

# The Fiscal Impacts of Seasonal Sales Tax in Maine

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## Abstract

This study presents an analysis of the potential implementation of a seasonal sales tax in Maine, focusing on its impact on state revenue and tax burden distribution. We address three key questions of interest to policymakers: the effect of various seasonal tax scenarios on overall tax revenue, the extent of tax burden shift from residents to tourists, and the potential impacts on local businesses. Our model incorporates differential price elasticities for residents and tourists, as well as seasonal spending patterns, to provide robust estimates. By combining theoretical modeling with real-world data, this research offers evidence-based insights to inform policy decisions. The findings suggest that a well-designed seasonal sales tax could potentially increase state revenue and shift the tax burden away from permanent residents and towards tourists. Our baseline estimates suggest a seasonal sales tax system could increase sales tax revenue by \$117 million per year, of which 76% of the burden would be borne by out-of-state tourists. As an overall share, tourists' burden of the total annual sales tax revenue in Maine would rise from 20.6% to 25.3%.

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## 1 Executive Summary

Maine’s economy is significantly influenced by its robust, highly-seasonal tourism industry. In 2019, tourists spent nearly \$6.5 billion in the state, supporting approximately 115,000 jobs in the tourism sector.<sup>1</sup> Nearly 80% of this total came from out-of-state overnight visitors on tourism-related trips. Another sizable portion came from out-of-state day trip visitors from neighboring states and Canada. The highly seasonal nature of Maine’s tourism industry presents both opportunities and challenges.

As a result of the state’s strong tourist industry, many businesses adjust their prices seasonally in response to higher demand as millions visit to experience Maine’s natural beauty and outdoor opportunities in the summertime. However, Maine’s sales tax, restaurant tax, and lodging tax are fixed at year-round rates (5.5% sales, 8% restaurant, 9% lodging).

Just as businesses adapt to seasonal demand, the state government could explore a similar approach: generating additional revenue during peak tourism months while reducing the tax burden on year-round Maine residents. Restaurants in Maine earn over twice as much revenue in August compared to January, while lodging establishments experience an even more pronounced variation, taking in eight times more in August than in January. This paper studies the effects of implementing a seasonal sales tax on overall tax revenue, and – for a fixed amount of revenue raised – the burden of revenue borne between in-state residents and out-of-state tourists.

In section 2, we discuss the key policy questions of the paper:

1. How would various seasonal tax regimes affect overall sales tax revenue?
2. To what extent can a seasonal sales tax shift the tax burden from residents to tourists?

The primary objective of this proposed tax restructuring are to capitalize on the high volume of tourist activity to provide tax relief to year-round residents during the off-peak months while maintaining a constant level of sales tax revenue. This approach aims to shift a larger portion of the tax burden onto tourists while potentially easing the financial strain on local residents and businesses during the quieter months.

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<sup>1</sup>[https://motpartners.com/wp-content/uploads/2020/06/2019\\_Maine\\_Tourism\\_Highlights.pdf](https://motpartners.com/wp-content/uploads/2020/06/2019_Maine_Tourism_Highlights.pdf)

We simulate a seasonal sales tax regime that considers that “high tax” season to run five months, from May through September, which coincides with peak tourism season in Maine. Consequently, the “low tax” season stretches from October through April. Our baseline scenario considers a seasonal restaurant tax of 6% in the low season and 12% in the high season. Our baseline considers a lodging tax of 7% in the low season and 14% in the high season. Lastly, our baseline considers a general sales tax rate of 4% in the low season and 8% in the high season.

Our estimates suggest a total increase in tax revenue for the state of Maine of \$117.3 million, an increase of 9.26% in overall revenue. This increase in tax revenue is borne disproportionately by out-of-state tourists, whose tax burden would increase by \$89.11 million, which is 34% higher than they pay currently. Meanwhile, Maine residents would experience a modest tax increase of just 2.8% relative to their pre-seasonal sales tax burden, accounting for \$28.17 million of the revenue increase. As an overall share, tourists’ burden of the total annual sales tax revenue in Maine would rise from 20.6% to 25.3%.

This seasonal sales tax regime translates to a net benefit of \$53 per resident if the additional revenue is distributed.<sup>2</sup> In our analysis, longer peak seasons and higher peak rates effectively capture more tourist spending while maintaining reasonable off-peak relief for residents. This demonstrates that a seasonal sales tax could successfully leverage Maine’s tourism industry to provide tax relief for year-round residents while maintaining and even increasing overall tax revenue.

In section 3, we develop an economic model incorporating seasonal spending patterns and differential price elasticities for residents and tourists. Section 4 presents an application example using available data and reasonable assumptions for Maine’s context, demonstrating how our model can deliver reasonable real-world projections. Finally, Section 5 summarizes our key findings, acknowledges the limitations of our study, and suggests directions for future research to further refine our understanding of seasonal sales tax impacts in Maine’s tourism-driven economy.

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<sup>2</sup>This account for all taxes paid for by both tourists and year-round residents.

## 2 Key Policy Questions

The implementation of a seasonal sales tax structure in Maine raises several critical questions that require thorough examination. This study focuses on addressing three interconnected key questions of particular interest to policymakers, each with significant implications for the state’s economy, residents, and tourism industry. Before delving into these questions, it’s important to define some key terms. The tax burden refers to the total amount of tax paid by an individual or group relative to their income or spending. In Maine’s context, the peak season typically runs from June through September, when tourist activity is highest. A seasonal sales tax is a tax structure where rates vary depending on the time of year.

### 2.1 Impact on Overall Tax Revenue

The first question we address is how various seasonal tax regimes would affect overall tax revenue. This question is fundamental to assessing the fiscal viability of a seasonal sales tax policy. Understanding the revenue implications is crucial for policymakers to determine whether such a policy can meet the state’s financial needs while potentially offering tax relief during off-peak seasons.

Our approach to this question involves modeling various tax regimes, considering different rate structures and their potential impact on consumer behavior. We will use historical sales data and econometric modeling to project potential outcomes. This analysis will consider the perspectives of different stakeholders. The government seeks to maintain overall revenue. Residents are interested in a lower year-round tax burden. Businesses are concerned about the impact on consumer spending and administrative complexity.

One of the main challenges in addressing this question is accurately predicting changes in consumer behavior in response to tax changes, especially given the seasonal nature of the policy. Despite this challenge, the results of this analysis will directly inform the structure of any proposed seasonal tax policy, helping to set rates that balance revenue goals with other policy objectives.

## 2.2 Shifting the Tax Burden

The second key question examines to what extent a seasonal sales tax can shift the tax burden from residents to tourists. This question addresses the core objective of the proposed policy - to leverage Maine's tourism industry to provide tax relief for residents. Understanding the potential for burden shifting is crucial for assessing the policy's effectiveness and fairness.

To approach this question, we will analyze spending patterns of residents versus tourists, considering factors such as price elasticity of demand for various goods and services, which characterize consumers' sensitivity to changing prices. We estimate the potential shift in tax burden. This analysis will consider various stakeholder perspectives. Residents are primarily concerned with potential tax relief. Tourists may be sensitive to perceived fairness and overall cost of visiting Maine. The tourism industry is concerned about potential negative impacts on visitor numbers.

