Sales Tax Holidays: Timing Behavior and Tax Incidence

by

Adam J. Cole

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Doctoral Committee:

Professor James R. Hines, Jr., Chair
Professor John Bound
Professor Brian A. Jacob
Professor Joel B. Slemrod

To my parents

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CHAPTER I

Introduction

A "sales tax holiday" is a period of time, usually lasting a few days, during which state sales tax and sometimes local sales taxes are not levied on a set of goods, typically clothing, footwear, and school supplies. This policy originated in 1997 as a way to keep New Yorkers from traveling to New Jersey to buy clothing that was tax-free year-round in the Garden State. Since then, the policy has evolved to include a larger set of goods. From 1997 through 2007, 20 states and the District of Columbia held 118 different tax holidays. In each year from 2004 through 2007, at least 100 million people lived in a state that had a sales tax holiday. This accounts for roughly one-third of the US population and at least 35 percent of the US population living in a state with a sales tax.

Sales tax holidays merit rigorous examination. Because goods are taxed at different rates on consecutive days, consumers have an incentive to time their purchases to coincide with the lower tax rate during the holiday. Sales tax holidays therefore can be used to learn about how taxes affect when consumers purchase certain goods. Further, because this policy is known in advance, we can learn how prices consumers pay and retailers receive change as tax rates change over a short period of time.

In this dissertation, I utilize this transitory reduction in the sales tax base to estimate the incidence of the sales tax and the timing behavior of consumer purchases. To address those topics appropriately, one first needs to have a firm background in the history and institutional detail of sales tax holidays. In chapter II, I provide a comprehensive history of the sales tax holidays occurring from 1997 through 2007 and a discussion of the major policy issues surrounding them.

In chapter III, I estimate the incidence of state sales taxes on computers by exploiting exogenous changes in tax rates due to sales tax holidays. Using scanner data that span nine tax holidays in 2007, I find that the sales tax is fully or slightly over-shifted to consumers. Demand is extremely responsive to small price changes during tax holidays. The quantity responses range from 5.76 to 16.53 more computers purchased per 10,000 people than would be predicted in the absence of the

holidays. The timing response accounts for between 37 and 90 percent of the increase in purchases in the tax holiday states over the 30-week horizon.

In chapter IV, I investigate the effects of having sales tax holidays on state sales tax collections. Estimates indicate that tax collections decrease 0.52 percent to 7.83 percent during tax holiday months. Up to half of the revenue reduction is due to consumers' timing purchases within the month to exploit the tax holiday. Extending a tax holiday by one day does not impact tax collections. Instead, the existence of the holiday appears to matter more than its duration, which again points to the importance of the timing response of consumer purchases to this policy. There is no evidence of large substitutions of purchases across months.

CHAPTER II

Sales Tax Holidays, 1997-2007: A History

2.1 Introduction

The "sales tax holiday" is a recent phenomenon in state-level tax policy. It is a period of time, usually lasting a few days, during which state sales tax and sometimes local option sales taxes are not levied on a set of goods, typically clothing, footwear, and school supplies. Some states exempt computers and computer peripherals, while others exempt energy-efficient items and weatherization products. Florida has even implemented tax holidays exempting hurricane preparedness items.

From 1997 through 2007, 20 states and the District of Columbia held 118 different tax holidays. In each year from 2004 through 2007, at least 100 million people lived in a state that had a sales tax holiday. This accounts for roughly one-third of the US population and at least 35 percent of the US population living in a state with a sales tax.

Given the policy's popularity, obvious questions arise. What was the genesis of this policy? How did it spread? Why did some states adopt this policy? Can the policy be justified from an optimal taxation perspective? Going forward, if a state is considering enacting or eliminating a sales tax holiday, or altering one currently in its statutes, what issues should policy-makers take into account before making such decisions?

This policy originated in 1997 as a way to keep New Yorkers from traveling to New Jersey to buy clothing that was tax-free year-round in the Garden State. Since then, the policy has evolved to include a larger set of goods. As this occurred, political justifications changed to focus more on normative issues, particularly to helping parents purchase clothes and supplies for the beginning of the school year.

Tax holidays can be justified from an optimal commodity taxation perspective. They can be used to increase sales during periods of low seasonal demand, when consumers are more responsive

to price changes. However, following this logic, the sales tax rate should increase during periods of high seasonal demand, say, between Thanksgiving and Christmas, when consumers are less responsive to price changes.

Sales tax holidays affect consumer behavior in three important ways. Because goods are taxed at different rates on consecutive days, consumers have an incentive to time their purchases to coincide with the lower tax rate during the holiday. Since goods of the same type are taxed at different rates during the tax holiday depending on their pre-tax prices, consumers have an incentive to purchase the good that is tax-exempt, even though the pre-tax prices of two otherwise identical goods may differ by only \$0.01. Third, sales tax holidays affect the difference in tax rates between adjacent jurisdictions, providing consumers with an incentive to travel to the jurisdiction with the lower tax rate to make their purchases.

Tax holidays impose compliance costs on retailers and arguably increase the ability of retailers to evade their sales tax obligations. They have not been designed to be revenue-neutral and thus raise the question of the policy's impact on tax revenue. The matter is further complicated when local governments have the choice to participate in the holiday, especially if the state reimburses local governments for revenues lost as a consequence of the tax holiday.

If policy-makers determine the aims of tax holidays are good ones, they need to consider whether there are more efficient ways to achieve the same objectives. One possibility is to have a year-round exemption on the items that are exempted during the sales tax holiday. Another is not to alter the tax base but to reduce the tax rate.

Sales tax holidays merit rigorous examination. They offer us an opportunity to learn how consumers alter their purchases from one day to the next in the face of different tax rates on different days and how differences in tax rates across jurisdictions affect where they shop. We can learn how prices consumers pay and retailers receive change as tax rates change over a short period of time. To address those topics appropriately, one first needs to have a firm background in the history and institutional detail of sales tax holidays. This paper provides a comprehensive history of the sales tax holidays occurring from 1997 through 2007 and a discussion of the major policy issues surrounding them. It can be used as a launching pad for future research, analysis, and debate.

The remainder of the paper is structured as follows. I present a historical narrative of the development and diffusion of the sales tax holiday across the states in section 2.2. To fix ideas, I examine tax holidays that (1) last strictly less than one month, (2) are state-level policies, i.e., state sales tax is not levied on certain products in the entire state, and (3) do not include gasoline or other

petroleum products as tax-exempt. I catalogue all 118 sales tax holidays that occurred from 1997 through 2007 and describe in detail the characteristics of the sales tax holidays in 2007 in section 2.3. In section 2.4, I discuss the main issues relevant to tax holidays with which policy-makers should concern themselves. Section 2.5 concludes.

2.2 A Narrative History of the Sales Tax Holiday, 1997-2007

New York was the first state to enact a sales tax holiday. During the mid-1990s, politicians, particularly then-New York City Mayor Rudolph W. Giuliani, noted that New Jersey and other states bordering New York do not tax clothing purchases.[1, 2] For example,

> Newport Center, which is just opposite a PATH train stop [in Jersey City, New Jersey, across the Hudson River from lower Manhattan], draws 25 percent of its customers from New York City... [Consequently, New York] retailers have complained for years that they were losing business to New Jersey and surrounding states, where clothing is not taxed.[3]

Giuliani proposed in 1995 to have clothing items priced below $500 to be exempt year-round from the city's sales tax, but this measure did not pass in the state legislature, even after it was scaled back to cover clothing items priced below $100 only.[4] As a compromise, the state legislature agreed to a one-week sales tax holiday to be held in January 1997.

For the inaugural holiday, most clothing and footwear priced $500 or less per item were exempt from the state's 4 percent sales tax. In addition, counties and localities could repeal their local option sales taxes during the state sales tax holiday. Fifty-four of the state's 62 counties suspended their sales tax; New York City suspended its 4 percent sales tax; and the Metropolitan Transit Authority suspended its 0.25 percent levy.[5] The state's expected fiscal loss from the inaugural

[1] Clothing (including sewing materials, e.g., fabric, thread, yarn, buttons, and zippers, purchased by noncommercial purchasers) and footwear are exempt from tax, but, as of July 2, 2005, "clothing accessories or equipment, sport or recreational equipment, or protective equipment [except equipment necessary for daily work]" are taxable. See title 54, section 32B-8.4 of the New Jersey Permanent Statutes. See also New Jersey Sales Tax Guide <http://www.state.nj.us/treasury/taxation/pdf/pubs/sales/su4.pdf> (visited Sept. 4, 2007).

[2] Since November 1980, Pennsylvania has not taxed most clothing or footwear (61 Pa. Code §53.1-2 (2007)). Massachusetts does not tax most clothing or footwear priced $175 or less per article (Mass. Gen. Laws ch. 64H, §6(k) (2007)). Connecticut has a similar provision with a price cap, as of 2003, of $50 per article (Conn. Gen. Stat. vol. 4, tit. 12, ch. 219, §12-412(47) (2006)). Since December 1, 1999, Vermont has not taxed most clothing articles-footwear is taxed-priced $110 or less per article (Equal Education Opportunity Omnibus Act (Act 49), §34 (1999)); it exempted footwear priced $110 or less from tax beginning July 1, 2001 (An Act Relating to Education Funding (Act 68), §67 (2003)) and then abolished the price caps on clothing and footwear in 2005 (Vt. Stat., tit. 32, Ch. 233, Subch. 2, §9741(45) (2007)). Minnesota is the only other state that exempts clothing purchases from sales tax (Minn. Stat. ch. 297A, §67(8) (2006)).

[3] Lisa W. Foderaro, "Stores gear up for week of tax relief," *The New York Times* (New York, NY), Jan. 18, 1997, Late Edition - Final, Section 1, p. 27.

[4] "Small business report; government watch; retailers look to merchandise January's clothing tax holiday: test may lead to a permanent cut," *Crain's New York Business* (New York, NY), Dec. 9, 1996, News, p. 28.

[5] Foderaro, *supra* note 3, at 27.

holiday was forecast to be $20 million in sales tax remittances.[6]

The tax holiday would affect New Yorkers in at least two important ways if the prices consumers pay in New York decrease during the holiday. First, New Yorkers who purchase clothes in New York should increase their purchases during the holiday. Second, because the tax rate on items of clothing and footwear priced $500 or less is reduced to zero and thus equals New Jersey's rate, the holiday should induce New Yorkers who would normally travel to New Jersey to purchase clothes to stay in New York instead. Concerns of consumers' crossing borders to shop are a recurring theme in press accounts when other states weighed bills that would establish sales tax holidays, particularly when those states border a state with a sales tax holiday and the state without a sales tax holiday has a substantial population living near the border. For example, prior to Oklahoma's inaugural holiday in 2007, Oklahoma Governor Charles B. "Brad" Henry said, "In past years, Oklahomans have taken their money to Texas to take advantage of that state's sales tax holiday. There's no reason to keep exporting Oklahoma retail dollars south of the Red River."[7]

The policy spread from New York to Florida in 1998 and then to Texas in 1999. It appears the cross-border shopping concerns outlined above were not the driving force behind the decisions to have sales tax holidays in those states. Rather, with the economy reaching the peak of its business cycle in the late 1990s, the states' budgets were in surplus, and this policy was one way to offer tax relief to the states' residents. Thereafter, and coincident with the down-turn in the economy, the justifications politicians gave for tax holidays shifted markedly to normative ones, particularly once South Carolina exempted school supplies in its inaugural holiday in 2000. In his proposal for a tax holiday in 1999, Governor James H. Hodges said, "Parents who provide for their child's education shouldn't have to face the additional burden of heavy sales taxes."[8] This rhetoric even made its way into a bill before the General Assembly of Arkansas in 2005:

> It is found and determined by the General Assembly of the State of Arkansas that clothing school children is very costly; that the cost of clothing school children is always increasing; that to help defray the cost a sales tax holiday on the sale of clothing and footwear is necessary...[9]

As tax holidays propagated across the country, the set of goods included as tax-exempt expanded to include computers, energy-efficient items, and hurricane preparedness items. The tax holidays were then used as instruments for other policies. The goal of Pennsylvania's tax holiday on comput-

[6] Sharon Linstedt, "Get set for state's sales-tax holiday; taxes to be cut on most apparel week of Jan. 18," *Buffalo News* (Buffalo, NY), Jan. 5, 1997, Final Edition, Business, p. 1B.

[7] "Governor signs rules for tax cut," The Associated Press State & Local Wire, July 25, 2007, available in Lexis-Nexis.

[8] "Hodges seeks 'tax holiday' for the state," *The Post and Courier* (Charleston, SC), Oct. 21, 1999, p. 1.

[9] S. 9, 85th Gen. Assembly, Reg. Sess. (Ark. 2005). The bill did not pass.

ers, for example, was "to boost Pennsylvania's lagging computer ownership rate. A survey [in 2000] found the state ranked 36th among the 50 states in personal computer ownership, according to the Washington-based National Telecommunications and Information Administration."[10] Vermont's tax holiday on computers was intended to encourage families and students to purchase computers. Vermont Governor James H. Douglas said,

> 'Personal computers help us embrace technological advances that make it possible for Vermonters to operate in a diverse, high-wage economy, even while working from the most remote corners of our state[.]'[11]

Georgia's inaugural tax holiday on energy-efficient items came in October 2005 in the wake of the run-up in energy prices after Hurricane Katrina and was used to promote energy conservation.

> 'We want people to go [buy] appliances, light bulbs and things like that that will help to conserve energy overall,' [Georgia State Senator Mitchell W.] Seabaugh said. 'How successful [this sales tax holiday is] will be somewhat of a determining factor in how far we expand it for other types of energy conservation.'[12]

Florida's busy hurricane season in 2004, when the state was affected by Tropical Storm Bonnie and Hurricanes Charley, Frances, Ivan, and Jeanne, appears to be the cause of Florida's tax holiday on hurricane preparedness items.[13] During the signing of the tax holiday bill, Florida Governor John E. "Jeb" Bush said, "Being prepared for hurricane season can protect property and save lives...I hope this tax benefit will encourage Floridians to ready themselves, their families, homes and businesses for the 2005 hurricane season."[14]

2.3 Characteristics of Sales Tax Holidays

By 2007, 20 states and the District of Columbia held a total of 118 sales tax holidays. This accounts for nearly half of the 45 states and the District of Columbia that levy some form of sales tax.[15] The policy was concentrated largely in states east of the Mississippi River. The only states west of the Mississippi River that had a tax holiday during the period are Iowa, Louisiana, Missouri,

[10] Rebecca Sinderbrand, "Retailers hope tax break leads to big sales," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 1, 2001, available in LexisNexis.

[11] "State lifts sales tax on computers for three days," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 4, 2003, available in LexisNexis.

[12] Nancy Badertscher, "A brake on energy is a brief sales tax break," *The Atlanta Journal-Constitution* (Atlanta, GA), Oct. 1, 2005, Home Edition, News, p. 1A.

[13] Charley, Frances, and Jeanne caused $28 billion in damages. Ivan, which came ashore in Alabama, caused $13 billion in damages. See National Climatic Data Center, U.S. Department of Commerce <http://www.ncdc.noaa.gov/oa/climate/research/2004/hurricanes04.html> (visited Feb. 5, 2008).

[14] Linda Kleindienst, "Florida gov. Jeb Bush creates sales-tax holiday for buying emergency equipment," *South Florida Sun-Sentinel* (Fort Lauderdale, FL), May 24, 2005.

[15] Alaska, Delaware, Montana, New Hampshire, and Oregon do not levy a sales tax.

New Mexico, Oklahoma, and Texas. At the close of 2007, 12 states and the District of Columbia had 15 holidays that are codified as annual events in their statutes.[16]

Table 2.1 shows the diffusion of this policy across the states throughout the period. Since 1998, two or more states had a sales tax holiday in a given year, and in 2006 and 2007, 15 states and the District of Columbia held at least one sales tax holiday. In each year from 2004 through 2007, at least 100 million people lived in a state that had a sales tax holiday. Starting in 1999, this policy affected more than 20 percent of the US population living in a state with a sales tax. This proportion has been at least 35 percent since 2004 and peaked at 44 percent in 2006.

Though the policy has spread across the states, there has been variation in the set of goods exempted from the sales tax and in the length and timing of the holidays. Table 2.2 details, by state and year, each of the 118 sales tax holidays that occurred from 1997 through 2007. For each tax holiday, the following are listed: the calendar dates of the holiday, including days of the week; the items exempt from the sales tax, including the prices per item below which goods must fall in order to be tax-exempt-subsequently referred to as "price caps;" the forecasted or estimated fiscal impact of the holiday, where available;[17] whether the holiday is codified as an annual event in the state's statutes; and additional relevant notes.

From 1997 through 1999, clothing and footwear were the only items exempted from sales tax during the holidays in New York, Florida, and Texas. While clothing and footwear continued to be the mainstays of sales tax holidays throughout the period, there have been some additions to the set of exempted goods. In 2000, South Carolina exempted-in addition to clothing and footwear-school supplies, computers, printers, printer supplies, computer software, and bedroom and bathroom items, while Pennsylvania exempted only computers and related hardware and software. In 2002, in their inaugural holidays, Georgia exempted children's books; North Carolina exempted educational software and sports and recreation equipment; and West Virginia exempted educational software.

Massachusetts for one day in 2004 suspended sales tax from *all* non-business, retail sales of tangible personal property (with the exception of motor vehicles, boats, meals, telecommunications services, gas, steam, and electricity). In 2005, Florida held a holiday at the beginning of the Atlantic hurricane season that exempted hurricane preparedness items. Georgia's holiday in 2005 exempted

[16]These states are Alabama, Connecticut, Iowa, Louisiana, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. The District of Columbia and Virginia have two annual sales tax holidays each. Virginia's Energy Star sales tax holiday is annual through 2011.

[17]Most of these numbers are reported in newspaper articles, which are cited for the zealous reader. They often come from sentences such as, "Consumers are expected to save/saved $\$x$ million in state taxes and $\$y$ million in local option taxes." The articles do not always give a citation for these numbers. If a citation is given, it is often to "state officials." Further, the methodologies used to construct the forecasts or the ex post estimates are not clear from any of the articles. To say the least, this is less than satisfying.

energy-efficient products—appliances, light bulbs, and programmable thermostats—bearing the US Environmental Protection Agency and the US Department of Energy's "Energy Star" label.

Even within the types of goods exempted from sales tax during the tax holidays, not every good is actually exempted from sales tax. Nearly uniformly—with the exception of South Carolina—goods must fall below a certain price per item (a "price cap") in order to be exempt from sales tax. For states that have annual holidays codified in their statutes, none indexes the price caps to a measure of inflation or economic growth.

To describe the price caps and a few other issues in more detail, I will focus on the 20 holidays in 2007. For the discussion of price caps, I set aside Massachusetts' holiday, which exempted almost all tangible personal property priced at $2,500 or less per item, and Louisiana's holiday, which exempted the *first* $2,500 per item of nearly all tangible personal property purchases.

There were 15 holidays in 2007 that exempted clothing and footwear from sales tax. Fourteen of these holidays had price caps, ranging from $50 per item (Florida) to $300 per item (Connecticut). The modal cap (12 holidays) was $100 per item.

In 2007, ten states and the District of Columbia held holidays exempting school supplies. Price caps ran from $10 per item (Florida) to $100 per item (District of Columbia, North Carolina, and Tennessee). New Mexico's cap was $15 per item for most supplies; two states (Georgia and Virginia) had caps of $20 per item; and two states (Alabama and Missouri) had caps of $50 per item. Alabama, Florida, and Georgia, exempted books priced no more than $30, $50, and $20 each respectively.

Seven states held holidays exempting purchases of computers in 2007. Price caps varied from $750 per single purchase (Alabama) to $3,500 per item (Missouri and North Carolina). New Mexico's cap was $1,000 per item, while Georgia and Tennessee had caps of $1,500 per single purchase in the case of the former and $1,500 per item in the case of the latter. Similarly, among the holidays exempting computer purchases, all but Tennessee's exempted computer peripherals. Price caps ran from $350 per item for software purchases in Missouri to $3,500 per item for computer peripherals purchases in Missouri.

Georgia and Virginia each had holidays exempting energy-efficient items certified by the Energy Star program in 2007. Georgia exempted air conditioners, ceiling fans, fluorescent light bulbs, clothes washers, dehumidifiers, dish washers, doors, programmable thermostats, refrigerators, and windows priced $1,500 or less per item. Virginia's holiday was nearly identical in the set of exempted items, but its price cap was $2,500 per item.

Florida's hurricane preparedness holiday exempted an array of goods, including flashlights, batteries, radios, and portable generators. There were 9 separate per-item price caps, ranging from $10 for artificial ice, $20 for flashlights and lanterns, $200 for storm shutter devices, to $1,000 for portable generators.

In addition to variation in the goods exempted from tax, there is variation in how long the holidays lasted and when during the year those holidays occurred. Florida's hurricane preparedness holiday in 2007 ran for 12 days (June 1-12), making it the longest tax holiday that year. The median and modal holiday (nine different states) lasted three days. Three holidays lasted two days (Iowa, Louisiana, and Massachusetts), three lasted four days (Georgia's two holidays and Virginia's); Connecticut's lasted one week; the District of Columbia's August holiday lasted nine days; and two holidays lasted ten days (the District of Columbia's post-Thanksgiving holiday and Florida's August holiday).

Turning briefly to the intersection of the per-item price caps and holiday length, there appears to be a weak, negative association between holiday length and the restrictiveness of the price caps. When the holiday is short, the price caps tend to be relatively large. South Carolina's two-day holiday has no price caps, and Louisiana and Massachusetts' two-day holidays in 2007 had $2,500 caps. Florida's 10-day, August holiday had a $10 cap on school supplies and a $50 cap on clothes and footwear; both caps were the most restrictive in their respective categories among the "back-to-school" holidays in 2007. The state's 12-day, hurricane preparedness holiday had a myriad of caps, most of which were less than $100.

Thirteen of the annual holidays take place in August, and eight of these take place on the first Friday through the first Sunday in August.[18] Iowa and Louisiana's permanent holidays span the first Friday and Saturday of August. Georgia's "back-to-school" holiday lasted the first Thursday through Sunday of August in 2007. The annual holiday in Texas moved from the first to the third Friday through Sunday in August in 2007. Connecticut's annual holiday runs from the third Sunday in August through the fourth Saturday in August, while the District of Columbia's annual holidays run from the first Saturday in August through the second Sunday in August and from the fourth Friday in November (the day after Thanksgiving) through the first Sunday in December. Holidays for energy-efficient items in Georgia and Virginia were in early October in 2007; Georgia's holiday is not annual, whereas Virginia's is annual through 2011.

[18]The holidays are in Alabama, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, and Virginia.

2.4 Policy Issues

Tax holidays alter consumers' incentives regarding which goods to purchase and when and where to make their purchases. Further, based on the types of goods exempted, tax holidays have been used as mechanisms to achieve other policy objectives. As with every tax policy, normative issues, compliance issues, and issues of revenue impact also surface. Policy-makers should think carefully about all of these issues before enacting, eliminating, or altering a sales tax holiday. I discuss these in turn below.

A tax holiday affects consumers' incentives to purchase particular types of goods. Throughout the year, the tax code gives consumers the incentive to purchase goods that are never taxed compared to goods that are taxed, e.g., services and, in some states, groceries versus most tangible personal property. Introducing a tax holiday on certain goods, such as clothing, eliminates the incentive created by the tax law for consumers to purchase services or groceries compared to clothing. Throughout the year, there is no incentive in the tax code for consumers to purchase clothing versus other tangible personal property. However, a tax holiday, at least for a few days, introduces such an incentive. All sales tax holidays exhibit these characteristics, but one could argue that the holidays in Louisiana and Massachusetts come closest to eliminating them since nearly all tangible personal property becomes exempt during their sales tax holidays.

Further, as outlined in Table 2, not all clothing becomes tax-exempt during a tax holiday. In most cases, only clothing items priced below a certain level—the "price cap"—qualifies for the exemption. If, for example, only clothing priced at or below $100 per item is tax-exempt during the holiday, the tax code creates an incentive for consumers to purchase clothing priced below $100 since the tax treatment of an article priced at $100 is different than an article-one that may even be otherwise identical-that is priced at $100.01. All sales tax holidays exhibit this characteristic except for South Carolina's, which has no price caps.

A tax holiday provides consumers an incentive to time their purchases to coincide with the reduced tax rate. For example, suppose a tax holiday is held on Friday, Saturday, and Sunday, and suppose the sales tax rate is five percent outside of the holiday. If a consumer purchases a pair of $100 shoes on Thursday night or the following Monday, he pays $105, but if he purchases them during the tax holiday, he would pay only $100.[19] By their very nature, *all* tax holidays exhibit this characteristic.

The importance of this aspect of the policy stems from four facts. First, sales tax holidays are

[19]This crucially assumes retailers do not charge different prices before, during, and after the holiday.

generally advertised to the public through media reports and signage in stores well in advance of the holiday. Second, the items exempted are largely durable goods, and some are substantial purchases (computers), for which comparison shopping is prudent. Third, the duration of the holidays is short. If the holidays lasted for a month, several months, or a year, the rate at which consumers shift their purchases from one day to the next would be less relevant. Fourth, many of the holidays are annual events. All of these give consumers incentives to consider their anticipated purchases and concentrate them during the sales tax holiday, which is something they would not have done absent the holiday.

A tax holiday also affects consumers' decisions about where to shop. Consider two adjacent jurisdictions, and, for simplicity, assume there are no costs associated with traveling from one jurisdiction to the other. Further, suppose one jurisdiction has no sales tax while the other has one. The tax codes create an incentive for consumers to travel to the no-tax jurisdiction to purchase goods. In the presence of a sales tax holiday, though, this incentive is eliminated.[20] However, if the jurisdictions have positive but unequal tax rates, say one jurisdiction's rate is four percent and the other's rate is six percent, introducing a tax holiday *increases* the incentive to purchase goods in the lower-tax jurisdiction.

In addition to the positive implications of how tax holidays affect consumer behavior described above, there are several normative issues to consider. Part of any tax reduction is to encourage new purchases of that good, and part is to reward those who already are going to purchase the good. As shown above, tax holidays have been used to increase the proportion of households with computers; to create a more technologically-savvy workforce; to reduce any existing price premia on energy-efficient items to induce their consumption as a part of larger pollution, climate change, and energy policies; to help families purchase clothes and supplies for children returning to school in the fall; and to reduce (potentially) the humanitarian, recovery, and cleanup costs of a hurricane borne by the state of Florida.[21]

After going through these policy issues, several questions linger. First, can a sales tax holiday be justified from an optimal taxation perspective? A basic rule of commodity taxation is that goods for which purchases are not very responsive to price changes should be taxed at a relatively high rate compared to goods for which purchases are very responsive to price changes. This raises the needed amount of revenue with the fewest changes in consumer behavior due to the tax code and

[20] In this simple framework, the equilibrium is such that the after-tax prices are equal in both jurisdictions.

[21] Some derided the hurricane preparedness holiday as "The Home Depot Relief Act." See Tom Zucco, "Tax break on storm items starts today," *St. Petersburg Times* [St. Petersburg, FL] June 1, 2007, South Pinellas Edition, Business, p. 1D.

is a rationale behind "sin taxes," such as those on cigarettes.

The same rule can be used to address demand for a good at different points of the year. When seasonal demand is high for certain goods, e.g., flowers and chocolate before Valentine's Day, pumpkins before Halloween, or most goods after Thanksgiving and before Christmas, consumers are less responsive to price changes. Applying the above rule, it would be optimal to tax those goods at higher rates during those times of the year and at lower rates the rest of the year. From this perspective, sales tax holidays can be justified for periods of low seasonal demand. Importantly, though, the same logic would imply *raising* tax rates during parts of the year with high seasonal demand, i.e., having sales tax anti-holidays. It should be noted that the timing of tax holidays appears to be the opposite of what this rule would suggest.[22]

If this is a road down which policy-makers do not want to travel, there are still other questions that need to be considered. Concentrating first on the sales tax holidays for energy-efficient items, if this is a policy aimed at promoting reductions in energy use, why are business purchases of these items not exempted from tax? As a more general proposition not focused solely on the holidays for energy-efficient items, if the goal is to encourage the purchase of certain products, why suspend the sales tax on these goods for only a few days? If policy makers are concerned about parents' being able to clothe their children, why not have a year-round exemption, à la an exemption on groceries? To the extent the sales tax is a regressive tax, a sales tax holiday reduces this regressivity, at least for a few days. However, the question should be asked: Are there more efficient ways to reduce the regressivity of the sales tax, perhaps by maintaining the same broad base but reducing the rate a small amount?

In addition to the positive and normative economic issues that this policy raises, policy-makers should consider the compliance costs associated with sales tax holidays. Prior to the holiday, retailers must determine which of their goods qualify for the tax exemption during the holiday. To combat the confusion this may generate, for the inaugural holiday in New York,

> [t]he New York State Department of Taxation and Finance held seminars all week with local Chambers of Commerce and distributed an encyclopedic list of the tax-free categories. Among the finer distinctions: nylons, chef uniforms, ski masks and clerical vestments are tax exempt, but riding boots, bobby pins and watch bands are not.[23]

Retailers with multiple locations also must determine which county and local options sales taxes are repealed during the holiday. It could be argued that retailers with a large number of locations

[22] Normative considerations create a tension with this rule. For example, the rule would say groceries should be taxed at a high rate, but, allowing for normative considerations, it could be argued that groceries should be taxed at a low rate.

[23] Foderaro, *supra* note 3, at 27.

throughout a state will incur disproportionately more compliance costs if counties and localities have the choice of suspending their local sales taxes. Prior to Florida's inaugural holiday, retailers were scurrying to train their staff on the idiosyncrasies of the holiday and to reprogram their registers.

> 'To have 4,000 sales associates who know how to apply this is a challenge,' said Conrad Szymanski, president of Beall's Department Stores... 'It's going to be an extreme challenge for us to implement it,' Szymanski said. 'For one week you cannot reprogram 2,000 different point-of-sale registers, only to have to reprogram them a week later.'[24]

This suggests the costs of training staff, reprogramming registers before and after the holiday, and making appropriate adjustments to accounting systems is non-trivial, particularly for something that lasts only a few days.

After determining which products are exempt and which local taxes have been suspended, retailers then need to communicate this to their customers, who may not necessarily comprehend the finer distinctions of the exemptions.

> Szymanski said he wanted to simply give customers a break on all the merchandise and have the company eat the taxes on non-exempt items. 'We thought it would be worth it to us to incur the money for a week to make things more simple for our customers,' he said. But the state said no. 'The law does not allow that,' said Bebe Blount, director of legislative and Cabinet services for the state Revenue Department.[25]

Unlike those for Florida, the promulgated rules for Virginia's sales tax holiday law *did* allow retailers to "absorb" taxes from consumers during the holiday.[26,27] From a consumer's perspective, this means all goods in the store are "tax-free." For example, "Wal-Mart store officials announced this week that they will absorb the tax on all computers and computer accessories during the three-day holiday."[28] New Mexico took a different approach from other states on this front by allowing retailer participation to be *voluntary*. If a retailer participates, it does not remit taxes on exempted items sold during the sales tax holiday, but if a retailer does *not* participate, it must remit taxes on goods as it otherwise is obligated to do.

This speaks to the tax evasion possibilities associated with this policy. Having a broad-based sales tax reduces the opportunities for tax evasion. Once certain types of goods and, within those types, goods under a price cap, become exempt, the possibility increases. This is amplified when retailers are confused over which items qualify for the tax exemption. Further, when retailers

[24]Peter Wallsten, "Sales tax holiday shaping up as big headache," *St. Petersburg Times* (St. Petersburg, FL), June 27, 1998, South Pinellas Edition, National, p. 1A.

[25]Wallsten, *supra* note 24, at 1A.

[26]Sara Perkins, "Navigating the tax holiday maze," *The Virginian-Pilot* (Norfolk, VA), Aug. 2, 2006, The Virginian-Pilot Edition, Front, p. A1.

[27]Tax absorption is not legal in Virginia outside the holiday (Va. Code tit. 58.1, ch. 6 §626 (2007)).

[28]Perkins, *supra* note 26, at A1.

are required to remit payments once a month or once a quarter and the tax holiday lasts fewer days than the reporting period, it is plausibly easier for retailers to shift sales (on paper) to say that sales occurring outside the holiday occurred during the holiday (thus reducing the retailer's tax payment), particularly when the state already anticipates smaller remittance payments from retailers as a consequence of the holiday.

