



Economic Impact from the Proposed Congressional Budget Reconciliation Legislation of 2021

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Foreword

By NATO Executive Director Thomas A. Briant

Retailers and distributors are of critical importance to the national, state and local economies. There are over 253,000 retail stores that sell tobacco products and more than half of them, some 136,000 stores, are single-owner operations.¹ Many of these stores are operated by diverse, middle-class, and first-generation owners and their families, and are the primary source of their and their employees' income.

The large federal tax increases proposed in the Congressional budget reconciliation legislation would have a significant negative economic impact not only on retail stores, distributors, and their employees, but also on states, cities and the local communities.

According to market data, cigarette and other tobacco product sales account for more than one-third of in-store sales at the nation's convenience stores and upwards of 90% of sales at tobacco outlet stores.² In addition, some 3.8 million employees nationwide work at stores that sell tobacco products. State and local excise taxes and sales taxes collected on these products are also critical revenue sources to state and localities across the nation.

Cigarette and other tobacco product sales are a vital part of retailers' continued operations, helping them support their communities by providing jobs to local residents and also serving as a source of groceries, gasoline and other product staples to local residents. In fact, convenience stores were deemed to be "essential businesses" during the COVID-19 pandemic and remained open during statewide business shutdowns to provide necessary products and services to their customers, despite the risks of being open to the public. In addition, these retailers are selling tobacco products to legal age adults in a law-abiding, responsible manner.

The proposed federal cigarette and tobacco product tax increases in the Congressional budget reconciliation legislation would result in major market disruptions and substantial economic impacts. These disruptions and impacts would occur because the legislation would double the federal cigarette tax, a 100% increase from \$1.01 per pack to \$2.02 per pack, while increasing the tax rates on other tobacco products by up to 2,000%. Such drastic increases in federal excise tax rates will reduce sales, lead to employee terminations, cause lost wage income, decrease state and local excise and sales tax collections, and reduce annual Master Settlement Agreement payments to all U.S. states and territories (including the four separately settling states).

Compounding these direct economic impacts will be additional indirect and induced economic losses as explained in this report. Moreover, cigarette and

¹ Source: Management Science Associates Inc (MSAi)

² Source: National Association of Convenience Stores, NACS State of the Industry Report of 2019 Data, 50th Edition (Table 9A)

tobacco excise taxes are highly regressive and these proposed tax rate increases will fall most heavily on those who are least able to afford paying such high product tax rates.

For the aforementioned reasons, the Congressional budget reconciliation legislation would be detrimental to NATO members, their employees, and their communities, as well to the national, state, and local economies.

1. Executive Summary

The proposed budget reconciliation legislation being considered by Congress will increase the federal excise tax (FET) on tobacco products such as cigarettes, cigars, and moist snuff tobacco. Also, the legislation will introduce a new federal excise tax on electronic cigarette/nicotine vapor (E-vapor) products.

This report lays out the impact of the increased FET tax rates on four economic indicators:

- jobs
- retail sales
- state and local tax revenue
- the broad economy

Chmura Economics & Analytics³ (Chmura) predicts that the proposed Congressional budget reconciliation legislation tax rates, will negatively impact the national tobacco retail industry, state and local governments, as well as the broader economy.

Using Fiscal Year (FY) 2020 as a benchmark,⁴ retailers' revenue is estimated to decline by \$801.3 million per year in the nation if the increased FET tax rates are imposed.⁵ In addition:

- Jobs directly in tobacco retail would decline by 8,317 in the nation.
- The subsequent ripple impact would lead to a more extensive national job loss of 14,030.

Chmura investigates the impacts on the hypothesis that the increased FET tax rates had been imposed on tobacco sales during FY2020. Adoption of the increased FET tax rates would cause state and local governments to suffer fiscally; Chmura estimates state and local tax revenue will decline by \$1.1 billion per year. These losses do not include payments to the states from the Tobacco Master Settlement Agreement (MSA), nor the payments to the four separately settling states. Payments to states via the MSA and the four individual state settlements will decline by \$402.5 million, with a total revenue loss for state and local governments reaching \$1.5 billion per year.

Specifically, this study evaluates the sales impact of the increased FET tax rates on the following four tobacco products:⁶

1. Cigarettes
2. Cigars
3. Moist Snuff Tobacco (MST)
4. Electronic Cigarettes and Nicotine Vapor Products (E-vapor)

³ Chmura Economics & Analytics (Chmura) was contracted to conduct this study. Chmura provides economic software, consulting, and data to our clients that help them make informed decisions to benefit their communities. Over the past 22 years, Chmura has served hundreds of clients nationwide with thoroughness, accuracy, and objectivity.

⁴ Fiscal Year 2020 starts July 1, 2019 and ends June 30, 2020.

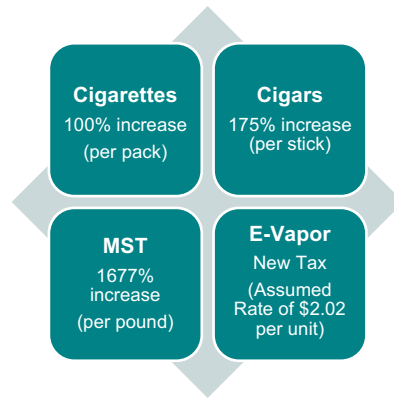
⁵ Appendix 2 includes a definition of terms.

⁶ Cigars in this analysis refer to large cigars sold individually; not small cigars sold in packs. There are also other tobacco products affected by the proposed legislation, such as chewing tobacco, roll your own (RYO) tobacco, pipe tobacco, and single-use oral products. Sales data for these products are not available, but information from industry experts indicates they account for a very small percentage of the tobacco market.

Under the proposed legislation, all tobacco products will be affected. Per product,⁷ the new legislation will create:

- An increase in the cigarette tax from \$1.01 to \$2.02 per pack
- An increase in the cigar tax from a maximum of \$0.4026 per stick to \$49.56 per pound
- An increase in the MST tax from \$1.51 per pound to \$26.84 per pound
- A new FET on E-vapor products which is assumed to be \$2.02 per unit in this study. [Note: The budget reconciliation legislation is proposing a nicotine content-based tax rate for E-vapor products of \$100.66 per 1,810 milligrams of nicotine.]

Figure 1.1: Change in Taxes Due to Proposed Legislation



From a policy perspective, these impacts will negatively affect retailers’ revenue and job creation across the industry’s ecosystem. This occurs because an increase in federal excise taxes translates into higher prices for consumers who then reduce the amount purchased. Said differently, price increases on tobacco products result in lower sales volumes. Lower volumes mean fewer jobs and lost ancillary sales (additional retail merchandise).

Finally, a reduction in sales volume of tobacco products and ancillary retail sales will decrease state and local tax revenue. The price of cigarettes will increase by 15.7%, leading to a 6.4% sales decline. For cigars, the new tax will cause a price increase of 92.8% for consumers, resulting in a 55.9% decline in sales volume. The price of MST would increase by 48.2%, leading to a 29.3% reduction in sales volume. The FET will increase the price of E-vapor products by 45.4% and cause a 34.4% reduction in sales volume. Sales of other retail items at the national level will suffer as well, as tobacco retailers will lose \$3.4 billion in gross receipts, or a \$1.7 billion decline in ancillary retail due to changes in consumer purchasing patterns on other products (Table 1.1).