A significant challenge in this analysis is accurately distinguishing between resident and tourist spending, especially in border areas or for part-time residents. Despite this challenge, the findings from this question will inform the design of the tax structure to maximize the shift of burden to tourists while minimizing potential negative impacts on tourism.

## 2.3 Impacts on Local Businesses

The third key question explores the potential impacts on local businesses, including both challenges and benefits. Local businesses are a crucial part of Maine's economy and will be directly affected by any changes in tax policy. Understanding these impacts is essential for designing a policy that supports economic growth and minimizes unintended negative consequences.

Our approach to this question involves analyzing financial data and modeling potential impacts on different business sectors. We will consider factors such as changes in consumer behavior, administrative costs, and potential benefits like increased off-season activity. This analysis will consider the perspectives of various types of businesses. Small businesses are often concerned about administrative burden and impact on competitiveness. Large businesses and chains may have different concerns related to statewide operations and interstate commerce. Seasonal businesses are particularly interested in how the policy might affect peak season revenues and off-season

sustainability.

These three questions are closely interrelated and collectively provide a comprehensive picture of the potential impacts of a seasonal sales tax in Maine. The revenue effects are directly influenced by the extent of burden shifting and the impacts on local businesses. The ability to shift the tax burden to tourists depends on how businesses respond to and implement the tax changes. The impacts on local businesses will be shaped by both the overall revenue effects and the success in shifting the tax burden.

By addressing these questions together, we aim to provide a holistic understanding of the potential outcomes of implementing a seasonal sales tax in Maine. This comprehensive approach will allow policymakers to weigh the trade-offs and design a policy that best serves the interests of Maine's residents, businesses, and overall economy.



### 3 Analytical Framework for Seasonal Sales Tax

#### 3.1 Overview of the Model

This section develops a comprehensive framework for analyzing how seasonal sales tax changes affect Maine’s economy. Our model tracks the impact of tax changes through four key stages: (1) price formation, (2) consumer response, (3) business revenue effects, and (4) tax revenue collection. By systematically evaluating each stage, we can quantify how different seasonal tax regimes redistribute the tax burden between residents and tourists while affecting overall economic activity.

The central insight of our approach is that sales tax changes affect different groups asymmetrically. Specifically, when tax rates increase during peak tourist season and decrease during off-peak months, the tax burden shifts toward tourists due to:

- Differences in consumption timing (tourists concentrate spending in peak months)
- Different price sensitivities (tourists are typically less price-sensitive than residents)
- Varying consumption patterns (tourists spend more heavily in certain sectors)

Our model explicitly accounts for these differences, allowing us to trace how tax changes propagate through the economy and ultimately affect businesses, residents, and government revenue.

#### 3.2 Basic Market Structure

We model Maine’s economy with two types of consumers (residents and tourists) and three major sectors (restaurants, lodging, and general retail). Each sector exhibits distinct seasonal patterns and resident-tourist consumption ratios.

For each sector  $s$  and month  $m$ , we define:

- $S_{s,m}$  = total pre-tax sales (the revenue businesses receive before taxes)
- $\alpha_{s,m}$  = resident share of sales (proportion purchased by Maine residents)
- $(1 - \alpha_{s,m})$  = tourist share of sales (proportion purchased by non-residents)
- $\tau_{s,m}$  = tax rate (which may vary by season)

The resident and tourist components of pre-tax sales can be written as:

$$S_{s,m,r} = S_{s,m} \times \alpha_{s,m} \quad (\text{resident sales}) \tag{1}$$

$$S_{s,m,t} = S_{s,m} \times (1 - \alpha_{s,m}) \quad (\text{tourist sales}) \tag{2}$$

Equations 1 and 2 decompose total sales into their resident and tourist components. This decomposition is crucial because these two groups respond differently to price changes, which we will model in subsequent sections.

### 3.3 Tax Incidence and Price Formation

When sales tax rates change, the question of who bears the tax burden—consumers or businesses—depends on what economists call "tax incidence." Tax incidence is determined by market forces rather than by who legally pays the tax. In competitive markets, the burden is typically shared between consumers and businesses, with the exact distribution depending on the relative price sensitivities of demand and supply.

#### 3.3.1 Tax Pass-Through

In our model, we make the standard assumption of complete (100%) tax pass-through, meaning that changes in sales tax are fully reflected in consumer prices. This assumption is supported by empirical research in the restaurant and lodging industries, where tax changes are often fully passed to consumers, particularly in tourist areas where demand is relatively price-inelastic.

With 100% pass-through, when the tax rate changes from  $\tau_0$  to  $\tau_1$ , the relationship between the original tax-inclusive price ( $P_0$ ) and the new tax-inclusive price ( $P_1$ ) is:

$$P_1 = P_0 \times \frac{1 + \tau_1}{1 + \tau_0} \tag{3}$$

Equation 3 shows that the tax-inclusive price changes proportionally to the tax rate adjustment. To derive this equation, consider that the pre-tax price ( $\tilde{P}$ ) remains unchanged with 100% pass-through, so:

$$P_0 = \tilde{P}(1 + \tau_0) \tag{4}$$

$$P_1 = \tilde{P}(1 + \tau_1) \tag{5}$$

Dividing the second equation by the first gives us Equation 3.

### 3.3.2 Percentage Change in Price

For our analysis, we need to calculate the percentage change in price resulting from a tax change:

$$\frac{\Delta P}{P} = \frac{P_1 - P_0}{P_0} \tag{6}$$

$$= \frac{P_0 \times \frac{1+\tau_1}{1+\tau_0} - P_0}{P_0} \tag{7}$$

$$= \frac{1 + \tau_1}{1 + \tau_0} - 1 \tag{8}$$

Equation 8 provides the percentage change in the tax-inclusive price. This formula is a key input for our subsequent calculations of consumer response. For example:

- When tax increases from 8% to 12%:  $\frac{\Delta P}{P} = \frac{1.12}{1.08} - 1 = 0.037$  (3.7% price increase)
- When tax decreases from 8% to 6%:  $\frac{\Delta P}{P} = \frac{1.06}{1.08} - 1 = -0.0185$  (1.85% price decrease)

These price changes drive consumer responses, which we model in the next section. Note that the percentage price change is not equal to the percentage point change in the tax rate, but rather reflects how the tax-inclusive price changes. This distinction is important because consumers respond to the total price they pay, not just the tax component.

### 3.4 Consumer Response to Price Changes

When prices change due to tax adjustments, consumers modify their purchasing behavior. The extent of this adjustment is captured by the price elasticity of demand, which measures the percentage change in quantity demanded relative to the percentage change in price.

### 3.4.1 Elasticity and Quantity Response

The price elasticity of demand ( $\epsilon$ ) is formally defined as:

$$\epsilon = \frac{\% \text{ change in quantity}}{\% \text{ change in price}} = \frac{\Delta Q/Q}{\Delta P/P} \quad (9)$$

Rearranging Equation 9 to solve for the percentage change in quantity:

$$\frac{\Delta Q}{Q} = \epsilon \times \frac{\Delta P}{P} \quad (10)$$

Equation 10 allows us to calculate how much consumers will adjust their purchasing quantities in response to a tax-induced price change. For example, if prices increase by 3% and the elasticity is -0.5, quantity demanded will decrease by  $-0.5 \times 3\% = -1.5\%$ .