Concerning sales tax revenue more generally, in none of the sales tax holidays examined has there been a mention of making the policy revenue-neutral. Moreover, the policy, at least recently, has been marketed as a tax break or reduction for consumers. However, this does not imply some legislators are not cognizant of the fiscal impacts of the policy:

> This was the second time the [Massachusetts] Legislature waited until the last minute to send a tax holiday bill to the governor. [Governor] Deval Patrick signed the bill into law this summer just nine days before the tax holiday, while last year he signed it 10 days before the weekend, [Bill Rennie, vice president at the Retailers Association of Massachusetts] said.
>
> Lawmakers have said they don't want to approve the tax holiday too early in the year because they don't want consumers delaying big purchases until the tax-free weekend.[29]

Further revenue issues arise when one takes into account local governments. In some instances, states have mandated local governments suspend their local sales taxes during the holiday. Some states (Tennessee) reimbursed local governments for revenue lost as a consequence of the holiday. Other things equal, this increases the total cost of this policy.

In some states (Missouri), local governments can choose whether or not to participate in the sales tax holiday. This again raises compliance issues for retailers and issues concerning different tax rates across adjacent jurisdictions, both outlined above. It is not clear, from the local government's perspective, whether it is optimal to participate in the state sales tax holiday. The answer likely depends on whether the jurisdiction is close to another jurisdiction and the population sizes of those jurisdictions. For example, it might be optimal for Sedalia, Missouri to keep its local taxes during the holiday since there are no large towns nearby, but the story could very well be different for one of the suburbs of Kansas City or St. Louis.

2.5 Conclusion

The sales tax holiday has been an increasingly popular state-level tax policy in the US. Since its inception in 1997, 20 states and the District of Columbia held 118 different tax holidays. The

[29] Jon Chesto, "Slight sales decline seen in tax holiday; weekend was still a boost for stores but probably not as much as previous years," *The Patriot Ledger* (Quincy, MA), August, 20 2007, ROP Edition, Business, p. One-25.

holidays directly affected 100 million people each year from 2004 through 2007, or, equivalently, at least 35 percent of the US population that lives in a state with a sales tax.

What initially began as a way to keep New Yorkers from traveling to neighboring states, particularly New Jersey, to avoid paying sales tax on clothing, has evolved to cover such goods as school supplies, computers, energy-efficient appliances, and hurricane preparedness items. As the policy spread, political justifications for it morphed as well. In Florida and Texas, it was initially argued for as a way to reduce state budget surpluses in the late 1990s. As the economy faltered, politicians marketed sales tax holidays as a way to help families purchase clothing and school supplies. The primacy of that justification is a recurring theme in many press accounts. Holidays for computers, Energy Star-labeled items, and hurricane preparedness items were sold to increase computer ownership and create a more technologically-savvy workforce, to encourage energy conservation, and to trigger preparations for upcoming hurricane seasons.

Tax holidays provide consumers an incentive to time their purchases with lower tax rates; to purchase goods that fall under a price cap—thus making them tax—exempt-even if otherwise identical items have a pre-tax price of $0.01 more; and to travel to purchase goods in lower tax jurisdictions. Sales tax holidays can be justified from an optimal taxation perspective as a way to increase sales in periods of low seasonal demand; but, following that logic, one must then concede that it is optimal to *raise* the sales tax rate in periods of high seasonal demand. If this is not feasible, policy-makers should consider whether alternative policies would achieve the same aims, e.g., keeping the same tax base but lowering the tax rate or having year-round exemptions on certain goods. Finally, policy-makers should consider carefully the compliance costs, the possibilities for tax avoidance and evasion, and the impacts on state and local sales tax revenue this policy generates.

Table 2.1: States with Sales Tax Holidays, 1997-2007

Year	States	Population Affected	Percent
1997	New York (2)	18,656,546	7.02
1998	Florida, New York (2)	34,242,465	12.73
1999	Florida, New York (2), Texas	55,200,366	20.28
2000	Connecticut, Florida, Iowa, New York, Pennsylvania, South Carolina, Texas	78,644,158	28.58
2001	Connecticut, District of Columbia (2), Florida, Iowa, Maryland, Pennsylvania (2), South Carolina, Texas	66,352,002	23.86
2002	Connecticut, District of Columbia, Georgia (2), Iowa, North Carolina, Pennsylvania, South Carolina, Texas, West Virginia	63,813,477	22.73
2003	Connecticut, Georgia, Iowa, New York, North Carolina, South Carolina, Texas, Vermont, West Virginia	71,430,831	25.22
2004	Connecticut, District of Columbia (2), Florida, Georgia, Iowa, Massachusetts, Missouri, New York (2), North Carolina, South Carolina, Texas, Vermont (2), West Virginia	102,326,460	35.79
2005	Connecticut, District of Columbia (2), Florida (2), Georgia (2), Iowa, Louisiana, Massachusetts, Missouri, New Mexico, New York (2), North Carolina, South Carolina, Texas	107,537,517	37.27
2006	Alabama, Connecticut, District of Columbia (2), Florida (3), Georgia, Iowa, Maryland, Massachusetts, Missouri, New Mexico, New York, North Carolina, South Carolina (2), Tennessee, Texas, Virginia	128,464,282	44.10
2007	Alabama, Connecticut, District of Columbia (2), Florida (2), Georgia (2), Iowa, Louisiana, Massachusetts, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia (2)	112,953,027	38.41

Numbers in parentheses indicate the number of sales tax holidays the state had that year. "Population Affected" is the combined population of states that had sales tax holidays that year. The final column is the "Population Affected" that year divided by the combined population of states with a sales tax that year. Population data source (1997-1999): U.S. Census Bureau, Intercensal Population Estimates, "Table SA1-3 - Population," Regional Economic Information System, Bureau of Economic Analysis, September 2007. See <http://www.bea.gov/regional/spi/default.cfm?satable=summary> (viewed Jan. 7, 2008). Population data source (2000-2007): "Table 1: Annual Estimates of the Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2007," (NST-EST2007-01), Population Division, U.S. Census Bureau, Release Date: December 27, 2007. See <http://www.census.gov/popest/states/NST-ann-est.html> (viewed Jan. 7, 2008).

Table 2.2: By State and Year, Details of Sales Tax Holidays, 1997-2007

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Alabama	2006	Fri., 8.4 - Sun., 8.6 (3 days)	Clothing priced $100 or less per item; a single purchase of computers, computer software, and school computer supplies totalling $750 or less; school supplies, school art supplies, and school instructional material priced $50 or less per item; and books priced $30 or less per book.	-6.0 to -6.5	Yes	Counties and municipalities can choose to exempt these items from their sales tax during the state's STH.
	2007	Fri., 8.3 - Sun. 8.5 (3 days)	Same as in 2006.	?	Yes	Same as in 2006.
Sources: 2006 Ala. Act 574. See <http://www.revenue.alabama.gov/salestax/STholACT.PDF> (visited Feb. 10, 2008). Anita Debro & Toraine Norris, "Saturday taxes inevitable? Not this weekend: back-to-school shoppers expected to save millions," *Birmingham News* (Birmingham, AL), Aug. 5, 2006, News, p. 1A. Wayne Smith, "Ready, set, shop! Clock's ticking on tax holiday," *Huntsville Times* (Huntsville, AL), Aug. 3, 2007, 2nd Edition, Local News, p. 1A.						
Connecticut	2000	Sun., 8.20 - Sat., 8.26 (7 days)	Clothing and footwear priced $300 or less per item. There are some exceptions to this, including certain clothing accessories.	-0.58	No	During the holiday, tax is applied to the entire price to clothing and footwear items with sales prices of more than $300 per item. Normally, clothing priced $75 or less per item is not subject to sales tax.
	2001	Sun., 8.19 - Sat., 8.25 (7 days)	Same as in 2000.	-1.6	No	Same as in 2000.
	2002	Sun., 8.18 - Sat., 8.24 (7 days)	Same as in 2000.	-3.2	No	Same as in 2000.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2003	Sun., 8.17 - Sat., 8.23 (7 days)	Same as in 2000.	-3.3	No	Normally, clothing priced $50 or less per item is not subject to sales tax.
	2004	Sun., 8.15 - Sat., 8.21 (7 days)	Clothing and footwear priced $300 or less per item. Exceptions include "(1) any special clothing or footwear primarily designed for athletic activity or protective use and which is not normally worn except when used for the athletic activity or protective use for which it was designed, and (2) jewelry, handbags, luggage, umbrellas, wallets, watches and similar items carried on or about the human body but not worn on the body in the manner characteristic of clothing intended for exemption under this section."	-3.3	Yes	Same as in 2003.
	2005	Sun., 8.21 - Sat., 8.27 (7 days)	Same as in 2004.	-4.3	Yes	Same as in 2003.
	2006	Sun., 8.20 - Sat., 8.26 (7 days)	Same as in 2004.	-3.3	Yes	Same as in 2003.
	2007	Sun., 8.19 - Sat., 8.25 (7 days)	Same as in 2004.	-3.3	Yes	Same as in 2003.

Sources: Conn. Gen. Stat., vol. 4, tit. 12, ch. 219, §12-407e is the sales tax holiday statute, effective July 1, 2004.
Conn. Gen. Stat., vol. 4, tit. 12, ch. 219, §12-412(47) is the year-round price-capped exemption on clothing from sales tax.
2003 Conn. Pub. Act 2 §28 amended (47) to lower the threshold for the clothing exemption from $75 to $50, effective April 1, 2003, and applicable to sales occurring on or after that date. See <http://www.cga.ct.gov/2003/act/Pa/2003PA-00002-R00HB-06495-PA.htm> (visited Feb. 10, 2008).
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Note: Unless otherwise stated, fiscal impact estimates are for state sales tax collections. "

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
District of Columbia	2001	Fri., 8.3 - Sun., 8.12 (10 days)	School supplies (items "purchased for educational use in the classroom, at home, or for any school activity, including pens, pencils, stationery, book bags, lunch boxes, and calculators"), clothing, and footwear (except "skis, swim fins, roller blades, and skates") priced less than $101 per item.	+0.002	No	Applies to layaway sales, mail order sales, and online sales.
	2001	Fri., 11.23 - Sun., 12.2 (10 days)	Clothing, accessory items ("jewelry, watches, watchbands, handbags, handkerchiefs, umbrellas, scarves, ties, headbands, and belt buckles"), and shoes ("all footwear except skis, swim fins,roller blades, and skates") priced $100 or less per item.	?	No	Applies to layaway sales, mail order sales, and online sales.
	2002	Sat., 8.9 - Sun., 8.18 (10 days)	Clothing ("including all footwear except skis, swim fins, roller blades, and skates"), and school supplies ("[items] purchased for use in the classroom, at home, or for any school activity, including pens, pencils, stationery, book bags, lunchboxes, and calculators.") priced less than $100 per item.	?	No	Applies to layaway sales, mail order sales, and online sales.
	2004	Sat., 8.7 - Sun., 8.15 (9 days)	School supplies ("an item purchased for educational use in the classroom, at home, or for any school activity, including pens, pencils, stationery, art supplies, book bags, lunch boxes, and calculators"), articles of clothing, accessory items ("jewelry, non-prescription eyeglasses, watches, watchbands, handbags, handkerchiefs, umbrellas, gloves, scarves, ties, headbands, hats, belts and belt buckles, and other traditional accessory items"), and shoes ("all footwear except skis, swim fins, roller blades, and skates") priced $100 or less per item.	-1.2 (with Nov. 2004 STH)	Yes	Applies to layaway sales.
	2004	Fri., 11.26 - Sun., 12.5 (10 days)	Clothing, accessory items, and shoes—but *not* school supplies—priced $100 or less per item. See August 2004 STH for other details.	See Aug. 2004 STH.	Yes	Same as August 2004 STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2005	Sat., 8.6 - Sun., 8.14 (9 days)	Same as August 2004 STH.	?	Yes	Same as August 2004 STH.
	2005	Fri., 11.25 - Sun., 12.4 (10 days)	Same as November 2004 STH.	?	Yes	Same as November 2004 STH.
	2006	Sat., 8.5 - Sun., 8.13 (9 days)	Same as August 2004 STH.	-1.1 (with Nov. 2006 STH)	Yes	Same as August 2004 STH.
	2006	Fri., 11.24 - Sun., 12.3 (10 days)	Same as November 2004 STH.	See Aug. 2006 STH.	Yes	Same as November 2004 STH.
	2007	Sat., 8.4 - Sun., 8.12 (9 days)	Same as August 2004 STH.	-1.1	Yes	Same as August 2004 STH.
	2007	Fri., 11.23 - Sun., 12.2 (10 days)	Same as November 2004 STH.	?	Yes	Same as November 2004 STH.

Sources: Sales Tax Holiday Act of 2000 (A13-0505) (effective June 9, 2007) is the relevant act for the August 2001 tax holiday.
Sales Tax Holiday Emergency Amendment Act of 2001 (B14-0424 and A14-0166) (enacted Nov. 15, 2001) is the relevant act for the Nov./Dec. 2001 tax holiday.
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Nikita Stewart, "District briefing," *The Washington Post* (Washington, D.C.), Nov. 22, 2007, Met 2 Edition, Metro, p. B04.

Florida	1998	Sat., 8.15 - Fri., 8.21 (7 days)	"[A]ny article or wearing apparel, including footwear, intended to be worn on or about the human body" priced $50 or less per item.	-15.2	No	At least some local sales taxes were also repealed for the state's STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	1999	Sat., 7.31 - Sun., 8.8 (9 days)	Clothing, footwear, wallets, handbags, backpacks, fanny packs or diaper bags priced $100 or less per item.	-34.7	No	At least some local sales taxes were also repealed for the state's STH.
	2000	Sat., 7.29 - Sun., 8.6 (9 days)	Clothes and accessories deemed to be part of normal attire (including backpacks) priced $100 or less per item.	-35.0 (state) -5.6 (local)	No	Local sales taxes repealed for the state's STH.
	2001	Sat., 7.28 - Sun., 8.5 (9 days)	Most clothing, footwear, and accessories priced $50 or less per item and school supplies priced $10 or less per item.	-30.1 (state and local)	No	Local sales taxes repealed for the state's STH.
	2004	Sat., 7.24 - Sun., 8.1 (9 days)	Books, most clothing, and some accessories (including hats, handbags, and backpacks) priced $50 or less per item and school supplies priced $10 or less per item.	-29.7 to -35.5 (state)	No	Local sales taxes repealed for the state's STH.
	2005	Wed., 6.1 - Sun., 6.12 (12 days)	$20 or less per item: Candles, battery-powered flashlights/lanterns, gas-powered lanterns, and portable self-powered light sources. Gas or diesel fuel containers priced $25 or less per item. $30 or less per item: batteries, including rechargeable, of sizes AA, C, D and 6- and 9-volt (excluding car and boat batteries); coolers and ice chests for food storage, non-electrical; and first aid kits. $50 or less per item: self- or battery-powered radios, two-way radios, and weather band radios; tarpaulins; flexible waterproof sheeting such as Visqueen; ground anchor systems; and tie-down kits. $750 or less per item: portable generators to provide light or communications or to preserve perishable food in the event of a power outage caused by a hurricane.	-10.0 (state and local)	No	Local sales taxes repealed for the state's STH.
	2005	Sat., 7.23 - Sun., 7.31 (9 days)	Books, clothing (including wallets, handbags, backpacks and diaper bags), and footwear priced $50 or less per item and school supplies (including pens, pencils, erasers, crayons, notebooks, paper, scissors, tape, glue, rulers, and calculators) priced $10 or less per item.	-38.0	No	Local sales taxes repealed for the state's STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2006	Sun., 5.21 - Thurs., 6.1 (12 days)	$10: Blue/artificial ice. $20: portable, self-powered light sources; battery-powered flashlights and lanterns; gas-powered lanterns; and candles. $25: gas or diesel fuel containers. $30: AAA, AA, C, D, 6- and 9-volt batteries; and coolers and ice chests (non-electrical). $40: cell phone chargers. $50: self- or battery-powered radios, two-way radios, and weather band radios; tarpaulins; Visqueen, plastic sheeting/drop cloths, and other flexible waterproof sheeting; ground anchor systems; tie-down kits; Bungee cords; and ratchet straps. $60: cell phone batteries. $75: carbon monoxide detectors and packages consisting of two or more of the listed qualifying items sold for $75 or less. Packages consisting of one or more of the previously listed items and at least one other item that is otherwise tax-exempt and the package is sold for $75 or less. $200: storm shutter devices (materials/products specifically manufactured, rated, and marketed for the purpose of preventing window damage from storms). $1,000: portable generators used to provide light, communications, or to preserve perishable food in case of power outage.	-41.0	No	Price caps are per item, no limit on the number of items, and are "less than or equal to." Local sales taxes repealed for the state's STH.
	2006	Sat., 7.22 - Sun., 7.30 (9 days)	See July 2005 STH. No major changes.	-39.0	No	Tax is collected on the full price for any item exceeding the price cap. Local sales taxes repealed for the state's STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2006	Thurs., 10.5 - Wed., 10.11 (7 days)	Dishwashers, clothes washers, air conditioners, ceiling fans, incandescent or fluorescent light bulbs, dehumidifiers, programmable thermostats, and refrigerators that are certified by the federal Energy Star program, are for personal use, and are priced $1,500 or less per item.	-2.7	No	If an in-store sale or retailer coupon reduces the price to below $1,500, the item is tax-free. Rebates or manufacturers' coupons that reduce the price to below $1,500 will not make the item tax-free. Local sales taxes repealed for the state's STH.
	2007	Fri., 6.1 - Tues., 6.12 (12 days)	$10: Blue/artificial ice. $20: portable, self-powered light sources; battery-powered flashlights and lanterns; gas-powered lanterns; and candles. $25: gas or diesel fuel containers. $30: AAA, AA, C, D, 6-volt and 9-volt batteries; and coolers and ice chests (non-electrical). $40: cell phone chargers. $50: tarpaulins; Visqueen, plastic sheeting/drop cloths, and other flexible waterproof sheeting; ground anchor systems; tie-down kits; Bungee cords; and ratchet straps. $60: cell phone batteries. $75: self- or battery-powered radios, two-way radios, and weather band radios; carbon monoxide detectors; and packages consisting of two or more of the listed qualifying items sold for $75 or less. $200: storm shutter devices (materials/products specifically manufactured, rated, and marketed for the purpose of preventing window damage from storms). $1,000: portable generators used to provide light, communications, or to preserve perishable food in case of power outage.	-25.0	No	Price caps are per item, no limit on the number of items, and are "less than or equal to." Local sales taxes repealed for the state's STH.
	2007	Sat., 8.4 - Mon., 8.13 (10 days)	See July 2005 STH. No major changes.	-46.6	No	Local sales taxes repealed for the state's STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes

Sources: Florida Department of Revenue. "Tax Information Publication: Hurricane Preparedness Sales Tax Holiday June 1 through June 12, 2007." TIP #07A01-04 (Apr. 30, 2007). See <http://dor.myflorida.com/dor/tips/pdf/tip07a01-04.pdf> (visited Sept. 17, 2007).
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David Bauerlein, "Tax holiday can save $$ for long time; today begins Florida's first week of tax breaks focused on the purchase of energy-efficient products," *Florida Times-Union* (Jacksonville, FL), Oct. 5, 2006, p. A-1.
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Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Georgia	2002	Fri., 3.29 - Sat., 3.30 (2 days)	Clothing and footwear priced $100 or less per item (does *not* include jewelry, watches, handbags, umbrellas, clothing intended primarily as athletic gear or merchandise bought at theme parks); computer and computer-related accessories used for nonbusiness home or personal use up to $1,500 (includes personal computers, blank CDs, peripheral devices, educational software and Internet access devices); school supplies used in the classroom priced $20 or less per item (includes pens, pencils, notebooks, calculators, and dictionaries); and children's books priced less than $20 per item.	-11.0 (state) -4.4 (local) (with Aug. 2002 STH)	No	No sales tax is levied on the *first* $1,500 of the computer purchase. Peripherals must be purchased with a computer in order to be exempt from sales tax. Local sales taxes repealed for the state's STH.
	2002	Fri., 8.2 - Sat., 8.3 (2 days)	See March 2002 STH.	See Mar. 2002 STH.	No	See March 2002 STH.
	2003	Thurs., 7.31 - Sun., 8.3 (4 days)	Clothing priced $100 or less per item; computers and accessories (printers, memory, web cameras, etc.) priced $1,500 or less per item; and school supplies and children's books (plus dictionaries and thesauri) priced $20 or less per item.	-14.0 to -16.0 (state and local)	No	Only computer items priced $1,500 or less are exempt from sales tax. Uniforms and sports footwear, such as football cleats, are now potentially exempt. Local sales taxes repealed for the state's STH.
	2004	Thurs., 7.29 - Sun., 8.1 (4 days)	School supplies (including dictionaries, notebooks, calculators, and notebooks) priced $20 or less per item; clothing and footwear priced $100 or less per item (does not include accessories such as jewelry, handbags, and watches); and computers and computer accessories (such as keyboards, monitors, modems and printers but not personal digital assistants and non-recreational software) $1,500 or less per *transaction*. For a more comprehensive list, see Eckstein (2004).	-7.1 (state) -6.0 (local)	No	Local sales taxes repealed for the state's STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2005	Thurs., 7.28 - Sun., 7.31 (4 days)	Clothing and shoes priced $100 or less per item; school supplies priced $20 or less per item; and a single purchase of computer and computer accessories totalling $1,500 or less. For a more comprehensive list, see "Exempt and Taxable Items for the 2005 Sales Tax Holiday."	-10.4 (state) -6.5 (local)	No	If the computer purchase exceeds $1,500, the entire transaction is taxable. Local sales taxes repealed for the state's STH.
	2005	Thurs., 10.6 - Sun., 10.9 (4 days)	Dishwashers, clothes washers, air conditioners, ceiling fans, incandescent or fluorescent light bulbs, dehumidifiers, programmable thermostats, and refrigerators carrying the the federal Energy Star label priced $1,500 or less per item.	-0.187	No	Items for personal use only, not for businesses or resale. Local sales taxes are *not* repealed for the state's STH.
	2006	Thurs., 8.3 - Sun., 8.6 (4 days)	Clothing and footwear priced $100 or less per item; school supplies (including notebooks, pens, pencils, calculators, and children's books) priced $20 or less per item; computers and computer accessories (including monitors, printers, non-recreational software and personal digital assistants that do not function as a phone) up to $1,500 per *transaction*; and federal Energy Star-labeled items (including windows, dishwashers, air conditioners, and fluorescent lights) priced $1,500 or less per item.	-11 (state) -8.5 (local)	No	Local sales taxes repealed for the state's STH.
	2007	Thurs., 8.2 - Sun., 8.5 (4 days)	Clothes and footwear (excluding accessories) priced $100 or less per item; school supplies (including notebooks, pens, pencils, calculators, and children's books) priced $20 or less per item; a single purchase, with a sales price of $1,500 or less, of personal computers and computer accessories (including monitors, personal digital assistants, peripheral devices, and non-recreational software).	-12 (state) -8.9 (local) (with Oct. 2007 STH)	No	Local sales taxes repealed for the state's STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2007	Thurs., 10.4 - Sun., 10.7 (4 days)	Non-commercial purchases of air conditioners, ceiling fans, fluorescent light bulbs, clothes washers, dehumidifiers, dish washers, doors, programmable thermostats, refrigerators, and windows carrying the federal Energy Star label priced at $1,500 or less per item.	See Aug. 2007 STH.	No	Local sales taxes repealed for the state's STH.

Sources: Ga. Code Ann. §48-8-3 (2007).
H.B. 128, 2007-2008 Gen. Assembly, (Ga. 2007). See <http://www.legis.ga.gov/legis/2007_08/pdf/hb128.pdf> (visited Feb. 10, 2008). See also Georgia Department of Revenue, "2007 Energy Efficient Products Sales Tax Holiday; October 4-7, 2007," <http://www.dor.ga.gov/salestax/holiday/energy_efficient_holiday_2007.aspx> (visited Sept. 17, 2007).
"Details on Georgias sales tax holiday," The Associated Press State & Local Wire, BC Cycle, State and Regional, July 31, 2002, available in LexisNexis.
Sandra Eckstein, "Sales-tax holiday back for four-day run," *The Atlanta Journal-Constitution* (Atlanta, GA), July 24, 24 2003, Home Edition, Business, p. 1G.
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"Georgia sales tax holiday to begin July 29," The Associated Press State & Local Wire, BC Cycle, State and Regional, June 30, 2004, available in LexisNexis.
Renee Degross, "Sales tax break lures shoppers," *The Atlanta Journal-Constitution* (Atlanta, GA), July 30, 2004, Home Edition, Business, p. 1H.
Sandra Eckstein, "Buyer's edge: tax-free holiday," *The Atlanta Journal-Constitution* (Atlanta, GA), July 29, 2004, Home Edition, Features, p. 5E.
"Back-to-school guide: sales tax takes 4-day holiday," *The Atlanta Journal-Constitution* (Atlanta, GA), July 28, 2005, Home Edition, Gwinnett News, p. 9SJ.
"Exempt and taxable items for the 2005 sales tax holiday," *The Atlanta Journal-Constitution* (Atlanta, GA), July 28, 2005, Home Edition, Living, p. 7D.
Greg Gelpi, "Shoppers start mission early," *The Augusta Chronicle* (Augusta, GA), July 29, 2005, All Edition, News, p. A01.
Nancy Badertscher, "A brake on energy is a brief sales tax break, *The Atlanta Journal-Constitution* (Atlanta, GA), Oct. 1, 2005, Home Edition, News, p. 1A.
Vicky Eckenrode, "Sales tax taken off efficient products," *The Augusta Chronicle* (Augusta, GA), Oct. 5, 2005, All Editions, Business, p. A17.
"Tax-free holidays," *The Augusta Chronicle* (Augusta, GA), Aug. 3, 2006, All Editions, News, p. A01.
Vicky Eckenrode, "Sales tax savings start today," *The Augusta Chronicle* (Augusta, GA), Aug. 3, 2006, All Editions, News, p. A08.
Megha Rajagopalan, "Tax holiday: stores stocked for annual rush; back-to-school tax holiday creates an annual frenzy," *The Atlanta Journal-Constitution* (Atlanta, GA), Aug. 1, 2007, Main Edition, News, p. 1A.

Iowa	2000	Fri., 8.4 - Sat., 8.5 (2 days)	Clothing and footwear priced less than $100 per item. This does *not* include clothing accessories, e.g., jewelry, handbags, nonprescription sunglasses, umbrellas, and watches; protective equipment, e.g., breathing masks, helmets, protective gloves, and safety glasses; and sports equipment, e.g., cleated or spiked athletic shoes, gloves (baseball, bowling, boxing, hockey, and golf), goggles, life preservers, roller and ice skates, ski boots, waders, and wetsuits and fins.	-1.6	Yes	Store coupons (but *not* rebates or manufacturer's coupons) and discounts can be used to reduce the sales price so the good becomes exempt from sales tax. Local sales taxes repealed for the states STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2001	Fri., 8.3 - Sat., 8.4 (2 days)	Same as in 2000.	-1.3	Yes	Same as in 2000.
	2002	Fri., 8.2 - Sat., 8.3 (2 days)	Same as in 2000.	*	Yes	Same as in 2000.
	2003	Fri., 8.1 - Sat., 8.2 (2 days)	Same as in 2000.	**	Yes	Same as in 2000.
	2004	Fri., 8.6 - Sat., 8.7 (2 days)	Same as in 2000.	-2.4	Yes	Same as in 2000.
	2005	Fri., 8.5 - Sat., 8.6 (2 days)	Same as in 2000.	***	Yes	Same as in 2000.
	2006	Fri., 8.4 - Sat., 8.5 (2 days)	Same as in 2000.	-2.0	Yes	Same as in 2000.
	2007	Fri., 8.3 - Sat., 8.4 (2 days)	Same as in 2000.	-2.0	Yes	Same as in 2000.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Sources: Iowa Code §423.3 (2007). Greg Smith, "Governor signs 'tax free' weekend bill," The Associated Press State & Local Wire, BC Cycle, State and Regional, May 27, 2000, available in LexisNexis. Mike Glover, "Vilsack signs an end to this year's legislature," The Associated Press State & Local Wire, AM Cycle, State and Regional, May 28, 2000, available in LexisNexis. "Iowa sales tax holiday," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 4, 2000, available in LexisNexis. M.D. Kittle, "Iowa retailers prepare for tax-free holiday; save 6%: event is modeled after similar plans in other states," *Telegraph Herald* (Dubuque, IA), Aug. 1, 2001, p. A1. M.D. Kittle, "Merchants eagerly awaiting tax holiday; 6% savings: two-day reprieve set for Friday and Saturday," *Telegraph Herald* (Dubuque, IA) Aug. 1, 2002, p. A1. M.D. Kittle, "Tax-free shopping begins; with a sales-tax holiday, Dubuque merchants expect to be busy," *Telegraph Herald* (Dubuque, IA) Aug. 1, 2003, p. A1. * "State budget cuts left the [Department of Revenue] without the resources to track [2002's] figures, according to spokeswoman Renee Mulvey." (ibid.) M.D. Kittle, "Iowa to offer 5th sales tax holiday this weekend; Dubuque shoppers can save 7%," *Telegraph Herald* (Dubuque, IA), Aug. 5, 2004, Tristate, p. A3. ** "The [Department of Revenue] no longer tracks annual sales figures generated from the tax holiday, the consequence of state budget cuts." (ibid.) "Sales tax holiday set for Aug. 5-6," The Associated Press State & Local Wire, BC Cycle, State and Regional, July 27, 2005, available in LexisNexis. Josh Weinhold, "Retailers prep for tax-free weekend; back-to-school event provides a real boost to summer business," *Telegraph Herald* (Dubuque, IA), Aug. 3, 2006, Front, p. A1. *** "Finance department officials did not calculate savings amounts in 2002, 2003 and 2005 due to budgetary restrictions." (ibid.) Stacey Becker, "Iowa's sales tax takes another weekend holiday," *Telegraph Herald* (Dubuque, IA), Aug. 2, 2007, A, p.1.						
Louisiana	2005	Fri., 12.16 - Sun., 12.18 (3 days)	The *first* $2,500 of non-titled goods, i.e., no homes and automobiles. Taxable services such as meals, tickets to athletic and entertainment events do *not* qualify for the exemption.	-16.0	No	Local sales taxes are *not* repealed for the state's STH.
	2007	Fri., 8.3- Sat., 8.4 (2 days)	The *first* $2,500 of all consumer purchases of tangible personal property (for non-business use). The exemption does not apply to (1) vehicles subject to license and title and (2) meals furnished for consumption on the premises where purchased, including to-go orders.	-6.0	Yes	Local sales taxes are *not* automatically repealed for the state's STH, but it appears parishes can vote to do so.
Sources: 2007 La. Acts 244, 2007 Reg. Sess. (La. 2007). See <http://www.legis.state.la.us/billdata/streamdocument.asp?did=449729> visited (Sept. 17, 2007). Meghan Gordon, "Sales Tax Holiday Rules a Hard Sell; Consumers, Retailers Expressing Confusion." *Times-Picayune* [New Orleans, LA] 15 December 2005, National: 1. Timothy Boone, "Tax holiday keeps retailers busy." *The Advocate* [Baton Rouge, LA] 17 December 2005, Main Edition, C: 1. Timothy Boone, "Retailers Ready for Onslaught of Shoppers on Tax-free Days." *The Advocate* [Baton Rouge, LA] 15 December 2005, Main Edition, A: 1. "Parish Joins in State Tax Holiday; Shoppers Will Pay Less Today, Saturday." *Times-Picayune* [New Orleans, LA] 3 August 2007, Metro: 1. Jen DeGregorio, "Tax Holiday Arrives, But With No Publicity; Some Retailers Say Shoppers Unaware." *Times-Picayune* [New Orleans, LA] 3 August 2007, Money: 1.						
Maryland	2001	Fri., 8.10 - Thurs., 8.16 (7 days)	Clothing and footwear (*not* accessories such as jewelry, watches, ties, and headbands) priced $100 or less per item.	-5.1	No	Local sales taxes are *not* repealed for the state's STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2006	Wed., 8.23 - Sun., 8.27 (5 days)	Clothing and footwear (*not* accessories such as jewelry, watches, watchbands, handbags, handkerchiefs, umbrellas, scarves, ties, headbands, and belt buckles) priced $100 or less per item.	-5.6	No	Local sales taxes are *not* repealed for the state's STH.
Sources: H.B. 37, 2005 Md. Gen. Assembly, Reg. Sess. (Md. 2005). See <http://mlis.state.md.us/2005rs/bills/hb/hb0037e.pdf> (viewed Feb. 10, 2008). It affected Md. Code Ann., [Tax-Gen] §11-228 (2006). Sara Marsh, "Tax-free week approaches," *The Capital* (Annapolis, MD), July 25, 2001, Business, p. A6. William Donald Schaefer, "Comptroller's Comments: Tax-free Holiday..." *ReveNews*, Annapolis: Summer 2006. See <http://taxpros.marylandtaxes.com/publications/revenews/archives/sum06.pdf> (viewed July 10, 2007). Grant Huang, "Tax holiday boosts sales for state's retailers," *The Maryland Gazette* (Glen Burnie, MD), Sept. 6, 2006, Business, p. A6.						
Massachusetts	2004	Sat., 8.14 (1 day)	All non-business retail sales of tangible personal property (except motor vehicles, boats, meals, telecommunications services, gas, steam, and electricity) priced $2,500 or less per item. If the price exceeds $2,500, even if it refers to a set of items bundled and sold at a single price, tax is due on the *entire* price charged for the item.	-10.0	No	Normally, there is no sales tax on clothing priced $175 or less; only the *increment* over $175 is subject to tax. If, on the STH, the price exceeds $2,500, $175 is deducted from the amount subject to tax; the threshold is *not* increased by $175. Layaway sales qualify if the last payment is made during the STH.
	2005	Sat., 8.13 - Sun., 8.14 (2 days)	Same as in 2004, except tobacco products *are* subject to taxes during the holiday, but non-motorized boats such as canoes, kayaks and rowboats priced $2,500 or less are *not*.	-14.5	No	Same as 2004 STH.
	2006	Sat., 8.12 - Sun., 8.13 (2 days)	Same as 2005 STH, except prior sales and layaway sales are ineligible.	-16.9	No	Same as 2005 STH except as noted.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2007	Sat., 8.11 - Sun. 8.12 (2 days)	Same as in 2006.	-14.2	No	Same as in 2006.