State and local governments will see a combined total tax revenue reduction of \$1.1 billion. The state excise tax revenue on tobacco products will be reduced by \$1.3 billion, followed by a \$36.0 million reduction of local excise tax revenue. These reductions will be partially offset by a moderate increase in state and local sales tax revenue, as sales tax is applied to gross receipts for retailers, which are expected to increase after the tax change.

State revenue from the Tobacco Master Settlement Agreement (MSA) will be impacted as well. The MSA was an agreement made in 1998 between 46 states, five United States territories, the District of Columbia, and the four largest tobacco manufacturers at the time. The remaining states of Florida, Minnesota, Mississippi, and Texas do not fall under the MSA and have their own settlement agreements with major tobacco manufacturers. Under the MSA and state settlement agreements, the total payment to participating states is calculated each year. That amount is then distributed to participating states,

⁷ The units vary by product. In terms of changes in the value of sales, national retailers will experience an increase of \$5.7 billion in gross receipts and an increase of \$957.7 million in retailers’ revenue.

territories, and the District of Columbia, and is based on a fixed ratio. The changes in total settlement amounts are based primarily on the inflation rate and cigarette sales volume of the original participating manufacturers (OPM).

Table 1.1: National Impact Summary of Proposed FET

	Ciga- rettes	Cigars	Moist Snuff To- bacco	E-Vapor	Ancillary Retail	Total	
Retail Sales Impact	Price Change	15.7%	92.8%	48.2%	45.4%		
	Volume Change	-6.4%	-55.9%	-29.3%	-34.4%		
	Change in Gross Receipts (Millions)	\$5,708.7	-\$980.5	\$350.9	-\$173.9	-\$3,424.0	\$1,481.3
	Change in Retailers' Revenue (Millions)	\$957.7	-\$113.0	\$74.4	-\$14.0	-\$1,706.4	-\$801.3
Tax Revenue and MSA Impact	Change in State Excise Tax (Millions)	-\$945.6	-\$178.6	-\$76.5	-\$59.6		-\$1,260.3
	Change in Local Excise Tax (Millions)	-\$22.4	-\$8.6	-\$3.1	-\$1.9		-\$36.0
	Change in State & Local Sales Tax (Millions)	\$462.9	-\$70.6	\$24.8	-\$10.7	-\$245.2	\$161.1
	Change Total State and Local Tax (Millions)	-\$505.1	-\$257.8	-\$54.9	-\$72.2	-\$245.2	-\$1,135.2
	Change MSA Revenue (Millions)						-\$402.5
Broad Economic Impact	Change in Economic Output (Millions)						-\$1,679.0
	Change in Labor Income (Millions)						-\$630.2
	Change in Employment (Jobs)						-14,030

Note: The volume of tobacco products is defined as one million of the following: cigarettes (packs), cigars (sticks), MST (cans), and E-vapor products (units)

Source: NATO and Chmura

Based on cigarette sales volume in the benchmark year of FY2020, the total payment to the 50 states and the District of Columbia is estimated to reach \$6.94 billion. This amount excludes the payment to U.S. territories and includes the payment to the four separate settlement states. If the new federal excise tax had been imposed on FY2020 sales, it would have led to a reduction in cigarette sales volume. It is estimated that the total settlement payment to the 50 states and the District of Columbia would have decreased by \$402.5 million.

Chmura's estimate shows that national retail merchants will experience a reduction in revenue of \$801.3 million per year, which is the direct output impact for national retail businesses. This reduction in direct retailers' revenue will affect other parts of the national economy.

In conclusion, if the proposed federal excise tax is enacted, the national economy could lose \$1.7 billion in economic output, 14,030 jobs, and \$630.2 million in labor income per year.

Figure 1.2: National Impact Summary of Proposed FET

Retail Sales Impact	Tax Revenue and MSA Impact	Broad Economic Impact
<p>Price Change</p> <p>Cigarettes: +15.7%</p> <p>Cigars: +92.8%</p> <p>Moist Snuff Tobacco: +48.2%</p> <p>E-Vapor: +45.4%</p>	<p>Change in State Excise Tax (Millions)</p> <p>Cigarettes: -\$945.6</p> <p>Cigars: -\$178.6</p> <p>Moist Snuff Tobacco: -\$76.5</p> <p>E-Vapor: -\$59.6</p> <p>Total: -\$1,260.3</p> <p style="text-align: center;">+</p>	<p>Change in Economic Output (Millions)</p> <p>Total: -\$1,679.0</p>
<p>Volume Change</p> <p>Cigarettes: -6.4%</p> <p>Cigars: -55.9%</p> <p>Moist Snuff Tobacco: -29.3%</p> <p>E-Vapor: -34.4%</p>	<p>Change in Local Excise Tax (Millions)</p> <p>Cigarettes: -\$22.4</p> <p>Cigars: -\$8.6</p> <p>Moist Snuff Tobacco: -\$3.1</p> <p>E-Vapor: -\$1.9</p> <p>Total: -\$36.0</p> <p style="text-align: center;">+</p>	<p>Change in Labor Income (Millions)</p> <p>Total: -\$630.2</p>
<p>Change in Gross Receipts (Millions)</p> <p>Cigarettes: \$5,708.7</p> <p>Cigars: -\$980.5</p> <p>Moist Snuff Tobacco: \$350.9</p> <p>E-Vapor: -\$173.9</p> <p>Ancillary Retail: -\$3,424.0</p> <p>Total: \$1,481.3</p>	<p>Change in State & Local Sales Tax (Millions)</p> <p>Cigarettes: \$462.9</p> <p>Cigars: -\$70.6</p> <p>Moist Snuff Tobacco: \$24.8</p> <p>E-Vapor: -\$10.7</p> <p>Ancillary Retail: -\$245.2</p> <p>Total: \$161.1</p> <p style="text-align: center;">=</p>	<p>Change in Employment</p> <p>Total: -14,030</p>
<p>Change in Retailers' Revenue (Millions)</p> <p>Cigarettes: \$957.7</p> <p>Cigars: -\$113.0</p> <p>Moist Snuff Tobacco: \$74.4</p> <p>E-Vapor: -\$14.0</p> <p>Ancillary Retail: -\$1,706.4</p> <p>Total: -\$801.3</p>	<p>Change in Total State and Local Tax (Millions)</p> <p>Cigarettes: -\$505.1</p> <p>Cigars: -\$257.8</p> <p>Moist Snuff Tobacco: -\$54.9</p> <p>E-Vapor: -\$72.2</p> <p>Ancillary Retail: -\$245.2</p> <p>Total: -\$1,135.2</p>	
	<p>Change in MSA Revenue (Millions)</p> <p>Total: -\$402.5</p>	

Source: NATO and Chmura

2. Background

The proposed Congressional budget reconciliation legislation would significantly increase the federal excise tax rates on cigarettes and other tobacco products. Also proposed is a new excise tax on E-vapor products.

The National Association of Tobacco Outlets, Inc. (NATO) is a national trade association whose goal is to enhance the common business interests of all tobacco retailers and to monitor and assist members in responding to tobacco-related legislation at the local, state, and federal levels. The national tobacco retail industry includes both large and small retailers. Convenience stores are an important sector of tobacco outlets and are particularly dependent on tobacco sales. As of July 2021, there were over 253,000 retail stores nationwide that sold tobacco products.⁸ Additionally, per the National Association of Convenience Stores, as of January 1, 2021, there were 150,274 “convenience stores” nationwide.⁹

According to market data, cigarette and other tobacco product sales account for more than one-third of in-store sales at U.S. convenience stores and upwards of 90% of sales at tobacco outlet stores.¹⁰ In addition, some 3.8 million employees nationwide work at stores that sell tobacco products.¹¹ State and local excise taxes and sales taxes collected on these products are also critical revenue sources to states and localities across the nation.