### 3.4.2 Differential Elasticities

A key feature of our model is that we assume different price elasticities for residents and tourists:

$$|\epsilon_t| < |\epsilon_r| \quad (11)$$

where  $\epsilon_r$  is the resident price elasticity and  $\epsilon_t$  is the tourist price elasticity. Equation 11 indicates that tourists are less price-sensitive (more inelastic) than local residents.

These values reflect empirical findings that tourists are generally less price-sensitive than local residents for several reasons:

- Vacation expenditures represent planned, often budgeted spending
- Limited knowledge of local price alternatives
- Emphasis on convenience and experience over cost-saving
- Higher average income among travelers compared to the general population

Using Equation 10 with these differentiated elasticities, we can calculate separate quantity responses for residents and tourists:

$$\frac{\Delta Q_r}{Q_r} = \epsilon_r \times \frac{\Delta P}{P} \quad (\text{resident quantity change}) \quad (12)$$

$$\frac{\Delta Q_t}{Q_t} = \epsilon_t \times \frac{\Delta P}{P} \quad (\text{tourist quantity change}) \quad (13)$$

Equations 12 and 13 capture how residents and tourists will adjust their consumption differently in response to the same price change. For example, if prices increase by 3.7% (as in our earlier example of a tax increase from 8% to 12%):

- Residents reduce consumption by:  $-0.8 \times 3.7\% = -2.96\%$
- Tourists reduce consumption by only:  $-0.2 \times 3.7\% = -0.74\%$

This differential response is a key mechanism through which the seasonal tax policy shifts burden toward tourists.

### 3.5 Impact on Business Revenue

The next step is to calculate how these changes in consumer behavior affect business revenue. This requires careful analysis because changes in pre-tax business revenue depend on both price and quantity effects.

#### 3.5.1 Components of Revenue Change

For businesses, what matters is the pre-tax revenue, which is the amount they receive after taxes are remitted to the government. When tax rates change, pre-tax revenue changes due to:

- Direct price effect: Businesses get a different pre-tax amount per item sold
- Quantity effect: Consumers buy different quantities in response to price changes

However, with our assumption of 100% tax pass-through, the pre-tax price received by businesses remains constant. Therefore, the change in pre-tax revenue is driven solely by changes in quantity sold. This is a crucial insight: while tax-inclusive prices paid by consumers change, the pre-tax amount received by businesses per unit sold stays the same.

### 3.5.2 New Sales Calculation

Given the quantity changes calculated in Equations 12 and 13, the new pre-tax sales for each consumer group are:

$$S_{1,r} = S_{0,r} \times \left(1 + \frac{\Delta Q_r}{Q_r}\right) \quad (14)$$

$$= S_{0,r} \times \left(1 + \epsilon_r \times \frac{\Delta P}{P}\right) \quad (15)$$

$$S_{1,t} = S_{0,t} \times \left(1 + \frac{\Delta Q_t}{Q_t}\right) \quad (16)$$

$$= S_{0,t} \times \left(1 + \epsilon_t \times \frac{\Delta P}{P}\right) \quad (17)$$

Equations 15 and 17 provide the new pre-tax sales from residents and tourists, respectively.

The total new pre-tax sales is the sum of these components.

For a given sector  $s$  in month  $m$ , the total new pre-tax sales can be written as:

$$S_{1,s,m} = S_{1,s,m,r} + S_{1,s,m,t} \quad (18)$$

$$= S_{0,s,m,r} \times \left(1 + \epsilon_r \times \frac{\Delta P}{P}\right) + S_{0,s,m,t} \times \left(1 + \epsilon_t \times \frac{\Delta P}{P}\right) \quad (19)$$

Substituting Equations 1 and 2 into Equation 19:

$$S_{1,s,m} = S_{0,s,m} \times \alpha_{s,m} \times \left(1 + \epsilon_r \times \frac{\Delta P}{P}\right) + S_{0,s,m} \times (1 - \alpha_{s,m}) \times \left(1 + \epsilon_t \times \frac{\Delta P}{P}\right) \quad (20)$$

Equation 20 is our comprehensive formula for calculating the new pre-tax sales in sector  $s$  and month  $m$  after a tax change. This equation incorporates:

- Original sales volume ( $S_{0,s,m}$ )

- Resident-tourist composition ( $\alpha_{s,m}$ )
- Different price elasticities ( $\epsilon_r$  and  $\epsilon_t$ )
- Tax-induced price change ( $\frac{\Delta P}{P}$ )

This equation is critical for our empirical analysis because it allows us to calculate how business revenue changes in response to seasonal tax adjustments, incorporating both consumer composition and differential behavioral responses.

### 3.6 Tax Revenue Impact

After calculating the new pre-tax sales, we can determine how tax revenue changes under the proposed seasonal tax regime. This analysis is crucial for assessing the fiscal implications of the policy.

#### 3.6.1 Tax Revenue Calculation

Tax revenue is calculated by multiplying the pre-tax sales by the applicable tax rate. For each consumer group (residents and tourists) in sector  $s$  and month  $m$ , the tax revenue is:

$$T_{0,s,m,r} = S_{0,s,m,r} \times \tau_{0,s} \quad (\text{original resident tax}) \quad (21)$$

$$T_{0,s,m,t} = S_{0,s,m,t} \times \tau_{0,s} \quad (\text{original tourist tax}) \quad (22)$$

$$T_{1,s,m,r} = S_{1,s,m,r} \times \tau_{1,s,m} \quad (\text{new resident tax}) \quad (23)$$

$$T_{1,s,m,t} = S_{1,s,m,t} \times \tau_{1,s,m} \quad (\text{new tourist tax}) \quad (24)$$

Where:

- $T_{0,s,m,r}$  and  $T_{0,s,m,t}$  represent the original tax revenue from residents and tourists
- $T_{1,s,m,r}$  and  $T_{1,s,m,t}$  represent the new tax revenue from residents and tourists
- $\tau_{0,s}$  is the original tax rate for sector  $s$
- $\tau_{1,s,m}$  is the new tax rate for sector  $s$  in month  $m$  (which varies seasonally)

The total tax revenue for sector  $s$  in month  $m$  is the sum of resident and tourist contributions:

$$T_{0,s,m} = T_{0,s,m,r} + T_{0,s,m,t} \quad (\text{original total tax}) \quad (25)$$

$$T_{1,s,m} = T_{1,s,m,r} + T_{1,s,m,t} \quad (\text{new total tax}) \quad (26)$$

### 3.6.2 Aggregate Tax Revenue

To evaluate the overall fiscal impact, we aggregate tax revenue across all months and sectors:

$$T_0 = \sum_s \sum_m T_{0,s,m} \quad (\text{original annual tax revenue}) \quad (27)$$

$$T_1 = \sum_s \sum_m T_{1,s,m} \quad (\text{new annual tax revenue}) \quad (28)$$

Equations 27 and 28 provide the total annual tax revenue before and after implementing the seasonal tax policy. The difference between these values indicates the net fiscal impact of the policy:

$$\Delta T = T_1 - T_0 \quad (\text{change in annual tax revenue}) \quad (29)$$

A positive value of  $\Delta T$  indicates that the seasonal tax policy increases overall revenue, while a negative value indicates a revenue decrease. Our empirical analysis will determine this value based on actual Maine sales data.