Sources: Mass. Gen. Laws ch. 64H, §6(k) (2007) is the clothing exemption.
2003 Mass. Acts. ch. 141 §§55-59 is the tax holiday for 2004. See <http://www.mass.gov/legis/laws/seslaw03/sl030141.htm> (viewed Feb. 10, 2008).
2005 Mass. Acts ch. 52 §§1-5 is the tax holiday for 2005. See <http://www.mass.gov/legis/laws/seslaw05/sl050052.htm> (viewed Feb. 10, 2008).
2006 Mass. Acts ch. 204 §§1-7 is the tax holiday for 2006. See <http://www.mass.gov/legis/laws/seslaw06/sl060204.htm> (viewed Feb. 10, 2008).
2007 Mass. Acts ch. 81 §§1-6 is the tax holiday for 2007. See <http://www.mass.gov/legis/laws/seslaw07/sl070081.htm> (viewed Feb. 10, 2008).
Mass. Dept. of Revenue, "TIR 04-14: The Massachusetts Sales Tax Holiday." Boston: May 25, 2004. Retrieved July 11, 2007.
Mass. Dept. of Revenue, "TIR 05-9: The 2005 Massachusetts Sales Tax Holiday Weekend." Boston: May 22, 2005. Retrieved July 11, 2007.
Mass. Dept. of Revenue, "TIR 06-13: The 2006 Massachusetts Sales Tax Holiday Weekend." Boston: Aug. 2, 2006. Retrieved July 11, 2007.
Mass. Dept. of Revenue, "TIR 07-12: The 2007 Massachusetts Sales Tax Holiday Weekend." Boston: Aug. 6, 2007. Retrieved Sept. 18, 2007.
Jennifer Heldt Powell, "State tax-free day far from doubt-free; questions remain about economic benefits," *The Boston Herald* (Boston, MA), Dec. 24, 2004, All Editions, Finance, p. 24.
Donna Goodison, "Taxes up despite 'holiday' weekend," *The Boston Herald* (Boston, MA), Oct. 4, 2005, All Editions, Finance, p. 33.
Milton J. Valencia, "Tax holiday brings sales; some doubt true savings," *Sunday Telegram* (Worcester, MA), Aug. 13, 2006, All Editions, Local News, p. B1.
Donna Goodison, "Critics hit sales tax holiday," *The Boston Herald* (Boston, MA), Aug. 12, 2007, All Editions, Finance, p. 33.
Dan Ring, "Global warming bill passed by state senate," *The Republican* (Springfield, MA), Jan. 2, 2008.

Missouri	2004	Fri., 8.13 - Sun., 8.15 (3 days)	School supplies priced $50 or less per item; clothes and shoes (but *not* accessories such as watches and jewelry) priced $100 or less per item; computer software priced $200 or less per item; and computer equipment priced $2,000 or less.	-18.5 (state & local)	No	Local governments could opt out of the STH by approving a local ordinance. Sixty-six of 114 counties and 179 of 571 municipalities chose to collect local sales taxes during the STH this year.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2005	Fri., 8.5 - Sun., 8.7 (3 days)	Clothing and footwear (*not* including accessories such as watches, jewelry, handbags, handkerchiefs, umbrellas, ties, or belt buckles) priced $100 or less per item; school supplies (including but not limited to textbooks, notebooks, paper, writing instruments, crayons, art supplies, rulers, book bags, backpacks, hand-held calculators, chalk, maps, globes, and computer software having a taxable value of $350 or less) for $50 or less per purchase; computer software with a taxable value of $350 or less; and personal computers and peripherals priced at $3,500 or less per item.	?	Yes	Local governments that chose to exempt local sales taxes in 2004 also must do so in 2005. Other local governments have a choice in 2005.
	2006	Fri., 8.4 - Sun., 8.6 (3 days)	Same as in 2005.	?	Yes	Starting in 2006, cities and counties must vote to opt out of the STH. One ordinance will do, i.e., they do not have to pass an ordinance each year to do so. Fifty-two counties and 172 cities chose to collect local sales taxes during the STH this year.
	2007	Fri., 8.3 - Sun., 8.5 (3 days)	Same as in 2005.	-3.0 (state)	Yes	Fifty-one counties and 169 cities chose to collect local taxes during the STH this year.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Sources: Mo. Rev. Stat. §144.049 (2005). See <http://www.moga.mo.gov/statutes/c100-199/1440000049.htm> (viewed Jan. 5, 2008). Paul Sloca, "State receiving calls about tax holiday not due for a year," The Associated Press State & Local Wire, BC Cycle, State and Regional, July 31, 2003, available in LexisNexis. Michele Munz, "Sales tax holiday may earn encore next year," *St. Louis Post-Dispatch* (St. Louis, MO), Aug. 18, 2004, Metro, p. B01. "Missouri's new sales tax holiday for school supplies starts Friday," *St. Louis Post-Dispatch* (St. Louis, MO), Aug. 10, 2004, Five Star Late Lift Edition, News, p. A08. Scott Charton, "Back to school: Missouri easing its sales tax bite for three days," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 7, 2004, available in LexisNexis. Kelly Wiese, "Sales tax holiday is back," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 3, 2005, available in LexisNexis. Kelly Wiese, "Break on computers, clothes, books starts Friday," The Associated Press State & Local Wire, State and Regional, Aug. 3, 2006, available in LexisNexis. "Sales tax holiday weekend under way," The Associated Press State & Local Wire, Aug. 3, 2007, available in LexisNexis. "Annual Missouri sales-tax holiday business expo in August," *St. Charles County Business Record* (St. Charles, MO), July 30, 2007, News.						
New Mexico	2005	Fri., 8.5 - Sun., 8.7 (3 days)	Sales at retail of clothing and footwear priced less than $100 per item (except those designed for athletic or protective use and accessories, e.g., handbags, jewelry, luggage, umbrellas, wallets, and watches); desktop, laptop, and notebook computers priced $1,000 or less; any associated monitor, speakers, printer, keyboard, microphone, or mouse priced $500 or less per item; and school supplies priced less than $15* per item for items such as notebooks, paper, writing instruments, crayons, art supplies, rulers, paper clips, staples, staplers, scissors and rulers and priced less than $100* per item for items such as book bags, backpacks, hand-held calculators, maps and globes. "School supplies" excludes watches, radios, compact disc players, headphones, sporting equipment, portable or desktop telephones, copiers, office equipment, furniture or fixtures.	-4.4 (state & local)	Yes	Retailers are *not* required to participate in the STH. If they do not participate, they pay tax on otherwise eligible sales and may recover their tax costs from the customer. Layaway, Internet, mail order, and telephone transactions can qualify for the exemption.
	2006	Fri., 8.4 - Sun., 8.6 (3 days)	Same as in 2005.	-3.0 to -5.0 (state & local)	Yes	Same as in 2005.
	2007	Fri., 8.3 - Sun., 8.5 (3 days)	Same as in 2005.	-1.9 to -3.0 (state) -1.3 to -2.1 (local)	Yes	Same as in 2005.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Sources: N.M. Stat. Ann. §7-9-95 (2005). * Price caps for school supplies are not found in the statute referenced above. However, the caps are referenced in: N.M. Taxation and Revenue Department, "FYI-203: Gross Receipts Tax Holiday," Santa Fe: Tax Information/Policy Office, May 2006. See <http://www.tax.state.nm.us/pubs/FYI-203 2007.pdf> (viewed Aug. 28, 2007). "Tax holiday is this weekend," *Albuquerque Journal* (Albuquerque, NM), Aug. 4, 2005, News, p. A3. Rebecca Szymanski, "Celebrate 3-day tax holiday with shopping spree," *Albuquerque Journal* (Albuquerque, NM), July 30, 2006, Back to School, p. 8. Barry Massey, "New Mexico holds tax holiday this weekend," The Associated Press State & Local Wire, State and Regional, July 31, 2007, available in LexisNexis. Bob Quick, "No child required for tax-free shopping," *The Santa Fe New Mexican* (Santa Fe, NM), July 31, 2007, State and Regional News.						
New York	1997	Sat., 1.18 - Fri., 1.24 (7 days)	General use clothing (*not* costumes; accessories such as jewelry, watches, purses, sunglasses, and umbrellas; helmets, gloves, mitts, and protective padding for every sport; and wet suits) and footwear (*not* shoes with cleats or spikes, bowling shoes, fishing waders, climbing shoes, skis, hiking boots, and riding boots) priced less than $500 per *transaction*. Jerseys, pants, and socks (including team uniforms) are *not* taxed, nor are swimsuits and swim caps.	-20.0 (state) -12.0 (local)	No	Counties and localities can choose to repeal their sales taxes during the state's STH.
	1997	Mon., 9.1 - Sun., 9.7 (7 days)	Clothing (*not* shoes, accessories, costumes, or athletic gear) priced less than $100 per item.	?	No	Counties and localities can choose to repeal their sales taxes during the state's STH. Catalog, Internet, and mail-order items; layaways initiated during the STH; and special orders and rain checks arranged during the STH can be exempt.
	1998	Sat., 1.17 - Fri., 1.23 (7 days)	Clothing and shoes priced less than $500 per item. See January 1997 STH for more details.	?	No	Counties and localities can choose to repeal their sales taxes during the state's STH.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	1998	Tues., 9.1 - Mon., 9.7 (7 days)	Clothing (*not* costumes, fashion accessories, sports protective gear, and sewing materials) and footwear priced less than $500 per item.	?	No	See Jan. 1998 STH.
	1999	Sun., 1.17 - Sun., 1.24 (8 days)	Same as in 1998.	?	No	Same as in 1998.
	1999	Wed., 9.1 - Tues., 9.7 (7 days)	Same as in 1998.	?	No	Same as in 1998.
	2000	Sat., 1.15 - Fri., 1.21 (7 days)	Same as in 1998.	?	No	Same as in 1998.
	2003	Tues., 8.26 - Mon., 9.1 (7 days)	Clothing (*not* accessories, occupational protective gear, sports equipment, costumes, or rented formal wear), footwear, and equipment used to make or repair clothing (including fabric, thread, yarn, buttons, hooks and zippers) priced less than $110 per item.	-46.0 (state)	No	Counties and localities can choose to repeal their sales taxes during the state's STH.
	2004	Mon., 1.26 - Sun., 2.1 (7 days)	Same as in 2003.	-46.0 (state)	No	Same as in 2003.
	2004	Tues., 8.31 - Mon., 9.6 (7 days)	Same as in 2003.	-75.0 (state & local)	No	Same as in 2003.
	2005	Mon., 1.31 - Sun., 2.6 (7 days)	Same as in 2003.	?	No	Same as in 2003.
	2005	Tues., 8.30 - Mon., 9.5 (7 days)	Same as in 2003.	?	No	Same as in 2003.
	2006	Mon., 1.30 - Sun., 2.5 (7 days)	Same as in 2003.	-36.0 (state)	No	Same as in 2003.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes

Sources: N.Y. State Dept. of Taxation and Finance, Office of Tax Policy Analysis Technical Services Division. "Year-Round Sales and Use Tax Exemption of Clothing, Footwear, and Items Used to Make or Repair Exempt Clothing (Effective April 1, 2006)," TSB-M-06(6)S, Mar. 29, 2006. See <http://www.tax.state.ny.us/pdf/memos/sales/m06_6s.pdf> (viewed Aug. 13, 2007).
Sharon Linstedt, "Get set for states sales-tax holiday; taxes to be cut on most apparel week of Jan. 18," *Buffalo News* (Buffalo, NY), Jan. 5, 1997, Final Edition, Business, p. 1B.
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Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
North Carolina	2002	Fri., 8.2 - Sun., 8.4 (3 days)	Clothing (*not* accessories or protective equipment) and school supplies (including "pens, pencils, paper, binders, notebooks, textbooks, reference books, book bags, lunchboxes, and calculators") priced $100 or less per item; "[c]omputers, printers and printer supplies, and educational computer software" priced $3,500 or less per item; and "[s]port or recreational equipment" priced $50 or less per item. Furniture is taxable. "['Computer'] means a central processing unit for personal use and any peripherals sold with it and any computer software installed at the time of purchase."	-8.0 to -10.0 (state) -3.7 to -5.0 (local)	Yes	Local sales taxes are repealed for the state's STH. Rentals, items for use in trade or business, and "[s]ales involving a layaway contract or a similar deferred payment and delivery plan" are taxable.
	2003	Fri., 8.1 - Sun., 8.3 (3 days)	Same as in 2002, except printers, printer supplies, and educational computer software are no longer exempt.	-8.6 (state)	Yes	Same as in 2002, except layaway sales now can be exempt.
	2004	Fri., 8.6 - Sun., 8.8 (3 days)	Same as in 2003.	-8.0 (state)	Yes	Same as in 2003.
	2005	Fri., 8.5 - Sun., 8.7 (3 days)	Same as in 2003.	-8.4 (state)	Yes	Same as in 2003.
	2006	Fri., 8.4 - Sun., 8.6 (3 days)	Same as in 2003, except added computer supplies priced $250 or less. per item.	?	Yes	Same as in 2003.
	2007	Fri., 8.3 - Sun., 8.5 (3 days)	Same as in 2006.	?	Yes	Same as in 2003.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Sources: 2001 N.C. Sess. Laws 424 §34.16.(a) established the 2002 tax holiday, and 2001 N.C. Sess. Laws 476 §18(b) (effective prior to the 2002 tax holiday) made minor adjustments. See <http://ncleg.net/EnactedLegislation/SessionLaws/HTML/2001-2002/SL2001-476.html> (viewed Sept. 1, 2007). 2003 N.C. Sess. Law 284, §45.7 made some minor adjustments effective for the 2003 tax holiday. See <http://ncleg.net/EnactedLegislation/SessionLaws/HTML/2003-2004/SL2003-284.html> (viewed Sept. 1, 2007). 2005 N.C. Sess. Law 276 §33.11 made minor adjustments effective for the 2006 tax holiday. See <http://ncleg.net/EnactedLegislation/SessionLaws/HTML/2005-2006/SL2005-276.html> (viewed Sept. 1, 2007). N.C. Gen. Stat. §105-164.13C. See <http://ncleg.net/EnactedLegislation/Statutes/HTML/BySection/Chapter_105/GS_105-164.13C.html> (viewed Sept. 1, 2007). Eric Dyer, "Sales tax holiday coming next year," *News & Record* (Greensboro, NC), Sept. 27, 2001, All Editions, General News, p. A1. David Rice & Fran Daniel, "No-tax weekend local retail merchants brace for state's first sales-tax 'holiday,"' *Winston-Salem Journal* (Winston Salem, NC), July 27, 2002, Metro Edition, A, p. 1. Scott Mooneyham, "N.C. residents get back-to-school tax break," The Associated Press State & Local Wire, BC Cycle, State and Regional, July 31, 2003, available in LexisNexis. Steve Hartsoe, "N.C.'s third annual sales tax holiday a mixed bag," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 9, 2004, available in LexisNexis. Sue Stock, "Tax-free: easy as 1-2-3; N.C.'s 4th tax holiday is this weekend; here's your cliffs notes," *The News & Observer* (Raleigh, NC), Aug. 4, 2005, Final Edition, Business, p. D1.						
Oklahoma	2007	Fri., 8.3 - Sun., 8.5 (3 days)	Clothing and footwear priced less than $100 per item. The exemption excludes items primarily designed for athletic activity or protective use; accessories such as jewelry, handbags, luggage, umbrellas, wallets, and watches; and the rental of clothing or footwear.	-6.4	Yes	Local sales taxes are repealed for the state's STH. Layaway sales, rain checks, pre-orders, mail orders, and telephone and Internet purchases can be exempt from tax during the STH.
Sources: S. 861, 51st Okla. Leg., Reg. Sess. (Okla. 2007). See <http://www.sos.state.ok.us/documents/Legislation/51st/2007/1R/SB/861.pdf> (viewed Sept. 19, 2007). Okla. Tax Commission. "Up to the Minute: Oklahoma Sales Tax Holiday Set for August 3-5, 2007," July 10, 2007. (Refers to S. 861, 51st Okla. Leg., Reg. Sess. (Okla. 2007)). See <http://www.tax.ok.gov/upmin071007.html> (viewed Sept. 19, 2007). Okla. Tax Commission. "Emergency Rule 710:65-13-511 Sales Tax Holiday.' See <http://www.tax.ok.gov/rules/ER-65-13-511.pdf> (viewed Sept. 19, 2007). Angel Riggs, "It's your tax-free holiday: sales-tax exemption covers some items, but not others," *Tulsa World* (Tulsa, OK), Aug. 3, 2007, Final Home Edition, News, p. A9.						

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Pennsylvania	2000	Sun., 8.6 - Sun., 8.13 (8 days)	Personal computers (at a minimum, must include a central processing unit, random access memory, storage drive, display monitor, and keyboard) for nonbusiness use. Related hardware and software bought in the same transaction is exempt but not 'unrelated equipment and supplies' like paper. Upgrades, replacement parts, and new accessories like printers or scanners that are not purchased with a new computer remain taxable.	-8.3 to -10.0 (state)	No	Some local sales taxes are repealed for the state's STH. Mail, telephone, and Internet purchases can qualify for the STH. Customers must pay during the STH regardless but may place an order and take delivery later.
	2001	Sun., 2.18 - Sun., 2.25 (8 days)	Same as in 2000.	-8.3 to -10.0 (state)	No	Same as in 2000.
	2001	Sun., 8.5 - Sun., 8.12 (8 days)	Personal computers and accessories and Internet access devices for personal use. Software is taxable. Accessories are exempt even when not purchased with a computer.	-10.7 (state)	No	Same as in 2000.
	2002	Sun., 2.17 - Sun., 2.24 (8 days)	See August 2001 STH.	-10.7 (state)	No	Same as in 2000.

Sources: "Terms of the Pennsylvania computer sales-tax holiday," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 3, 2000, available in LexisNexis.
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Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
South Carolina	2000	Fri., 8.4 - Sun., 8.6 (3 days)	Non-business purchases of "clothing; clothing accessories including, but not limited to, hats, scarves, hosiery, and handbags; footwear; school supplies including, but not limited to, pens, pencils, paper, binders, notebooks, books, bookbags, lunchboxes, and calculators; computers, printers and printer supplies, and computer software; [and] bath wash clothes, blankets, bed spreads, bed linens, sheet sets, comforter sets, bath towels, shower curtains, bath rugs and mats, pillows, and pillow cases." Does not apply to "jewelry, cosmetics, eyewear, wallets, watches" or furniture sales. There are *no* price caps on exempted items.	-3.6	Yes	Local sales taxes are repealed for the state's STH. "[Items] place on layaway or similar deferred payment and delivery plan" are not exempt from tax.
	2001	Fri., 8.3 - Sun., 8.5 (3 days)	Same as in 2000.	-2.7	Yes	Same as in 2000.
	2002	Fri., 8.2 - Sun., 8.4 (3 days)	Same as in 2000.	-2.9	Yes	Same as in 2000.
	2003	Fri., 8.1 - Sun., 8.3 (3 days)	Same as in 2000.	-2.3	Yes	Same as in 2000.
	2004	Fri., 8.6 - Sun., 8.8 (3 days)	Same as in 2000.	-2.7	Yes	Same as in 2000.
	2005	Fri., 8.5 - Sun., 8.7 (3 days)	Same as in 2000.	-3.0	Yes	Same as in 2000.
	2006	Fri., 8.4 - Sun., 8.6 (3 days)	Same as in 2000.	-3.0	Yes	Same as in 2000.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2006	Fri., 11.24 - Sat., 11.25 (2 days)	"[All] purchases made by all nonprofit organizations, governmental agencies, business or any person." "Purchases considered exempt... include: apparel, footwear, electronic devices, machines, appliances, equipment, supplies, employee uniforms, jewelry, toys, cookware, repair parts, motor vehicles, manufactured homes, luggage, games, building materials, furniture, food, cosmetics, purchase of services...." It "does not apply to sales tax imposed on accommodations and additional guest charges, subject to tax under Code Section 12-36-920."	-14.4	No	The state sales, use, and casual excise taxes are suspended. Local sales taxes are *not* repealed for the state's STH.
	2007	Fri., 8.3 - Sun., 8.5 (3 days)	Same as in 2000.	-3.0	Yes	Same as in 2000.

Sources: S.C. Code Ann. §12-36-2120 (57) (2000). See <http://www.scstatehouse.net/code/t12c036.htm> (viewed Sept. 1, 2007).
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Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Tennessee	2006	Fri., 8.4 - Sun., 8.6 (3 days)	Non-business purchases of clothing and school supplies priced $100 or less per item and computers priced $1,500 or less per item. Clothing accessories or equipment, protective equipment, sport or recreational equipment, school art supplies, school instructional material, computer software, and school computer supplies are taxable.	-11.1 (state) -3.7 (local)	Yes	The state reimbursed localities for local sales tax losses. Mail, telephone, Internet, and certain layaway purchases can be exempt from tax during the STH. The seller's time zone determines the time period for the STH. Discounts and retailer coupons can be used to make goods exempt.
	2007	Fri., 8.3 - Sun., 8.5 (3 days)	Same as in 2006.	?	Yes	Same as in 2006.
Sources: Tenn. Code §67-6-393 (2006). See <http://www.michie.com/tennessee/lpext.dll?f=templates&fn=main-h.htm&cp=> (viewed Aug. 28, 2007). "Sept. tax revenue increases, despite sales tax holiday," The Associated Press State & Local Wire, Oct. 23, 2006, Business News.						
Texas	1999	Fri., 8.6 - Sun., 8.8 (3 days)	Clothing and footwear priced $100 or less per item. Does *not* include "any special clothing or footwear that is primarily designed for athletic activity or protective use and that is not normally worn except when used for the athletic activity or protective use for which it is designed; accessories, including jewelry, handbags, luggage, umbrellas, wallets, watches, and similar items carried on or about the human body, without regard to whether worn on the body in a manner characteristic of clothing; and the rental of clothing or footwear."	-25.6 (state) -7 (local)	Yes	Local sales taxes are repealed for the state's STH. Municipal participation was mandatory this year, but cities and towns can opt out of the program in 2000.
	2000	Fri., 8.4 - Sun., 8.6 (3 days)	Same as in 1999.	-29.2 (state) -7.8 (local)	Yes	Layaway items can now be exempt.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
	2001	Fri., 8.3 - Sun., 8.5 (3 days)	Same as in 1999.	-31.2 (state) -8.4 (local)	Yes	Same as in 2000.
	2002	Fri., 8.2 - Sun., 8.4 (3 days)	Same as in 1999.	-33.2 (state) -8.8 (local)	Yes	Same as in 2000.
	2003	Fri., 8.1 - Sun., 8.3 (3 days)	Same as in 1999.	-43.8 (state & local)	Yes	Same as in 2000.
	2004	Fri., 8.6 - Sun., 8.8 (3 days)	Same as in 1999.	-46.0 (state & local)	Yes	Same as in 2000.
	2005	Fri., 8.5 - Sun., 8.7 (3 days)	Same as in 1999.	-47.4 (state & local)	Yes	Same as in 2000.
	2006	Fri., 8.4 - Sun., 8.6 (3 days)	Same as in 1999.	-38.5 (state) -10.5 (local)	Yes	Same as in 2000.
	2007	Fri., 8.17 - Sun., 8.19 (3 days)	Same as in 1999, except backpacks priced $100 or less are now exempt.	-52.1 (state & local)	Yes	Same as in 2000.

Sources: Tex. [Tax] Code §§151.326-327. See <http://tlo2.tlc.state.tx.us/statutes/docs/TX/content/pdf/tx.002.00.000151.00.pdf> (viewed Aug. 31, 2007).
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Maria Halkias, "Tax-free holiday returns," *The Dallas Morning News* (Dallas, TX), Aug. 4, 2006, Business and Financial News.
Maria Halkias, "Tax-free weekend changes dates: backpacks go on list for shopping days, which move to Aug. 17-19," *The Dallas Morning News* (Dallas, TX), July 17, 2007, Business and Financial News.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Vermont	2003	Sat., 8.9 - Mon., 8.11 (3 days)	Desktop and laptop computers (but *not* palm-sized devices) for personal use, and associated equipment, e.g., keyboards and monitors but *not* printers, with a total value up to $4,000.	-0.06 (state)	No	Some local sales taxes are repealed for the state's STH.
	2004	Sat., 8.7 - Mon., 8.9 (3 days)	New and used desktop, laptop, and notebook computers for personal use priced $4,000 or less. When a separate charge is made for a monitor, keyboard, mouse, operating system software, or software installed by the original equipment manufacturer (OEM), these items are exempt if the central processing unit (CPU) is purchased during the same STH and the total charge, including the CPU, is at most $4,000. The exemption does *not* apply to hand-held devices; tablet PCs; software products (except operating systems) not installed by the OEM; and peripherals (printers, scanners, multifunctional office machines, digital cameras, web cams, storage devices, network switches, routers, adapters, cables, game controllers, and surge protection or uninterrupted power supply devices). If a computer and peripherals are bundled, the bundle is exempt if (1) the bundle is sold for $4,000 or less and (2) the most common selling price of items that would be taxed if charged separately is not more than $250 or 15 percent of the selling price of the package, whichever is greater.	?	No	Local sales taxes are repealed for the state's STH. Certain layaway sales qualify for the exemption. Computers purchased outside Vermont by mail-order or on the Internet are *not* subject to use tax.
	2004	Sat., 10.9 - Mon., 10.11 (3 days)	See August 2004 STH.	?	No	See Aug. 2004 STH.

Sources: "State lifts sales tax on computers for three days," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 4, 2003, available in LexisNexis. "Computers to be tax-exempt over three-day period," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 2, 2004, available in LexisNexis. George H. Phillips, Tax: Sales and Use Tax TB 30. Subject: Temporary Exemption for Computers August 7 - 9 and October 9-11, 2004, Vermont Department of Taxes, July 7, 2004. See <http://www.state.vt.us/tax/pdf.word.excel/legal/tb/TB30.pdf> (viewed Aug. 9, 2007). (Refers to 2004 Vt. Acts & Resolves 121 §51).

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Virginia	2006	Fri., 8.4 - Sun., 8.6 (3 days)	School supplies, including binders, book bags, writing utensils, paper, art supplies, and music supplies, priced $20 or less per item and clothing and footwear priced $100 or less per item. Sports equipment is taxable unless it falls under "clothing."	-3.6	Yes	Retailers can choose to "absorb" ("pay") the tax on any other items during the STH. Retailer or vendor discounts, coupons, or other credits can make items exempt from tax.
	2007	Fri., 8.3 - Sun., 8.5 (3 days)	Same as in 2006.	-3.8	Yes	Same as in 2006.
	2007	Fri., 10.5 - Mon., 10.8 (4 days)	"Energy Star qualified products [dishwashers, clothes washers, air conditioners, ceiling fans, compact fluorescent light bulbs, dehumidifiers, programmable thermostats, and refrigerators] with a sales price of $2,500 or less per product purchased for noncommercial home or personal use."	-0.166	Through 2011.	Retailers can choose to "absorb" ("pay") the tax on any other items during the STH. Retailer or vendor discounts, coupons, or other credits *cannot* make items exempt from tax. The STH is separate from the state's Energy Star Income Tax Deduction.*

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes
Sources: Va. Code §58.1-611.2. See <http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+TOC58010000006000000000000> (viewed Aug. 29, 2007). Va. Code §58.1-609.1. See <http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+58.1-609.1> (viewed Sept. 6, 2007). Virginia Department of Taxation. "Energy Star Sales Tax Holiday FAQ's," Sept. 24, 2007. See <http://www.tax.virginia.gov/site.cfm?alias=EnergyStarSalesTaxHolidayFAQs> (viewed Jan. 6, 2008). * (ibid.) "The Energy Star Income Tax Deduction allows for a deduction equal to 20% of the retail sales and use tax paid in purchasing for one's personal use, certain Energy Star qualified products. This deduction is completely separate and distinguished from the Energy Star Sales Tax Holiday. None of the rules that are listed in the Energy Star Sales Tax Holiday Guidelines will apply to the Energy Star Income Tax Deduction, nor will the rules governing the income tax deduction apply during the Energy Star Holiday." Sara Perkins, "Navigating the tax holiday maze," *The Virginian-Pilot* (Norfolk, VA), Aug. 2, 2006, The Virginian-Pilot Edition, Front, p. A1. Margaret Matray, "Sales-tax holiday isn't just for kids: first weekend in August, back-to-school shopping is only a part of the lure," *Richmond Times - Dispatch* (Richmond, VA), July 29, 2007, Final Edition, Business, p. D1. "State balances energy goals and lost revenue; sales-tax holiday comes as state faces budget shortfall," *Richmond Times - Dispatch* (Richmond, VA), Oct. 5, 2007, Final Edition, Business, p. B9.						
West Virginia	2002	Fri., 8.2 - Sun., 8.4 (3 days)	Clothing, footwear, school supplies, computers and educational software priced less than $100 per item. Furniture is not included.	-1.7	No	
	2003	Fri., 8.1 - Sun., 8.3 (3 days)	Clothing (but *not* athletic equipment or accessories such as jewelry, watches, purses, and wallets), footwear, and school supplies priced less than $100 per item; $750 in computer equipment; and computer accessories (*not* personal digital assistants, computer games, joy sticks, and MP3 players) up to $100 after credit for a manufacturer's rebate.	-1.9	No	
	2004	Fri., 8.6 - Sun., 8.8 (3 days)	Clothing and footwear (*not* athletic or sporting gear and accessories such as jewelry, handbags, purses, wallets, watches, and non-prescription eyewear) priced less than $100 per item; school supplies, including pens, pencils, binders, notebooks, reference books, book bags, lunch boxes, and calculators, priced less than $100 per item; individual computers or computers and computer accessories sold as a package if priced less than $750; computer accessories (*not* furniture, personal digital assistants, devices, software, or peripherals designed for recreational use) priced less than $100.	-1.9	No	Certain layaway, mail order, and Internet transactions qualify for the exemption. Manufacturer's coupons or rebates can make computers and accessories tax exempt.

Table 2.2: *Continued*

State	Year	Dates	Exempted Items	Fiscal Impact ($ millions)	Annual	Notes

Sources: Melanie Jarvis, "Tax takes a holiday: stores prepare for crush of shoppers," *Charleston Gazette* (Charleston, WV), Aug. 1, 2002 (Correction Date: Aug. 2, 2002), News, p. 1A.
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Jim Balow, "West Virginia's tax holiday applies to garters, tuxedos too," *The Charleston Gazette* (Charleston, WV), July 31, 2003.
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All dollar values quoted in this table are in nominal dollars.

CHAPTER III

Christmas in August: Prices and Quantities During Sales Tax Holidays

3.1 Introduction

Public finance economists have developed many models that predict the incidence of different taxes.[1] Estimation of these models is made difficult because of the lack of plausibly exogenous variation in tax rates. This is particularly true for sales taxes.[2] This paper exploits exogenous changes in sales tax rates due to sales tax holidays to estimate the incidence of state sales taxes on computers.

The sales tax holiday—a brief period of time during which state or local sales taxes are not levied on a set of goods—has become politically popular during the past decade (Cole (2008b)). Lawmakers' two chief policy goals in creating such holidays are to reduce the tax burden on families with children and to stimulate the economy generally or to encourage purchases of certain products in particular, e.g., computers. They implicitly, and sometimes explicitly, assume that tax-inclusive prices will decrease one-for-one with the tax rate during tax holidays.

There is some evidence supporting this hypothesis. Harper et al. (2003) sent students to collect price data on ten clothing items from retailers in the Pensacola, Florida Metropolitan Statistical Area (MSA) and the Mobile, Alabama MSA the week before, during, and after Florida's 2001 sales tax holiday.[3] They found the pre-tax price of a basket of 74 items in the Pensacola MSA increased roughly 1 percent during the holiday relative the week before and the tax-inclusive price decreased 5.6 percent when the state's 6 percent tax rate was rescinded during the holiday.