In addition, cigarette and other tobacco product sales are a vital part of retailers’ continued operations, helping them support their communities by providing jobs to local residents and also serving as a source of groceries, gasoline, and other product staples to local residents. In fact, convenience stores were deemed to be “essential businesses” during the COVID-19 pandemic and remained open during statewide business shutdowns to provide necessary products and services to their customers, despite the risks of being open to the public. As national tobacco retailers recover from the pandemic, the proposed new federal excise tax will disrupt the industry.

NATO and its representatives seek to educate members of Congress, state lawmakers, locally elected officials, and other policymakers about the economic consequences from the potential enactment of the Congressional budget reconciliation legislation. Specifically, it seeks to understand the likely impact of the FET tax rates increases on the retail tobacco industry in the form of reduced retail sales, fewer retail jobs, reduced state and local tax revenue, and the spillover economic impacts in other industries closely tied to the tobacco retail industry.

The remainder of this report is organized as follows:

- Section 3 summarizes Chmura’s approach to this study, including a review of the literature underpinning key assumptions of the analysis
- Section 4 analyzes the impact of the proposed legislation at the national level
- Section 5 summarizes the impact of the proposed legislation at the state level
- Section 6 discusses the impact of the proposed legislation on state revenue from the Master Settlement Agreement
- Section 7 presents a conclusion
- Appendix 1 provides more details to the methodology, including a review of the literature underpinning key assumptions of the analysis
- Appendix 2 provides definitions of key terms used in this analysis

⁸ Source: National Association of Tobacco Outlets.

⁹ Source: National Association of Convenience Stores, at <https://www.convenience.org/Research/FactSheets/IndustryStoreCount>.

¹⁰ Source: National Association of Convenience Stores, NACS State of the Industry Report of 2019 Data, 50th Edition (Table 9A).

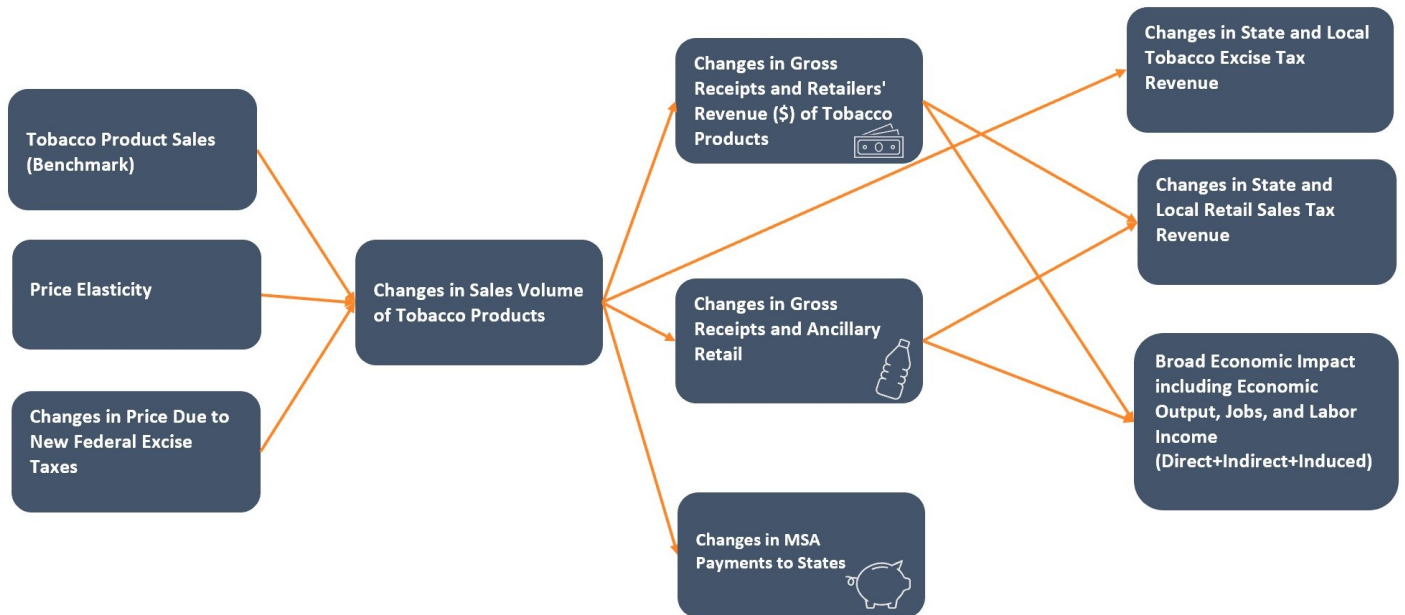
¹¹ Source: JobsEQ by Chmura.

3. Methodology

Chmura analyzes the effect of the proposed Congressional budget reconciliation legislation at the national, state and congressional district level on the following important economic indicators:

- Retail sales at the state and congressional district levels
- State and local tobacco excise tax revenue
- State and local retail sales tax revenue
- State revenue under the Master Settlement Agreement (MSA)
- Economic output, labor income, and employment impact (jobs) at the national, state, and congressional levels

Figure 3.1: Research Methodology



Source: Chmura

The steps Chmura followed to determine the impact on the economic indicators is as follows:

1. Calculate change in product prices based on proposed FET.
2. Use change in product prices (Step 1) and estimated price elasticity by product type to calculate the percentage change in sales volume by product type.
3. Apply the percentage change in sales volume (Step 2) to FY2020 product sales to calculate the change in sales volume by product type.
4. Use the change in sales volume by product type to estimate:
 - a. Change in gross receipts and retailers’ revenue (tobacco products)
 - b. Change in gross receipts and retailers’ revenue (ancillary retail)
 - c. Change in MSA payment to states
5. Calculate the change in state and local excise tax revenue using the change in retail volume for tobacco products (Step 3).

6. Calculate the change in state and local retail sales tax revenue using the change in gross receipts for tobacco products (Step 4a) and ancillary retail (Step 4b).
7. Calculate the change in MSA payments to states using the change in tobacco retail volume (Step 3).
8. Calculate the broad economic impact using the change in retailers' revenue for tobacco products (Step 4a) and ancillary products (Step 4b).

For more detail on the methodology, please see Appendix 1.

4. Economic Impact in the United States

4.1. Proposed Federal Excise Tax Changes

The proposed Congressional budget reconciliation legislation will increase or impose federal excise taxes on cigarettes and a wide range of other tobacco products (OTP). In this report, Chmura analyzes the impact of the proposed increased or new FET tax rates on the following four products:

1. Cigarettes
2. Cigars (Large Machine Made)
3. Moist Snuff Tobacco (MST)
4. E-Cigarettes and Nicotine Vapor Products (E-vapor)

In this proposed legislation, FET increases are also imposed on premium cigars, small cigars (such as those sold in packs of 20), chewing tobacco, roll your own (RYO) tobacco, pipe tobacco, and single-use oral products. However, sales data on those products are not available. Information from industry experts indicates that those tobacco products account for a very small percentage of the market. As a result, they are not included in this analysis.