### 3.7 Welfare and Distributional Analysis

Beyond the aggregate impacts on business revenue and tax collection, we are particularly interested in how the tax burden shifts between residents and tourists. This distributional analysis is key to evaluating whether the policy achieves its goal of leveraging tourism to provide tax relief for Maine residents.



### 3.7.1 Tax Burden Distribution

We calculate the total tax burden on each group before and after the policy change:

$$B_{0,r} = \sum_s \sum_m T_{0,s,m,r} \quad (\text{original resident burden}) \quad (30)$$

$$B_{0,t} = \sum_s \sum_m T_{0,s,m,t} \quad (\text{original tourist burden}) \quad (31)$$

$$B_{1,r} = \sum_s \sum_m T_{1,s,m,r} \quad (\text{new resident burden}) \quad (32)$$

$$B_{1,t} = \sum_s \sum_m T_{1,s,m,t} \quad (\text{new tourist burden}) \quad (33)$$

The changes in burden for each group are:

$$\Delta B_r = B_{1,r} - B_{0,r} \quad (\text{change in resident burden}) \quad (34)$$

$$\Delta B_t = B_{1,t} - B_{0,t} \quad (\text{change in tourist burden}) \quad (35)$$

### 3.7.2 Per Capita Impact

To make these figures more interpretable, we calculate the per-resident impact by dividing the change in resident burden by Maine's population ( $N$ ):

$$\Delta B_{r,pc} = \frac{\Delta B_r}{N} \quad (\text{per capita change in resident burden}) \quad (36)$$

Similarly, we can express the additional tax contribution from tourists on a per-resident basis:

$$C_{t,pc} = \frac{\Delta B_t}{N} \quad (\text{tourist contribution per resident}) \quad (37)$$

Equation 37 quantifies how much additional tax each tourist pays, spread across Maine's population. This can be interpreted as the potential tax relief available to each resident if the additional tourist tax revenue were redistributed.

### 3.7.3 Net Benefit Calculation

Finally, we calculate the net benefit per resident by subtracting the per capita burden increase from the per capita tourist contribution:

$$NB = C_{t,pc} - \Delta B_{r,pc} \quad (\text{net benefit per resident}) \quad (38)$$

Equation 38 provides a single summary measure of the policy’s distributional impact. A positive value indicates that Maine residents could receive a net benefit if the additional revenue were used for resident tax relief or public services.

## 3.8 Key Assumptions and Limitations

Our model relies on several important assumptions that should be kept in mind when interpreting the results:

### 3.8.1 Tax Pass-Through

We assume 100% tax pass-through, meaning that changes in tax rates are fully reflected in consumer prices. While this is a standard assumption supported by empirical research in tourism-heavy sectors, the actual pass-through rate may vary across businesses and over time. If pass-through is less than 100%, the price changes faced by consumers would be smaller, resulting in smaller quantity responses and different distributional effects.

### 3.8.2 Constant Elasticities

Our model assumes constant price elasticities for residents (-0.8) and tourists (-0.2) across:

- All months (regardless of season)
- All sectors (restaurants, lodging, and retail)
- All price levels

In reality, elasticities may vary by season, with consumers potentially being more price-sensitive during off-peak periods. Additionally, elasticities may differ across sectors, with necessities being

less elastic than luxury goods.

### **3.8.3 No Cross-Price Effects**

We do not model cross-price elasticities between different goods or services. In reality, consumers might substitute between categories (e.g., eating at restaurants vs. cooking at home) in response to tax changes. Additionally, we do not model potential cross-border shopping effects where consumers might travel to neighboring states to avoid taxes.

### **3.8.4 No Intertemporal Substitution**

Our model does not account for consumers shifting their purchases across time in response to seasonal tax changes. In practice, some consumers might adjust their vacation timing or make larger purchases during lower-tax periods. This limitation may cause our model to underestimate the efficiency benefits of seasonal taxation.

### **3.8.5 No Supply-Side Responses**

Beyond the assumption of tax pass-through, we do not model other supply-side responses such as changes in business operations, investment, or entry/exit decisions. In the long run, businesses might adapt their seasonal operations in response to the tax policy.

Despite these limitations, our model captures the primary mechanisms through which seasonal sales taxes affect Maine’s economy. The next sections apply this framework to real data from Maine, providing empirical estimates of the policy’s impacts on businesses, government revenue, and the distribution of tax burden between residents and tourists.

## **4 Application Example**

This section demonstrates how the proposed seasonal sales tax would affect Maine’s restaurant sector using 2018 data. We provide a detailed, step-by-step analysis to ensure clarity and reproducibility. To summarize our key findings from section 4.7.5, we estimate a seasonal sales tax in Maine would boost total tax revenue by \$117.3 million (9.3%). We estimate 76% of this increase in tax revenue is borne by out-of-state tourists, whose tax burden would increase by \$89.11 million.

As an overall share, tourists’ burden of the total sales tax revenue in Maine would rise from 20.6% to 25.3%.

### 4.1 Basic Assumptions

Our analysis relies on the following assumptions:

1. Current tax rate ( $\tau_0$ ): 7%
2. Proposed tax rates ( $\tau_1$ ):
  - Off-peak (October-May): 5%
  - Peak (June-September): 9%
3. Price elasticity of demand:
  - Residents ( $\epsilon_r$ ): -0.8
  - Tourists ( $\epsilon_t$ ): -0.2
4. Tax pass-through rate: 100% (tax changes fully reflected in consumer prices)

### 4.2 Monthly Sales Data

Monthly restaurant sales data for Maine in 2018 (in millions of dollars):

Table 1: Monthly Sales in Maine by Sector, 2018 (Millions of Dollars)

Sales Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Restaurant	159	169	199	192	237	291	345	360	298	241	184	223
Lodging	28	31	37	42	77	130	209	220	147	90	34	38
Remainder	1,056	1,051	1,262	1,260	1,534	1,654	1,545	1,625	1,533	1,469	1,404	1,648

*Note:* Remainder of sales includes following categories taxed at general sales tax rate of 5.5%: Building Supply, Food Store, General Merchandise, Other Retail, Auto/Transportation.

### 4.3 Estimated Monthly Spending Proportions

The estimated monthly spending proportions are based on a combination of factors:

These proportions are estimated based on:

Table 2: Estimated Monthly Spending Proportions

	Jan-May	Jun	Jul	Aug	Sep	Oct-Dec
<i>A. Restaurants</i>						
Residents	0.90	0.65	0.55	0.52	0.62	0.90
Tourists	0.10	0.35	0.45	0.48	0.38	0.10
<i>B. Hotels</i>						
Residents	0.40	0.20	0.05	0.05	0.15	0.50
Tourists	0.60	0.80	0.95	0.95	0.85	0.50
<i>C. Remainder</i>						
Residents	0.95	0.80	0.75	0.75	0.80	0.95
Tourists	0.05	0.20	0.25	0.25	0.20	0.05

1. Seasonal tourism patterns in Maine, with peak tourism occurring in July and August.
2. Assumption that residents maintain relatively stable dining-out habits year-round, with some increase during summer months.
3. Recognition that even during peak tourist season, residents still make up a significant portion of restaurant patrons.
4. Hotel proportion estimates are based on testimonies from general managers of several hotels in Brewer and Lewiston.

