0.121	0.030	-0.013	-0.802	-0.060
	(2.932)	(0.119)	(1.512)	(0.023)	(1.086)	(0.082)
β/Mean	3.27 %	62.4 %	1.86 %	-33.8 %	-81.7 %	-80.4 %
Married-No Children	-1.558	-0.014	-0.303	-0.006	0.038	-0.047*
	(1.039)	(0.038)	(0.555)	(0.009)	(0.317)	(0.028)
β/Mean	-37.0 %	-10.3 %	-30.0 %	-28.0 %	4.19 %	-51.2 %
Married-Young Children	6.115**	0.277**	1.763	0.057*	0.503	0.202
	(2.770)	(0.121)	(1.253)	(0.032)	(0.956)	(0.131)
β/Mean	96.5 %	98.8 %	102.3 %	128.8 %	32.5 %	154.4 %
Married-Old Children	4.377	0.215	-0.324	-0.000	0.171	0.346
	(3.499)	(0.151)	(1.121)	(0.024)	(0.958)	(0.239)
β/Mean	69.3 %	95.2 %	-18.7 %	-0.42 %	8.26 %	293.4 %
Single Households	-0.086	0.016	0.290	0.013*	0.798	0.009
	(0.642)	(0.022)	(0.312)	(0.008)	(0.885)	(0.019)
β/Mean	-4.00 %	20.4 %	44.5 %	94.2 %	160 %	18.4 %
"Other" Households	-0.072	0.057	0.187	0.014	-0.050	0.045
	(1.711)	(0.056)	(0.675)	(0.016)	(0.303)	(0.083)
β/Mean	-1.60 %	31.4 %	13.7 %	44.4 %	-5.22 %	58.7 %
Income Groups						
Income < $30,000	0.445	0.058	0.608	0.015	0.714	-0.022
	(0.629)	(0.039)	(0.482)	(0.010)	(0.798)	(0.017)
β/Mean	19.0 %	56.5 %	77.6 %	74.1 %	145.2 %	-45.1 %
Income $30,000-$70,000	1.071	0.091*	-0.191	0.007	0.218	0.135**
	(0.924)	(0.047)	(0.397)	(0.009)	(0.289)	(0.067)
β/Mean	27.4 %	54.3 %	-16.0 %	25.5 %	24.4 %	160.7 %
Income > $70,000	2.789	0.119*	0.538	0.018	-0.007	0.015
	(1.846)	(0.066)	(0.787)	(0.018)	(0.476)	(0.052)
β/Mean	38.8 %	48.1 %	30.8 %	48.7 %	-0.38 %	11.0 %

Standard Errors clustered at the household level. Household composition regressions

Table 6
Heterogeneous Household's and the Distribution of Intra-Household Consumption of Clothing and Shoes

STH_Day	Clothing-Men		Clothing-Women		Clothing-Children	
	$ Spent	# Purchased	$ Spent	# Purchased	$ Spent	# Purchased
Married-Young Children	0.992	0.039	1.822	0.053	3.078*	0.174**
	(0.994)	(0.031)	(1.224)	(0.042)	(1.824)	(0.082)
β/Mean	77.8 %	85.1 %	87.1 %	64.2 %	116.7 %	123.2 %
Income $30,000-$70,000	0.244	0.008	0.614	0.029	0.288	0.049*
	(0.445)	(0.016)	(0.583)	(0.024)	(0.408)	(0.027)
β/Mean	24.1 %	22.0 %	33.6 %	40.7 %	32.1 %	95.3 %
Income > $70,000	0.341	0.009	0.288	-0.001	2.097*	0.109**
	(0.798)	(0.018)	(0.881)	(0.026)	(1.178)	(0.051)
β/Mean	18.2 %	16.6 %	8.70 %	-0.70 %	129.6 %	136.3 %

STH_Day	Shoes -Men		Shoes -Women		Shoes -Children	
	$ Spent	# Purchased	$ Spent	# Purchased	$ Spent	# Purchased
Married-Young Children	0.070	0.005	-0.237	0.003	1.931**	0.048*
	(0.491)	(0.008)	(0.393)	(0.012)	(0.965)	(0.026)
β/Mean	14.1 %	63.8 %	-41.4 %	22.5 %	294.7 %	234.9 %
Income $30,000-$70,000	-0.270	-0.001	-0.016	0.005	0.096	0.003
	(0.204)	(0.004)	(0.235)	(0.006)	(0.208)	(0.005)
β/Mean	-63.9 %	-9.73 %	-3.03 %	36.1 %	40.9 %	40.2 %
Income > $70,000	-0.508*	-0.006*	0.602	0.008	0.444	0.016
	(0.271)	(0.003)	(0.528)	(0.011)	(0.479)	(0.013)
β/Mean	-89.1 %	-68.3 %	73.9 %	43.7 %	122.3 %	156.3 %

Errors clustered at the household level. Household composition regressions include income group controls and vice-versa