Table 4.1 summarizes the proposed changes in the federal excise tax on the four tobacco products included in this study. Under the proposed legislation, the FET tax rates on all those products will be increased significantly. For example, the current FET tax rate on cigarettes is \$1.01 per pack. The proposed legislation intends to double that to \$2.02 per pack. The tax on MST will increase from \$1.51

Table 4.1: Proposed Federal Excise Tax Changes

Product	Current Tax	Proposed Tax
Cigarettes	\$1.01 per pack	\$2.02 per pack
Cigars	52.75% of price (\$0.4026 per cigar maximum)	\$49.56 per pound (\$0.10066 per cigar minimum)
Moist Snuff Tobacco	\$1.51 per pound	\$26.84 per pound
E-Vapor Products	None	\$2.02 per unit (Assumed rate)

Source: Congressional Budget Reconciliation Legislation and NATO

per pound to \$26.84 per pound, an increase of almost 17 times. The FET tax rate on cigars will also be increased significantly. Currently, there is no federal tax on E-vapor products. A new FET will be created for E-vapor products. In this study, Chmura estimates that the tax rate would be \$2.02 per unit for E-vapor products. [Note: The budget reconciliation legislation is proposing a nicotine content-based tax rate for E-vapor products of \$100.66 per 1,810 milligrams of nicotine.]

Chmura's impact analysis of the proposed new FET uses FY2020 as a benchmark. This study intends to determine what the impact will be if the new FET tax rates were imposed on the sales data of FY2020. Chmura chose FY2020 since there is uncertainty related to the timing of the proposed legislation. Rather than projecting tobacco product sales for future years and performing an impact analysis with respect to the projections, this analysis uses the latest actual data as the standard. More important is the relative changes of retail sales and tax revenue compared with the benchmark year's data.

4.2. Effect on Tobacco Product Sales and Ancillary Retail Sales

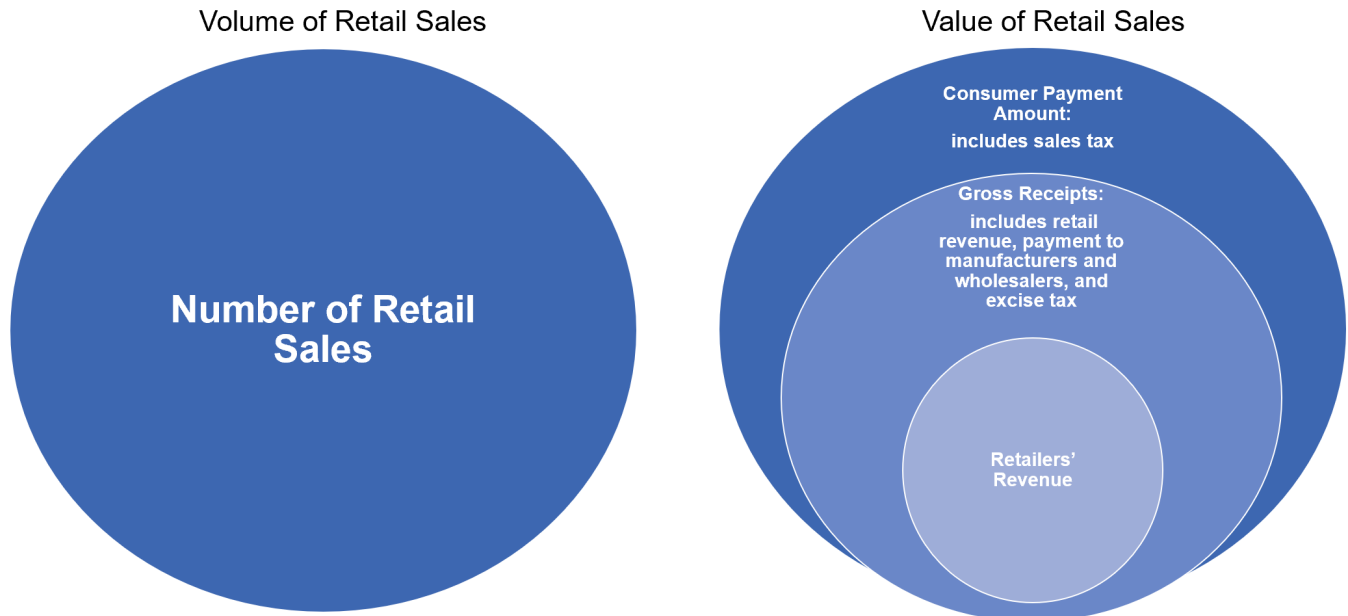
Imposing any new tax, such as a federal excise tax on tobacco products, will trigger a series of events. Federal excise taxes are passed along to retail merchants and ultimately to consumers. As a result, consumers will face higher prices at cash registers when they purchase tobacco products. Economic theory on consumer demand indicates that a price increase on tobacco products will result in lower sales volume for those products. Ultimately, this will result in lower ancillary retail sales as consumers make fewer trips to purchase tobacco products.

There are multiple ways to measure retail sales. In general, retail sales are sales of merchandise or services at retail establishments. In this report, retail sales can be defined as either the volume of sales or the value of sales (see Figure 4.1).

When measuring the economic impact of the proposed Congressional budget reconciliation legislation, it is important to distinguish the value of retail sales because only a percentage of each sale is subject to taxes. Specifically, the value of sales can be measured as the consumer payment amount, gross receipts, or retailers' revenue. The consumer payment amount is the broadest measure of the value of retail sales, defined as the final price paid by consumers multiplied by the volume of sales. This measure, using the final price, includes the cost of products paid to manufacturers and wholesalers; federal, state, and local excise taxes; as well as state and local sales taxes.

Gross receipts are estimated using the tobacco product price (without sales tax) to estimate the value of retail sales.¹² The price used in the gross receipts calculation includes many pass-through items, such as the cost of products paid to manufacturers and wholesalers, and excise taxes paid to federal, state, and local governments. Sales tax is not included in this definition. Gross receipts are not a good indicator of the revenue that is meaningful to retail merchants. For example, if the federal government increases the cigarette excise tax by \$1.01, that will generate an increase in gross receipts for every pack of cigarettes sold. Despite this growth, the benefit to retail merchants will be insignificant since this tax is sent to the federal government.

Figure 4.1: Definition of Retail Sales



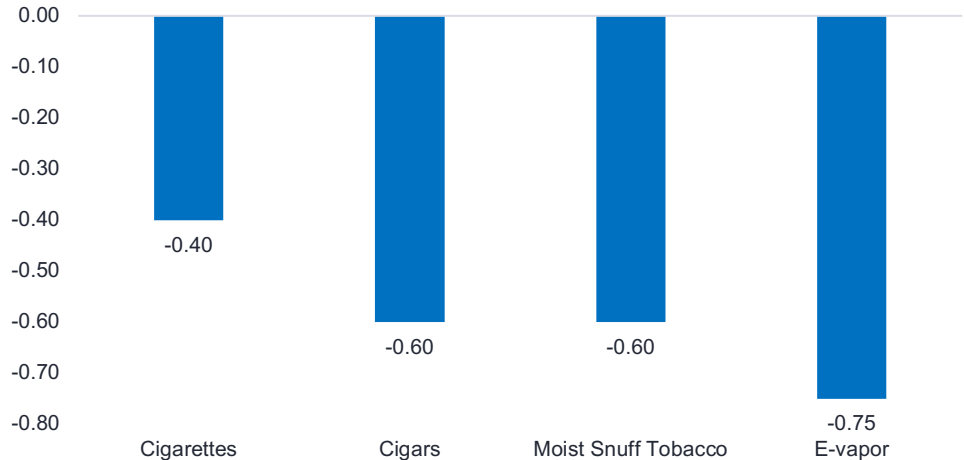
Source: Chmura

¹² For example, the sales amount data provided by NATO to Chmura for FY2020 uses this definition.