Doyle, Jr. and Samphantharak (2008) use the temporary moratoria of the sales taxes on gasoline

[1] See Fullerton and Metcalf (2002) for examples.

[2] For two examples of papers that investigate the long-run incidence of the sales tax on various products, see Besley and Rosen (1999), who cannot reject full pass-through of the sales tax onto consumers for some products and over-shifting of the sales tax for other goods, and Poterba (1996), who cannot reject full pass-through.

[3] Pensacola is roughly 60 miles southeast of Mobile. Alabama did not have a sales tax holiday until 2006.

in Illinois and Indiana in 2000 to estimate the incidence of sales tax.[4] They found "70 [percent] of the tax reduction is passed on to consumers in the form of lower prices, while prices increase by 80-100 [percent] of the tax when it is reinstated."

Using retail scanner data on computers spanning 9 tax holidays on computers during a 30-week period in 2007, I find the pre-tax price of a computer model *decreases* 0.27 percent during the tax holidays in the face of a 4.76 percentage point decrease in the sales tax rate. The point estimate is not statistically significantly different from zero. Taken at face value, though, the evidence suggests the sales tax on computers is fully or slightly over-shifted to consumers.

Separating out desktops from laptops, the data suggest (weakly) that retailers lower pre-tax prices of desktops during tax holidays, but the pre-tax prices for laptops do not change. I speculate that potential buyers of (inexpensive) desktops are more likely to be on the extensive margin of buying a computer than are purchasers of laptops. Therefore, during the tax holiday, retailers lower the pre-tax prices of desktops to induce purchases that otherwise would not have occurred in the absence of the holiday.

In addition to tax incidence, because tax holidays last for such a short period of time, lawmakers should be concerned that a tax holiday induces primarily a timing response from consumers—where consumers shift purchases that would have been made outside the tax holiday to occur during the the holiday to exploit the lower tax rates—instead of inducing purchases that otherwise would not have been made absent the tax holiday. This generates some tension between the two policy goals. Further, large timing responses of consumer purchases during tax holidays will generate large sales tax revenue losses on exempted goods.

Recent papers that examine the timing of purchases based on the tax benefits associated with doing so include House and Shapiro (2008), who find very large elasticities of investment supply (6-14) in response to the bonus depreciation allowance on long-lived capital goods that arose from federal laws passed in 2002 and 2003, and Sallee (2008), who finds consumers timed purchases of gasoline-electric hybrid vehicles just prior to reductions or eliminations of tax credits on those vehicles. He also finds that consumers captured nearly all of the subsidy, which is at odds with the inelastic supply of these vehicles at the time.[5] Cole (2008c) estimates the effects of having sales tax holidays on state sales tax collections; back-of-the-envelope calculations suggest up to half of the revenue reduction is due to consumers' timing purchases within the month to exploit the lower

[4]Curiously, this paper was not discussed during the 2008 U.S. Presidential primaries during which Senators John McCain (R-Arizona) and Hillary Clinton (D-New York) proposed to repeal the federal gasoline excise tax during the summer months of 2008.

[5]The author develops a model to rationalize these two findings.

tax rate during the holiday.[6]

In response to small price changes, I find consumers purchase large numbers of computers during sales tax holidays. For the week ending August 4th, consumers purchased 9.3 percent and 7.5 percent more desktops and laptops, respectively, in the tax holiday states than they did in those same states during the week that included the Friday and Saturday after Thanksgiving, routinely regarded as one of the year's busiest shopping weeks. There were no such spikes in purchases in the non-holiday states.

The time series plots of computer purchases suggest that purchases of desktops during the tax holidays are likely to be purchases that otherwise would not have occurred in the absence of the tax holiday. In contrast, the suggest that the tax holidays induce primarily a timing response from laptop consumers. During the tax holidays, the largest increases in computer purchases were for desktops priced between $250 and $750 and for laptops priced between $500 and $1,000.

To isolate the timing response from the "extra purchases" response, I constructed a counterfactual amount of computers that would sell in each tax holiday state if purchases in that state mimicked the purchases in a non-holiday control state. For the week of the tax holiday, the quantity responses ran from 5.76 to 16.53 more computers per 10,000 people than would be predicted in the absence of the holiday. The timing response accounts for between 37 and 90 percent of the increase in purchases in the tax holiday states over the 30-week horizon.

Because the timing responses are large, the tax revenue consequences of the policy are large as well. In the extreme case where there is only a timing response, I estimate the state governments that had tax holidays on computers in 2007 lost between $3.3 and $5.1 million in sales tax revenue because of the tax holidays. The revenue loss was largest in Tennessee, which lost in total between $0.67 million and $1 million.

In sum, it is safe to say the tax holidays achieve policymakers' goal of reducing consumers' tax burden. More computers are purchased—particularly desktops—during the tax holidays than would be if there were no such policy. The policy, however, produces a large timing response on the part of consumers, particularly those purchasing laptops, which leads to substantial sales tax revenue losses.

The remainder of the paper is organized as follows. The next section presents relevant background information on sales tax holidays. Section 3.3 provides an overview of the data and estimation strategy employed in the analysis. A discussion of the empirical results is found in section 3.4.

[6]He finds state sales and use tax collections decrease between 0.52 percent and 7.83 percent during tax holiday months.

Finally, section 3.5 summarizes, offers future avenues of research, and concludes.

3.2 Background

Since 1997, Americans have routinely encountered sales tax holidays. Cole (2008b) documents a total of 118 sales tax holidays occurring from 1997 through 2007 in 20 states and the District of Columbia and provides the dates of the holidays, the goods exempt from the sales tax during the holidays, and whether the holiday is an annual occurrence codified in the state's statute. In each year from 2004 through 2007, at least 100 million people lived in a state that had a sales tax holiday. This accounts for roughly 35 percent of the US population living in states with sales taxes.

The policy began as a way to keep New Yorkers from traveling to New Jersey to purchase clothing that was tax-free year-round in the Garden State. It initially spread to Florida and Texas in the late 1990s—when the economy was reaching the peak of the business cycle and those states' budgets were in surplus—as a way to offer tax relief to the states' residents. Over time, the policy expanded geographically and in terms of the breadth of goods covered, including school supplies, energy efficient appliances, hurricane preparedness items, and computers.

South Carolina was an innovator of this policy by including school supplies and computers to the list of exempted items during its inaugural holiday in 2000. Also in 2000, Pennsylvania had the first of its four tax holidays specifically for the purchases of computers. Three years later, Vermont held the first of its three holidays on computer purchases.

Fifteen states and the District of Columbia held 20 sales tax holidays in 2007. Seven holidays explicitly exempted computers from sales tax (see Table 3.1). Two others (Louisiana and Massachusetts) exempted a very broad range of consumer purchases.

Part of any tax reduction is to reward those who were already going to purchase the good in question and to induce additional purchases of that good. Political justifications focused on these two aspects once school supplies were added to the list of exempted goods. "'The sales tax holiday helps Georgia parents who are preparing their children for the right start to a new school year,' said [Georgia] Gov. Sonny Perdue. 'This holiday also provides a boost to retailers catering to those families.'"[7]

Texas state Senator Rodney Ellis (D-Houston) supported the tax holiday

> because Texas' sales tax rate of 6.25 percent is one of the nation's highest and 'has a disproportionate impact on low-income people.' ... [Adding local taxes,] the actual sales

[7] "Georgia sales tax holiday to begin July 29." The Associated Press State & Local Wire 30 June 2004, BC Cycle, State and Regional.

> tax can be as high as 8.25 percent. 'The least we can do is help them buy shoes and socks once a year,' Ellis Said.[8]

Mogab and Pisani (2007) surveyed 710 shoppers during Texas' 2004 sales tax holiday and found the holiday was an important factor in determining whether to shop that weekend for those with household income between $10,000 and $40,000 and for those expecting to spend between $100 and $750.

The tax holidays in Pennsylvania were intended "to boost Pennsylvania's lagging computer ownership rate."[9] In describing the purpose of Vermont's holiday—to encourage families and students to purchase computers—Governor James H. Douglas said, "Personal computers help us embrace technological advances that make it possible for Vermonters to operate in a diverse, high-wage economy, even while working from the most remote corners of our state[.]"[10]

Since sales tax holidays are hyper-transitory policies, the extent to which consumers benefit from a sales tax holiday depends crucially on the behavioral responses of consumers and retailers. Consumers are better off if the equilibrium prices they pay (weakly) decrease, and only if supply and demand are not perfectly inelastic will there be additional purchases. Because the holidays last for such short periods of time and because the goods exempted from sales tax during the holidays, particularly computers, are durable goods, the behavioral response of consumers is a mixture of a timing response (reordering when purchases occur to benefit from the lower tax rate) and extra purchases that would not have been made absent the lower tax rate. In the next section, I discuss the empirical approach and data used in the analysis below to shed light on these responses.

3.3 Estimation Strategy and Data

3.3.1 Estimation Strategy

Following the framework outlined in Besley and Rosen (1999), consider a retailer selling computer model i in state s in week t. The retailer chooses a vector of variables $\mathbf{x}_{ist}$, which may include both the tax-exclusive price p_{ist} and quantity q_{ist}, to maximize profit subject to the actions chosen by other retailers and the ad valorem sales tax rate τ_{ist}. Assuming a Nash equilibrium is reached, the solution to the problem is such that the tax-exclusive price equals a markup over marginal cost, and the tax-inclusive price is $(1 + \tau_{ist})p_{ist}$. The markup is a function of the tax rate, so the

[8] Kaplan, David. "Tax-Free Holiday; It's a Lot Like Christmas in August." *The Houston Chronicle* [Houston, TX] 1 August 2003, 3 Star Edition, Business: 1.

[9] Rebecca Sinderbrand, "Retailers hope tax break leads to big sales," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 1, 2001, available in LexisNexis.

[10] "State lifts sales tax on computers for three days," The Associated Press State & Local Wire, BC Cycle, State and Regional, Aug. 4, 2003, available in LexisNexis.

tax-exclusive price can be written as a function of the tax rate and a vector of cost shifters θ_{ist} that vary by computer model, state, and week:

$$p_{ist} = f_{ist}\left(\tau_{ist}, \theta_{ist}\right). \tag{3.1}$$

Besley and Rosen estimate a semilogarithmic specification of equation (3.1). Because the data in the current setting span only 30 weeks, I assume the marginal cost of a computer model within a state is time-invariant, i.e., $\theta_{ist} = \theta_{is}$.[11] With this functional form and cost structure assumption, equation (3.1) can be written as

$$ln\left(p_{ist}\right) = \boldsymbol{\phi}_{is} + \boldsymbol{\psi}_t + \beta\tau_{ist} + \varepsilon_{ist}, \tag{3.2}$$

where the $\boldsymbol{\phi}_{is}$ are model-state fixed effects, the $\boldsymbol{\psi}_t$ are week fixed effects, and ε_{ist} is an idiosyncratic error term. The model-state fixed effects encapsulate differences in costs and demand conditions across models and across states that are constant over time. The week fixed effects capture seasonal demand conditions that are the same across states within a week, e.g., weeks containing national holidays like Independence Day, Memorial day, and Thanksgiving.

Sales tax holidays induce variation in the sales tax rate on computers in the tax holiday states that are priced below the relevant price cap (see Table 3.1). Provided the variation in the sales tax rate for a computer model within a state is uncorrelated with unobservables, after netting out week-of-year effects, the parameter of interest β is identified. Properly interpreted, β is the percentage change in the tax-exclusive computer price, on average, given a one percentage point change in the state sales tax rate.

The value of β relative to zero provides insight into the degree to which the sales tax is shifted to consumers. A β that equals zero means the tax-exclusive price does not change when the sales tax rate changes. The sales tax is fully shifted to consumers; the tax-inclusive price decreases one-for-one with the tax rate during the sales tax holiday. A negative β implies the tax-exclusive price increases when the sales tax rate decreases during a tax holiday. The sales tax burden is shared between consumers and producers; the tax-inclusive price decreases during a tax holiday but not one-for-one with the tax rate. Finally, a positive β implies the tax-exclusive price decreases when the sales tax rate decreases during a tax holiday. The sales tax is over-shifted to consumers; the

[11] In contrast, their data cover 12 commodities in 155 cities from 1982 through 1990. I have no data on costs of production for any computer model. As such, and unlike Besley and Rosen, I cannot incorporate a measure of costs into the estimating equation.

tax-inclusive price decreases more than one-for-one with the tax rate during the tax holiday.

What sign of β should we expect? Because the attributes of computer models vary considerably across the price distribution, a model with differentiated products is an appropriate characterization of the computer market and lens through which to view the results. Below, I incorporate an ad valorem tax and an increase in the volume of shopping per household to the spatial competition model of Salop (1979).[12] Holding the volume of shopping per household and number of firms fixed in the short-run, a decrease in the sales tax rate leads to an increase in the tax-exclusive price. However, holding the sales tax rate and number of firms fixed in the short-run, an increase in the volume of shopping per household (during periods of high seasonal demand) leads to a decrease in the tax-exclusive price. The model therefore yield an ambiguous prediction about the sign of β; how pre-tax prices change during sales tax holidays is an empirical question.

In the Salop (1979) model, there is a fixed number of firms N located equidistantly apart on a circle, and each firm produces the good at a constant marginal cost c and a fixed cost F. Consumers are uniformly distributed along the circle. Each consumer exogenously demands q units of the good per period, and each consumer prefers to purchase the good at a location x that is nearest his most preferred location x^*. The consumer pays a tax-inclusive price $(1+\tau)p$ per unit of the good plus a transportation cost equal to k per unit of distance the farther away x is from x^*. Utility is

$$u = v - (1+\tau)\, p \cdot q - k|x - x^*|, \tag{3.3}$$

where $v > 0$ is sufficiently large to ensure $u > 0$ so that a purchase is made.

Store i competes with adjacent stores $i-1$ and $i+1$ for customers. Let the tax-exclusive prices at these stores be p_{i-1}, p_i, and p_{i+1}. A consumer located at $\widehat{x} \in [0, 1/N]$ from store $i+1$ is indifferent to traveling $\widehat{x}$ units to purchase the q units at store i or to travel $(1/N - \widehat{x})$ to purchase the units at store $i+1$ if

$$(1+\tau)\, p_i \cdot q + k\widehat{x} = (1+\tau)\, p_{i+1} \cdot q + k\left(\frac{1}{N} - \widehat{x}\right), \tag{3.4}$$

which implies

$$\widehat{x} = \frac{[(1+\tau)p_{i+1} - (1+\tau)p_i]\, q}{2k} + \frac{1}{2N}. \tag{3.5}$$

[12] This draws on results in Warner and Barsky (1995) and Fullerton and Metcalf (2002).

Similarly, a consumer located at

$$\widetilde{x} = \frac{[(1+\tau)p_{i-1} - (1+\tau)p_i]\,q}{2k} + \frac{1}{2N} \tag{3.6}$$

is indifferent to purchasing at store $i-1$ or at store i. Demand for store i arises from consumers located between $\widetilde{x}$ and $\widehat{x}$:

$$Q_d(p_{i-1}, p_i, p_{i+1}) = \frac{[(1+\tau)p_{i-1} + (1+\tau)p_{i+1} - 2(1+\tau)p_i]\,q}{2k} + \frac{1}{N}. \tag{3.7}$$

Firm i maximizes profit by choosing price p_i taking the prices of the other firms and the tax rate as given:

$$\underset{p_i}{\text{Max}}\ p_i Q_d(p_{i-1}, p_i, p_{i+1}) - cQ_d(p_{i-1}, p_i, p_{i+1}) - F. \tag{3.8}$$

Differentiating with respect to p_i and setting the resulting expression equal to zero yields firm i's best-response function. In a symmetric equilibrium, $p_i^* = p_{i+1}^* = p_{i-1}^*$, and we have

$$p_i^* = \frac{k}{N(1+\tau)q} + c,\ \forall i = 1, \ldots, N. \tag{3.9}$$

In the short-run, the number of firms N is fixed. This is a plausible assumption in the context of sales tax holidays since the modal holiday lasts only three days. Holding the number of units each consumer demands q constant, an increase in the sales tax rate leads to a decrease in the tax-exclusive price:

$$\left.\frac{dp_i^*}{d\tau}\right|_{N,q} = -\frac{k}{Nq(1+\tau)^2} < 0. \tag{3.10}$$

All else equal, a tax holiday would lead to an increase in the pre-tax price of computers ($\beta < 0$ in equation (3.2)).

Tax holidays occur during weekends, which Warner and Barsky (1995) argue are characterized by high demand, in August just prior to the resumption of school. Higher foot-traffic through stores as consumers do bulk shopping for back-to-school items increases the perceived number of consumers in a firm's market. In the model, this increase in q leads to a decrease in the firm's

tax-exclusive price as firms compete more heavily with one another:

$$\left.\frac{dp_i^*}{dq}\right|_{N,\tau} = -\frac{k}{N(1+\tau)q^2} < 0. \tag{3.11}$$

Anecdotal evidence from media accounts suggests there is a large increase in foot-traffic in stores during tax holiday weekends. In the model, τ is decreasing simultaneously as q is increasing during the tax holiday. This leads to an ambiguous prediction for how prices will change. The increased competition induced by the high seasonal demand serves to temper retailers' desire to increase their prices.

Further, consumers are primed by advertising and news stories leading up to the tax holiday to be highly cognizant of prices. This could increase the price elasticity of demand, lowering the mark-up and the tax-exclusive price. Complementary to this, retailers who sell computers as well as other items may choose to lower prices on computers (and/or other items in the store) to (1) entice consumers to purchase other goods in the store that they otherwise would not have purchased and (2) to prime consumers to think about that particular retailer the next time the consumer needs to purchase an expensive, durable good.[13] For these reasons, in the regression models, I would expect to see coefficient estimates near or greater than zero.

3.3.2 Data

The scanner data on computer purchases used in this paper come from the market research company The NPD Group, Inc. and span the 30 weeks between May 6, 2007 and December 1, 2007. During this period, nine states held tax holidays on computers (see Table 3.1). Eight of the holidays occurred on the first weekend in August; Massachusetts' holiday occurred one week later.

Each data cell is an item-state-week triplet. In what follows, I index items by i, states by s, and weeks by t. An item is a computer brand and model number. For privacy reasons, NPD generated a unique identifier for each item that masks the computer's brand and model number. The dataset contains the NPD identifier and whether the computer is a desktop or laptop computer. No other defining characteristics of the item are contained in the dataset.

When an item is purchased in one of NPD's retail partners' stores, its *pre-tax* price is logged into a database.[14] At the end of the week, which runs from Sunday through Saturday, the store

[13] Without scanner data on other goods sold in these stores, I cannot test hypotheses about consumer purchases of other durable goods in and around tax holidays. Future work should address this.

[14] The data are for brick-and-mortar stores only. The names of NPD's retail partners are confidential. However, they include many large retailers. In 2006, according to a report from the National Retail Federation (NRF) and Shop.org, online sales of computer hardware and software totaled $17.2 billion. This constituted

reports to NPD the number of units purchased and the total (tax-exclusive) revenue generated from that item. NPD sums the week's totals across their retail partners' stores in the state.[15] A row in the dataset contains the total quantity of item i sold in state s in week t, q_{ist}, and the total revenue generated from the purchases of that item, TR_{ist}. The total revenue is divided by the quantity to generate the average pre-tax price of the item, $p_{ist} = TR_{ist}/q_{ist}$.[16]

A computer is exempt from sales tax during a tax holiday if it is for personal use and if its pre-tax price is below a certain level. The price caps for the tax holidays in 2007 are listed in Table 3.1 and vary across the states, ranging from \$750 per *purchase* in Alabama to \$3,500 per *item* in Missouri and North Carolina. According to the statutes, if the computer's pre-tax price is even \$0.01 more than the price cap, the computer is fully taxed.[17] Let τ_s be the state sales tax rate in state s, and $\overline{p}_s$ be the price cap in state s. Then, the tax rate on computer i during the tax holiday period is

$$\tau_{ist} = \begin{cases} 0, & p_{ist} \leq \overline{p}_s \\ \tau_s, & p_{ist} > \overline{p}_s \end{cases} .^{18} \tag{3.12}$$

The sales tax rate data come from The Tax Foundation.

Local sales taxes were repealed during the tax holidays in Georgia, New Mexico, North Carolina, South Carolina, and Tennessee. Localities had a choice to repeal their taxes in Alabama, Louisiana, and Missouri. Local tax rates are not incorporated in the analysis below. As such, the state sales tax rate acts as a proxy for the combined state and local sales tax rate.

According to New Mexico's statute, retailers are *not* required to participate in the tax holiday. If a retailer does not participate, it remits taxes on sales made during the holiday as it normally would. If it chooses to participate, it remits taxes on sales made during the holiday only on computers with tax-exclusive prices exceeding \$1,000. Since it is unknown which retailers participated and which did not, I treated the data for New Mexico identically to that of the other states. All computers with pre-tax prices less than or equal to \$1,000 during the tax holiday had a state sales tax rate of

29.1 percent of the \$59.1 billion of personal consumption expenditures in 2006 on computers, peripherals, and software reported by the U.S. Bureau of Economic Analysis. See "Online sales spike 19 percent." CNN-Money.com, 14 May 2007. Accessed at http://money.cnn.com/2007/05/14/news/economy/online_retailing/ on March 12, 2009. See also "Table 2.4.5, Personal Consumption Expenditures by Type of Product," accessed at http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=69&Freq=Year&FirstYear=2006&LastYear=2007 on March 12, 2009.

[15] The 48 contiguous U.S. states and the District of Columbia are represented in the dataset.

[16] Dollar amounts are in nominal 2007 dollars.

[17] South Carolina and Louisiana are the exceptions; the former has no price caps during its holiday, and the latter exempts the *first* \$2,500 per item from tax.

[18] In Lousiana, the tax-inclusive price is p_{ist} for $p_{ist} \leq \$2,500$ and $p_{ist} + \tau_s(p_{ist} - 2500)$ for $p_{ist} > \$2,500$. In coding the tax rate for computers in Louisiana, I treated the \$2,500 as a strict cutoff as in the other tax holiday states. In the data, there was only one computer during Louisiana's tax holiday that had a pre-tax price greater than \$2,500.

zero.

As stated above, a reporting week in the dataset spans from Sunday through Saturday. Eight of the nine tax holidays occur on a Saturday and the succeeding Sunday. As such, the 'treatment' of the sales tax holiday technically covers two reporting weeks in the dataset. Figure 3.2 indicates that the majority of the purchases during the tax holiday occur during the first reporting week. In the regression analysis below, I define the tax holiday to occur the week ending August 11th for Massachusetts and the week ending August 4th for the remaining states in Table 3.1.[19]

Estimating equation (3.2) on the full sample is problematic because not every computer model is purchased in each week. If a model is not purchased in a given week, either because it was not on a store's shelf or, despite being on the shelf, no one purchased it, the model is not included in the dataset for that week. Only computers actually purchased are in the dataset. The dataset therefore is an unbalanced panel of computers available for purchase during this time period.

The unbalanced nature of the panel is important to consider when estimating a model using the fixed effects estimator since, for each computer model, the estimator first subtracts the mean price of that model over the periods it is observed. Having missing values affects this mean price. To the extent that less expensive computers have non-randomly missing observations in some of the weeks outside the tax holiday, we would expect the coefficient estimate on the sales tax rate to be biased.

The methods of addressing this issue fall under two headings: imputing prices in the missing weeks to construct a balanced panel and introducing sample selection criteria to construct a balanced panel. Bradley (2003) discusses four methods of imputing prices, the simplest of which is carrying forward the most recently observed price for the item. Instead of making what amounts to educated guesses about computer prices for missing observations, I choose to restrict the sample to include only computers that sold positive quantities each week within a window around the sales tax holiday.

A wide window around the tax holiday would better capture secular price changes during the period. The tradeoff with the wider window, however, is that fewer computers satisfy the criterion that they are observed each week. This necessarily leads to an estimate identified from an increasingly small number of computer models.

I examine computers that sold positive quantities each week in a two-week window on either side of the tax holiday (spanning the weeks ending July 21 through August 18). There are 6,177 computer models in this sample, 1,262 of which are in the tax holiday states. The number of models in these states varies from 88 in New Mexico to 177 in Georgia; the mean number of models is 140.

[19] I have produced tables where the tax holiday is defined to be the weeks ending August 11th and August 18th for Massachusetts, the week ending August 4th for Louisiana, and the weeks ending August 4th and August 11th for the remaining states in Table 3.1. These are found in the appendix.

3.4 Empirical Results

3.4.1 Prices

Table 3.2 displays summary statistics by week for the computers in the balanced panel. For the five-week period, the mean pre-tax price is $854.37 with a standard deviation of $391.69; the median pre-tax price is $791.53. The mean pre-tax price for desktops is $677.65 and $934.99 for laptops. The mean pre-tax price in the tax holiday states is nominally lower (by at most $30) but not statistically different from the mean pre-tax price in the non-holiday states in each week. This suggests that variation in tax-inclusive prices is due mainly to variation in sales tax rates, which in turn suggests the burden of the sales tax largely falls on consumers.

Table 3.3 presents results from estimating equation (3.2) on the sample described above. Columns I and IV pool all 6,177 computer models. 1,171 models—roughly 19 percent of the sample—qualified for the zero tax rate during the holiday. Taking the coefficient estimate in column I at face value, a one-percentage point increase in the state sales tax rate is associated with a 0.0559 percent increase in the pre-tax price, on average. In the tax holiday states, the mean state sales tax rate is 4.76 percent. So, during a tax holiday, the pre-tax price of a computer model would decrease, on average, by $4.76 \times 0.0559 = 0.266$ percent with a standard error of 0.293 percent. Nominally, the estimate indicates the sales tax is over-shifted to consumers, but statistically we cannot reject the pre-tax price of computers, on average, does not change during tax holidays. The estimate in column IV, constructed using the first difference estimator, also supports this finding.

Taken at face value, this coefficient estimate lines up with the findings in Warner and Barsky (1995). They find, controlling for type of good, month effects, and type of store, pre-tax prices decrease 0.64 percent, on average, on Friday, a day they argue that is characterized by exogenously high demand.

The regressions in columns I and IV treat computers as if they were homogeneous products. Desktops are being compared with laptops, and vice versa. $1,500 laptops are being compared to $750 desktops. Consumers shopping for a cheap desktop may be quite different from those shopping for a high-powered laptop. Therefore, retailers' pricing strategies before, during, and after tax holidays may differ based on the observable characteristics of the computers. Restricting the sample further to make the treatment computers (those that qualify for the tax holidays) and control computers more similar will refine the results.

I first restrict the sample to examine desktops and laptops separately. There are 1,935 desktop models in the sample, 18.5 percent of which qualified for the tax holidays; and there are 4,242

laptop models in the sample, 19.2 percent of which were tax-free during the tax holidays. When the sample is restricted to the desktops, the point estimate on the tax rate remains positive and is three times larger than it is for the pooled sample. Again, the point estimate remains statistically insignificant when the fixed effects estimator is applied to the data (column II of Table 3.3). When the first difference estimator is used (column V), the coefficient on the sales tax rate is marginally significant and positive, giving rise to weak evidence that retailers lower their prices on desktops during tax holidays and that therefore the sales tax on computers is overshifted to consumers. Estimating the same equation on the sample of laptops (columns III and VI), I find no evidence that pre-tax prices change during tax holidays.

Since the desktops are less expensive than laptops on average, I speculate that potential purchasers of (cheap) desktop computers are on the extensive margin of purchasing a desktop. Retailers lower their pre-tax prices during the tax holiday in an effort to get the prices below consumers' reservation prices to induce purchases that otherwise, absent the tax holiday, would not be made. Laptop customers, on the other hand, are less likely to be on the extensive margin of purchasing a computer, let alone a laptop. Therefore, retailers do not lower their pre-tax prices on laptops. If this story is true, it suggests that the purchases of laptops during a tax holiday are primarily a timing response and that purchases of desktops, particularly cheap desktops, are likely to include a greater proportion of "new" purchases.

In an effort to refine further the treatment and control computers to be more comparable to each other, I split the sample into different price groups and estimate equation (3.2) separately for each price group. This also allows examination of whether the pass-through implications of the sales tax vary across the price distribution. If the foregoing story is true, I would expect to see a positive coefficient on the tax rate for inexpensive desktops and coefficients near zero for laptops and more expensive desktops.

There are inherent problems with categorizing a computer based on its price, an endogenous variable. The computers that comprise a price group could change from week to week. For example, suppose only computers priced below $750 are tax-exempt during the tax holiday, and one of the price groups has a cutoff point at $750. It is plausible that a computer that sells for $774.99 in the week prior to the holiday would sell for $749.99 during the tax holiday. As the computer migrates from the higher price group to the lower price group, the mean in the lower price group could increase even though the tax rate decreases. This would attenuate the coefficient estimate on the sales tax rate.

The above example also illustrates the endogeneity a computer's tax rate, shown more formally in equation (3.12). The endogeneity of the tax rate appears not to be a large concern, though. Only 14 of the 994 computer models in the tax holiday states had prices above the price cap the week prior to the holiday and had prices below the price cap during the week of the holiday.

I create seven price groups with price cut-offs at every $250 from $500 to $2,000. In each week, I determine to which price group a computer model belongs. To address the endogenous group categorization issue, if the model remains in the same price group in each of the five weeks, it is retained in the sample. Otherwise, it is dropped from consideration.[20]

The results of estimating equation (3.2) for these prices groups are found in Table 3.4. The top panel provides estimates for when desktops and laptops are pooled together; the middle and bottom panels provide estimates for the sample restricted to desktops and laptops, respectively. The sample restrictions put in place to move from Table 3.3 to Table 3.4 cut the sample size approximately in half. Nearly half of all computers in the sample changed price groups at least once during this five week period.

In the pooled sample, the largest coefficient estimates are for the computers priced between $750 to $1,000 and the computers priced between $1,000 and $1,250. The estimate is marginally significant for the former price group. When desktops and laptops are pooled together, the point estimates for the other prices groups are an order of magnitude smaller, and none is statistically significant.

When the sample is restricted to desktops only, none of the coefficient estimates is statistically different from zero. However, the point estimate is nominally positive for each price group below $1,250, and the point estimate for the $250-$500 desktops is the largest among these. Though not statistically significant, this relatively large coefficient—compared to the coefficients for the other desktop price groups—fits with the story that retailers would lower prices of cheap desktop computers to induce consumers on the margin to make purchases they would otherwise not have made in the absence of the holiday.

Taken at face value, during the tax holiday, the pre-tax price of computers in this group in the tax holiday states would decrease 1.33 percent, on average. The mean pre-tax price of desktops in the tax holiday states during the week ending July 28 was roughly $416. With a 4.76 percent sales tax rate, the price consumers pay would be $436. During the holiday, the pre-tax price would

[20]Separately, and not reported herein, I classified a computer model based on to which price group it belonged in the first week of the panel and ran the regressions shown in Table 3.4. The coefficient estimates differed but not in a pattern I could discern. Only laptops initially priced between $1,250 and $1,500 had a statistically significant coefficient on the tax rate at the five percent level (0.2078 with a standard error of 0.0980).

decrease to $404; consumers would save $29, on average, if they purchased a desktop in this price group.

The coefficient estimate for laptops in this price group, however, was negative and statistically significant at the five percent level. During the week ending July 28, the mean pre-tax price for computers in this group in the tax holiday states was $423. Consumers would pay, on average, $443 given the mean sales tax rate of 4.76 percent. During the holiday, the pre-tax price would increase 3.71 percent, on average, to $436. Consumers would save only $7 if they purchased a laptop in this price group. The evidence, though it is only suggestive, supports the notion that retailers are lowering prices of desktops to induce purchases that otherwise would not be made.

The evidence thus far points to either full pass-through or mild over-shifting of the sales tax on computers. Taking the statistical significance of the coefficient estimates seriously, however, one interpretation of the finding that the tax rate has no effect on the pre-tax price is that firms have costs of changing their prices and have determined that the expected profit from changing prices does not exceed the cost of doing so. If menu costs are driving the result, it should be the case that a large number of computers do not experience a price change from week to week.[21]

Table 3.5 shows the number of computer models that experienced a price decrease, a price increase, or no price change from the preceding week for the weeks ending July 28th, August 4th (the tax holiday week), and August 11th. The computer models used to construct this table are the models used in tables 3.3 and 3.4. The top panel shows the results for all states; the middle panel shows results for the non-holiday states; and the bottom panel shows results for the tax holiday states. The table also displays the mean log price change from the preceding week for computers that had a positive or negative price change. Finally, the table displays the mean price in the preceding week for these different groups of computers.