Table 7
Average Daily Expenditures in August on Non-STH Days

Household Type	Clothing	Shoes	School Supply	Clothing + Shoes + School	
Household Composition	$ Spent	$ Spent	$ Spent	$ Spent	$ Sales Tax
One Parent	6.32	2.51	1.83	10.70	0.53
	(43.4)	(16.8)	(18.0)	(56.5)	(3.02)
Married-No Children	3.32	0.99	0.83	5.15	0.26
	(27.3)	(10.2)	(16.2)	(36.8)	(2.01)
Married-Young Children	7.60	2.14	2.50	12.20	0.62
	(46.9)	(17.0)	(24.5)	(66)	(3.50)
Married-Old Children	5.98	1.88	4.69	12.60	0.62
	(33.4)	(12.8)	(44.3)	(63.5)	(3.26)
Single Households	1.93	0.70	0.66	3.31	0.17
	(17.7)	(9.33)	(12.9)	(25.2)	(1.28)
"Other" Households	4.32	1.49	1.18	7.00	0.35
	(28.5)	(1.03)	(17.9)	(40.3)	(2.08)
Income Groups					
Income < $30,000	2.24	0.88	0.80	3.94	0.20
	(19.0)	(9.92)	(13.8)	(29.7)	(1.56)
Income $30,000-$70,000	4.21	1.41	1.35	6.97	0.36
	(27.4)	(12.5)	(20.3)	(40.6)	(2.13)
Income > $70,000	7.21	2.03	2.69	12.0	0.59
	(47.0)	(16.0)	(28.4)	(65.3)	(3.45)

Table 8
The Effect of STH on Non-Exempt Items

	Non-Exempt Items[1]			Food at Home		
	$ Spent	# Purchased	% Days	$ Spent	# Purchased	% Days
STH_Day	-3.302	-0.066	-0.016	-0.153	0.235	0.010
	(13.578)	(0.121)	(0.015)	(0.625)	(0.179)	(0.012)
β/Mean	-2.86 %	-2.25 %	-2.38 %	-1.29 %	6.86 %	3.00 %

All regressions include controls for age, sex, and race of reference head, household composition and income controls, and state and calendar date fixed effects. Standard Errors clustered at the household level
1. Excluding food purchased at home

Table 9
Does STH cause shifting of consumption? Days before and after STH

Time	Clothing			Shoes			School Supply		
Levels	$ Spent	# Purchased	% Days	$ Spent	# Purchased	% Days	$ Spent	# Purchased	% Days
15-21 Days Before	-0.161	-0.031*	-0.014***	-0.145	-0.008*	-0.008***	-0.081	-0.002	-0.001
	(0.785)	(0.018)	(0.005)	(0.368)	(0.005)	(0.003)	(0.111)	(0.006)	(0.004)
8-14 Days Before	0.306	0.002	0.005	0.211	0.006	0.004	0.170	0.003	0.004
	(0.824)	(0.019)	(0.006)	(0.284)	(0.005)	(0.004)	(0.276)	(0.008)	(0.004)
Sales Tax Holiday	1.150*	0.084***	0.015**	0.297	0.013*	0.011**	0.385	0.043*	0.005
	(0.662)	(0.029)	(0.007)	(0.322)	(0.007)	(0.005)	(0.300)	(0.023)	(0.006)
8-14 Days After	0.701	0.051**	0.007	0.262	0.008	0.006	0.325	0.015	0.005
	(0.610)	(0.025)	(0.006)	(0.242)	(0.006)	(0.004)	(0.631)	(0.016)	(0.005)
15-21 Days After	-0.563	-0.021	0.001	0.013	-0.005	-0.002	0.387	0.005	0.005
	(0.446)	(0.018)	(0.006)	(0.259)	(0.004)	(0.003)	(0.575)	(0.012)	(0.005)
Number of Observations	600,591	600,591	600,591	600,591	600,591	600,591	600,591	600,591	600,591

Standard Errors clustered at the household level.

Table 10 Simulated Sales Tax Holidays

STH_Day	Actual STH		Modal-STH		Recent-STH	
Total	$ Spent	# Purchased	$ Spent	# Purchased	$ Spent	# Purchased
Clothing	1.106*	0.083***	-0.170	-0.026	-0.194	-0.022
	(0.655)	(0.029)	(0.894)	(0.027)	(0.966)	(0.029)
Shoes	0.281	0.013*	0.767	0.005	0.281	0.003
	(0.317)	(0.007)	(0.605)	(0.008)	(0.397)	(0.008)
School Supplies	0.328	0.055*	0.259	0.005	0.383	0.017
	(0.304)	(0.032)	(0.530)	(0.021)	(0.480)	(0.024)
Men's						
Clothing	0.081	0.005	-0.447	-0.008	0.084	-0.003
	(0.270)	(0.008)	(0.350)	(0.009)	(0.415)	(0.008)
Shoes	-0.146	-0.001	0.062	0.001	-0.039	-0.000
	(0.123)	(0.002)	(0.203)	(0.003)	(0.172)	(0.002)
Women's						
Clothing	0.141	0.010	0.246	-0.000	0.164	0.002
	(0.342)	(0.012)	(0.633)	(0.015)	(0.818)	(0.019)
Shoes	0.107	0.003	0.235	-0.001	0.242	0.001
	(0.174)	(0.004)	(0.393)	(0.004)	(0.292)	(0.004)
Children						
Clothing	0.910**	0.068***	-0.053	-0.017	-0.510*	-0.022
	(0.394)	(0.020)	(0.475)	(0.015)	(0.304)	(0.015)
Shoes	0.319	0.010**	0.471	0.006	0.078	0.002
	(0.207)	(0.005)	(0.420)	(0.006)	(0.171)	(0.005)

All regressions include controls for age, sex, and race of reference head, household composition and income controls, and state and calendar date fixed effects. Standard Errors clustered at the household level

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