Finally, retailers' revenue excludes any payments made to manufacturers or wholesalers. It also excludes taxes paid to federal, state, and local governments. Retailers' revenue is most closely related to the money received by retail merchants. In essence, it is the margin for retailers. This money, in turn, is used to hire and pay workers, pay rent and utilities, and acquire services to maintain operations. Industry data indicate that the retail margin is about 16.7% of the cost of products and excise taxes.¹³

One key assumption used in this analysis is the price elasticity of tobacco products. From the literature review and consultation with industry experts, it is assumed that the price elasticity of cigarettes is -0.4, meaning a 1% increase in the price of cigarettes will lead to a 0.4% decline in cigarette sales volume. Elasticities for cigars, MST, and E-vapor products are -0.6, -0.6, and -0.75, respectively (Figure 4.2).

Figure 4.2: Price Elasticity of Tobacco Products



Source: NATO; various academic studies

Table 4.2 presents estimated effects of the proposed new federal excise tax on retail sales. Using cigarettes as an example, it is estimated that the proposed \$1.01 FET tax rate increase will lead to a 6.4% decline in cigarette volume sales. To arrive at this estimate, Chmura first evaluated the price changes that will be faced by consumers. The latest national average price paid by consumers (including excise and sales tax) is \$7.60 per pack. Adding the proposed tax increase (\$1.01) and retail margin,¹⁴ the national average price will be \$8.80, or a 15.7% increase. Relative price increases vary by state depending on the existing price level. After applying price elasticity to price changes in each state, it is estimated that the national sales volume of cigarettes would decline by 6.4%.¹⁵

In terms of changes in retail sales value, national retailers will experience an increase of \$5.7 billion in gross receipts, and \$957.7 million in retailers' revenue for cigarettes. This is despite a decline in sales volume and is primarily due to the relatively inelastic nature of cigarette demand.¹⁶

The sales volume declines for other tobacco products such as cigars, MST, and E-vapor products are much more severe for two reasons. The first is that the new federal excise tax would lead to larger increases in prices for those products. In addition, non-cigarette products have a larger price elasticity (in absolute terms). For example, the current national average price of cigars is \$1.13 per single stick. The proposed federal excise tax is equivalent to \$0.70 per stick. In addition, for products such as cigars, many states' excise tax rates are based on the wholesale price, which already includes the federal excise tax. On a per-stick basis, an increase in the FET tax rate triggers an increase in the state excise tax as well. As a result, the national average price for cigars is estimated to be \$2.18 per stick when allowing for the new tax. That represents a price increase of 92.8% for consumers, causing a 55.9% decline in sales volume. In terms of changes in the retail sales

¹³ Source: National Association of Tobacco Outlets.

¹⁴ The retail margin will be added to the federal excise tax by retailers.

¹⁵ Please note that in the analysis, the price elasticity is applied to the state average price. The national price is the weighted average of state prices. States with a higher percentage of price increases will experience larger declines in sales volume, reducing its weight in average national price computation after the FET tax rate increase. Due to this process, the result is that national volume change (-6.4%) does not equal exactly to national price change (15.7%) multiplying elasticity (0.4).

¹⁶ Any good or service with a price elasticity less than 1 is said to be inelastic, meaning volume decline will be smaller than a price increase.

value of cigars, national retailers will experience a \$980.5 million reduction in gross receipts, and a \$113.0 million reduction in retailers' revenue.

Table 4.2: National Retail Sales Impact

	Ciga- rettes	Cigars	Moist Snuff To- bacco	E-Vapor	Ancillary Retail	Total	
Before FET Change	FY2020 Gross Receipt (Millions)	\$71,684.9	\$6,355.6	\$7,236.7	\$3,655.5	\$88,932.7	
	FY2020 Retailers' Revenue (Millions)	\$10,258.1	\$909.5	\$1,035.6	\$523.1	\$12,726.3	
	FY2020 Volume*	10,122.7	6,069.1	1,419.4	670.7		
	FY2020 National Average Consumer Price	\$7.60	\$1.13	\$5.48	\$5.85		
After FET Change	Estimated National Average Price with New FET	\$8.80	\$2.18	\$8.12	\$8.50		
	Estimated Price Change	15.7%	92.8%	48.2%	45.4%		
	Estimated Volume Change	-648.5	-3,392.1	-415.3	-230.9		
	Estimated Volume Change (%)	-6.4%	-55.9%	-29.3%	-34.4%		
	Estimated Gross Receipt (with FET, Millions)	\$77,393.6	\$5,375.1	\$7,587.7	\$3,481.6	\$93,838.0	
	Estimated Retailers' Revenue (with FET, Millions)	\$11,215.8	\$796.5	\$1,110.0	\$509.1	\$13,631.4	
	Estimated Change in Gross Receipt with FET (Millions)	\$5,708.7	-\$980.5	\$350.9	-\$173.9	-\$3,424.0	\$1,481.3
	Estimated Change in Retailers' Revenue with FET (Millions)	\$957.7	-\$113.0	\$74.4	-\$14.0	-\$1,706.4	-\$801.3
Estimated Change in Retailers' Revenue	9.3%	-12.4%	7.2%	-2.7%			

* Volume is defined as one million of the following: cigarettes (packs), cigars (sticks), moist snuff tobacco (cans), and E-vapor products (units)

Source: NATO and Chmura

Similarly, the proposed federal excise tax would increase the national average price of MST from \$5.48 per can to \$8.12 per can. This is a 48.2% increase, which would lead to a 29.3% reduction in MST sales volume. That will result in an increase of \$350.9 million in gross receipts, and a \$74.4 million increase in retailers' revenue.

The proposed federal excise tax would increase the national average price of E-vapor products from \$5.85 per unit to \$8.50 per unit, leading to a 45.4% increase in price and a 34.4% reduction in sales volume. That will result in a reduction of \$173.9 million in gross receipts, and a \$14.0 million reduction in retailers' revenue.

Ancillary retail will suffer as a result of the volume decline of tobacco product sales. For adults who purchase tobacco products, these transactions often include prominent add-on purchases such as gas, packaged beverages, candy, snacks, and other products. A 2018 study showed that these ancillary retail sales are 28% of total purchases consumers make at tobacco retailers.¹⁷ As the new FET tax rates result in a decline in retail sales volume, tobacco consumers will make fewer trips to retailers. Chmura estimates that due to fewer trips made by consumers to purchase tobacco products, all retailers will suffer a loss of \$3.4 billion in gross receipts. The loss in retailers' revenue is \$1.7 billion from ancillary merchandise.

If the new FET tax rates had been imposed on FY2020 sales, the total estimated annual loss of retailers' revenue in the United States would have reached \$801.3 million. This loss will recur each year as long as the new FET is in effect.

¹⁷ Source: Path to Purchase: Adult Tobacco Consumer Experience, 2018.

4.3. Effect on State and Local Tax Revenue

Declining sales in tobacco products and ancillary retail items will lead to an overall reduction in tax revenue for state and local governments. However, state and local governments may experience an increase in sales tax revenue. The main revenue sources affected are state and local excise taxes on tobacco products and state and local sales taxes on tobacco products and ancillary merchandise.