It’s important to note that these are simplified estimates for illustrative purposes. In a full study, more precise data would be needed, potentially including credit card data analysis to distinguish between in-state and out-of-state spending patterns.

#### 4.4 Restaurant Sector Analysis

The restaurant sector currently faces an 8% sales tax. We propose modifying this to 6% during off-peak months (October-April) and 12% during peak months (May-September). From 2018 data, this sector shows significant seasonality, with August sales (\$360M) more than double January sales (\$159M). The consumer composition also varies seasonally, with tourists comprising 10% of customers in off-peak months but up to 48% in peak season.

#### 4.4.1 Detailed Calculation: July Example

Using July 2018 data:

##### 1. Base Data (Pre-tax) Total sales: \$345M

$$\text{Resident sales} = 345 \times 0.55 = 189.75\text{M}$$

$$\text{Tourist sales} = 345 \times 0.45 = 155.25\text{M}$$

##### 2. Tax-inclusive Price Change (8% → 12%)

$$\frac{\Delta P}{P} = \frac{1.12}{1.08} - 1 = 0.0370$$

##### 3. Quantity Response With resident elasticity $\epsilon_r = -0.8$ and tourist elasticity $\epsilon_t = -0.2$ :

$$\text{Resident change: } -0.8 \times 0.0370 = -0.0296$$

$$\text{Tourist change: } -0.2 \times 0.0370 = -0.0074$$

##### 4. New Pre-tax Revenue

$$\text{New resident sales} = 189.75 \times (1 - 0.0296) = 184.13\text{M}$$

$$\text{New tourist sales} = 155.25 \times (1 - 0.0074) = 154.10\text{M}$$

$$\text{Total new sales} = 338.23\text{M}$$

$$\text{Change} = -1.96\%$$

##### 5. Tax Revenue

$$\text{Original tax} = 345.00 \times 0.08 = 27.60\text{M}$$

$$\text{New tax} = 338.23 \times 0.12 = 40.59\text{M}$$

#### 4.4.2 Annual Results

Applying this same methodology to all months yields:

##### Pre-tax Business Revenue

Original monthly revenue:

$$\begin{aligned} S_0 &= 159 \text{ (Jan)} + 169 \text{ (Feb)} + 199 \text{ (Mar)} + 192 \text{ (Apr)} + 237 \text{ (May)} + 291 \text{ (Jun)} \\ &\quad + 345 \text{ (Jul)} + 360 \text{ (Aug)} + 298 \text{ (Sep)} + 241 \text{ (Oct)} + 184 \text{ (Nov)} + 223 \text{ (Dec)} \\ &= 2,898.00\text{M} \end{aligned}$$

New monthly revenue:

$$\begin{aligned} S_1 &= 160.43 \text{ (Jan)} + 170.52 \text{ (Feb)} + 200.79 \text{ (Mar)} + 193.73 \text{ (Apr)} + 232.35 \text{ (May)} + 285.30 \text{ (Jun)} \\ &\quad + 338.23 \text{ (Jul)} + 352.94 \text{ (Aug)} + 292.16 \text{ (Sep)} + 243.17 \text{ (Oct)} + 185.66 \text{ (Nov)} + 225.01 \text{ (Dec)} \\ &= 2,883.97\text{M} \end{aligned}$$

##### Tax Revenue

Original monthly tax (8%):

$$\begin{aligned} T_0 &= 12.72 \text{ (Jan)} + 13.52 \text{ (Feb)} + 15.92 \text{ (Mar)} + 15.36 \text{ (Apr)} + 18.96 \text{ (May)} + 23.28 \text{ (Jun)} \\ &\quad + 27.60 \text{ (Jul)} + 28.80 \text{ (Aug)} + 23.84 \text{ (Sep)} + 19.28 \text{ (Oct)} + 14.72 \text{ (Nov)} + 17.84 \text{ (Dec)} \\ &= 231.84\text{M} \end{aligned}$$

New monthly tax (6%/12%):

$$\begin{aligned} T_1 &= 9.49 \text{ (Jan)} + 10.09 \text{ (Feb)} + 11.88 \text{ (Mar)} + 11.46 \text{ (Apr)} + 29.32 \text{ (May)} + 34.79 \text{ (Jun)} \\ &\quad + 41.75 \text{ (Jul)} + 36.32 \text{ (Aug)} + 30.03 \text{ (Sep)} + 14.39 \text{ (Oct)} + 10.98 \text{ (Nov)} + 13.31 \text{ (Dec)} \\ &= 262.93\text{M} \end{aligned}$$

**Tax Burden by Group**

Original resident tax:

$$\begin{aligned}
T_{0r} &= 11.45 \text{ (Jan)} + 12.17 \text{ (Feb)} + 14.33 \text{ (Mar)} + 13.82 \text{ (Apr)} + 17.06 \text{ (May)} + 15.13 \text{ (Jun)} \\
&\quad + 15.18 \text{ (Jul)} + 14.98 \text{ (Aug)} + 14.78 \text{ (Sep)} + 17.35 \text{ (Oct)} + 13.25 \text{ (Nov)} + 16.06 \text{ (Dec)} \\
&= 175.56\text{M}
\end{aligned}$$

New resident tax:

$$\begin{aligned}
T_{1r} &= 8.70 \text{ (Jan)} + 9.25 \text{ (Feb)} + 10.89 \text{ (Mar)} + 10.50 \text{ (Apr)} + 25.09 \text{ (May)} + 22.25 \text{ (Jun)} \\
&\quad + 22.85 \text{ (Jul)} + 22.02 \text{ (Aug)} + 21.74 \text{ (Sep)} + 13.13 \text{ (Oct)} + 10.03 \text{ (Nov)} + 12.15 \text{ (Dec)} \\
&= 187.18\text{M}
\end{aligned}$$

Original tourist tax:

$$\begin{aligned}
T_{0t} &= 1.27 \text{ (Jan)} + 1.35 \text{ (Feb)} + 1.59 \text{ (Mar)} + 1.54 \text{ (Apr)} + 1.90 \text{ (May)} + 8.15 \text{ (Jun)} \\
&\quad + 12.42 \text{ (Jul)} + 13.82 \text{ (Aug)} + 9.06 \text{ (Sep)} + 1.93 \text{ (Oct)} + 1.47 \text{ (Nov)} + 1.78 \text{ (Dec)} \\
&= 56.28\text{M}
\end{aligned}$$