From the week ending July 28th to the week ending August 4th, 68 of the 1,262 computer models (5.4 percent) in the tax holiday states experienced no price change, compared to 7.7 percent of the models models in the non-holiday states. The proportion of computers that decreased in price from July 28th to August 4th was 55.7 percent in the tax holiday states and 52 percent in the non-holiday states. These proportions increased, respectively, 7.5 and 1.1 percentage points from their values between the weeks ending July 21st and July 28th. The data indicate there are significant amounts of short-term price fluctuations, which is evidence against the menu cost interpretation of the finding that pre-tax prices, on average, do not change during sales tax holidays. Nominal

[21] Since the data are aggregated up to the state level, the observed price changes cannot be strictly interpreted as an individual retailer changing its price.

rigidities do not appear to be operative in these data.

Finally, one particularly interesting feature of the tax holiday policy is the price cap below which a computer must fall in order to have the zero tax rate during the tax holiday. This notch may cause retailers to set prices just below the price cap and for consumers to substitute from purchasing computers that are just above the price cap to those just below the cap. Following **?**, I test whether there is a discontinuity in the density function of prices at the price cap.

Table 3.1 shows how the price caps vary across states. Because of this variation, I normalize a computer's pre-tax price by subtracting off the price cap in its state. I focus on the week ending August 4th since eight of the tax holidays occur that week. I restrict the sample by omitting South Carolina, which has no price cap (or, alternatively, an infinite price cap), and Massachusetts, which has its tax holiday one week later. For this exercise, I will refer this to as the "full sample." In addition, I use the 5-week balanced panel of computers for these states.

In the full sample, if a computer model is priced near the price cap, it is more likely to be below the cap than above it. This is shown in the top panel of Figure 3.1. The estimated log discontinuity at the price cap is large (103 percent for desktops and 79 percent for laptops) and statistically significant at the one percent level. Retailers are aware of the price caps and are pricing computers just below the cap during the holiday week; consumers are more likely to purchase a computer just below the price cap than just above it. When restricting the sample to include only those computers that sold in each of the two weeks on either side of the tax holiday (the bottom panel of Figure 3.1), the result holds for laptops but not desktops. The estimated log discontinuity at the price cap is 76.3 percent for laptops—again significant at the one percent level—and 58.6 percent for desktops, which is not statistically significant.

One can find a discontinuity at the price cap in these states in weeks other than the one containing the tax holiday. I conjecture that this is because the price caps occur at psychological price points, e.g., \$750, \$1,000, and \$1,500. Retailers list prices just below these points, so we would expect a discontinuity in the density function even in the absence of a tax holiday. In the next section, I take up the quantity response of purchases in the face of price changes brought about by sales tax holidays.

3.4.2 Quantities

Figure 3.2 shows the aggregate time series of desktop computers (solid lines) and laptop computers (dashed lines) in states with tax holidays on computers (left axis) and in states without tax

holidays on computers (right axis) for the 30-week period in 2007 covered by the dataset. Consumers in tax holiday states purchased a large number of computers during tax holidays. There is no such response in the non-tax holiday states during the same weeks, though there is a continuation of a seasonal increase in laptop purchases in the non-holiday states during the week ending August 11.

Consumers purchased 9.3 and 7.5 percent more desktops and laptops, respectively, in the tax holiday states during the week ending August 4 than sold in those states during the week ending November 24, which included the Friday and Saturday after Thanksgiving, routinely regarded as one of the busiest shopping weeks of the year. In contrast, consumers purchased 55.5 percent fewer desktops and 54.3 percent fewer laptops in the non-tax holiday states during the week ending August 4 than they purchased in those states during the week of Thanksgiving. 'Christmas in August' is not journalistic hyperbole. 8.2 percent of the desktops purchased and 8.5 percent of the laptops purchased in the holiday states during this period were purchased during the week ending August 4, compared to 3.6 percent of desktop purchases and 3.7 percent of laptop purchases in the non-tax holiday states.[22]

Consumers purchased 58,599 more computers—an increase of 161 percent—in the tax holiday states during the week ending August 4 compared to the prior week. Laptop purchases constitute 71.6 percent of this increase.[23] Increased purchases in Georgia, North Carolina, and Tennessee, respectively, accounted for 25.2 percent, 21.8 percent, and 17.8 percent of the increase in computer purchases in the holiday states over this two-week period. These states also had the largest percent increases in computers purchased over this two-week period; purchases increased 308 percent in Tennessee, 221 percent in Georgia, and 195 percent in North Carolina.

Excluding the weeks ending August 4th and 11th, the contemporaneous correlation coefficient for desktop purchases in the two groups of states was 0.989 The desktop time series plots for the two groups of states fall atop one another for the weeks up to July 21. Purchases in the non-holiday states increase slightly relative to those in the holiday states for the week ending July 28, the week prior to most of the tax holidays. Similarly, after the week ending August 18, the plot for the tax holiday states lies below the plot for non-holiday states. This is indicative of consumers timing purchases of desktops to coincide with the tax holidays. However, that the area between the two plots outside the holidays is small relative the area between the plots during the holidays suggests

[22] 13.4 percent of the desktops purchased and 14.5 percent of the laptops purchased in the holiday states during the period were purchased during the weeks ending August 4 and August 11. In contrast, 7.1 percent of desktop purchases and 8.1 percent of laptop purchases in the non-tax holiday states occurred during those two weeks.

[23] As a point of reference, 71.9 percent of the computers purchased in the dataset were laptops.

that, while there is some timing behavior in the desktop market, most of the purchases in the weeks ending August 4th and 11th are additional purchases that would not have been made absent the tax holidays.

This contrasts with the market for laptops. Excluding the weeks ending August 4th and 11th, the laptop time series for the two groups of states had a contemporaneous correlation coefficient of 0.997. The series for the holiday states lies everywhere below the series for the non-holiday states except for the tax holidays weeks. This is particularly the case in the weeks after the tax holiday and before the Labor Day holiday (the week ending September 8th). It appears the timing behavior of consumers looms much more largely in the laptop market than in the desktop market.

Taken together, the aggregate plots for desktops and laptops provide evidence supporting the notion that purchasers of desktops are more likely to be on the extensive margin of buying a computer. The lower tax rate during the tax holidays induces them to buy desktops. On the other hand, laptop buyers are less likely to be on the extensive margin, and the existence of the tax holiday appears to make them shift their purchases across time to capture the benefits of the lower tax rate.

The foregoing raises the question of what types of desktops and laptops are being purchased in the holiday states. Figures 3.3 and 3.4 decompose, respectively, the desktop and laptop purchases in the tax holiday states into five, $250 price groups.[24] Desktops priced between $500 and $750 and between $250 and $500 experienced the largest increase in the number of units purchased during the week ending August 4 compared to one week earlier, increasing by 8,064 units (242 percent) and 6,339 units (152 percent), respectively. Laptops priced between $500 and $750 and between $750 and $1,000 experienced the largest increase in the number of units purchased over this two-week period, increasing by 20,265 units (196 percent) and 11,318 units (162 percent), respectively. More computers sold in nine of the ten price groups during the week ending August 4 than during the week of Thanksgiving, with $250 to $500 laptops' being the exception. The time series of the shares of desktops or laptops within a price group are noisy.

Plotting the time series of computer purchases by price group masks whether the computers in that group qualify for the tax holiday because of the existence of the price caps. The previous plots tell us consumers are purchasing more qualifying computers during the tax holidays. The plots do not tell us, however, whether consumers are also purchasing more non-qualifying computers at the same time.

[24] These groups cover 95.9 percent of desktop purchases and 98.0 percent of laptop purchases in the tax holiday states.

In Figure 3.5, I plot the time series for desktops (solid lines) and laptops (dashed lines) that qualify for the tax holiday (left axis) and for those that do not (right axis). A computer model within a state is defined to be a "qualifying model" if its price is less than or equal to the price cap in that state. For the weeks that do not include the tax holiday, one can think of this categorization as: "If the holiday were held this week, this computer model's price is below the price cap and would therefore qualify for the zero tax rate."[25]

There is an increase in the purchases of computer models that do not qualify for the preferential tax treatment for the week ending August 4tth. Non-qualifying desktop purchases increased 43.64 percent (236 to 339), and non-qualifying laptop purchases increased 48.21 percent (1,062 to 1,574).[26] 60.2 percent of the increased desktop purchases and 84.6 percent of the increased laptop purchases come from consumers in Alabama. Recall that Alabama had the lowest price cap of any of the states at $750. This suggests there were a substantial number of consumers in Alabama who determined the attributes of the computers priced below this restrictive cap did not fit their computing needs and, while still in the store, decided to purchase a computer above the price cap, forgoing any tax savings. Because the price caps were at least $250 greater in the other holiday states, there were fewer consumers in those states for whom the cap was relevant. Thus there is not as large an increase in non-qualifying computer purchases in those states.

The data clearly show that consumers in tax holiday states purchased large numbers of relatively inexpensive computers during the tax holidays. This behavioral response to the policy is a mixture of a timing response to take advantage of a lower tax rate that lasts at most three days and extra purchases that otherwise would not have been made absent the lower tax rate. To determine the magnitudes of these responses, I construct a counterfactual number of computers that would sell in the tax holiday states if purchases in those states mimicked purchases in the non-holiday states.

I first match each tax holiday state with a control state. I use the following state-level variables in the matching process: the 2007 unemployment rate, the 2007 population, the median household income in 2006, the percentage of individuals below the poverty rate in 2006, the proportion of the population in 2006 between the ages of 18 and 64, the median age in 2006, the proportion of the population aged 25 and above with a bachelor's degree or greater for the years 2005 through 2007, and the state sales tax rate in 2007. The data come from the U.S. Census Bureau, 2005-2007 American Community Survey and the U.S. Bureau of Labor Statistics. For each state s' that did

[25] Because prices are endogenous, so is the computer's categorization. As a reminder, though, in the balanced panel I constructed, only 1.4 percent of the qualifying models had prices above the price cap in the week preceding the tax holiday.

[26] For comparison, qualifying desktop purchases increased 166.59 percent (9,915 to 26,432), and qualifying laptop purchases increased 165.09 percent (25,094 to 66,521).

not have a tax holiday, I compute the sum of squared percent deviations of these values from the corresponding values in tax holiday state s. I choose the state s' that had the smallest sum to be the comparison state for state s. The top five comparison states for each tax holiday state are listed in Table 3.6. The comparison state's ranking among all 50 states and the District of Columbia is listed in parentheses; for example, Kentucky was the third best comparison state for Alabama.[27]

Next, I partition the price distribution into \$250 bins (the same ones in Table 3.4). Consider price group j. I compute the per capita quantity of computers sold in price group j in tax holiday state s and control state s' in week t. Call these q_{jst} and $q_{js't}$. Using the ordinary least squares estimator, I regress the former on the later using the first 10 weeks of data:

$$q_{jst} = \alpha + \beta q_{js't} + \varepsilon_{jst},\ t = 1, \ldots, 10, \tag{3.13}$$

and retrieve the coefficient estimates $\widehat{\alpha}$ and $\widehat{\beta}$.[28] I use these coefficient estimates to predict the per capita number of computers in price group j purchased in the holiday state s for the remaining 20 weeks of the sample.[29] Call these values $\widehat{q}_{jst}$. I then convert the per capita numbers into levels $\widehat{Q}_{jst}$. The effect of the policy on the quantity of computers purchased in price group j in state s in week t is the difference between observed purchases Q_{jst} and the predicted number of purchases $\widehat{Q}_{jst}$ and for the $(n-m)$-week period is

$$\sum_{t=m}^{n} \left(Q_{jst} - \widehat{Q}_{jst} \right). \tag{3.14}$$

I do this separately for each price group between \$250 and \$1,500 and separately for desktops and laptops.

In words, I am engaging in the following thought experiment. Suppose purchases of \$250-\$500 desktops in Alabama mimic those in Kentucky, which did not have a tax holiday on computers. Then how many \$250-\$500 desktops would we expect to be purchased in Alabama in the absence of a tax holiday? I regress the per capita number of desktop purchases in this price group in Alabama on those in Kentucky using the data from the weeks ending May 12th through July 14th. I then use the coefficient estimates to predict the per capita quantity of \$250-\$500 desktops purchased in Alabama for the weeks ending July 21st through December 1st. I convert these back to level quantities by multiplying by Alabama's population. These quantities are the purchases of \$250-\$500

[27] South Carolina and Louisiana were ranked first and second but could not be chosen as control states because they had tax holidays on computers.

[28] This corresponds to the weeks ending May 12th through July 14th.

[29] The week ending August 4th corresponds to week 13 in the dataset.

desktops we would expect to see in Alabama in the absence of a tax holiday. The difference between the actual purchases in the week of the tax holiday and the purchases predicted by the models yields an upper bound on the timing response for purchases in that price group. The difference between the actual purchases over the 30-week period and the purchases predicted by the models provides an estimate of the number of additional computer purchases that would not have otherwise been made in the absence of the holiday.

Table 3.7 presents results of these counterfactual exercise. The first column contains the total number of computers—desktops and laptops combined—priced between $250 and $1,500 that consumers purchased. The second column contains the predicted number of computers in this price range consumers would have purchased in the absence of the tax holiday. The third column is the difference between the observed and predicted number of computer purchases. It provides an estimate of the extra number of computers sold due to the tax holiday. Columns four through six replicate the first three columns but are scaled to be the number of computers purchased per 10,000 people. The top panel presents estimates for the first week of the the tax holiday; this means the week ending August 11th for Massachusetts and the week ending August 4th for the other states. The middle panel gives estimates for tax holidays that span two reporting weeks; for Massachusetts, this means the weeks ending August 11th and 18th, and for the remaining states (save Louisiana), this means the weeks ending August 4th and 11th. The bottom panel presents estimates for the entire 30-week period.

As an example, consumers in Alabama purchased 7,216 computers priced between $250 and $1,500 during the week ending August 4th. Using Kentucky as the control state, if purchases in Alabama mimicked those in Kentucky, we would expect consumers in Alabama to have purchased 2,689 computers during that week. Therefore, the timing effect is at most 4,527 computers; consumers purchased at most 168 percent more computers that week than would be predicted in the absence of Alabama's tax holiday.

Over the 30-week horizon, consumers in Alabama purchased 81,319 computers priced between $250 and $1,500. The models predict in the absence of the holiday, those consumers would have purchased 72,362 computers in this price range during this period. An upper bound for the additional computer purchases induced by the tax holiday over this horizon is therefore 8,957 computers; consumers purchased at most 12.4 percent more computers than they would have in the absence of Alabama's tax holiday. The timing effect accounts for up to 50.5 percent (4,527/8,957) of the increase in computer purchases in Alabama over this period.

This pattern largely holds with the other tax holiday states. Shifting purchases that were already going to be made across time to coincide with the lower tax rate is an important response to this policy. Timing explains 90 percent of the increase purchases over the 30-week horizon in South Carolina—which, recall, has no price cap—and 82 percent in Georgia and North Carolina.[30] On the low end of the spectrum, timing explains only 37.3 percent and 41.9 percent of the increased purchases in New Mexico and Massachusetts, respectively.

The results are sensitive to the choice of control state but in ways that are not easily discernable or predictable. Taking the next best match based on the procedure outlined above, timing explains 44.5 percent on the increase in purchases over the horizon in South Carolina. The results for Georgia and North Carolina are roughly comparable, at 81 percent and 76 percent, respectively. Using West Virginia as a control state for New Mexico, timing accounts for up to 50 percent of the increased purchases for the 30-week period.

On a per capita basis, the policy induced the largest response in Tennessee, where consumers purchased 16.53 more computers per 10,000 people during the week ending August 4th than they would absent the holiday. Georgia followed closely with 15.56 extra computers per 10,000 people. Interestingly, both states did not have the largest price caps. North Carolina, South Carolina, and Missouri had the largest price caps; consumers in those states bought 14.03, 10.92, and 10.82 more computers per 10,000 people than if those states didn't have tax holidays during that week.

Unsurprisingly, states with lower price caps had smaller quantity responses. Alabama and New Mexico had the first and second most restrictive price caps and the fourth and second lowest per capita quantity response, respectively. However, Louisiana, which had a relatively generous cap on the first $2,500 of each computer purchase, had the lowest quantity response at 5.76 extra computers per 10,000 people during the week ending August 4th. Louisiana and Massachusetts, which had the third lowest quantity response, had holidays that covered all consumer purchases of non-titled personal property priced $2,500 or less. With the wider array of tax-free goods from which to choose, I speculate that consumers in these states may have opted to increase purchases of other goods at greater rates than they did for computers.

3.4.3 Revenue Loss Estimation

Finally, in order to judge the costs and benefits of tax holidays, policymakers need a measure of the revenue lost as a consequence of this temporary tax moratorium. During the week of the tax

[30] Missouri is anomalous in that timing explains more than 100 percent of the increased purchases over the 30-week period.

holiday, computer purchases dramatically increase. I have argued above that part of the increase is a shifting of purchases across time to coincide with the lower tax rate, and the balance is purchases that otherwise would not have been made in the absence of the tax holiday. As a bounding exercise, we can think of the two extremes: one where there is only a timing response and another where there is no timing response. In the case where there is no timing response, there is obviously no tax revenue loss because the computers sold during the tax holiday would not have been purchased in the counterfactual world. Estimating the revenue loss when there is only a timing effect will provide policymakers with an upper bound for the truth.

As done above, index computer models by i, states by s, and weeks by t. The tax revenue raised in state s in week t is

$$R_{st} = \sum_i \tau_{ist} \cdot p_{ist} \cdot q_{ist}. \tag{3.15}$$

Suppose there is only a timing response of consumer purchases, and further suppose there is no price response by retailers. Under these assumptions, the counterfactual prices and quantities $\widehat{p}_{ist}$ and $\widehat{q}_{ist}$ equal their observed values *in some period*. If price data existed for each computer model in each week, the quantities sold during the tax holiday could be allocated across the other weeks and matched up the prices in those weeks, and a range for the counterfactual tax revenue could be produced and compared to the actual tax revenue raised.

However, I cannot do this with this dataset. I therefore assume that the price paid during the week of the tax holiday is what the price would have been had the consumer purchased the model outside the holiday. In effect, I am answering the question: "If consumers made the same purchases during the week of the tax holiday and the sales tax rate had been in effect, for the observed prices consumers paid that week, what would the tax revenue have been?" Since the tax rate is the same for all computer models i, the counterfactual tax revenue raised, given the assumptions, is

$$\widehat{R}_{st} = \sum_i \tau_{st} \cdot \widehat{p}_{ist} \cdot \widehat{q}_{ist} = \sum_i \tau_{st} \cdot p_{ist} \cdot q_{ist}. \tag{3.16}$$

The revenue loss associated with the tax holiday is

$$\widehat{R}_{st} - R_{st} = \sum_i (\tau_{st} - \tau_{ist}) \cdot p_{ist} \cdot q_{ist}. \tag{3.17}$$

Given the assumption that the response of consumers is purely a timing response, $\widehat{R}_{st} = R_{st}$ for

all non-holiday weekends. Therefore, the revenue loss in percentage terms decreases as the window around the tax holiday increases.

Table 3.8 provides estimates of the revenue loss on computers due to the tax holidays in 2007. In the top panel, the tax holiday week is the week ending August 11th in Massachusetts and the week ending August 4th in the remaining states. In the bottom panel, the tax holiday weeks are the week ending August 4th in Louisiana, the weeks ending August 11th and 18th in Massachusetts, and the weeks ending August 4th and 11th in the remaining states.

The revenue loss from the tax holidays is substantial. In raw dollar terms, Tennessee experienced the largest decrease in tax revenue, between $676,692 and $1,014,018. It also has the largest sales tax rate among the tax holiday states at seven percent. The state governments that had tax holidays on computers in 2007 collectively lost between $3,285,508 and $5,127,858 in sales tax revenue because of these policies.

Not surprisingly, the states with the largest price caps—South Carolina, North Carolina, and Missoui—generated no sales tax revenue from computer sales during the week ending August 4th. Louisiana and Massachusetts, which also had generous price caps, raised between $55 and $615, respectively, during their tax holidays. Alabama, which had the most restrictive price cap, raised the most tax revenue during its tax holiday but lost between $134,578 and $203,037 by having the policy.

Tax revenue statements are published at the monthly frequency, so I examine how much revenue loss would occur in August 2007. By construction, the dollar amount of the revenue loss is the same as it was during the week of the tax holiday. However, the percentage loss in tax revenue takes on a slightly different interpretation. It assumes that all the timing behavior of purchases induced by the tax holiday occurs during August, i.e., all the purchases were going to be made in August, but consumers moved those purchases into the week of the tax holiday. Under this assumption, sales tax revenue generated from computer sales declines between 27 and 40 percent in Alabama and 44 to 97 percent in Georgia. Similarly, if we assume the timing behavior occurs over the entire 30-week period, the sales tax revenue loss from having a tax holiday on computers ranges from 5.8 to 8.8 percent in Alabama to 12.4 to 18.5 percent in Tennessee. South Carolina is the median state and lost between 9 and 14.6 percent of its sales tax revenue from computers over this period because of the tax holiday.

3.5 Conclusion

Estimating the incidence of the sales tax has been a difficult task because of the lack of plausibly exogenous variation in tax rates. The sales tax holiday, a temporary moratorium of the sales tax on certain goods, is a source of such variation. In this paper, I exploited the transitory reduction in the tax base to estimate the incidence of the sales tax on computers using weekly, retail scanner data covering nine tax holidays in 2007.

Modifying slightly the spatial competition model of Salop (1979), I showed that when the sales tax rate is reduced during a period of high demand, the model produces an ambiguous prediction about the direction pre-tax prices will change. The increased competition retailers face due to greater foot-traffic in their stores during sales tax holidays serves to temper their desire to increase pre-tax prices. The incidence of the sales tax, as identified from changes in tax rates during tax holidays, is ultimately an empirical question.

When desktops and laptops are pooled together, I find the pre-tax price of a computer model would decrease 0.266 percent during the tax holidays, on average, in the face of a 4.76 percentage point decrease in the sales tax rate. Though the estimate is not statistically different from zero, taken at face value, it suggests that the sales tax on computers is either fully or slightly over-shifted to consumers. Because there are significant amounts of short-term price fluctuations in the data, menu costs do not drive the results.

This pattern remains when one examines desktops separately from laptops. There is weak evidence that retailers lower their prices on desktops during tax holidays. In contrast, I find pre-tax prices for laptops do not change during tax holidays.

Because desktops are less expensive than laptops, I speculate that retailers lower prices on desktops to induce purchases by consumers who are on the extensive margin of buying a computer. Laptop customers are less likely to be on the extensive margin, so retailers do not lower the pre-tax prices of these computers during tax holidays. When desktops and laptops are grouped into $250 price bins, the constellation of coefficient estimates for the desktops—though not statistically significant—supports the conclusion that either pre-tax prices are not changing or are decreasing slightly during tax holidays, particularly in the $250 to $500 price bin. Retailers selling laptops in the $250 to $500 price group, on the other hand, increased the pre-tax prices of these computers by a statistically significant 3.7 percent, on average, during the tax holiday.

A key feature of tax holidays is the existence of a price cap. In order for a computer to qualify for the zero tax rate during the holiday, its price had to be below a certain level, ranging from

$750 in Alabama to $3,500 in Missouri and North Carolina. This notch creates an incentive for retailers to price computers just below the price cap and for consumers to purchase those computers during the tax holidays. There is evidence supporting the conclusion that retailers and consumers do just this. However, this phenomenon exists not only during tax holiday weeks. I speculate this is because the price caps occur at psychological price points, e.g., $750, $1,000, and $1,500.

In the presence of minimal price changes, consumers purchase large amounts of computers during tax holidays. Consumers purchased 9.3 percent and 7.5 percent more desktops and laptops, respectively, during the week ending August 4th in the tax holiday states than they did in those states during the week including the Friday and Saturday after Thanksgiving, routinely regarded as one of the busiest shopping weeks of the year. There was no such spike in purchases in the non-holiday states.

The time series plots provide evidence that the purchases of desktops during the tax holidays are more likely to be purchases that would otherwise not have been made in the absence of the tax holidays and that the tax holidays induce primarily a timing response by purchasers of laptops. The largest increases in desktop purchases come from those priced between $250 and $750, while the largest increases in laptop purchases come from computers priced between $500 and $1,000. During the tax holidays, there is clearly an increase in purchases of computers that receive the preferential tax treatment, but there is also an increase in purchases of computers that remained taxable. This phenomenon was mainly isolated in Alabama, which had the strictest price cap at $750.

I isolated the timing effects and the "extra purchases" effects of the tax holidays by constructing a counterfactual amount of computers that would sell in each of the tax holiday states if purchases in those states mimicked purchases in non-holiday control states. Though the results are sensitive to the choice of control state, I found that the timing response accounts for between 37 and 90 percent of the increase in purchases in the tax holiday states over the 30-week horizon. Tennessee had the largest per capita response during the week of the holiday, 16.53 more computers per 10,000 people than would be predicted in the absence of the holiday. Louisiana, which had a generous price cap applied to all non-titled goods, had the smallest response at 5.76 computers per 10,000 people greater than would be predicted for the week ending August 4th in the absence of the tax holiday.

The sales tax revenue lost as a consequence of the policy is substantial. The state governments that had tax holidays on computers in 2007 lost between $3.3 and $5.1 million in sales tax revenue because of the tax holidays. The largest dollar loss was in Tennessee; the suspension of its 7 percent

sales tax on computers priced below $1,500 reduced sales tax collections between $0.67 million and $1 million. If the timing behavior was solely isolated to purchases in August, South Carolina was the median state and lost between 9 and 15 percent of its sales tax revenue arising from computer sales during this month.

Lawmakers' policy aims in creating tax holidays are to reduce the tax burden on families with children and to stimulate purchases of certain products such as computers. The evidence presented in this paper suggests that the sales tax on computers is fully or marginally overshifted to consumers. The tax holidays do appear to be achieving the goal of reducing consumers' tax burden.

The results herein also suggest that the reduction of the sales tax rate does induce purchases of computers that otherwise would not have been purchased in the absence of the holiday. This is particularly true for inexpensive desktops. However, the policy also generates large-scale retiming of purchases to coincide with the lower tax rates. This appears to be the case more for laptops than desktops, as laptops are more expensive, on average, and potential purchasers of laptops are less likely to be on the extensive margin of purchasing a computer.

Though the policy may be achieving the goals of policymakers, it comes at a substantial revenue cost. I question whether this is the most efficient way of achieving these goals. If it is desirable to eliminate the sales tax on computers for three days during the year, why not reduce it for the entire year (and raise the sales tax rate on other goods to make the policy revenue neutral)?

Future work on tax holidays should address the prevalence of cross-border shopping effects. The tax incidence results may differ depending on whether a jurisdiction is close to a state boundary or in the interior of a state or if the jurisdiction is in a large metropolitan area or in a rural part of a state. Data on other products exempt from tax during sales tax holidays should also be analyzed to see if the results of this paper are relevant only to computers or if they can speak more broadly to consumer and retailer behavior in and around tax holidays.

Table 3.1: Tax Holidays on Computers, 2007

State	**Dates**	**Price Cap**	**Annual**	**Tax Rate (%)**	**Notes**
Alabama	Fri., 8.3 - Sun., 8.5	$750/purchase	Yes	4	Counties and municipalities can choose to exempt these items from their sales tax during the state's holiday.
Georgia	Thurs., 8.2 - Sun., 8.5	$1,500/item	No	4	Local sales taxes repealed for the state's tax holiday.
Louisiana	Fri., 8.3 - Sat., 8.4	*First* $2,500/item	Yes	4	Local sales taxes are *not* automatically repealed for the state's holiday, but it appears parishes can vote to do so.
Massachusetts	Sat., 8.11 - Sun., 8.12	$2,500/item	No	5	None.
Missouri	Fri., 8.3 - Sun., 8.5	$3,500/item	Yes	4.225	Fifty-one counties and 169 cities chose to collect local taxes during the holiday.
New Mexico	Fri., 8.3 - Sun., 8.5	$1,000/item	Yes	5	Retailers are *not* required to participate in the holiday. If they do not participate, they pay tax on otherwise eligible sales and may recover their tax costs from the customer.
North Carolina	Fri., 8.3 - Sun., 8.5	$3,500/item	Yes	4	Local sales taxes repealed for the state's tax holiday.
South Carolina	Fri., 8.3 - Sun., 8.5	No price cap	Yes	6	Local sales taxes repealed for the state's tax holiday.
Tennessee	Fri., 8.3 - Sun., 8.5	$1,500/item	Yes	7	The state reimbursed localities for local sales tax losses.

Note: The tax rate is the state sales tax rate. See Cole (2008b) for more detail. Full citations available from the author upon request.

Table 3.2: Summary Statistics

		Week Ending				
		7/21	7/28	8/4	8/11	8/18
All States	Mean Pre-tax Price ($s)	875.67	863.52	851.13	844.53	837.03
	(Standard Deviation)	(393.02)	(392.12)	(396.82)	(391.64)	(383.65)
	Computers Sold	192,073	191,510	255,382	242,675	253,689
Non-holiday States	Mean Pre-tax Price ($s)	879.98	867.70	856.27	850.35	842.03
	(Standard Deviation)	(399.01)	(398.56)	(403.88)	(397.89)	(389.62)
	Computers Sold	162,016	163,671	176,399	190,658	214,083
Holiday States	Mean Pre-tax Price ($s)	858.87	847.23	831.09	821.88	817.53
	(Standard Deviation)	(368.47)	(365.65)	(367.52)	(365.55)	(358.90)
	Computers Sold	30,057	27,839	78,983	52,017	39,606
Alabama	Mean Pre-tax Price ($s)	850.83	842.18	821.18	816.15	807.20
	(Standard Deviation)	(350.85)	(347.59)	(356.45)	(355.32)	(341.78)
	Computers Sold	2,090	1,831	5,621	3,121	2,844
Georgia	Mean Pre-tax Price ($s)	850.74	836.61	823.72	816.32	812.53
	(Standard Deviation)	(364.31)	(357.61)	(362.20)	(361.08)	(357.05)
	Computers Sold	5,904	5,270	18,556	10,058	6,895
Louisiana	Mean Pre-tax Price ($s)	882.41	865.90	850.19	838.30	838.91
	(Standard Deviation)	(396.67)	(403.94)	(399.84)	(406.69)	(399.62)
	Computers Sold	2,830	2,593	5,122	3,100	3,188
Massachusetts	Mean Pre-tax Price ($s)	862.02	847.52	836.92	820.80	821.22
	(Standard Deviation)	(378.00)	(382.10)	(383.17)	(373.92)	(370.72)
	Computers Sold	4,197	4,363	4,176	9,802	8,087
Missouri	Mean Pre-tax Price ($s)	830.24	829.97	807.41	803.37	791.19
	(Standard Deviation)	(359.39)	(346.78)	(350.79)	(353.55)	(347.16)
	Computers Sold	3,343	2,863	9,062	5,466	3,965
New Mexico	Mean Pre-tax Price ($s)	800.05	808.27	785.92	780.77	774.38
	(Standard Deviation)	(293.47)	(290.63)	(302.13)	(299.16)	(284.84)
	Computers Sold	844	854	2,128	1,334	1,140
North Carolina	Mean Pre-tax Price ($s)	872.85	855.50	834.61	827.88	825.66
	(Standard Deviation)	(372.20)	(372.20)	(371.87)	(368.34)	(363.99)
	Computers Sold	5,570	5,159	16,318	9,648	6,464
South Carolina	Mean Pre-tax Price ($s)	877.52	867.18	851.21	844.14	839.11
	(Standard Deviation)	(352.00)	(343.96)	(347.51)	(342.01)	(336.69)
	Computers Sold	2,552	2,322	6,772	3,865	3,524
Tennessee	Mean Pre-tax Price ($s)	876.53	857.14	849.50	833.03	827.88
	(Standard Deviation)	(408.11)	(403.83)	(398.83)	(396.13)	(386.85)
	Computers Sold	2,727	2,584	11,228	5,623	3,499

Notes: The data come from the NPD Group. The sample is a balanced panel of computers observed each week from the week ending July 21st, 2007 through the week ending August 18th, 2007.

Table 3.3: Effect of Sales Tax Holidays on Pre-tax Prices

Dependent variable: ln(pre-tax price)	I	II	III	IV	V	VI
Sales Tax Rate	0.0559	0.1844	0.0066	0.0436	0.2271*	-0.0317
	(0.0614)	(0.1276)	(0.0680)	(0.0685)	(0.1371)	(0.0779)
r^2	0.034	0.0357	0.0364			
F	144.18	57.04	118.45			
Wald χ^2				719.06	283.39	591.69
Computers	All	Desktops	Laptops	All	Desktops	Laptops
Computer Models	6,177	1,935	4,242	6,177	1,935	4,242
Models in Holiday States	1,262	377	885	1,262	377	885
Qualifying Models	1,171	358	813	1,171	358	813
Observations	30,885	9,675	21,210	24,708	7,740	16,968

Notes: The data come from the NPD Group. The sample is a balanced panel of computers observed each week from the week ending July 21st, 2007 through the week ending August 18th, 2007. Columns I through III have computer model-state fixed effects and are estimated using the within estimator. Columns IV through VI are estimated using first differences for weeks endings July 28th, 2007 through August 18th, 2007. All specifications have week fixed effects. Robust standard errors, in parentheses, are clustered at the computer model-state level. A *, **, and *** represents statistical significance at the 10-, 5-, and 1-percent level, respectively.