Table 4.3: Changes in State and Local Taxes (Millions)

Tax Category	Cigarettes	Cigars	Moist Snuff Tobacco	E-Vapor	Other Retail	Total
State Excise	-\$945.6	-\$178.6	-\$76.5	-\$59.6		-\$1,260.3
Local Excise	-\$22.4	-\$8.6	-\$3.1	-\$1.9		-\$36.0
State Sales	\$363.5	-\$55.2	\$19.2	-\$8.5	-\$188.7	\$130.3
Local Sales	\$99.4	-\$15.4	\$5.5	-\$2.2	-\$56.6	\$30.8
Total Tax	-\$505.1	-\$257.8	-\$54.9	-\$72.2	-\$245.2	-\$1,135.2

Source: NATO and Chmura

Table 4.3 summarizes the tax revenue impact for all state and local governments in the nation. In total, if the new FET tax rates are imposed on FY2020 sales, state and local governments will see a combined tax revenue reduction of \$1.1 billion. Of this amount, the state excise tax on tobacco products will be reduced by \$1.3 billion, followed by a \$36.0 million reduction of the local excise tax. There will be an increase in sales tax for state and local governments, as sales tax is typically applied to gross receipts, which are expected to increase after the tax change (see Table 4.2).

To arrive at those estimates, Chmura utilized the retail sales volume decline estimated in Section 4.2. For cigarettes, since almost all state and local excise taxes are on a per-pack basis, the reduction in sales volume results in a loss of \$945.6 million in state excise tax and a loss of \$22.4 million in local excise tax. For other tobacco products, state and local excise taxes are estimated to decline as well, but to a lesser degree. This is because many state excise taxes are based on the wholesale price, which already includes the federal excise tax. As a result, an increase in FET tax rates also leads to an increase in the state and local excise tax, offsetting any tax reductions due to volume decline.

State and local sales tax estimates are more complicated. Many states allow sales tax to be assessed on top of the excise tax. For those states, while lost sales volume of tobacco products will decrease state and local sales tax revenue, an increase in the federal excise tax on tobacco products will increase the sales tax base. This means state and local governments will experience an increase in sales tax collection.¹⁸ Accounting for different changes, Chmura estimates that state and local sales tax revenue from cigars and E-vapor products decreased, while state and local sales tax revenue from cigarettes and MST increased. In addition, the loss of ancillary retail sales will cause a decline of \$188.7 million in state sales tax revenue and a loss of \$56.6 million in local sales tax revenue. Summarizing all changes in state and local tax revenue, the net impact of the new FET tax rates is -\$1.1 billion for state and local governments in the country.

4.4. Broad Economic Impact

The loss of sales for tobacco retailers will also have ripple effects throughout the national economy. For example, due to lost sales of tobacco and ancillary retail, retailers will cut back their purchases from national suppliers to maintain their

¹⁸ Some states exclude excise taxes in their sales tax assessment. Minnesota includes the state sales tax on cigarettes in the price of state cigarette tax stamps.

operations (indirect impact). In addition, due to lost sales, retailers such as convenience stores may need to cut hours for store clerks or even lay off some workers. That will affect other businesses serving the retail industry because of the induced impact.

Chmura used its proprietary JobsEQ® multipliers to estimate the additional economic impact due to lost sales of tobacco products and ancillary merchandise. The estimated broad economic impact is presented in Table 4.4. Chmura’s estimate shows that national retail merchants will experience a reduction in retailers’ revenue of \$801.3 million (as evaluated in

Table 4.4: Broad Economic Impact in the United States

	Direct	Indirect	Induced	Total
Output (Millions)	-\$801.3	-\$340.1	-\$537.6	-\$1,679.0
Labor Income (Millions)	-\$319.6	-\$119.1	-\$191.4	-\$630.2
Employment (Jobs)	-8,317	-1,552	-4,162	-14,030

Source: Chmura

Section 4.2), which is the direct output impact for national retail businesses. This represents a loss of 8,317 jobs nationally, with associated lost labor income of \$319.6 million.¹⁹ The indirect impact is estimated to be \$340.1 million in lost economic output in industries providing goods and services to retail businesses, such as transportation, utilities, and professional services. This represents a job loss of 1,552, with associated lost labor income of \$119.1 million. Finally, the induced impact is estimated to be a loss of \$537.6 million in economic output. Since the source of the induced impact is lost labor income, the impacted industries are concentrated in consumer service businesses such as retail shops, restaurants, and health care services. This represents a job loss of 4,162, with associated lost labor income of \$191.4 million. In total, if the proposed federal excise tax is enacted, the national economy could lose \$1.7 billion in economic output, 14,030 jobs, and \$630.2 million in labor income. The estimated economic impact is an annual measurement, consequently, these losses will recur each year.

¹⁹ The employment (jobs) estimates in this study include both full and part-time positions and are not full-time equivalent (FTE) jobs. Labor income includes wages, salaries, and benefits.

5. State Impact Summary

Chmura uses the same approach to analyze the impact of the proposed Congressional budget reconciliation legislation in each state and for the District of Columbia. Table 5.1 summarizes the key impacts, including total retailers' revenue, total state and local tax revenue, and total economic impact.