New tourist tax:

$$\begin{aligned}
T_{1t} &= 0.97 \text{ (Jan)} + 1.03 \text{ (Feb)} + 1.21 \text{ (Mar)} + 1.17 \text{ (Apr)} + 2.79 \text{ (May)} + 11.99 \text{ (Jun)} \\
&\quad + 17.74 \text{ (Jul)} + 20.33 \text{ (Aug)} + 13.32 \text{ (Sep)} + 1.46 \text{ (Oct)} + 1.11 \text{ (Nov)} + 1.35 \text{ (Dec)} \\
&= 75.75\text{M}
\end{aligned}$$

The results show that in the restaurant sector:

- Business pre-tax revenue decreases by 0.48% (\$2,898.00M → \$2,883.97M)
- Total tax revenue increases by 13.41% (\$231.84M → \$262.93M)
- Resident tax burden increases by 6.62% (\$175.56M → \$187.18M)
- Tourist tax burden increases by 34.59% (\$56.28M → \$75.75M)



## 4.5 Lodging Sector Analysis

The lodging sector currently faces a 9% sales tax. We propose modifying this to 7% during off-peak months (October-April) and 14% during peak months (May-September). This sector shows the strongest seasonality, with August revenue (\$220M) nearly eight times January revenue (\$28M). Tourist share ranges from 50-60% in off-peak months to 95% during peak season.

### 4.5.1 Detailed Calculation: July Example

Using July 2018 data:

#### 1. Base Data (Pre-tax) Total sales: \$209M

$$\text{Resident sales} = 209 \times 0.05 = 10.45\text{M}$$

$$\text{Tourist sales} = 209 \times 0.95 = 198.55\text{M}$$

#### 2. Tax-inclusive Price Change (9% → 14%)

$$\frac{\Delta P}{P} = \frac{1.14}{1.09} - 1 = 0.0459$$

#### 3. Quantity Response With resident elasticity $\epsilon_r = -0.8$ and tourist elasticity $\epsilon_t = -0.2$ :

$$\text{Resident change: } -0.8 \times 0.0459 = -0.0367$$

$$\text{Tourist change: } -0.2 \times 0.0459 = -0.0092$$

#### 4. New Pre-tax Revenue

$$\text{New resident sales} = 10.45 \times (1 - 0.0367) = 10.07\text{M}$$

$$\text{New tourist sales} = 198.55 \times (1 - 0.0092) = 196.72\text{M}$$

$$\text{Total new sales} = 206.79\text{M}$$

$$\text{Change} = -1.06\%$$

## 5. Tax Revenue

$$\text{Original tax} = 209.00 \times 0.09 = 18.81\text{M}$$

$$\text{New tax} = 206.79 \times 0.14 = 28.95\text{M}$$

### 4.5.2 Annual Results

Applying this same methodology to all months yields:

#### Pre-tax Business Revenue

Original monthly revenue:

$$\begin{aligned} S_0 &= 28 \text{ (Jan)} + 31 \text{ (Feb)} + 37 \text{ (Mar)} + 42 \text{ (Apr)} + 77 \text{ (May)} + 130 \text{ (Jun)} \\ &\quad + 209 \text{ (Jul)} + 220 \text{ (Aug)} + 147 \text{ (Sep)} + 90 \text{ (Oct)} + 34 \text{ (Nov)} + 38 \text{ (Dec)} \\ &= 1,083.00\text{M} \end{aligned}$$

New monthly revenue:

$$\begin{aligned} S_1 &= 28.23 \text{ (Jan)} + 31.25 \text{ (Feb)} + 37.30 \text{ (Mar)} + 42.34 \text{ (Apr)} + 75.87 \text{ (May)} + 128.63 \text{ (Jun)} \\ &\quad + 206.79 \text{ (Jul)} + 217.68 \text{ (Aug)} + 145.04 \text{ (Sep)} + 90.83 \text{ (Oct)} + 34.27 \text{ (Nov)} + 38.35 \text{ (Dec)} \\ &= 1,076.58\text{M} \end{aligned}$$

#### Tax Revenue

Original monthly tax (9%):

$$\begin{aligned} T_0 &= 2.52 \text{ (Jan)} + 2.79 \text{ (Feb)} + 3.33 \text{ (Mar)} + 3.78 \text{ (Apr)} + 6.93 \text{ (May)} + 11.70 \text{ (Jun)} \\ &\quad + 18.81 \text{ (Jul)} + 19.80 \text{ (Aug)} + 13.23 \text{ (Sep)} + 8.10 \text{ (Oct)} + 3.06 \text{ (Nov)} + 3.42 \text{ (Dec)} \\ &= 97.47\text{M} \end{aligned}$$

New monthly tax (7%/14%):

$$\begin{aligned} T_1 &= 1.98 \text{ (Jan)} + 2.19 \text{ (Feb)} + 2.61 \text{ (Mar)} + 2.96 \text{ (Apr)} + 10.62 \text{ (May)} + 18.01 \text{ (Jun)} \\ &\quad + 28.95 \text{ (Jul)} + 30.48 \text{ (Aug)} + 20.31 \text{ (Sep)} + 6.36 \text{ (Oct)} + 2.40 \text{ (Nov)} + 2.68 \text{ (Dec)} \\ &= 129.54\text{M} \end{aligned}$$

### **Tax Burden by Group**

Original resident tax:

$$\begin{aligned} T_{0r} &= 0.91 \text{ (Jan)} + 1.01 \text{ (Feb)} + 1.20 \text{ (Mar)} + 1.36 \text{ (Apr)} + 1.25 \text{ (May)} + 0.53 \text{ (Jun)} \\ &\quad + 0.85 \text{ (Jul)} + 0.89 \text{ (Aug)} + 1.78 \text{ (Sep)} + 3.65 \text{ (Oct)} + 1.10 \text{ (Nov)} + 1.54 \text{ (Dec)} \\ &= 17.84\text{M} \end{aligned}$$

New resident tax:

$$\begin{aligned} T_{1r} &= 0.79 \text{ (Jan)} + 0.88 \text{ (Feb)} + 1.04 \text{ (Mar)} + 1.19 \text{ (Apr)} + 2.13 \text{ (May)} + 0.90 \text{ (Jun)} \\ &\quad + 1.41 \text{ (Jul)} + 1.49 \text{ (Aug)} + 3.05 \text{ (Sep)} + 3.18 \text{ (Oct)} + 0.96 \text{ (Nov)} + 1.37 \text{ (Dec)} \\ &= 18.25\text{M} \end{aligned}$$

Original tourist tax:

$$\begin{aligned} T_{0t} &= 1.61 \text{ (Jan)} + 1.78 \text{ (Feb)} + 2.13 \text{ (Mar)} + 2.42 \text{ (Apr)} + 5.68 \text{ (May)} + 11.17 \text{ (Jun)} \\ &\quad + 17.96 \text{ (Jul)} + 18.91 \text{ (Aug)} + 11.45 \text{ (Sep)} + 4.45 \text{ (Oct)} + 1.96 \text{ (Nov)} + 1.88 \text{ (Dec)} \\ &= 79.63\text{M} \end{aligned}$$