Table 3.4: By Price Group, Effect of Sales Tax Holidays on Pre-tax Prices

Dependent variable: ln(pre-tax price)	\$250.01-\$500	\$500.01-\$750	\$750.01-\$1,000	\$1,000.01-\$1,250	\$1,250.01-\$1,500	\$1,500.01-\$1,750	\$1,750.01-\$2,000
				All Computers			
Sales Tax Rate	-0.0053	0.0211	0.1537*	0.1219	-0.0075	-0.0295	0.0190
	(0.2128)	(0.0819)	(0.0913)	(0.1190)	(0.0757)	(0.1240)	(0.1598)
Computer Models	605	1,087	945	252	242	41	56
Qualifying Models	112	239	175	51	37	5	7
Observations	3,025	5,435	4,725	1,260	1,210	205	280
				Desktop Computers			
Sales Tax Rate	0.2791	0.0762	0.1484	0.1052	-0.3393		
	(0.2415)	(0.1025)	(0.1355)	(0.1529)	(0.4603)		
Computer Models	449	456	257	48	18	14	
Qualifying Models	81	98	42	7	3	1	
Observations	2,245	2,280	1,285	240	90	70	
				Laptop Computers			
Sales Tax Rate	-0.7787**	-0.0067	0.1653	0.0796	0.0019	-0.0707	0.0190
	(0.3923)	(0.1132)	(0.1118)	(0.1323)	(0.0784)	(0.1523)	(0.1598)
Computer Models	156	631	688	204	224	27	56
Qualifying Models	31	141	133	44	34	4	7
Observations	780	3,155	3,440	1,020	1,120	135	280

Notes: The data come from the NPD Group. The sample is a balanced panel of computers observed each week from the week ending July 21st, 2007 through the week ending August 18th, 2007. Each regression is estimated using the fixed effects within estimator. All specifications have computer model-state fixed effects and week fixed effects. Robust standard errors, in parentheses, are clustered at the computer model-state level. A *, **, and *** represents statistical significance at the 10-, 5-, and 1-percent level, respectively.

Table 3.5: Mean Tax-Exclusive Prices for Models Decreasing, Increasing, or Not Changing Price

		Price Decreases Week Ending			Price Increases Week Ending			No Price Change Week Ending		
		7/28	8/4	8/11	7/28	8/4	8/11	7/28	8/4	8/11
	Mean log Price Change	-0.105	-0.105	-0.087	0.092	0.093	0.082	-	-	-
	(s.d.)	(0.1367)	(0.134)	(0.109)	(0.137)	(0.133)	(0.108)			
All States	Mean Price$_{t-1}$ ($s)	898.62	867.64	891.45	822.84	839.28	787.07	982.01	965.39	961.83
	(s.d.)	(398.32)	(391.74)	(416.89)	(374.30)	(385.29)	(357.88)	(410.79)	(414.74)	(418.55)
	Computer Models	3,119	3,296	3,066	2,493	2,435	2,678	565	446	433
	Mean log Price Change	-0.103	-0.106	-0.089	0.090	0.092	0.086	-	-	-
	(s.d)	(0.140)	(0.142)	(0.111)	(0.138)	(0.135)	(0.111)			
Non-holiday States	Mean Price$_{t-1}$ ($s)	902.00	870.99	903.10	828.70	844.08	783.80	985.07	969.10	970.84
	(s.d.)	(405.78)	(397.39)	(426.81)	(381.02)	(392.88)	(359.12)	(407.81)	(419.89)	(424.22)
	Computer Models	2,502	2,558	2,401	1,974	1,979	2,141	439	378	373
	Mean log Price Change	-0.112	-0.101	-0.080	0.098	0.097	0.070	-	-	-
	(s.d.)	(0.124)	(0.101)	(0.098)	(0.133)	(0.122)	(0.094)			
Tax holiday States	Mean Price$_{t-1}$ ($s)	884.95	856.03	849.36	971.34	944.73	905.79	800.57	818.44	800.12
		(366.49)	(371.50)	(376.22)	(422.49)	(387.10)	(379.84)	(347.01)	(350.07)	(352.91)
	Computer Models	617	738	665	519	456	537	126	68	60

Notes: The data come from the NPD Group. The sample is a balanced panel of computers observed each week from the week ending July 21st, 2007 through the week ending August 18th, 2007. Each column entry is for the set of computers whose tax-exclusive price decreased, increased, or did not change from the preceding week. For example, the first column refers to computer models whose tax-exclusive price decreased from the week ending July 21st, 2007 to the week ending July 28th, 2007. Standard deviations are in parentheses.

Table 3.6: Control States for Counterfactual Exercise

Tax Holiday State	Control State Possibilities
Alabama	Kentucky (3), Oklahoma (4), Oregon (5), Wisconsin(8), and Coloardo (9)
Georgia	Michigan (1), Ohio (3), Virginia (4), Pennsylvania (5), and Arizona(6)
Louisiana	Kentucky (1), Oklahoma (4), Oregon (5), Mississippi (6), and Iowa (7)
Massachusetts	Washington (1), Maryland (2), Virginia (3), Minnesota (4), and Wisconsin (5)
Missouri	Indiana (2), Wisconsin (3), Arizona (4), Washington (7), and Minnesota (9)
New Mexico	Nebraska (1), West Virginia (2), Idaho (3), Maine (4), and Kansas (5)
North Carolina	Michigan (2), Ohio (3), Indiana (4), Arizona (5), and Virginia (8)
South Carolina	Kentucky (1), Oklahoma (4), Oregon (5), Colorado (6), and Wisconsin (7)
Tennessee	Indiana (2), Arizona (3), Wisconsin (4), Kentucky (8), and Washington (9)

Notes: Control states are chosen based on the minimum sum of the squared percent deviations from the tax holiday state based on the following variables: the 2007 unemployment rate, the 2007 population, the median household income in 2006, the percentage of individuals below the poverty rate in 2006, the proportion of the population in 2006 between the ages of 18 and 64, the median age in 2006, the proportion of the population aged 25 and above with a bachelor's degree or greater for the years 2005 through 2007, and the state sales tax rate in 2007. The data come from the U.S. Census Bureau, 2005-2007 American Community Survey and the U.S. Bureau of Labor Statistics. The values in parentheses indicate the state's ranking among all other states and the District of Columbia. A (3) indicates the state had the third lowest sum among the remaining states.

Table 3.7: The Effect of Tax Holidays on Computer Purchases

	1-week Impact					
				Per 10,000 People		
State	Quantity Sold	Predicted Quantity	Effect	Quantity Sold	Predicted Quantity	Effect
Alabama	7,216	2,689	4,527	15.59	5.81	9.78
Georgia	21,244	6,391	14,853	22.26	6.70	15.56
Louisiana	5,948	3,479	2,469	13.85	8.10	5.75
Massachusetts	11,692	5,525	6,167	18.13	8.57	9.56
Missouri	10,356	3,995	6,361	17.62	6.80	10.82
New Mexico	2,735	1,065	1,670	13.88	5.41	8.48
North Carolina	19,039	6,329	12,710	21.01	6.98	14.03
South Carolina	8,435	3,620	4,815	19.14	8.21	10.92
Tennessee	13,713	3,534	10,179	22.27	5.74	16.53
			2-week Impact			
Alabama	11,621	5,429	6,192	25.11	11.73	13.38
Georgia	33,248	13,825	19,423	34.83	14.48	20.35
Louisiana						
Massachusetts	20,881	10,946	9,935	32.37	16.97	15.40
Missouri	17,254	8,317	8,937	29.35	14.15	15.20
New Mexico	4,625	2,117	2,508	23.48	10.75	12.73
North Carolina	30,608	13,542	17,066	33.78	14.94	18.84
South Carolina	13,771	7,313	6,458	31.24	16.59	14.65
Tennessee	20,910	7,324	13,586	33.96	11.90	22.07
			30-week Impact			
Alabama	81,319	72,362	8,957	175.72	156.36	19.35
Georgia	206,242	188,035	18,207	216.08	197.00	19.08
Louisiana	97,964	93,291	4,673	228.18	217.30	10.88
Massachusetts	160,904	146,186	14,718	249.47	226.65	22.82
Missouri	115,249	109,387	5,862	196.05	186.08	9.97
New Mexico	35,322	30,846	4,476	179.31	156.58	22.72
North Carolina	198,059	182,482	15,577	218.58	201.39	17.19
South Carolina	98,302	92,974	5,328	223.02	210.94	12.09
Tennessee	110,146	95,459	14,687	178.90	155.05	23.85

Notes: The one-week impact columns are for the week ending August 11th in Massachusetts and August 4th in all other states. The two-week impact columns are for the weeks ending August 11th and August 18th in Massachusetts and August 4th and August 11th in all other states. The results are aggregated for desktops and laptops priced between $250 and $1,500. Kentucky serves as the control state for Alabama, Louisiana, and South Carolina; Michigan for Georgia and North Carolina; Indiana for Missouri and Tennessee; Washington for Massachusetts; and Nebraska for New Mexico.

Table 3.8: Estimates of State Sales Tax Revenue Loss Due to Tax Holidays

	Week of Tax Holiday			August 2007			30-week Period		
State	Tax Rev. ($s)	Counterfactual Tax Rev. ($s)	% Dif.	Tax Rev. ($s)	Counterfactual Tax Rev. ($s)	% Dif.	Tax Rev. ($s)	Counterfactual Tax Rev. ($s)	% Dif.
Alabama	58,745	193,323	-69.61	367,269	501,848	-26.82	2,170,410	2,304,988	-5.84
Georgia	11,277	598,643	-98.12	738,594	1,325,959	-44.30	5,250,404	5,837,770	-10.06
Louisiana	55	179,414	-99.97	329,953	511,212	-35.46	2,752,924	2,944,683	-6.51
Massachusetts	150	407,334	-99.96	717,040	1,124,224	-36.22	5,311,961	5,719,144	-7.12
Missouri	-	310,011	-100	465,773	775,784	-39.96	3,106,149	3,416,160	-9.07
New Mexico	13,205	96,017	-86.25	188,264	271,076	-30.55	1,225,290	1,308,102	-6.33
North Carolina	-	545,493	-100	743,830	1,289,323	-42.31	5,137,388	5,682,882	-9.60
South Carolina	-	362,013	-100	547,796	909,809	-39.79	3,655,804	4,017,817	-9.01
Tennessee	10,046	686,738	-98.54	737,204	1,413,896	-47.86	4,794,667	5,471,359	-12.37
	Week(s) of Tax Holiday			August 2007			30-week Period		
State	Tax Rev. ($s)	Counterfactual Tax Rev. ($s)	% Dif.	Tax Rev. ($s)	Counterfactual Tax Rev. ($s)	% Dif.	Tax Rev. ($s)	Counterfactual Tax Rev. ($s)	% Dif.
Alabama	110,636	313,673	-64.73	298,811	501,848	-40.46	2,101,951	2,304,988	-8.81
Georgia	19,872	920,390	-97.84	425,441	1,325,959	-96.81	4,937,251	5,837,770	-15.43
Louisiana	55	179,414	-99.97	329,953	511,212	-35.46	2,752,924	2,944,683	-6.51
Massachusetts	615	735,845	-99.92	388,994	1,124,224	-65.40	4,983,915	5,719,144	-12.86
Missouri	-	510,981	-100	264,803	775,784	-65.87	2,905,179	3,416,160	-14.96
New Mexico	25,071	161,626	-84.49	134,521	271,076	-50.38	1,171,547	1,308,102	-10.44
North Carolina	-	863,139	-100	426,184	1,289,323	-66.95	4,819,743	5,682,882	-15.19
South Carolina	-	585,021	-100	324,787	909,809	-64.30	3,432,796	4,017,817	-14.56
Tennessee	19,400	1,033,418	-98.12	399,879	1,413,896	-71.72	4,457,341	5,471,359	-18.53

Notes: The counterfactual tax revenue is computed by multiplying the state sales tax rate by the price and quantity of computers sold in the state during the period in question. In the top panel, the tax holiday week is the week ending August 11th in Massachusetts and the week ending August 4th in all other states. In the bottom panel, the tax holiday weeks are the week ending August 4th in Louisiana, the weeks ending August 11th and August 18th in Massachusetts, and the weeks ending August 4th and August 11th in all other states.

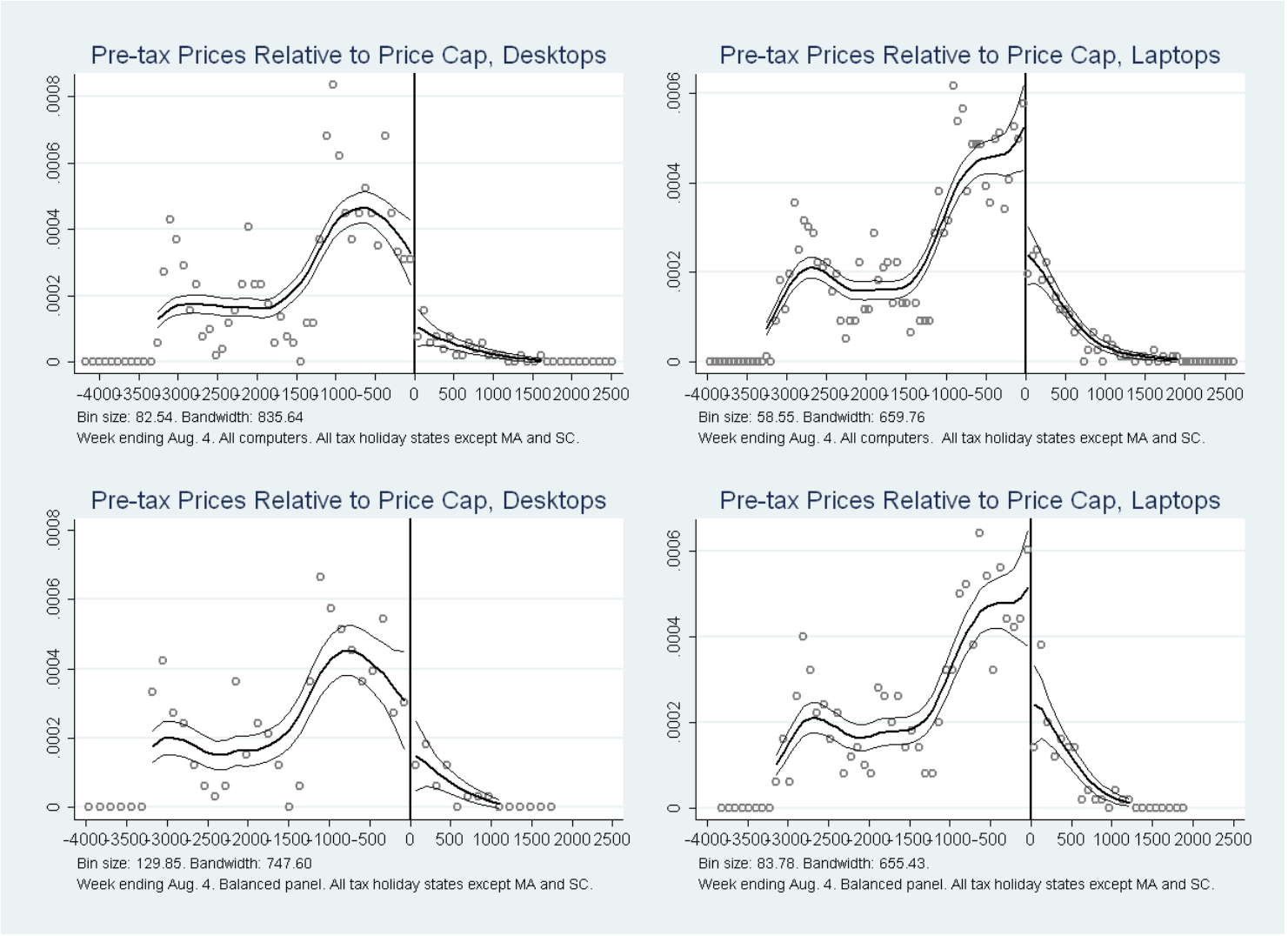

Figure 3.1: By Computer Type, Price Densities Relative to Price Cap

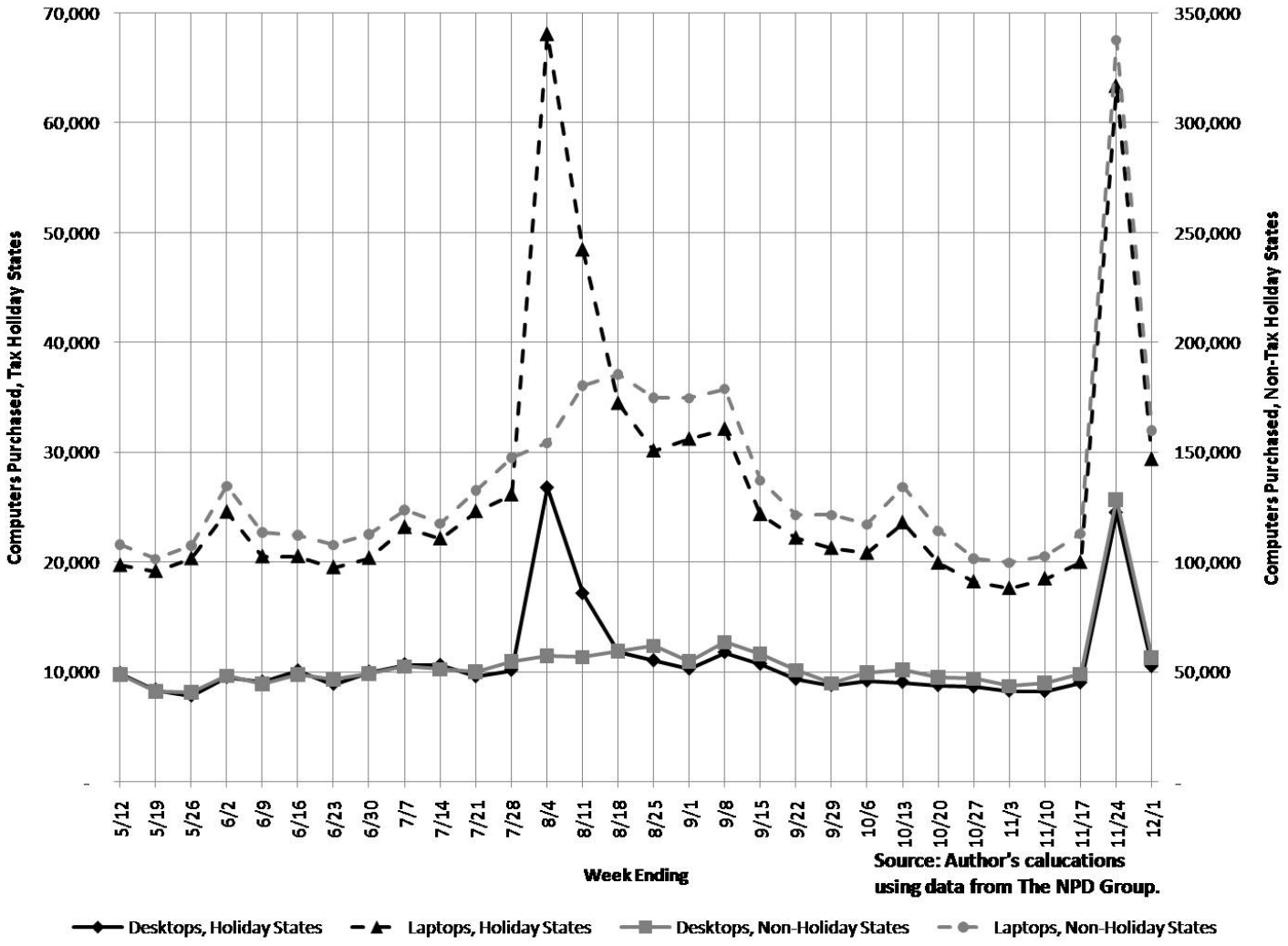

Figure 3.2: By Computer Type and State, Computers Purchased

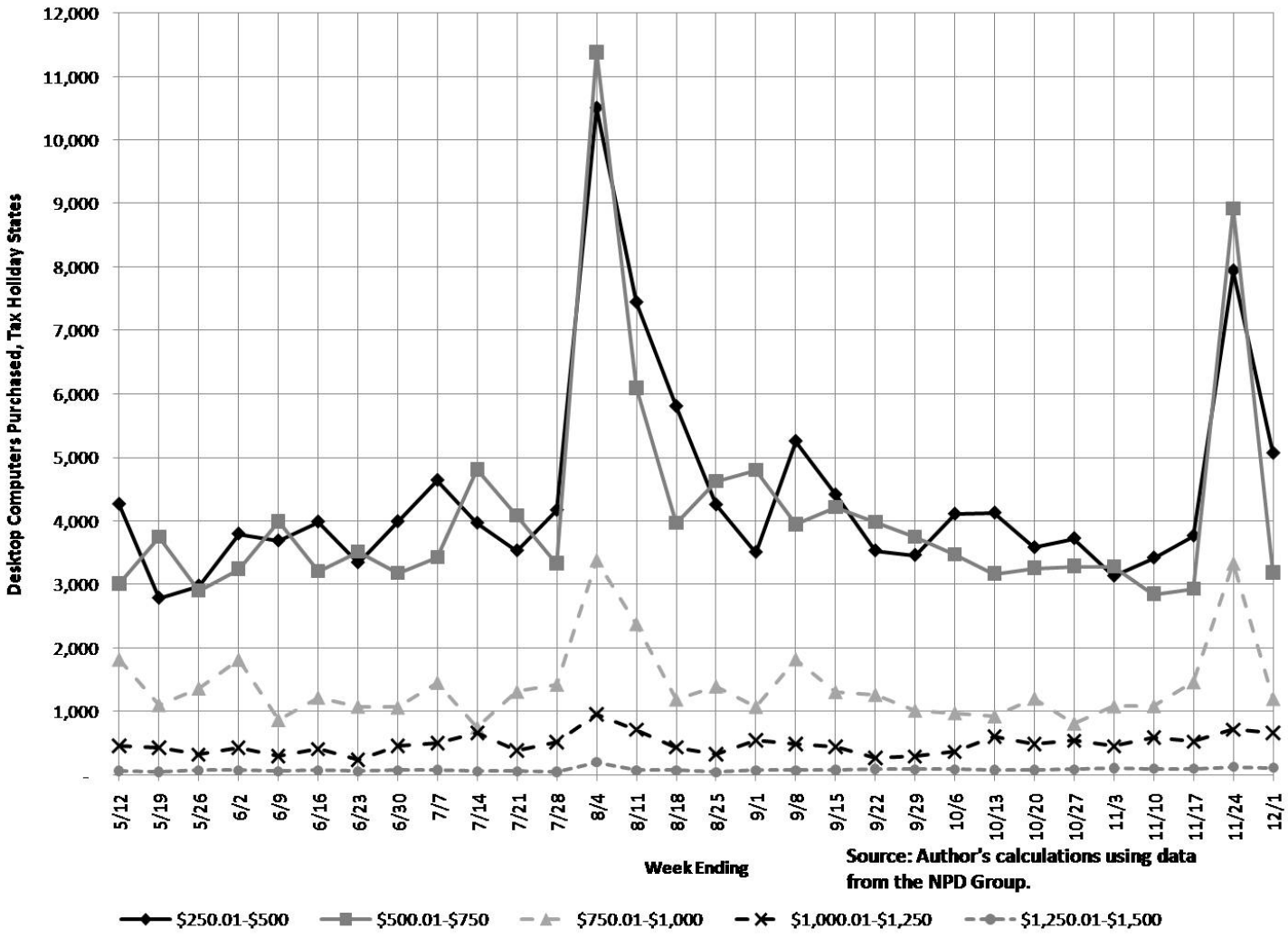

Figure 3.3: By Price Group, Desktops Purchased in Tax Holiday States

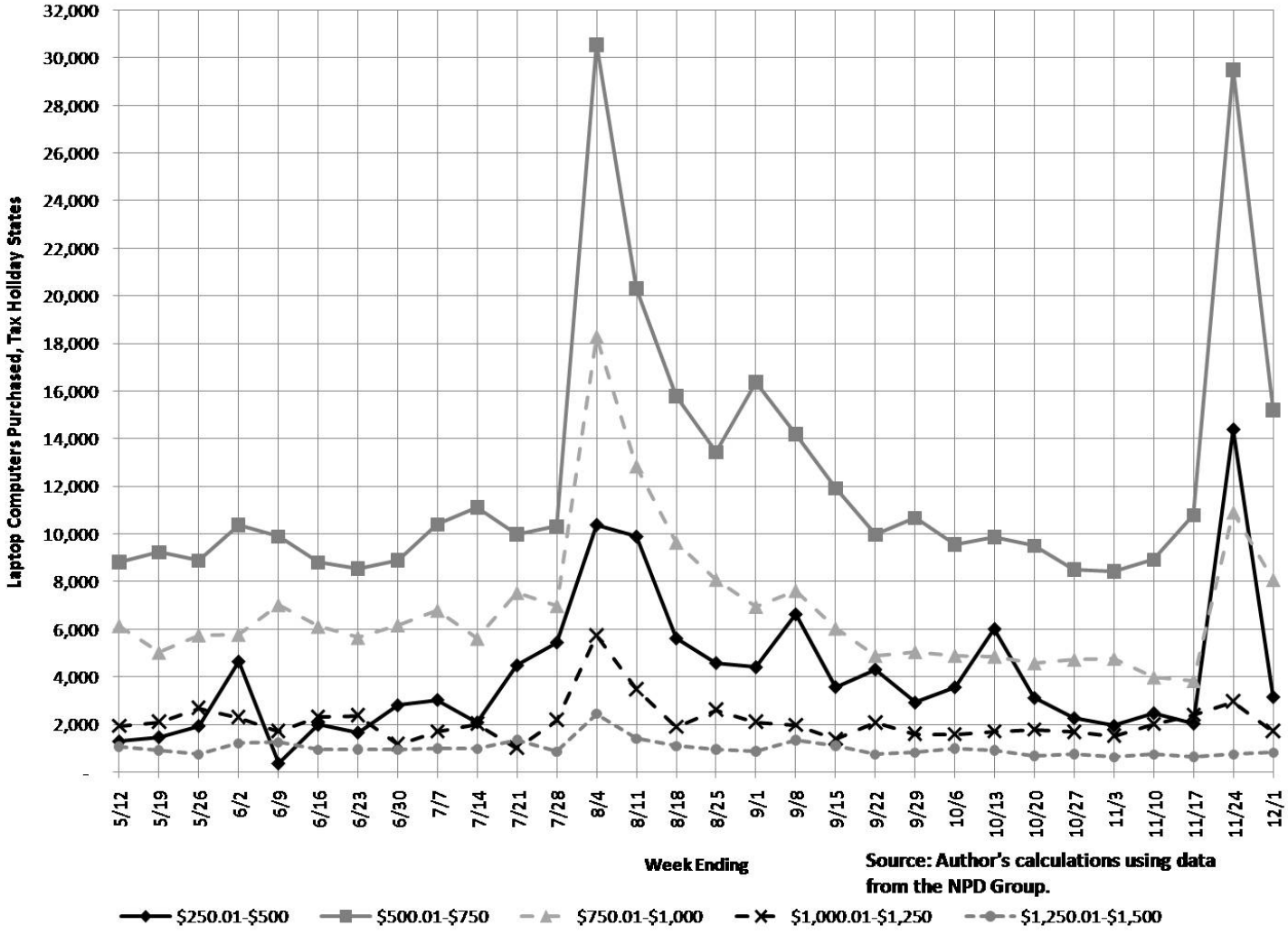

Figure 3.4: By Price Group, Laptops Purchased in Tax Holiday States

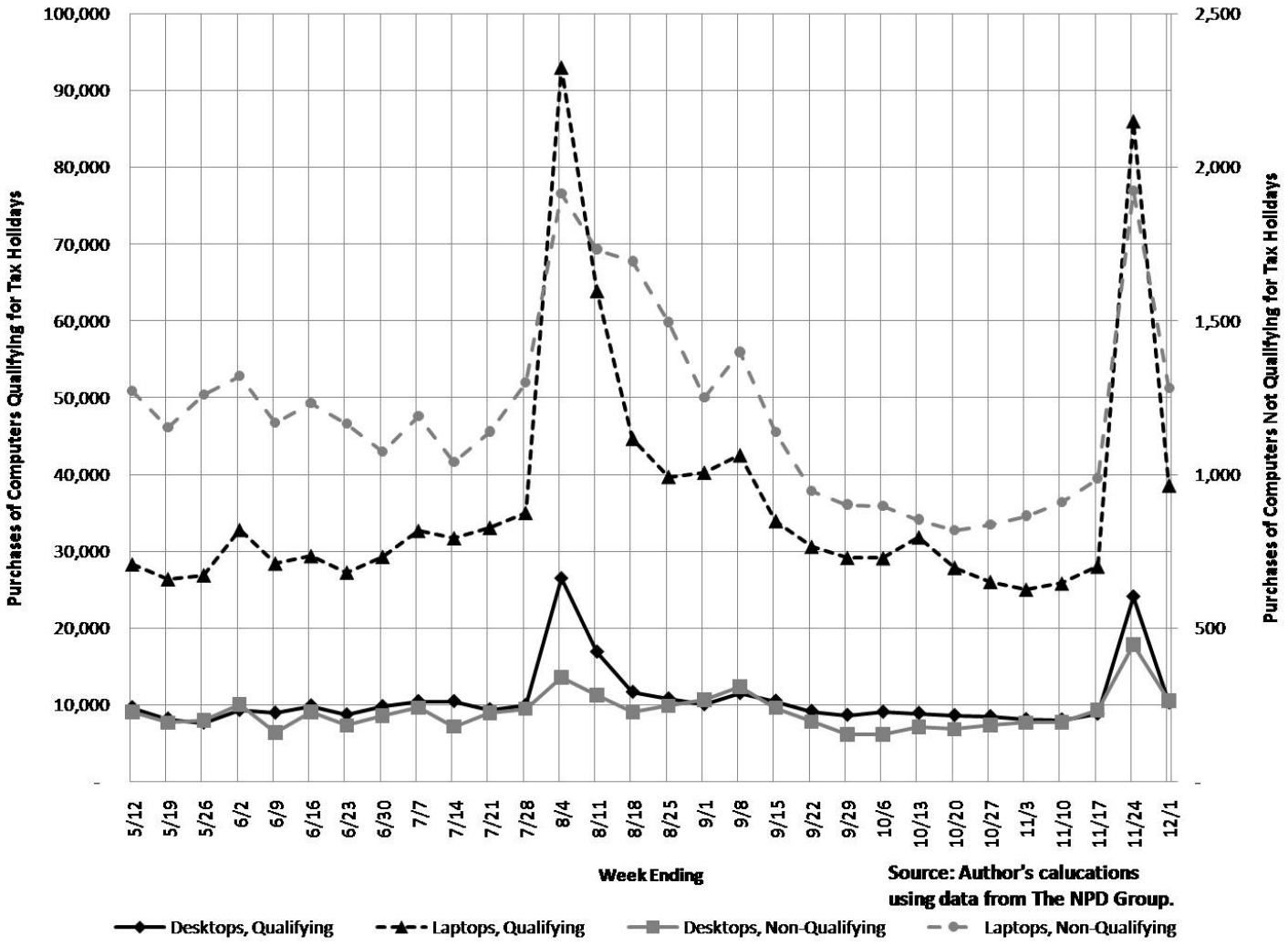

Figure 3.5: Qualifying vs. Non-qualifying Computer Purchases in Tax Holiday States

3.6 Appendix

In this appendix, I replicate Tables 3.3 and 3.4. The tax holidays in eight states include a Sunday. As such, they bleed over into a second reporting week in the data. For the holidays that last for two reporting weeks, roughly 3/5ths to 2/3rds of the computers purchased were purchased in the first of the two reporting weeks. In the tables below, I define the tax holiday to occur the week ending August 4th in Louisiana, the weeks ending August 11th and August 18th in Massachusetts, and the weeks ending August 4th and August 11th for the remaining states in Table 3.1.

The coefficients below are often greater than they are in Tables 3.3 and 3.4. I offer a possible explanation for the difference presently. If retailers had inventories of computers in excess of their optimal levels after the tax holiday and then reduced the prices of those computers immediately after the holiday ended (during the second reporting week of the holiday) so as to reduce inventory levels, this will tend to increase the coefficient estimates relative to what they would be when the tax holiday is defined for only one reporting week.