Table 5.1: State Impact Summary

State	(1) Direct Output Impact on Retailers' Revenue (Millions)	(2) Total Output Impact (Direct + indirect + Induced, Millions)	(3) Total Employment Impact (Jobs)	(4) Total Labor Income Impact (Millions)	(5) State and Local Tax Impact (Millions)	(6) Tobacco MSA Change (Millions)	(7) State and Local Revenue Impact (Millions)	(8) Aggregate Economic and Fiscal Impact (Millions)
Alabama	-\$16.0	-\$33.3	-314	-\$12.4	-\$19.2	-\$5.6	-\$24.8	-\$58.1
Alaska	-\$3.6	-\$6.4	-57	-\$2.6	-\$3.7	-\$1.2	-\$4.9	-\$11.3
Arizona	-\$5.9	-\$12.5	-97	-\$4.6	-\$20.3	-\$5.1	-\$25.4	-\$37.9
Arkansas	-\$22.9	-\$44.6	-463	-\$17.1	-\$13.9	-\$2.9	-\$16.8	-\$61.4
California	-\$46.2	-\$104.5	-670	-\$37.4	-\$69.3	-\$44.6	-\$113.9	-\$218.4
Colorado	-\$13.6	-\$29.0	-216	-\$10.7	-\$18.2	-\$4.8	-\$23.0	-\$52.1
Connecticut	-\$2.2	-\$4.8	-33	-\$1.7	-\$13.8	-\$6.5	-\$20.2	-\$25.0
Delaware	-\$2.8	-\$5.6	-45	-\$1.8	-\$8.1	-\$1.4	-\$9.5	-\$15.1
District of Co- lumbia	-\$0.8	-\$1.5	-10	-\$0.6	-\$1.5	-\$2.1	-\$3.6	-\$5.1
Florida	-\$103.9	-\$218.0	-1,689	-\$78.3	-\$90.7	-\$18.6	-\$109.3	-\$327.3
Georgia	-\$39.0	-\$87.9	-717	-\$34.9	-\$17.0	-\$8.6	-\$25.5	-\$113.5
Hawaii	-\$0.8	-\$1.5	-11	-\$0.6	-\$2.9	-\$2.1	-\$5.0	-\$6.6
Idaho	-\$4.3	-\$8.4	-79	-\$3.1	-\$0.6	-\$1.3	-\$1.8	-\$10.3
Illinois	-\$10.5	-\$23.5	-185	-\$9.3	-\$43.7	-\$16.3	-\$59.9	-\$83.4
Indiana	-\$12.3	-\$24.4	-230	-\$9.1	-\$23.4	-\$7.1	-\$30.6	-\$54.9
Iowa	-\$5.1	-\$10.0	-96	-\$3.9	-\$14.5	-\$3.0	-\$17.6	-\$27.6
Kansas	-\$7.4	-\$15.8	-156	-\$6.3	-\$5.2	-\$2.9	-\$8.1	-\$23.9
Kentucky	-\$14.9	-\$30.0	-295	-\$11.6	-\$28.8	-\$6.2	-\$35.0	-\$65.0
Louisiana	-\$23.7	-\$45.9	-434	-\$16.3	-\$12.5	-\$7.9	-\$20.4	-\$66.3
Maine	-\$3.8	-\$7.0	-63	-\$2.5	-\$10.3	-\$2.7	-\$13.0	-\$20.0
Maryland	-\$20.8	-\$42.9	-304	-\$15.6	-\$48.1	-\$7.9	-\$56.0	-\$98.9
Massachusetts	-\$6.4	-\$13.2	-93	-\$5.1	-\$21.5	-\$14.1	-\$35.6	-\$48.8
Michigan	-\$21.6	-\$46.0	-401	-\$19.6	-\$46.0	-\$15.2	-\$61.2	-\$107.2
Minnesota	-\$7.8	-\$17.0	-148	-\$6.7	-\$42.9	-\$8.6	-\$51.5	-\$68.5
Mississippi	-\$20.6	-\$39.7	-406	-\$14.9	-\$8.3	-\$5.7	-\$14.0	-\$53.7
Missouri	-\$16.0	-\$33.8	-318	-\$13.1	\$1.7	-\$7.9	-\$6.2	-\$40.1
Montana	-\$2.1	-\$4.0	-40	-\$1.5	-\$6.6	-\$1.5	-\$8.1	-\$12.2
Nebraska	-\$3.4	-\$6.9	-65	-\$2.7	-\$3.7	-\$2.1	-\$5.8	-\$12.7
Nevada	-\$6.7	-\$13.4	-98	-\$4.6	-\$8.8	-\$2.1	-\$10.9	-\$24.4
New Hamp- shire	-\$4.6	-\$9.0	-66	-\$3.1	-\$13.7	-\$2.3	-\$16.0	-\$25.0
New Jersey	-\$11.1	-\$23.6	-162	-\$9.0	-\$27.7	-\$13.5	-\$41.2	-\$64.8
New Mexico	-\$3.1	-\$5.7	-52	-\$2.1	-\$4.5	-\$2.1	-\$6.6	-\$12.4
New York	-\$19.8	-\$41.8	-286	-\$14.4	-\$48.7	-\$44.6	-\$93.3	-\$135.1
North Carolina	-\$38.6	-\$85.2	-756	-\$31.6	-\$13.3	-\$8.1	-\$21.4	-\$106.6
North Dakota	-\$1.0	-\$1.9	-16	-\$0.7	-\$2.1	-\$1.3	-\$3.4	-\$5.2
Ohio	-\$46.5	-\$98.9	-891	-\$38.9	-\$47.6	-\$17.6	-\$65.2	-\$164.1
Oklahoma	-\$19.9	-\$39.7	-384	-\$14.6	-\$29.4	-\$3.6	-\$33.0	-\$72.8
Oregon	-\$10.2	-\$20.4	-174	-\$7.7	-\$38.6	-\$4.0	-\$42.6	-\$63.0
Pennsylvania	-\$33.0	-\$67.9	-555	-\$25.5	-\$78.2	-\$20.1	-\$98.2	-\$166.2
Rhode Island	-\$2.8	-\$5.8	-46	-\$2.4	-\$7.1	-\$2.5	-\$9.7	-\$15.4

Table 5.1: State Impact Summary

State	(1) Direct Output Impact on Retailers' Revenue (Millions)	(2) Total Output Impact (Direct + indirect + Induced, Millions)	(3) Total Employment Impact (Jobs)	(4) Total Labor Income Impact (Millions)	(5) State and Local Tax Impact (Millions)	(6) Tobacco MSA Change (Millions)	(7) State and Local Revenue Impact (Millions)	(8) Aggregate Economic and Fiscal Impact (Millions)
South Carolina	-\$20.4	-\$42.2	-380	-\$17.1	-\$7.2	-\$4.1	-\$11.3	-\$53.5
South Dakota	-\$2.4	-\$4.5	-44	-\$1.6	-\$1.8	-\$1.2	-\$3.0	-\$7.4
Tennessee	-\$21.2	-\$43.9	-364	-\$16.4	-\$7.2	-\$8.5	-\$15.7	-\$59.6
Texas	-\$66.1	-\$143.1	-1,112	-\$52.6	-\$99.7	-\$24.5	-\$124.2	-\$267.3
Utah	-\$3.3	-\$6.8	-51	-\$2.3	-\$8.5	-\$1.6	-\$10.1	-\$16.9
Vermont	-\$1.1	-\$2.2	-18	-\$0.8	-\$4.2	-\$1.4	-\$5.7	-\$7.8
Virginia	-\$20.7	-\$43.6	-372	-\$17.6	-\$26.3	-\$7.1	-\$33.5	-\$77.0
Washington	-\$3.8	-\$8.0	-58	-\$2.8	-\$35.9	-\$7.2	-\$43.1	-\$51.0
West Virginia	-\$8.4	-\$15.9	-177	-\$6.4	-\$7.2	-\$3.1	-\$10.3	-\$26.3
Wisconsin	-\$16.8	-\$35.3	-319	-\$13.6	-\$22.5	-\$7.2	-\$29.7	-\$65.1
Wyoming	-\$0.9	-\$1.7	-16	-\$0.6	-\$1.9	-\$0.9	-\$2.8	-\$4.4
United States	-\$801.3	-\$1,679.0	-14,030	-\$630.2	-\$1,135.2	-\$402.5	-\$1,537.7	-\$3,216.7

Source: Chmura

Chmura's estimates show that the proposed legislation will have negative impacts on each state and the District of Columbia. As an example, using Alabama's FY2020 sales, retail merchants in the state will experience a loss of \$16.0 million in retailers' revenue from reduced sales of tobacco products and ancillary retail. State and local governments in Alabama will see a reduction of \$19.2 million in tax revenue from the tobacco product excise tax and retail sales tax. In total, the state economy will lose \$33.3 million in economic output, resulting in a loss of 314 jobs and \$12.4 million in labor income. The effects of the proposed legislation on other states and the District of Columbia can be interpreted similarly.

6. Effect on Master Settlement Agreement Payments

The Tobacco Master Settlement Agreement (MSA) was an agreement made in 1998 between 46 states, five United States territories, the District of Columbia, and the four largest tobacco manufacturers at the time. The MSA requires that the original participating manufacturers (OPMs) pay settlements to the participating states, the District of Columbia, and territories in perpetuity, to help mitigate the costs associated with tobacco consumption. The MSA also imposed restrictions on how tobacco companies could advertise their products, which was intended to prevent the companies from advertising to youth.²⁰ Outside of the MSA, the states of Florida, Minnesota, Mississippi, and Texas have their own settlement agreements with major tobacco manufacturers.

The total settlement amount under the MSA is calculated each year. That amount is then distributed to participating states, territories, and the District of Columbia, and is based on a fixed ratio. Under the MSA, the current total settlement amount starts at \$9.0 billion each year. This amount is then adjusted for inflation and cigarette sales volume. Each year, the settlement amount increases by 3.0% or at the consumer price index (CPI) of the previous year if the CPI is larger than 3.0%. Volume adjustment compares cigarette sales volume each year with the volume of 1998, as well as with the ratio used to adjust the settlement amount. There are additional adjustments allowed under the MSA, such as settlement credits. While the inflation adjustment increases the total settlement amount, the volume adjustment tends to reduce the total settlement amount, as cigarette smoking in the nation is on a downward trend. The settlement amounts for the four non-participating states are computed in a similar fashion.