New tourist tax:

$$\begin{aligned} T_{1t} &= 1.19 \text{ (Jan)} + 1.31 \text{ (Feb)} + 1.57 \text{ (Mar)} + 1.77 \text{ (Apr)} + 8.49 \text{ (May)} + 17.11 \text{ (Jun)} \\ &\quad + 27.54 \text{ (Jul)} + 28.99 \text{ (Aug)} + 17.26 \text{ (Sep)} + 3.18 \text{ (Oct)} + 1.44 \text{ (Nov)} + 1.31 \text{ (Dec)} \\ &= 111.29\text{M} \end{aligned}$$

The results show that in the lodging sector:

- Business pre-tax revenue decreases by 0.59% (\$1,083.00M  $\rightarrow$  \$1,076.58M)
- Total tax revenue increases by 32.90% (\$97.47M  $\rightarrow$  \$129.54M)
- Resident tax burden increases by 2.32% (\$17.84M  $\rightarrow$  \$18.25M)
- Tourist tax burden increases by 39.75% (\$79.63M  $\rightarrow$  \$111.29M)

## 4.6 General Retail Sector Analysis

The general retail sector currently faces a 5.5% sales tax. We propose modifying this to 4% during off-peak months (October-April) and 8% during peak months (May-September). This sector shows moderate seasonality, with highest sales in June (\$1,654M) about 57% higher than February sales (\$1,051M). The resident share is highest among all sectors, ranging from 95% in off-peak months to 75% during peak season.

### 4.6.1 Detailed Calculation: July Example

Using July 2018 data:

#### 1. Base Data (Pre-tax) Total sales: \$1,545M

$$\text{Resident sales} = 1,545 \times 0.75 = 1,158.75\text{M}$$

$$\text{Tourist sales} = 1,545 \times 0.25 = 386.25\text{M}$$

#### 2. Tax-inclusive Price Change (5.5% $\rightarrow$ 8%)

$$\frac{\Delta P}{P} = \frac{1.08}{1.055} - 1 = 0.0237$$

#### 3. Quantity Response With resident elasticity $\epsilon_r = -0.8$ and tourist elasticity $\epsilon_t = -0.2$ :

$$\text{Resident change: } -0.8 \times 0.0237 = -0.0190$$

$$\text{Tourist change: } -0.2 \times 0.0237 = -0.0047$$

#### 4. New Pre-tax Revenue

$$\text{New resident sales} = 1,158.75 \times (1 - 0.0190) = 1,136.73\text{M}$$

$$\text{New tourist sales} = 386.25 \times (1 - 0.0047) = 384.47\text{M}$$

$$\text{Total new sales} = 1,521.20\text{M}$$

$$\text{Change} = -1.54\%$$

#### 5. Tax Revenue

$$\text{Original tax} = 1,545.00 \times 0.055 = 84.97\text{M}$$

$$\text{New tax} = 1,521.20 \times 0.08 = 121.70\text{M}$$

#### 4.6.2 Annual Results

Applying this same methodology to all months yields:

##### Pre-tax Business Revenue

Original monthly revenue:

$$\begin{aligned} S_0 &= 1056 \text{ (Jan)} + 1051 \text{ (Feb)} + 1262 \text{ (Mar)} + 1260 \text{ (Apr)} + 1534 \text{ (May)} + 1654 \text{ (Jun)} \\ &\quad + 1545 \text{ (Jul)} + 1625 \text{ (Aug)} + 1533 \text{ (Sep)} + 1469 \text{ (Oct)} + 1404 \text{ (Nov)} + 1648 \text{ (Dec)} \\ &= 17,041.00\text{M} \end{aligned}$$

New monthly revenue:

$$\begin{aligned} S_1 &= 1067.56 \text{ (Jan)} + 1062.51 \text{ (Feb)} + 1275.82 \text{ (Mar)} + 1273.79 \text{ (Apr)} + 1509.28 \text{ (May)} + 1628.52 \text{ (Jun)} \\ &\quad + 1521.20 \text{ (Jul)} + 1599.97 \text{ (Aug)} + 1508.30 \text{ (Sep)} + 1485.08 \text{ (Oct)} + 1419.37 \text{ (Nov)} + 1666.04 \text{ (Dec)} \\ &= 17,017.45\text{M} \end{aligned}$$

##### Tax Revenue

Original monthly tax (5.5%):

$$\begin{aligned}
T_0 &= 58.08 \text{ (Jan)} + 57.80 \text{ (Feb)} + 69.41 \text{ (Mar)} + 69.30 \text{ (Apr)} + 84.37 \text{ (May)} + 90.97 \text{ (Jun)} \\
&\quad + 84.97 \text{ (Jul)} + 89.38 \text{ (Aug)} + 84.31 \text{ (Sep)} + 80.80 \text{ (Oct)} + 77.22 \text{ (Nov)} + 90.64 \text{ (Dec)} \\
&= 937.25\text{M}
\end{aligned}$$

New monthly tax (4%/8%):

$$\begin{aligned}
T_1 &= 42.70 \text{ (Jan)} + 42.50 \text{ (Feb)} + 51.03 \text{ (Mar)} + 50.95 \text{ (Apr)} + 120.74 \text{ (May)} + 130.28 \text{ (Jun)} \\
&\quad + 121.70 \text{ (Jul)} + 128.00 \text{ (Aug)} + 120.66 \text{ (Sep)} + 59.40 \text{ (Oct)} + 56.77 \text{ (Nov)} + 66.64 \text{ (Dec)} \\
&= 991.39\text{M}
\end{aligned}$$

### Tax Burden by Group

Original resident tax:

$$\begin{aligned}
T_{0r} &= 55.18 \text{ (Jan)} + 54.91 \text{ (Feb)} + 65.94 \text{ (Mar)} + 65.84 \text{ (Apr)} + 67.50 \text{ (May)} + 68.23 \text{ (Jun)} \\
&\quad + 63.73 \text{ (Jul)} + 67.03 \text{ (Aug)} + 67.45 \text{ (Sep)} + 76.76 \text{ (Oct)} + 73.36 \text{ (Nov)} + 86.11 \text{ (Dec)} \\
&= 812.03\text{M}
\end{aligned}$$

New resident tax:

$$\begin{aligned}
T_{1r} &= 40.57 \text{ (Jan)} + 40.38 \text{ (Feb)} + 48.48 \text{ (Mar)} + 48.40 \text{ (Apr)} + 96.59 \text{ (May)} + 97.71 \text{ (Jun)} \\
&\quad + 91.27 \text{ (Jul)} + 96.00 \text{ (Aug)} + 96.53 \text{ (Sep)} + 56.43 \text{ (Oct)} + 53.93 \text{ (Nov)} + 63.31 \text{ (Dec)} \\
&= 828.17\text{M}
\end{aligned}$$

Original tourist tax:

$$\begin{aligned}
T_{0t} &= 2.90 \text{ (Jan)} + 2.89 \text{ (Feb)} + 3.47 \text{ (Mar)} + 3.46 \text{ (Apr)} + 16.87 \text{ (May)} + 22.74 \text{ (Jun)} \\
&\quad + 21.24 \text{ (Jul)} + 22.34 \text{ (Aug)} + 16.86 \text{ (Sep)} + 4.04 \text{ (Oct)} + 3.86 \text{ (Nov)} + 4.53 \text{ (Dec)} \\
&= 125.23\text{M}
\end{aligned}$$