Table 3.9: Effect of Sales Tax Holidays on Pre-tax Prices

Dependent variable: ln(pre-tax price)	I	II	III	IV	V	VI
Sales Tax Rate	0.1264**	0.2159	0.0931	0.1296*	0.3308**	0.0484
	(0.0620)	(0.1327)	(0.0673)	(0.0716)	(0.1596)	(0.0757)
r^2	0.0341	0.0358	0.0365			
F	146.06	58.49	118.68			
Wald χ^2				727.06	291.05	592.12
Computers	All	Desktops	Laptops	All	Desktops	Laptops
Computer Models	6,177	1,935	4,242	6,177	1,935	4,242
Models in Holiday States	1,262	377	885	1,262	377	885
Qualifying Models	1,171	358	813	1,171	358	813
Observations	30,885	9,675	21,210	24,708	7,740	16,968

Notes: The data come from the NPD Group. The sample is a balanced panel of computers observed each week from the week ending July 21st, 2007 through the week ending August 18th, 2007. Columns I through III have computer model-state fixed effects and are estimated using the within estimator. Columns IV through VI are estimated using first differences for weeks endings July 28th, 2007 through August 18th, 2007. All specifications have week fixed effects. Robust standard errors, in parentheses, are clustered at the computer model-state level. A *, **, and *** represents statistical significance at the 10-, 5-, and 1-percent level, respectively.

Table 3.10: By Price Group, Effect of Sales Tax Holidays on Pre-tax Prices

Dependent variable: *ln*(pre-tax price)	$250.01-$500	$500.01-$750	$750.01-$1,000	$1,000.01-$1,250	$1,250.01-$1,500	$1,500.01-$1,750	$1,750.01-$2,000
				All Computers			
Sales Tax Rate	0.1812	0.0402	0.1886**	0.1283	-0.0308	-0.1013	0.0975
	(0.2015)	(0.0847)	(0.0782)	(0.1047)	(0.0937)	(0.0709)	(0.2568)
Computer Models	605	1,087	945	252	242	41	56
Qualifying Models	112	239	175	51	37	5	7
Observations	3,025	5,435	4,725	1,260	1,210	205	280
				Desktop Computers			
Sales Tax Rate	0.3964*	0.0726	0.2800**	0.2241***	-1.0280		
	(0.2379)	(0.1009)	(0.1111)	(0.0828)	(0.6187)		
Computer Models	449	456	257	48	18	14	
Qualifying Models	81	98	42	7	3	1	
Observations	2,245	2,280	1,285	240	90	70	
				Laptop Computers			
Sales Tax Rate	-0.4297	0.0202	0.1600*	0.0837	0.0221	-0.1940**	0.0975
	(0.3739)	(0.1203)	(0.0964)	(0.1212)	(0.0923)	(0.0868)	(0.2568)
Computer Models	156	631	688	204	224	27	56
Qualifying Models	31	141	133	44	34	4	7
Observations	780	3,155	3,440	1,020	1,120	135	280

Notes: The data come from the NPD Group. The sample is a balanced panel of computers observed each week from the week ending July 21st, 2007 through the week ending August 18th, 2007. Each regression is estimated using the fixed effects within estimator. All specifications have computer model-state fixed effects and week fixed effects. Robust standard errors, in parentheses, are clustered at the computer model-state level. A *, **, and *** represents statistical significance at the 10-, 5-, and 1-percent level, respectively.

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CHAPTER IV

The Fiscal Impact of Sales Tax Holidays

4.1 Introduction

The sales tax holiday—a brief period of time during which state or local sales taxes are not levied on a set of goods—has become politically popular over the past decade.[1] Lawmakers' two chief policy aims in creating such a holiday are to reduce the tax burden on families with children and to stimulate the economy. Because tax holidays last for such a short period of time, lawmakers should be concerned that the response of purchases in the face of the lower tax rate is primarily a shifting of purchases that were already going to occur from one period to another instead of generating purchases that would otherwise not have occurred absent the lower tax rate. This generates some tension between the two policy goals. This paper investigates the effect of sales tax holidays on state sales tax collections and estimates what portion of the revenue loss can be attributed to consumers' timing their purchases to take advantage of the transitory reduction in the state's sales tax base.

Economists have estimated timing responses and the revenue consequences arising from changes in the tax code in a variety of contexts. Some have examined such life events as birth (Dickert-Conlin and Chandra (1999)), marriage (Gelardi (1996) and Alm and Whittington (1997)), and death (Slemrod and Kopczuk (2003)). Others have looked at the timing of capital gains realizations (Auten et al. (1989)) and of charitable contributions (Randolph (1995)).

Closer to the setting examined in this paper, House and Shapiro (2008) investigate business purchases of long-lived capital goods. They find very large elasticities of investment supply (6-14) in response to the bonus depreciation allowance on long-lived capital goods that arose from federal laws passed in 2002 and 2003. Sallee (2008) finds consumers timed purchases of gasoline-electric

[1] See Cole (2008b). To fix ideas for the ensuing discussion, I examine sales tax holidays that (1) have duration strictly less than one month, (2) are state-level policies, i.e., state sales tax is not levied on certain products in the entire state, and (3) do not include gasoline or other petroleum products as tax-exempt.

hybrid vehicles just prior to reductions or eliminations of tax credits on those vehicles.

Using exogenous changes in sales tax rates during sales tax holidays, Cole (2008a) presents evidence of timing behavior of consumers purchases of computers—particularly laptops—during sales tax holidays. Consumers purchased between 5.76 and 16.53 more computers per 10,000 people than would be predicted if there were no tax holidays. The shifting of purchases to the days of the tax holidays to take advantage of the lower tax rate accounts for between 37 and 90 percent of the increase in computer purchases. Because of the large timing effects, states that had tax holidays on computers in 2007 lost between $3.3 and $5.1 million in sales tax revenue.

Doyle, Jr. and Samphantharak (2008) use the temporary moratoria of sales taxes on gasoline in Illinois and Indiana in 2000 to estimate the incidence of the tax on gasoline prices. Since they did have not access to data on the number of gallons purchased, they did not estimate the revenue lost from this policy. However, they quote government reports suggesting Illinois lost $157 million in its 184-day moratorium and Indiana lost $46 million in its 120-day moratorium.

Harper et al. (2003) use Florida's 2001 sales tax holiday to estimate the incidence of the tax on certain items of clothing. They sent students to collect price data on ten clothing items from retailers in the Pensacola, Florida Metropolitan Statistical Area (MSA) and the Mobile, Alabama MSA the week before, during, and after the sales tax holiday.[2] Because they did not collect data on quantities purchased, they could not estimate the tax revenue lost.

Lack of high-frequency data has hampered efforts to estimate the aggregate fiscal consequences of sales tax holidays. To remedy this, I have constructed a panel of monthly, state-level tax collection data from departments of revenue. Currently, the data set covers 13 states and the District of Columbia and contains information on sales, use, income (individual and corporate), estate and inheritance, gasoline and motor fuels, property, and certain excise taxes.

The panel nature of the dataset allows researchers to exploit the variation of the policy across states and within states over time. Policy variation stems from the proportion of the tax base exempted from sales tax during the holiday, the length of the holiday, and when the holiday occurs during the year. I estimate the impact of tax holidays on sales and use tax revenue using a model with state-level fixed effects. I use the coefficient estimates to produce back-of-the-envelope calculations of how much of the revenue loss is due to consumers' timing their purchases to coincide with the tax holiday. Further, I introduce leads and lags of the tax holiday variable to estimate whether tax collections decrease before, during, and after the month of the tax holiday.

In my preferred specification, I find that a tax holiday is associated with a 4.18 percent reduction,

[2]Pensacola is roughly 60 miles southeast of Mobile.

on average, in the state's sales and use tax collections during the month of the holiday. Consumer timing behavior within the month of the tax holiday accounts for up to half of this decrease in sales and use tax collections. There is no evidence that purchases are shifted across months to exploit the tax holiday in sufficient amounts to impact tax collections in months preceding or succeeding the month of a tax holiday.

Extending a tax holiday by one day does not impact tax collections. Instead, the mere existence of the holiday appears to matter more than its duration, which again points to the importance of the timing response of consumer purchases to this policy. Finally, a one percentage point increase in the proportion of consumer expenditures on durable and non-durable goods that is exempt from tax during the tax holiday reduces sales and use tax collections by 0.34 percent, on average.

The remainder of the paper unfolds as follows. In section 4.2, I present a brief narrative history of sales tax holidays and describe the characteristics of the tax holidays in 2007. I discuss the estimation strategy and data used in the analysis in section 4.3. I present the results in section 4.4. I summarize and recommend areas of future research in section 4.5.

4.2 Background

4.2.1 A Brief History of Sales Tax Holidays, 1997-2007

Two US presidential candidates—Senators John McCain (R-Arizona) and Hillary Clinton (D-New York)—proposed to repeal the federal gasoline excise tax during the summer months of 2008, drawing national attention to the tax holiday concept. However, the *sales* tax holiday policy began in 1997 as a way to keep New Yorkers from traveling to New Jersey to purchase clothing that was tax-free year-round in the Garden State.[3,4] New York City Mayor Rudolph W. Giuliani proposed in 1995 to have clothing items priced below $500 to be exempt year-round from the city's sales tax, but this measure did not pass in the state legislature, even after it was scaled back to cover clothing items priced below $100 only.[5] As a compromise, the state legislature agreed to a one-week sales tax holiday to be held in January 1997.

For the inaugural holiday, most clothing and footwear priced $500 or less per item were exempt

[3] Much of what immediately follows draws directly from Cole (2008b).

[4] Since November 1980, Pennsylvania has not taxed most clothing or footwear. Massachusetts does not tax most clothing or footwear priced $175 or less per article. Connecticut has a similar provision with a price cap, as of 2003, of $50 per article. Since December 1999, Vermont has not taxed most clothing articles—footwear is taxed—priced $110 or less per article; the state exempted footwear priced $100 or less beginning in July 2001 and then abolished the price caps on clothing and footwear in 2005. Minnesota is the only other state that exempts clothing purchases from sales tax. For full citations of these statutes, see Cole (2008b).

[5] "Small business report; government watch; retailers look to merchandise January's clothing tax holiday: test may lead to a permanent cut," *Crain's New York Business* (New York, NY), Dec. 9, 1996, News, p. 28.

from the state's 4 percent sales tax. In addition, counties and localities could repeal their local option sales taxes during the state sales tax holiday. Fifty-four of the state's 62 counties suspended their sales tax; New York City suspended its 4 percent sales tax; and the Metropolitan Transit Authority suspended its 0.25 percent levy.[6] The state's expected fiscal loss from the inaugural holiday was forecast to be $20 million in sales tax remittances.[7]

The policy spread from New York to Florida in 1998 and then to Texas in 1999. It appears the cross-border shopping concerns outlined above were *not* the driving force behind the decisions to have sales tax holidays in those states.[8] Rather, with the economy reaching the peak of its business cycle in the late 1990s, the states' budgets were in surplus, and this policy was one way to offer tax relief to the states' residents. Thereafter, and coincident with the down-turn in the economy, the justifications politicians gave for tax holidays shifted markedly to normative ones, particularly once South Carolina exempted school supplies in its inaugural holiday in 2000. As tax holidays propagated across the country, the set of goods included as tax-exempt expanded to include computers, energy-efficient items, and hurricane preparedness items.

By 2007, 20 states and the District of Columbia held a total of 118 sales tax holidays.[9] This accounts for nearly half of the 45 states and the District of Columbia that levy some form of sales tax.[10] At the close of 2007, 12 states and the District of Columbia had 15 holidays that are codified as annual events in their statutes.[11]

Table 4.1 shows the diffusion of this policy across the states throughout the period. Since 1998, 2 or more states had a sales tax holiday in a given year, and in 2006 and 2007, 15 states and the District of Columbia held at least 1 sales tax holiday. In each year from 2004 through 2007, at least 100 million people lived in a state that had a sales tax holiday. Starting in 1999, this policy affected more than 20 percent of the US population living in a state with a sales tax. This proportion has been at least 35 percent since 2004 and peaked at 44 percent in 2006.

[6] Lisa W. Foderaro, "Stores gear up for week of tax relief," *The New York Times* (New York, NY), Jan. 18, 1997, Late Edition - Final, Section 1, p. 27.

[7] Sharon Linstedt, "Get set for state's sales-tax holiday; taxes to be cut on most apparel week of Jan. 18," *Buffalo News* (Buffalo, NY), Jan. 5, 1997, Final Edition, Business, p. 1B.

[8] Concerns of consumers' crossing borders to shop, however, *are* a recurring theme in press accounts when other states weighed bills that would establish sales tax holidays, particularly when those states border a state with a sales tax holiday and the state without one has a substantial population living near the border.

[9] Cole (2008b) details each of these holidays.

[10] Alaska, Delaware, Montana, New Hampshire, and Oregon do not levy a sales tax.

[11] These states are Alabama, Connecticut, Iowa, Louisiana, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. The District of Columbia and Virginia have two annual sales tax holidays each. Virginia's Energy Star sales tax holiday is annual through 2011.

4.2.2 Characteristics of Sales Tax Holidays

Sales tax holidays exhibit policy variation across states in three dimensions: the portion of the tax base that becomes exempt from sales tax during the holiday; the length of the holiday; and when the holiday occurs. Table 4.2 provides the following details for each of the 20 sales tax holidays in 2007: the calendar dates of the holiday, including days of the week; the categories of goods exempt from the sales tax, including the prices caps below which goods must fall in order to be tax-exempt; the forecasted or estimated fiscal impact of the holiday, where available;[12] whether the holiday is codified as an annual event in the state's statutes; and additional relevant notes. For states that have annual holidays codified in their statutes, none indexes the price caps to a measure of inflation or economic growth.

Of the 20 holidays in 2007, 15 exempted clothing and footwear from sales tax, 10 exempted school supplies, 7 exempted computers, 6 exempted computer peripheral devices, and 3 exempted books.[13] Georgia and Virginia each had holidays exempting energy-efficient appliances and items certified by the federal Energy Star program. Florida had a "hurricane preparedness" holiday that exempted purchases of an array of goods, including flashlights, batteries, radios, and portable generators.

Each of the tax holidays exhibited some form of price cap for the exempted items, except for South Carolina. In most cases, if the price of an item is $0.01 above the price cap, the entire amount of the good is taxable. The price caps vary depending on the goods in question. The modal price cap on clothing and footwear was $100 per item. Price caps varied from $10 to $100 per item for school supplies and from $20 to $50 per book. The price caps for computers ran from $750 per single purchase in Alabama to $3,500 per item in Missouri and North Carolina. The price cap for the wide variety of goods qualifying for the Energy Star holiday in Georgia was $1,500 per item and $2,500 in Virginia. Florida's "hurricane preparedness" holiday had 9 separate per-item price caps, ranging from $10 for artificial ice, $20 for flashlights and lanterns, $200 for storm shutter devices, to $1,000 for portable generators.

Florida's hurricane preparedness holiday in 2007 ran for 12 days in June, making it the longest tax holiday that year. Iowa, Louisiana, and Massachusetts had the shortest holidays in 2007, each

[12] Most of these numbers are reported in newspaper articles. (Citations are available from the author upon request.) They often come from sentences such as, "Consumers are expected to save/saved $\$x$ million in state taxes and $\$y$ million in local option taxes." The articles do not always give a citation for these numbers. If a citation is given, it is often to "state officials." Further, the methodologies used to construct the forecasts or the ex post estimates are not clear from any of the articles.

[13] For this discussion, I set aside Massachusetts' holiday, which exempted almost all tangible personal property priced at $2,500 or less per item, and Louisiana's holiday, which exempted the *first* $2,500 per item of nearly all tangible personal property purchases.

lasting two days.[14] The median and modal holiday (nine states) lasted three days.

There appears to be a weak, negative association between holiday length and the restrictiveness of the price caps. When the holiday is short, the price caps tend to be relatively large. South Carolina's two-day holiday has no price caps, and Louisiana and Massachusetts' two-day holidays in 2007 had $2,500 caps. Florida's 10-day, August holiday had a $10 cap on school supplies and a $50 cap on clothes and footwear; both caps were the most restrictive in their respective categories among the "back-to-school" holidays in 2007. The state's 12-day, hurricane preparedness holiday had a myriad of caps, most of which were less than $100.

Finally, 13 of the annual holidays take place in August, and 8 of these take place on the first Friday through the first Sunday in August.[15] Georgia's "back-to-school" holiday in 2007 occurred in August as well. The District of Columbia has an annual holiday lasting ten days immediately after Thanksgiving in November. Holidays for energy-efficient items in Georgia and Virginia were in early October in 2007; Georgia's holiday is not annual, whereas Virginia's is annual through 2011.

4.3 Estimation Strategy and Data

4.3.1 Estimation Strategy

A sales tax holiday is a transitory reduction in a state's tax base. At the state level, the policy is a natural experiment. There are treatment states (those with tax holidays) and control states (those without tax holidays). Within the treatment states, there are treatment months (those with tax holidays) and control months (those without tax holidays).[16] Provided the underlying trends in tax collections across the treatment and control states are the same, data from a treatment month and control month can be used to construct a difference-in-difference estimate of the effect of the tax holiday. With a larger panel of states, the framework can be extended using regression models with state-level fixed effects. After controlling for other variables that affect sales tax collections, e.g., the month of the year, the state sales tax rate, and variables correlated with the business cycle, comparing collections in months with a sales tax holiday with collections in other months provides an estimate of the effect of this policy.

[14] Massachusetts' inaugural holiday in 2004 lasted only one day.

[15] The holidays are in Alabama, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, and Virginia. The other annual tax holidays in August are in Connecticut, the District of Columbia, Iowa, Louisiana, and Texas.

[16] Technically, the reduced tax base lasts for less than one month. However, because tax collections are reported at monthly frequencies, I will refer to the treatment periods as months and not days.

Let y_{smt} be the state tax collections attributable to economic activity in state s in month m of year t.[17] Define H_{smt} to be equal to 1 if the state had a tax holiday and 0 otherwise. Let τ_{smt} be the state sales tax rate, $\mathbf{X}_{smt}$ a vector of control variables, and ε_{smt} an idiosyncratic error term.

The basic equation to be estimated takes the form:

$$ln\left(y_{smt}\right) = \alpha_s + \gamma_m + \phi_t + \theta\tau_{smt} + \delta H_{smt} + \beta'\mathbf{X}_{smt} + \varepsilon_{smt}, \tag{4.1}$$

where the α_s, γ_m, and ϕ_t are, respectively, state, month, and year fixed effects.[18] The state-level fixed effects encapsulate unobserved characteristics of the state affecting tax collections that are constant across time. The month-level fixed effects capture the seasonal pattern of tax collections that are constant across states and years, e.g., economic activity in December due to the Christmas holiday always generates large collections. The year-level fixed effects take into account macroeconomic fluctuations affecting tax collections that are constant across states and months within the year.

Two other specifications of equation (4.1) include one that has state-specific linear time trends and another that has both state-specific month effects and state-specific year effects:

$$ln\left(y_{smt}\right) = \alpha_{sm} + \phi_{st} + \theta\tau_{smt} + \delta H_{smt} + \beta'\mathbf{X}_{smt} + \varepsilon_{smt}.[19] \tag{4.2}$$

The α_{sm} allow for different seasonal patterns of collections across states, perhaps arising from different statutory requirements regarding sales and use tax remittances. The ϕ_{st} allow for macroeconomic fluctuations to impact states differentially.

There are several modifications to equation (4.2) that should be considered. First, it is plausible that a tax holiday will lead to a larger reduction in sales tax collections the greater is the state's sales tax rate. Consumers have a stronger incentive to make purchases during the holiday the greater is the tax rate outside the holiday. This can be captured by interacting the tax holiday variable and the state tax rate.

Second, as shown in Table 4.2, the tax holiday treatment is not homogeneous across states and, sometimes, within a state across time. Holidays vary according the length of the holiday and the tax base exempted from sales tax during the holiday. These details are subsumed by H. Accounting

[17] There is generally a one-month lag between when a purchase generates a sales tax obligation and when the tax is remitted to the state. This will be discussed more in the section describing the data used in the analysis.

[18] One other possibility is to have the log of the sales tax rate on the right-hand side of the estimating equation instead of its level. I estimated such models and found the results to not differ substantively from the ones reported herein. The results are available upon request.

[19] This specification nests equation (4.1).

for these characteristics of the tax holiday will inform policy makers how adjusting either of these parameters of the policy impacts sales tax collections.

Let d_{smt} be the number of days the tax holiday in state s lasts in month m of year t. Let b_{smt} be a measure of the tax base exempted from state sales tax during the tax holiday. The treatment of the tax holiday, $\widetilde{H}_{smt}$, is an increasing function of each of these variables and is equal to zero if either of these variables is zero, i.e., $\widetilde{H}_{smt} = f\left(d_{smt}, b_{smt}\right)$, $f_1 > 0$, $f_2 > 0$, and $f(0, b_{smt}) = f(d_{smt}, 0) = 0$. Further, it is plausible that the change in the treatment given an increase in the tax base exempt from sales tax during the holiday is increasing in the length of the holiday, i.e., $f_{12} \geq 0$. One functional form that satisfies these criteria that will be used in the analysis is a simple interaction between the length and breadth of the tax holiday: $\widetilde{H}_{smt} = d_{smt} \cdot b_{smt}$.

Finally, economic theory suggests that if consumers are aware that tax rates are lower for one weekend in the future, they may delay or accelerate purchases of durable goods to coincide with the sales tax holiday. Consequently, the effects of a sales tax holiday on tax collections may not be confined to the month during which the holiday takes place. Placing leads and lags of the tax holiday variable into the estimating equation will allow for testing whether purchases are shifted across months to coincide with the tax holiday. A negative coefficient on a lagged (leading) value of the tax holiday indicates consumers accelerated (delayed) their purchases in anticipation of the tax holiday.

In order for the coefficient on the tax holiday variable to be identified, the timing of the tax holiday needs to be uncorrelated with the idiosyncratic error in each period. In addition, identifying parameters related to the length and breadth of the holidays requires states to have holidays of differing lengths and differing breadths over time.

One should be concerned that past shocks would affect a state's decision to hold a sales tax holiday in the future. This is particularly relevant for states that do not have annual sales tax holidays. Accounts in newspaper articles suggest at least one reason for a state's not having a sales tax holiday (after having one in the past) is the fiscal condition of the state. If the state is in or forecasts to be in deficit, legislatures were less likely to pass a sales tax holiday measure for that fiscal year. For example, explaining the reason Maryland did not have a tax holiday in 2002 after having one in 2001, Maryland State Senator Barbara A. Hoffman, Chairwoman of the Senate Budget and Taxation Committee, said, "The truth is we probably would have [had a sales tax holiday] this year if we had a lot of money."[20] Michael Golden, spokesman for Maryland's

[20]Fick, Laura. "Md. sales tax holiday unlikely in 2002," *The Daily Record* (Baltimore, MD). March 27, 2002.

comptroller said, "It's hard to argue for a tax-free week that robs the state of needed revenue[.]"[21]

Econometrically, the concern is that past shocks to *sales tax collections* affect the decision to have future tax holidays. It is plausible that legislators examine only the aggregate tax collections when determining the fiscal viability of future tax holidays. To the extent a state relies heavily upon the sales tax as a source of revenue, shocks to sales tax collections will affect the decision to have future tax holidays. However, this may be less relevant for states that rely more heavily on an individual income tax. Examining only states with an annual holiday is one way to address the potential breakdown of the strict exogeneity assumption.

The frequency with which retailers remit payments to state departments of revenue potentially inhibits precise estimation of the revenue loss due to tax holidays. For example, if large filers (in terms of revenue) are required to remit on a quarterly basis, the impact of the sales tax holiday may be hidden due to this aggregation. For the states currently in the dataset, all require retailers with large sales tax liabilities to file on a monthly basis.[22] Consequently, at least with the states in the dataset thus far, this particular issue does not appear to be a major concern. The specifications with state-specific month effects are more likely to capture the consequences of this aspect of the statutory filing and remittance requirements.

A related but more troubling issue is the fact that in certain states, retailers with large (in some cases, very large) tax liabilities are required to make estimated payments.[23] So, the aggregate collections reported for any given month are a mixture of "accelerated" payments for that month and the reconciliation payments for the previous month.[24] To the extent firms remit "correct" amounts for the accelerated payments, this will disrupt obvious seasonal patterns in the data, e.g., reported collections will increase in December and decrease in January. However, firms have a financial incentive to underestimate their sales tax liability and remit less for the accelerated payment. Personnel at some departments of revenue suggest that this, in fact, does happen, pointing to (admittedly subjective) evidence that they feel January collections are greater than they should be if retailers are remitting accelerated payments as they should according to the statute. While this

[21] ibid.

[22] Personnel at departments of revenue provided evidence that "large filers"—though defined by different dollar amounts in different states—constitute the lion's share of filers and share of revenue in any given month.

[23] For example, in Georgia, remittances for the reporting month are due on the 20th day of the subsequent month. Estimated payments are required for firms that have an estimated tax liability exceeding $5,000 for that month (which translates to taxable sales of at least $125,000). The estimated payment (50 percent of the amount estimated to be due for that month) is due on the 20th day of the reporting month, and the balance is due on the 20th day of the subsequent month. If, for example, a retailer forecasts his tax liability to be $6,000 for the month of January, he would need to remit $3,000 by January 20th. The balance of his liability is due on February 20th.

[24] The method used to construct the accelerated payment amount varies by state. Alabama, in contrast to Georgia, requires retailers that average $1,000 in sales tax liability per month in the preceding calendar year to pre-pay the *lesser* of 66 2/3 percent of the current month's liability or 66 2/3 percent of the liability in the same calendar month of the preceding year. See §40-23-7 of the Code of Alabama.

mitigates these concerns somewhat, I am not sure how heavily retailers' responses to this statutory feature color the results below.

4.3.2 Data

The data used in the analysis below are from a new panel dataset of monthly, state-level tax collections. I collected the tax data for a variety of taxes directly from state departments of revenue. This paper utilizes the sales and use tax data from 13 states and the District of Columbia. See Table 4.3 for a list of these states and the periods of economic activity covered by the data.[25] The tax data are converted to constant 2007 dollars using the Consumer Price Index (CPI).

I also collected from the departments of revenue the state sales tax rates and their effective dates. Local sales tax rates are not incorporated in this analysis. In the regressions below, the tax rate is entered as a percentage point, which implies the coefficient estimate for the sales tax rate should be interpreted as a semi-elasticity.

The state population figures are the intercensal population estimates from the U.S. Census Bureau. In the dataset, the intercensal population estimate is used for the month of July since the estimate is for the population as of July 1. The other monthly values are interpolated using a constant growth rate between years.

The state personal income data come from the Bureau of Economic Analysis (BEA). The BEA's quarterly estimate is used for each month in that quarter. This value is then translated into constant 2007 dollars using the CPI.

The state unemployment rate comes from the Bureau of Labor Statistics (BLS). In the dataset, the unemployment rate is entered as a percentage point. Therefore, the coefficient estimate should be interpreted as a semi-elasticity.

The personal consumption expenditure data come from the BEA. The data are national—not state-level—figures. The data are monthly, seasonally adjusted, and annualized.

These data are used to construct a measure of the breadth of the tax holidays, akin the b_{smt} variable above. The numerator is the expenditure sum on the categories of goods exempt from sales tax during the state's tax holiday. The denominator is the total expenditure on durable and non-durable goods. This proportion is entered as a percentage point. The coefficient estimate should be interpreted as the effect of a one percentage point increase in the (annual) consumer expenditure share on goods exempted from sales tax during the tax holiday.

[25] Full documentation of the data and their sources is found in a data dictionary and code book available on my website (http://sitemaker.umich.edu/adamjcole) and from me directly upon request.

The drawbacks to the personal consumption expenditure data's being national are readily apparent. To the extent expenditure patterns on goods differ across the states, the expenditure share will overstate consumption of certain goods in some states and understate it in others. Further, if the seasonal expenditure patterns differ across the states, the annualized, national expenditure share will deviate from the state's true share in a given month.

Matching the expenditure categories in the BEA data with the set of goods exempted from sales tax during tax holidays was generally straightforward. Two exceptions are the tax holidays on energy efficient appliances (the so-called Energy Star tax holidays) and the holidays on hurricane preparedness items. For the former, I use the category "kitchen and other household appliances," and for the latter, I use the category "hand tools," which encompasses "tools, hardware, and supplies" and "outdoor equipment and supplies."

4.4 Results

In this section I report the estimates from the regressions outlined in the previous section. I first present results from having a policy dummy variable for the tax holidays. I then decompose the estimates to see how increasing the duration and breadth of goods covered by a sales tax holiday affects tax collections. Finally, I examine whether there is evidence that consumers shifted purchases across months to coincide with tax holidays.

4.4.1 Baseline Estimates

When the ordinary least squares (OLS) estimator is applied to the pooled data, after controlling for year and month effects that are the same across states, having a tax holiday does not affect sales and use tax collections during the month of the holiday (column I of Table 4.4). Indeed, none of the variables of interest (the state's sales tax rate, population, unemployment rate, or personal income) is individually statistically different from zero in this setting. The OLS estimator does not capture unobserved, persistent differences in the tax base normally subject to sales tax across the states. As such, the fixed effects estimator should improve upon the results obtained from the OLS estimator.

When the state fixed effects are added, a state's sales and use tax collections decrease by 9.97 percent, on average, during a month containing a sales tax holiday (column II of Table 4.4). The standard error around this this estimate is roughly one-third its value under OLS estimation. A similar increase in precision occurs with the other covariates. Further, the sales tax rate and income

variables are now statistically significant.

Under the assumption that consumers do *not* time their purchases within a month to exploit the tax holiday, the 9.97 percent decrease in tax collections is a large response. Focusing on column II of Table 4.4, sales and use tax collections increase (decrease) 19.8 percent in a month in which the state sales tax rate increases (decreases) by a percentage point. The mean state sales tax rate during the holidays in the sample is 5.33 percent, and the mean length of these holidays is 4.78 days (or 15.42 percent of the month). Further, according to calculations using the BEA data, for the holidays in the sample, on average, 14.98 percent of consumer expenditures on durable and non-durable goods is covered by the tax holiday. The holiday's treatment can be thought of as reducing the state tax rate by 5.33 percentage points on 14.98 percent of expenditures for 15.42 percent of the month. Without any timing effects within the month, one would anticipate a tax holiday to reduce that month's collections, on average, by $[(0.198 \times 5.33) \times 0.1542 \times 0.1498] \times 100 \approx 2.44$ percent. This is within the 95-percent confidence band for the point estimate of the tax holiday variable, which spans -2.24 percent to -17.69 percent. Taking the point estimate at face value, this suggests the timing response could account for up to 75 percent of the 9.97 percent decrease in collections during the month of a holiday.

In columns III and IV of Table 4.4, I add state-specific month effects to capture any seasonal patterns of sales and use tax collections that differ across the states. These fixed effects reduce the point estimate by roughly 55 percent and the standard error by roughly half. My preferred specification is in column V, which includes both state-specific month effects and state-specific linear time trends.[26] In this specification, tax holidays are associated with a 4.18 percent reduction, on average, in the state's sales and use tax collections during the month of the holiday. Employing the same method as above, in the absence of consumer timing behavior, one would anticipate a tax holiday to reduce that month's collections, on average, by 2.12 percent. This again falls well within the 95-percent confidence interval (-0.52 percent to -7.83 percent) for the tax holiday variable's point estimate. Under this specification, consumer timing behavior accounts for up to half of the decrease in sales and use tax collections.

These results line up with those for computers; Cole (2008a) found timing behavior explains between 37 percent and 90 percent of the additional computers purchased in the tax holiday states in 2007. Alabama, Georgia, Massachusetts, and Tennessee had tax holidays on computers in 2007 and are also present in the dataset used in this paper. Timing behavior in those states explains,

[26] Column VI contains both state-specific month effects and state-specific year effects. This requires a lot from the data, and it appears not much is gained in the process. The F-statistic decreases markedly from column V to column VI.

51, 82, 42, and 69 percent, respectively, of the additional computer purchases in those states during the 30-week period the data span. Based on the findings in Cole (2008a) and the tax revenue data used in this paper, sales and use tax collections would have been between 0.07 percent and 0.15 percent greater in these states were there no tax holiday on computers.[27]

As mentioned above, some states do not codify their tax holidays as annual events. A new law must be passed for these states to have additional tax holidays. In the dataset, these states are Florida, Georgia, and Massachusetts. To the extent a state relies heavily on the sales tax as a source of revenue (see, for example, Florida, which has no personal income tax), negative shocks to sales tax collections have the potential to reduce the likelihood that the state has a tax holiday in the future.

Including these states in the analysis introduces upward bias in the coefficient estimate on the tax holiday policy dummy variable, i.e., a bias towards finding no revenue loss from the tax holiday. Omitting them should reduce the endogeneity concerns. Using this restriction, controlling for state-specific month effects and state-specific linear time trends, sales tax holidays reduce sales and use tax revenue 6.5 percent (p-value of 0.055) during the month of the holiday, up to 75 percent of which is due to consumer timing behavior. For the remainder of the paper, I will use the entire dataset, and the coefficient estimates should provide an upper bound of the mean effect of the tax holiday.

4.4.2 Holiday Heterogeneity

Consumers have a greater incentive to time their purchases to coincide with the sales tax holiday the greater is the state's sales tax rate. Consequently, the revenue loss of the tax holiday should also be greater in states with larger sales tax rates. This is tested by adding an interaction term between the policy dummy variable and the state sales tax rate to the specification in column V of Table 4.4. However, because there was no within-state variation in tax rates across different tax holidays, the parameter cannot be identified.

Other things equal, sales tax holidays that have longer duration should decrease tax collections more than shorter holidays since consumers have more days to take advantage of the lower tax rate. Using the example above, in the absence of a timing response by consumers, increasing the length of the tax holiday by one day should reduce sales and use tax collections by 0.44 percent.[28]

[27] Sales and use tax collections in August 2007 in Alabama, Georgia, Massachusetts, and Tennessee were, respectively, \$190, \$403, \$341, and \$573 million. The estimated sales tax revenue loss from the tax holidays on computers in these states were, respectively, \$0.13, \$0.59, \$0.41, and \$0.68 million.

[28] One would anticipate a holiday that lasts 5.78 days to reduce sales and use tax collections by $[(0.1724 \times 5.33) \times 0.1865 \times 0.1498] \times 100 \approx 2.57$ percent.

To test this in a regression context, I add the length of the tax holiday (in days) to the estimating equation. The coefficient on the tax holiday variable then represents the effect of having a holiday for one day, and the coefficient on the duration of the holiday represents the impact on sales and use tax collections by increasing the length of the holiday by one day. Identification of this parameter requires states to have holidays of differing lengths over time. Among the states in the data set, four exhibit this property: the District of Columbia, Florida, Georgia, and Massachusetts.

The estimates in column II of Table 4.5 indicate that adding an additional day to a sales tax holiday does not impact sales and use tax collections.[29] Of course, this cannot be true in the limit as the duration of the holiday grows. It suggests, however, that for holidays of such short duration, the mere existence of the holiday matters more than its length. In turn, this speaks to the importance or even primacy of consumer timing behavior in determining the effects of this policy.

Sales tax holidays that exempt a greater proportion of expenditures from tax should, all else equal, lead to lower tax collections more than holidays that exempt a smaller proportion of expenditures. In the example used above, absent a timing a response by consumers, a one percentage point increase in the proportion of consumer expenditures exempt from sales tax during a tax holiday should reduce sales and use tax collections by 0.14 percent.[30] To test this hypothesis, I add the proportion of consumer expenditures on durable and non-durable goods exempt during the tax holiday (in percentage points) to the estimating equation. Identification of the parameter requires that states have holidays of differing breadths over time. Because Florida and Georgia have tax holidays that exempt widely different amounts of consumer expenditures, they are the states likely generating any identifying variation.[31]

The estimates in column II of Table 4.6 suggest there is not a statistically significant linear relationship between the breadth of a tax holiday and sales and use tax collections. However, the coefficient estimates in column III indicate there is a quadratic relationship. At the mean breadth of a tax holiday (14.98 percent of consumer expenditures on durable and non-durable goods), increasing the breadth of goods exempt from tax by one percentage point leads to a statistically significant 0.34 percent decrease in sales and use tax collections.[32] With only two states generating

[29]Though not shown in the table, estimating this equation with the square of the holiday length (but not the policy dummy) yields the same conclusion.

[30]One would anticipate a holiday that covers 15.98 percent of consumer expenditures on durable and non-durable goods to reduce sales and use tax collections by $[(0.1724 \times 5.33) \times 0.1542 \times 0.1598] \times 100 \approx 2.26$ percent.

[31]The tax holidays in Florida covered between 0.41 percent and 11.24 percent of consumer expenditures on durable and non-durable goods. In Georgia, the exemptions covered between 1 percent and 13.22 percent. This variation largely comes from those states' having tax holidays on hurricane preparedness items or on energy-efficient appliances in addition to the traditional back-to-school holidays. In the other tax holiday states, this variation was less than 1.3 percentage points.

[32]Separately, and not reported, I created a set of dummy variables for the types of goods exempt from sales tax during tax holidays, e.g., clothing, school supplies, computers, etc., as a different measure of the breadth of the

the variation in the breadth of goods covered during tax holidays, I consider these results speculative at best.

4.4.3 Cross-month Effects

Consumers who are aware that a tax holiday will be held in the future may time their purchases to coincide with the holiday. This may not be isolated to moving purchases around within the month of the tax holiday. Suppose there is a tax holiday in August on clothing, footwear, and computers. Parents who had planned to make purchases of these goods in September right before school begins may instead move up their purchases into the August tax holiday. Similarly, the author of this paper may have planned to purchase a laptop computer early in the summer before beginning his job market odyssey. Knowing there is a holiday in August, he may forestall his purchase to take advantage of the holiday.

This behavior has the potential of manifesting itself in the monthly tax collection data if enough consumers behave in this manner and the aggregate amount of purchases is sufficiently large. If this were the case, the coefficients on leads and lags of the tax holiday dummy variable would be negative. Insignificant coefficients are not necessarily indicative of the absence of such cross-month timing behavior. Consumers may well shift purchases across months, but the dollar amount of those purchases may not be large enough to be observed in the aggregate data.

There is another possibility, not mutually exclusive with the above story, that could lead to reductions in tax revenues during the month of the tax holiday and the months preceding and succeeding it. Sales tax holidays have durations strictly less than one month, which is the shortest period for tax reporting that retailers in the sample face. This presents ample opportunity for tax evasion. Indeed, one could easily argue this policy is actually a form of legalized evasion. Registers must be reprogrammed to take into account the holiday. These could easily be reprogrammed so that purchases are dated on paper so that they occurred during the holiday. Auditors would have difficulty decoupling what is the (legal) effect due to the holiday and what part is due to evasion since they would anticipate increased sales during the holiday. It is unclear at this point how to test for these in the aggregate tax collection data.

Table 4.7 presents results from regressions that include up to three lags or leads of the tax holiday policy dummy variable. Column I reproduces the previous result that tax holidays reduce

tax holiday. Running similar regressions with this set of dummy variables, none of these variables was individually statistically significant. I also decomposed each of these into dummy variables for the different price caps and ran regressions with that set of dummy variables. Coefficients of implausible signs and magnitudes resulted. For example, increasing the price cap on clothing from $100 per item to $300 leads to a 36.7 *increase* in sales and use tax collections.

monthly sales and use tax collections by 4.18 percent, on average. This contemporaneous effect is not altered in terms of sign, magnitude, or significance by adding leads and lags of the tax holiday dummy variable.

None of the coefficients on the leads or lags of the tax holiday policy dummy variable is statistically significant, though all are nominally negative. This is true irrespective of whether only leads, only lags, or both leads and lags are added to the estimating equation. This suggests that if consumers are shifting their purchases across different months to exploit the tax holiday, the magnitude of this timing effect is not sufficient to be observed in the aggregate tax collection data. Based on results above in the baseline cases, the evidence is more suggestive of substitution of purchases across days within the month of the tax holiday.

In Cole (2008a), there is some evidence of substitution of laptop purchases across months. Even so, the revenue loss in August 2007 from computer purchases in the tax holiday states in the dataset used herein ranged from 0.7 percent to 0.15 percent, assuming *all* of the timing behavior occurred in August. If the timing behavior is spread over more months, it would be difficult to isolate the revenue loss in the other months from normal fluctuations in sales tax collections. That sales and use tax collections appear not to decrease in months preceding or succeeding tax holidays is not all that surprising if purchases of the other goods exempt from tax during tax holidays follow a similar pattern.

4.5 Conclusion

Sales tax holidays are transitory reductions in a state's sales tax base, usually lasting only a few days. The lower sales tax rate will lead to some purchases that otherwise would not have been made absent the tax holiday. However, since the policy is transitory and known in advance, consumers have an incentive to shift purchases that were already going to be made to the days of the tax holiday. This creates a degree of tension between the policy goals of stimulating the economy and reducing the tax burden on families with children.

Before enacting or altering a sales tax holiday, policymakers should understand the relative magnitudes of these effects of the policy and how much sales tax revenue is reduced because of the policy. Using a newly created panel dataset of monthly, state-level tax collections, I found sales tax holidays reduce sales and use tax collections 4.18 percent, on average, during the month of the tax holiday. Consumers' timing their purchases within the month to take advantage of the tax holiday accounts for up to half of this decrease in tax collections. The shifting of purchases appears largely

to be isolated to the month of the holiday. There is no evidence that tax holidays lead to decreases in sales and use tax collections in preceding or succeeding months.

The findings largely support those in Cole (2008a), which found that timing behavior accounts for between 37 and 90 percent of the increase in computer purchases during the tax holidays in 2007. States that had tax holidays on computers in 2007 lost between $3.3 and $5.1 million in sales tax revenue. Even with evidence that laptop purchases may have been shifted across different months, the percentage decrease in aggregate sales and use tax collections that would accompany this would be small and likely imperceptible in the aggregate data.

The importance of the timing behavior is reinforced when one examines the impact of extending the length of a tax holiday. I found that increasing the duration of a tax holiday by one day does not have a statistically significant effect on sales and use tax collections. Instead, it appears the existence of a tax holiday matters more than the length of time it covers.

Apart from the duration of the holiday, the major choice policymakers have in designing a tax holiday is what set of goods to exempt from the sales tax. In the dataset, the goods exempt during tax holidays constitute, on average, approximately 15 percent of personal consumption expenditures on durable and non-durable goods. I found a non-linear relationship between this proportion and sales and use tax collections. At the mean, a one percentage point increase in this proportion reduces sales and use tax collections by 0.34 percent, on average, during the month of a tax holiday. In the dataset, only Florida and Georgia have sufficiently large variation to identify this parameter. As such, I would caution against making too much of this result.

There are two other aspects of the policy that have not yet been investigated but should be the subject of future research. First, the policy began as a form of tax competition between New York and New Jersey. During the sales tax holiday in New York, the difference between the sales tax rates in these two states was reduced, reducing the incentive for New Yorkers to engage in cross-border shopping. Policymakers often discussed the spectre of cross-border shopping in neighboring states that had tax holidays as a reason for enacting tax holiday legislation in their states. Tax holidays allow economists to investigate the prevalence and magnitude of cross-jurisdiction shopping effects arising from differences in sales tax rates.

Second, because tax holidays last less than one month—which is the generally the reporting period for retailers remitting sales tax—the policy provides opportunities for retailers to evade taxes. They could state purchases that actually occurred outside the holiday instead occurred during the tax holiday in order to reduce their tax liability. Assuming the results found above are

not the result of evasion activities, the large timing response of consumer purchases cuts in two ways as far as retailers are concerned. It reduces the benefits of altering the sales logs, but it also increases the ability of retailers to deny (plausibly) that they are altering their sales logs to reduce their tax liability. Researchers should use tax holidays to learn about how retailers' accounting systems can be manipulated to evade taxes. Policymakers should be admonished that any analysis of tax holidays that does not address the possibilities for tax evasion is incomplete.

Table 4.1: States with Sales Tax Holidays, 1997-2007

Year	States	Population Affected	Percent
1997	New York (2)	18,656,546	7.02
1998	Florida, New York (2)	34,242,465	12.73
1999	Florida, New York (2), Texas	55,200,366	20.28
2000	Connecticut, Florida, Iowa, New York, Pennsylvania, South Carolina, Texas	78,644,158	28.58
2001	Connecticut, District of Columbia (2), Florida, Iowa, Maryland, Pennsylvania (2), South Carolina, Texas	66,352,002	23.86
2002	Connecticut, District of Columbia, Georgia (2), Iowa, North Carolina, Pennsylvania, South Carolina, Texas, West Virginia	63,813,477	22.73
2003	Connecticut, Georgia, Iowa, New York, North Carolina, South Carolina, Texas, Vermont, West Virginia	71,430,831	25.22
2004	Connecticut, District of Columbia (2), Florida, Georgia, Iowa, Massachusetts, Missouri, New York (2), North Carolina, South Carolina, Texas, Vermont (2), West Virginia	102,326,460	35.79
2005	Connecticut, District of Columbia (2), Florida (2), Georgia (2), Iowa, Louisiana, Massachusetts, Missouri, New Mexico, New York (2), North Carolina, South Carolina, Texas	107,537,517	37.27
2006	Alabama, Connecticut, District of Columbia (2), Florida (3), Georgia, Iowa, Maryland, Massachusetts, Missouri, New Mexico, New York, North Carolina, South Carolina (2), Tennessee, Texas, Virginia	128,464,282	44.10
2007	Alabama, Connecticut, District of Columbia (2), Florida (2), Georgia (2), Iowa, Louisiana, Massachusetts, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia (2)	112,953,027	38.41

Numbers in parentheses indicate the number of sales tax holidays the state had that year. "Population Affected" is the combined population of states that had sales tax holidays that year. The final column is the "Population Affected" that year divided by the combined population of states with a sales tax that year. Population data source (1997-1999): U.S. Census Bureau, Intercensal Population Estimates, "Table SA1-3 - Population," Regional Economic Information System, Bureau of Economic Analysis, September 2007. See <http://www.bea.gov/regional/spi/default.cfm?satable=summary> (viewed Jan. 7, 2008). Population data source (2000-2007): "Table 1: Annual Estimates of the Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2007," (NST-EST2007-01), Population Division, U.S. Census Bureau, Release Date: December 27, 2007. See <http://www.census.gov/popest/states/NST-ann-est.html> (viewed Jan. 7, 2008).

Table 4.2: By State, Characteristics of Sales Tax Holidays in 2007

State	Dates	Exempted Items	Price Cap	Annual	Fiscal Impact ($ millions)	Notes
Alabama	Fri., 8.3 - Sun., 8.5 (3 days)	Books Clothing and footwear Computers and software School supplies	$30/item $100/item $750/purchase $50/item	Yes	?	Counties and municipalities can choose to exempt these items from their sales tax during the state's holiday.
Connecticut	Sun., 8.19 - Sat., 8.25 (7 days)	Clothing and footwear	$300/item	Yes	-3.3	Outside the holiday, clothing priced $50 or less per item is not subject to sales tax.
District of Columbia	Sat., 8.4 - Sun., 8.12 (9 days)	Clothing and footwear School supplies	$100/item $100/item	Yes	-1.1	Applies to layaway sales.
District of Columbia	Fri., 11.23 - Sun., 12.2 (10 days)	Clothing and footwear	$100/item	Yes	?	Same as Aug. 2007 tax holiday.
Florida	Fri., 6.1 - Tues., 6.12 (12 days)	Artificial ice Flashlights and lanterns Gas and diesel containers Coolers and various batteries Cell phone chargers Tarps, tie-down kits, and Bungee cords Cell phone batteries Various radios and carbon monoxide detectors Storm shutters Portable generators	$10/item $20/item $25/item $30/item $40/item $50/item $60/item $75/item $200/item $1,000/item	No	-25.0	Local sales taxes repealed for the state's tax holiday.
Florida	Sat., 8.4 - Mon., 8.13 (10 days)	Books Clothing and footwear School Supplies	$50/item $50/item $10/item	No	-46.6	Local sales taxes repealed for the state's tax holiday.

Table 4.2: *Continued*

State	Dates	Exempted Items	Price Cap	Annual	Fiscal Impact ($ millions)	Notes
Georgia	Thurs., 8.2 - Sun., 8.5 (4 days)	Books (children's) Clothing and footwear Computers and peripherals School supplies	$20/item $100/item $1,500/purchase $20/item	No	-12.0 (state) -8.9 (local) (with Oct. 2007 holiday)	Local sales taxes repealed for the state's tax holiday.
Georgia	Thurs., 10.4 - Sun., 10.7 (4 days)	Air conditioners, ceiling fans, fluorescent light bulbs, clothes washers, dehumidifiers, dish washers, doors, programmable thermostats, refrigerators, and windows carrying the federal Energy Star label.	$1,500/item	No	See Aug. 2007 holiday.	Local sales taxes repealed for the state's tax holiday.
Iowa	Fri., 8.3 - Sat., 8.4 (2 days)	Clothing and footwear	$100/item	Yes	-2.0	Local sales taxes repealed for the state's tax holiday.
Louisiana	Fri., 8.3 - Sat., 8.4 (2 days)	The *first* $2,500 of *all* consumer purchases of tangible personal property (for non-business use) except for vehicles subject to license and title and meals furnished for consumption.		Yes	-6.0	Local sales taxes are *not* automatically repealed for the state's holiday, but it appears parishes can vote to do so.
Massachusetts	Sat., 8.11 - Sun., 8.12 (2 days)	All non-business retail sales of tangible personal property (except motor vehicles and boats, meals, tobacco products, telecommunications services, gas, steam, and electricity).	$2,500/item	No	-14.2	Outside the holiday, there is no sales tax on clothing priced $175 or less; only the increment over $175 is subject to tax. If, during the holiday, the price exceeds $2,500, $175 is deducted from the amount subject to tax; the threshold is not increased by $175.

Table 4.2: *Continued*

State	Dates	Exempted Items	Price Cap	Annual	Fiscal Impact ($ millions)	Notes
Missouri	Fri., 8.3 - Sun., 8.5 (3 days)	Clothing and footwear Computers and peripherals Computer software School supplies	$100/item $3,500/item $350/item $50/item	Yes	-3.0	Fifty-one counties and 169 cities chose to collect local taxes during the holiday.
New Mexico	Fri., 8.3 - Sun., 8.5 (3 days)	Clothing and footwear Computers Computer peripherals School supplies (backpacks and calculators)* School supplies (writing/art instruments and paper)*	$100/item $1,000/item $500/item $100/item $15/item	Yes	-1.9 to -3.0 (state) -1.3 to -2.1 (local)	Retailers are *not* required to participate in the holiday. If they do not participate, they pay tax on otherwise eligible sales and may recover their tax costs from the customer.
North Carolina	Fri., 8.3 - Sun., 8.5 (3 days)	Clothing and footwear Computers Computer peripherals School supplies Sports and recreational equipment	$100/item $3,500/item $250/item $100/item $50/item	Yes	?	Local sales taxes repealed for the state's tax holiday.
Oklahoma	Fri., 8.3 - Sun., 8.5 (3 days)	Clothing and footwear	$100/item	Yes	-6.4	Local sales taxes repealed for the state's tax holiday.
South Carolina	Fri., 8.3 - Sun., 8.5 (3 days)	Bedroom and bathroom linens and towels Clothing and footwear Computers and peripherals School supplies	None	Yes	-3.0	Local sales taxes repealed for the state's tax holiday.
Tennessee	Fri., 8.3 - Sun., 8.5 (3 days)	Clothing and footwear Computers School supplies	$100/item $1,500/item $100/item	Yes	?	The state reimbursed localities for local sales tax losses.
Texas	Fri., 8.17 - Sun., 8.19 (3 days)	Backpacks Clothing and footwear	$100/item $100/item	Yes	-52.1 (state & local)	Local sales taxes repealed for the state's tax holiday.

Table 4.2: *Continued*

State	Dates	Exempted Items	Price Cap	Annual	Fiscal Impact ($ millions)	Notes
Virginia	Fri., 8.3 - Sun., 8.5 (3 days)	Clothing and footwear School supplies	$100/item $20/item	Yes	-3.8	Retailers can choose to "absorb" ("pay") the tax on any other items during the holiday.
Virginia	Fri., 10.5 - Mon., 10.8 (4 days)	Dishwashers, clothes washers, air conditioners, ceiling fans, compact fluorescent light bulbs, dehumidifiers, programmable thermostats, and refrigerators carrying the federal Energy Star label.	$2,500/item	Through 2011	-0.166	Retailers can choose to "absorb" ("pay") the tax on any other items during the holiday.

Notes: See Cole (2008b) for more detail. Full citations available from the other upon request.
Unless otherwise specified, fiscal impact numbers are for state sales taxes and come from various print sources.
*Price caps for school supplies are not found in the statute referenced above. However, the caps are referenced in: N.M. Taxation and Revenue Department, "FYI-203: Gross Receipts Tax Holiday," Santa Fe: Tax Information/Policy Office, May 2006. See <http://www.tax.state.nm.us/pubs/FYI-203_2007.pdf> (viewed Aug. 28, 2007).

Table 4.3: States Used in the Analysis

State	**Revenue Categories**	**Dates**
Alabama	Sales tax, use tax, and sales & use tax	Sept. 2001 - Dec. 2007
Colorado	Sales tax	Jan. 1986 - Aug. 2007
District of Columbia	Sales & use tax	Sept. 1999 - Dec. 2007
Florida	Sales tax, use tax, and sales & use tax	Dec. 1985 - Dec. 2007
Georgia	Sales & use tax	Apr. 1996 - Dec. 2007
Hawaii	Sales & use tax	June 1996 - Dec. 2007
Iowa	Sales tax, use tax, and sales & use tax	June 1986 - Dec. 2007
Kansas	Sales tax, use tax, and sales & use tax	Dec. 1982 - Dec. 2007
Maine	Sales tax, use tax, and sales & use tax	June 1993 - Dec. 2007
Massachusetts	Sales & use tax	May 1994 - Dec. 2007
Michigan	Sales tax, use tax, and sales & use tax	Oct. 1984 - Dec. 2007
Nebraska	Sales & use tax	Dec. 1973 - Dec. 2007
Tennessee	Sales & use tax	Dec. 1967 - Dec. 2007
Utah	Sales & use tax	Dec. 1994 - Dec. 2007

The dates correspond to the period of economic activity covered by the data, which are not necessarily identical to the months of the revenue reports that are the sources of the data.

Table 4.4: Effect of Tax Holidays on Sales and Use Tax Collections

Dependent variable: natural log of real, monthly state sales tax collections ($ millions)	I	II	III	IV	V	VI
Tax Holiday	-0.0595	-0.0997**	-0.0930**	-0.0434**	-0.0418**	-0.0279*
	(0.1084)	(0.0355)	(0.0352)	(0.0190)	(0.0168)	(0.0153)
Sales Tax Rate	0.1506	0.1980***	0.1778***	0.2049***	0.1724***	0.1712***
	(0.1042)	(0.0197)	(0.0225)	(0.0225)	(0.0193)	(0.0248)
ln(population)	0.1941	-0.3471	2.1235	-0.4332*	2.0625	-14.8842
	(0.4261)	(0.2150)	(2.3852)	(0.2191)	(2.1998)	(19.8281)
Unemp. Rate	0.0391	-0.0272*	-0.0399*	-0.0260	-0.0410*	-0.0257*
	(0.0303)	(0.0150)	(0.0195)	(0.0168)	(0.0220)	(0.0136)
ln(real income)	0.7844	0.9480***	0.9141**	1.0012***	0.9803***	1.4898*
	(0.4723)	(0.2058)	(0.3860)	(0.1715)	(0.3124)	(0.8001)
r^2	0.777	0.249	0.253	0.416	0.421	0.466
F	.	20.72	2,299.91	52.87	10,741.73	2.89
Observations	2,805	2,805	2,805	2,805	2,805	2,805
Estimation	OLS	FE	FE	FE	FE	FE
Month Effects	Y	Y	Y	N	N	N
State-specific Month Effects	N	N	N	Y	Y	Y
State-specific Time Trends	N	N	Y	N	Y	N
State-specific Year Effects	N	N	N	N	N	Y

All regressions include year fixed effects and a national linear time trend. Robust standard errors are clustered by state. The r^2 for fixed effects estimation is the within-state r^2. A * denotes $p < 0.10$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

Table 4.5: Interactions with Sales Tax Rate and Holiday Length

Dependent variable: natural log of real, monthly state sales tax collections ($ millions)	I	II	III
Tax Holiday	-0.0418**	-0.0229	-0.0175
	(0.0168)	(0.0294)	(0.0343)
Sales Tax Rate	0.1724***	0.1724***	0.1724***
	(0.0193)	(0.0193)	(0.0193)
Length		-0.0042	-0.0177
		(0.0071)	(0.0292)
Rate×Length			0.0022
			(0.0044)
ln(population)	2.0625	2.0458	2.0452
	(2.1998)	(2.1893)	(2.1903)
Unemp. Rate	-0.0410*	-0.0410*	-0.0410*
	(0.0220)	(0.0220)	(0.0220)
ln(real income)	0.9803***	0.9880***	0.9885***
	(0.3124)	(0.3117)	(0.3117)
r^2	0.421	0.421	0.421
F	10,742	9,861	6,468
Observations	2,805	2,805	2,805

All regressions include state fixed effects, year effects, state-specific month effects, and state-specific linear time trends. Robust standard errors are clustered by state. The r^2 for fixed effects estimation is the within-state r^2. A * denotes $p < 0.10$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

Table 4.6: Effect of Holiday Breadth on Tax Collections

Dependent variable: natural log of real, monthly state sales tax collections ($ millions)	I	II	III	IV	V
Tax Holiday	-0.0418**				
	(0.0168)				
Sales Tax Rate	0.1724***	0.1724***	0.1725***	0.1724***	0.1725***
	(0.0193)	(0.0192)	(0.0193)	(0.0192)	(0.0193)
Breadth		-0.0007	-0.0052**	-0.0005	0.0008
		(0.0007)	(0.0019)	(0.0132)	(0.0011)
$(\text{Breadth})^2$			0.0001**		
			(0.0000)		
Rate×Breadth				-0.0000	
				(0.0026)	
Length					-0.0038
					(0.0035)
Length×Breadth					-0.0006
					(0.0005)
ln(population)	2.0625	2.0758	2.0860	2.0758	2.0356
	(2.1998)	(2.2036)	(2.2069)	(2.2037)	(2.1911)
Unemp. Rate	-0.0410*	-0.0409*	-0.0409*	-0.0409*	-0.0409*
	(0.0220)	(0.0220)	(0.0220)	(0.0220)	(0.0220)
ln(real income)	0.9803***	0.9721***	0.9747***	0.9721***	0.9907***
	(0.3124)	(0.3161)	(0.3147)	(0.3160)	(0.3124)
r^2	0.421	0.421	0.421	0.421	0.421
F	10,742	14,823	9,668	10,790	34.059
Observations	2,805	2,805	2,805	2,805	2,805

All regressions include state fixed effects, year effects, state-specific month effects, and state-specific linear time trends. Robust standard errors are clustered by state. The r^2 for fixed effects estimation is the within-state r^2. A * denotes $p < 0.10$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

Table 4.7: Effects of Tax Holidays on Tax Collections in Non-holiday Months

Dependent variable: natural log of real, monthly state sales tax collections ($ millions)	I	II	III	IV	V	VI	VII	VIII	IX	X
Tax Holiday$_i$	-0.0418**	-0.0415**	-0.0421**	-0.0421**	-0.0408**	-0.0437**	-0.0450**	-0.0403**	-0.0442**	-0.0443**
	(0.0168)	(0.0173)	(0.0173)	(0.0166)	(0.0152)	(0.0163)	(0.0164)	(0.0159)	(0.0172)	(0.0163)
Tax Holiday$_{i-1}$		-0.0023	-0.0014	-0.0049				-0.0044	-0.0042	-0.0096
		(0.0186)	(0.0178)	(0.0173)				(0.0194)	(0.0191)	(0.0195)
Tax Holiday$_{i-2}$			-0.0075	-0.0024					-0.0133	-0.0029
			(0.0156)	(0.0144)					(0.0144)	(0.0130)
Tax Holiday$_{i-3}$				-0.0418						-0.0405
				(0.0267)						(0.0251)
Tax Holiday$_{i+1}$					-0.0149	-0.0117	-0.0134	-0.0153	-0.0121	-0.0153
					(0.0197)	(0.0177)	(0.0175)	(0.0201)	(0.0176)	(0.0176)
Tax Holiday$_{i+2}$						-0.0290	-0.0283		-0.0295	-0.0297
						(0.0202)	(0.0201)		(0.0199)	(0.0200)
Tax Holiday$_{i+3}$							-0.0124			-0.0162
							(0.0316)			(0.0328)
Sales Tax Rate	0.1724***	0.1724***	0.1724***	0.1723***	0.1716***	0.1712***	0.1712***	0.1716***	0.1712***	0.1710***
	(0.0193)	(0.0193)	(0.0193)	(0.0193)	(0.0193)	(0.0191)	(0.0190)	(0.0193)	(0.0191)	(0.0191)
ln(population)	2.0625	2.0610	2.0551	2.0126	2.1357	2.0779	2.0874	2.1323	2.0612	2.0255
	(2.1998)	(2.1949)	(2.1925)	(2.1883)	(2.3040)	(2.2776)	(2.2886)	(2.2982)	(2.2672)	(2.2756)
Unemp. Rate	-0.0410*	-0.0410*	-0.0410*	-0.0410*	-0.0415*	-0.0415*	-0.0418*	-0.0415*	-0.0415*	-0.0418*
	(0.0220)	(0.0220)	(0.0220)	(0.0220)	(0.0225)	(0.0224)	(0.0226)	(0.0225)	(0.0225)	(0.0226)
ln(real income)	0.9803***	0.9807***	0.9816***	0.9890***	0.9804***	0.9990***	1.0063***	0.9812***	1.0020***	1.0190***
	(0.3124)	(0.3126)	(0.3121)	(0.3076)	(0.3175)	(0.3183)	(0.3146)	(0.3175)	(0.3171)	(0.3097)
r^2	0.421	0.421	0.421	0.421	0.419	0.419	0.418	0.419	0.419	0.418
F	10,742	10,697	10,106	9,812	9,631	12.720	8.179	9,896	9,844	10,662
Observations	2,805	2,805	2,805	2,805	2,792	2,779	2,767	2,792	2,779	2,767

All regressions include state fixed effects, year effects, state-specific month effects, and state-specific linear time trends. Robust standard errors are clustered by state. A * denotes $p < 0.10$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

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CHAPTER V

Conclusion

The sales tax holiday—a transitory reduction in a state's sales tax base lasting only a few days—is an increasingly popular state tax policy. It began as a way to keep New Yorkers from traveling to New Jersey to purchase clothing that was tax-free year-round. Since then, it has evolved to include school supplies, computers, energy-efficient appliances, and hurricane preparedness items. From 1997 through 2007, 20 states and the District of Columbia held 118 different tax holidays. More than 100 million people lived in a state that had a sales tax holiday during the 2004 to 2007 period, accounting for roughly one-third the U.S. population.

A key feature of every sales tax holiday is that goods are taxed at different rates on consecutive days. Further, this policy is known in advance. Consequently, consumers have an incentive to time their purchases to coincide with the lower tax rate during the holiday. Consumers will benefit from this policy if the prices they pay decrease during the tax holiday, and retailers will benefit if consumers make purchases they otherwise would not have made in the absence of the tax holiday.

Lawmakers need to know how prices change before, during, and after tax holidays. They also must know what proportion of any increased sales during tax holidays is attributable to consumers' shifting their purchases to coincide with the holiday and what proportion is additional purchases. Knowing the answers to the these questions, lawmakers will be able to gauge whether their policy goals of reducing the tax burden on families and stimulating the economy are achieved and what the revenue cost of the policy is. In this dissertation, I have provided answers to these questions regarding the incidence of the sales tax, the timing behavior of consumer purchases, and the revenue cost of sales tax holidays.

In chapter III, I examined the market for personal computers. Using scanner data that span nine tax holidays in 2007, I found that the sales tax is fully or slightly over-shifted to consumers. Demand is extremely responsive to small price changes during tax holidays. The quantity responses

range from 5.76 to 16.53 more computers purchased per 10,000 people than would be predicted in the absence of the holidays. The timing response accounts for between 37 and 90 percent of the increase in purchases in the tax holiday states over the 30-week horizon.

In chapter IV, I constructed a new dataset containing monthly, state-level tax collection to investigate the revenue loss associated with sales tax holidays. On average, sales and use tax collections decrease 4.18 percent during months containing tax holidays. Back-of-the-envelope calculations suggest that up to half of the revenue loss is due to consumers' timing their purchases within the month to exploit the lower tax rate during the tax holiday. The existence of a tax holiday matters more than its duration; extending a holiday by one day has no impact on tax collections. This reinforces the importance of the timing response of consumers purchases to the policy. Finally, the evidence indicates that consumers are not shifting purchases across months in sufficiently large dollar amounts that tax collections decrease in months preceding or succeeding tax holidays. The substitution appears to be coming within the month of the tax holiday.

The information generated in this dissertation will inform policy discussions taking place in state legislatures throughout the country. However, more work on this topic needs to be done. Future work should investigate how differences in sales tax rates across jurisdictions that arise because of sales tax holidays influence consumers' choice of where to purchase goods. Research should also be conducted on the degree to which retailers exploit the fact that tax holidays last fewer days than is their tax-reporting period in order to evade their sales tax obligations.