New tourist tax:

$$\begin{aligned} T_{1t} &= 2.13 \text{ (Jan)} + 2.12 \text{ (Feb)} + 2.55 \text{ (Mar)} + 2.55 \text{ (Apr)} + 24.15 \text{ (May)} + 32.57 \text{ (Jun)} \\ &\quad + 30.42 \text{ (Jul)} + 32.00 \text{ (Aug)} + 24.13 \text{ (Sep)} + 2.97 \text{ (Oct)} + 2.84 \text{ (Nov)} + 3.33 \text{ (Dec)} \\ &= 163.21\text{M} \end{aligned}$$

The results show that in the general retail sector:

- Business pre-tax revenue decreases by 0.14% (\$17,041.00M  $\rightarrow$  \$17,017.45M)
- Total tax revenue increases by 5.78% (\$937.25M  $\rightarrow$  \$991.39M)
- Resident tax burden increases by 1.99% (\$812.03M  $\rightarrow$  \$828.17M)
- Tourist tax burden increases by 30.33% (\$125.23M  $\rightarrow$  \$163.21M)

## 4.7 Aggregate Analysis Across All Sectors

Combining the results from restaurant, lodging, and general retail sectors reveals the total impact of the proposed seasonal sales tax regime:

### 4.7.1 Total Business Impact

Pre-tax revenue by sector:

Restaurant: 2,898.00M  $\rightarrow$  2,883.97M (-0.48%)

Lodging: 1,083.00M  $\rightarrow$  1,076.58M (-0.59%)

Retail: 17,041.00M  $\rightarrow$  17,017.45M (-0.14%)

Total: 21,022.00M  $\rightarrow$  20,978.00M (-0.21%)

#### 4.7.2 Total Tax Revenue

Tax revenue by sector:

Restaurant: 231.84M → 262.93M (+13.41%)

Lodging: 97.47M → 129.54M (+32.90%)

Retail: 937.25M → 991.39M (+5.78%)

Total: 1,266.56M → 1,383.86M (+9.26%)

#### 4.7.3 Total Tax Burden Distribution

Tax burden shift between residents and tourists:

Residents: 1,005.43M → 1,033.60M (+2.80%)

Tourists: 261.14M → 350.25M (+34.12%)

#### 4.7.4 Per Resident Impact

Based on Maine's population of 1.15 million adult residents:

Direct Tax Increase: + \$24.50 per resident

Tourist Contribution: + \$77.49 per resident

Net Benefit: + \$52.99 per resident

#### 4.7.5 Key Findings

The aggregate analysis reveals several important findings:

1. **Business Impact:** The overall effect on business revenue is minimal (-0.21%), with the largest decline in the lodging sector (-0.59%) and smallest in retail (-0.14%).
2. **Tax Revenue:** Total tax revenue increases by 9.26% (\$117.30M), with the largest percentage increase in lodging (+32.90%) and smallest in retail (+5.78%).



3. **Burden Shift:** The policy successfully shifts tax burden toward tourists:

- Resident tax burden increases modestly (+2.80%)
- Tourist tax burden increases substantially (+34.12%)
- Tourist share of total tax burden rises from 20.62% to 25.31%

4. **Distributional Effects:** For the average Maine resident, the \$24.50 increase in direct tax burden is more than offset by the \$77.49 per capita increase in tourist tax contributions, resulting in a potential net benefit of \$52.99 per resident if the additional revenue is used for resident tax relief.

These results suggest that the proposed seasonal sales tax achieves its primary goal of leveraging Maine’s tourism industry to increase tax revenue while shifting substantial tax burden to tourists, all with minimal impact on business revenue.

## 5 Conclusion

This study has developed and applied a comprehensive economic model to analyze the potential fiscal impacts of implementing a seasonal sales tax in Maine. Our research focused on two key policy questions: how various seasonal tax scenarios would affect overall tax revenue, and to what extent such a policy could shift the tax burden from residents to tourists.

The analytical framework developed in this study considers price formation mechanisms, differential price elasticities between residents and tourists, business revenue impacts, tax revenue changes, and distributional effects of tax burden. Applying this model to 2018 Maine data reveals that a seasonal sales tax regime has the potential to offer significant fiscal and distributional benefits.

Our key findings are as follows:

First, the proposed seasonal tax scenario (restaurant tax: 6% off-peak/12% peak, lodging tax: 7% off-peak/14% peak, general sales tax: 4% off-peak/8% peak) is projected to generate approximately \$117.3 million in additional annual tax revenue, representing a 9.26% increase.

Second, the majority of this additional tax burden (76%) would be borne by out-of-state tourists. While the tax burden on tourists would increase by approximately 34%, Maine residents would experience only a 2.8% increase in their tax burden. As an overall share, tourists' burden of the total annual sales tax revenue in Maine would rise from 20.6% to 25.3%.

Third, the impact on business pre-tax revenue would be relatively modest, with an overall decrease of just 0.21%. By sector, lodging would be most affected (-0.59%), followed by restaurants (-0.48%) and general retail (-0.14%).

Fourth, the net benefit per resident is estimated at approximately \$53, representing the potential benefit if the additional revenue were distributed to residents or used for enhanced public services.

These results suggest that a seasonal sales tax represents a promising policy tool for Maine to leverage its seasonal tourism flows to generate additional revenue while reducing the tax burden on year-round residents. By taking advantage of the lower price sensitivity of tourists compared to residents, applying higher rates during peak season can more than offset the revenue loss from tax reductions during the off-season.

However, several important limitations should be considered when interpreting our findings: First, our model relies on assumptions such as constant price elasticities, 100% tax pass-through, and no cross-price effects. In reality, these assumptions may not be fully met, which could affect the accuracy of our projections. Second, our analysis does not account for intertemporal substitution effects, where consumers might adjust their purchase timing in response to seasonal rate changes. Some consumers, particularly residents, might defer large purchases to the off-season, which could impact revenue projections. Third, our model does not fully capture long-term business responses to tax structure changes, such as operational adjustments, investment decisions, or entry/exit decisions. Fourth, the administrative costs and complexity of implementing a seasonal sales tax remain important considerations that warrant further study.

Despite these limitations, this study provides a robust initial assessment of the potential impacts of a seasonal sales tax. Future research could extend in several directions:

1. Empirical studies to more accurately measure actual consumption patterns and price elasticities of Maine tourists and residents

2. Analysis of consumer intertemporal substitution behavior in response to seasonal rate changes
3. Detailed assessment of the administrative costs and complexity of implementing a seasonal sales tax
4. Investigation of the differential impacts of seasonal sales taxes across various regions and demographic groups within Maine

In conclusion, a seasonal sales tax appears to be an attractive policy option for Maine to leverage its unique seasonal tourism economy to generate additional revenue and provide tax benefits to year-round residents. The analytical framework and preliminary results developed in this study provide policymakers with important insights into the potential benefits and challenges of such an approach. With careful design and implementation, a seasonal sales tax could contribute to strengthening Maine's fiscal health and improving the equity of tax burden distribution.