Data from the National Association of Attorneys General (NAAG) show that the 2019 total payment (calculated based on 2018 volume) was \$6.09 billion, while the 2020 payment (based on 2019 volume) was \$6.11 billion. Based on inflation and volume from the benchmark year of FY2020, Chmura estimates that the total MSA settlement amount will be \$6.07 billion. Excluding payment to U.S. territories and adding back payment to the four non-participating states,²¹ the total settlement payment to the 50 states and the District of Columbia is estimated at \$6.94 billion, also based on FY2020 volume.

If the Congressional budget reconciliation legislation is passed, imposing the new federal cigarette excise tax on FY2020 sales will result in a 6.4% reduction in cigarette sales volume. Accounting for this volume reduction, it is estimated that total MSA payment to the 50 states and the District of Columbia will be reduced by \$402.5 million. Table 5.1 in the previous section presents the estimated reduced settlement amount for each state.

²⁰ Found at <https://www.publichealthlawcenter.org/topics/commercial-tobacco-control/commercial-tobacco-control-litigation/master-settlement-agreement>.

²¹ The settlement amounts for the four non-participating states were calculated separately.

7. Conclusion

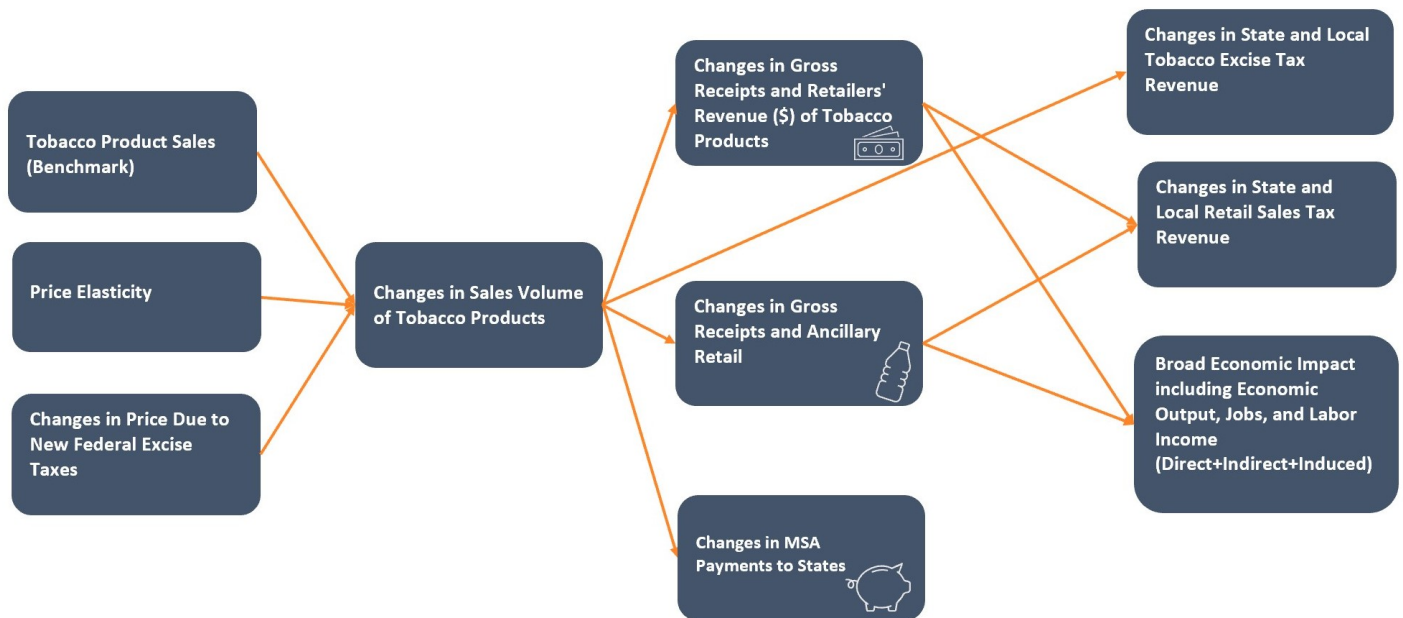
Chmura estimates that the proposed new federal excise tax on tobacco products will negatively affect the national tobacco retail industry and the broader economy. Using FY2020 data, it is estimated that tobacco retailers in the United States will lose \$801.3 million of revenue per year, as well as 8,317 jobs in those retail establishments. Other industries related to retail will also be affected. Adding indirect and induced impacts, the national economy could lose \$1.7 billion in economic output per year, with an estimated 14,030 jobs being lost. State and local governments will also be negatively impacted. Chmura estimates that tax revenue for state and local governments will decline by \$1.1 billion per year. In addition, payment to states via the Tobacco Master Settlement Agreement (MSA) and payments to the other four states pursuant to separate settlements will decline by \$402.5 million, with a total revenue loss for state and local governments reaching \$1.5 billion per year.

Appendix 1: Methodology

A1.1. Approach to Retail Sales of Tobacco Retailers

Figure A.1 illustrates the research process. To examine the change in the proposed federal tobacco excise tax on various economic indicators, the first task is to understand how such a tax change will affect retail sales (in volume or value) of tobacco products. For consumers, an increase in the tobacco product excise tax implies that the price they pay rises. Economic theory indicates that the demand for a product usually declines when its price increases. Consumers either reduce their purchases due to income constraints or substitute the consumption of this product by purchasing other similar products.

Figure A.1: Research Methodology



Source: Chmura

Economists typically use price elasticity to measure the degree of demand change with respect to a price change. Price elasticity is defined as the percentage change in consumer purchases caused by a one percent change in price. Chmura did not perform an original analysis on price elasticity of tobacco products as there is significant research in this area. Chmura reviewed existing literature and consulted with industry experts to understand the price elasticity for different tobacco products. After price elasticities for tobacco products were determined, based on the benchmark volume of tobacco product sales, Chmura was able to estimate the changes in tobacco product sales volumes at the state and congressional district levels.

The imposition of a new tobacco tax will not only affect tobacco sales, but ancillary retail sales as well. Some research has shown that when consumers purchase tobacco products, they tend to purchase additional goods from tobacco retailers such as drinks, snacks, gasoline, and other items. When consumers reduce tobacco product purchases, this leads to fewer trips to tobacco stores. As a result, retailers will lose ancillary sales. Chmura used tobacco consumer profile studies to estimate the changes in ancillary retail sales associated with tobacco product purchases.

A1.2. Approach to Broad Economic Impact

A change in tobacco product sales and ancillary retail sales will have a broad economic impact at the national, state, and congressional district levels. The broad impacts are estimated for economic output, labor income, and employment (jobs).

The changes in tobacco and ancillary retail sales will affect revenue of retail businesses. Declining sales may lead to a reduction in staff hours or workers being laid off. These circumstances are direct economic impacts of the proposed federal tax changes. The total economic impact also includes ripple effects (indirect and induced) from the direct impact. Using a convenience store as an example, indirect impacts are benefits to industries that supply goods and services to the convenience store, such as local transportation and other service businesses. Induced effects occur when convenience store workers and suppliers' workers spend their income within the community. After the direct impacts are determined, broad economic impacts are estimated by Chmura with the JobsEQ economic impact model.

A1.3. Approach to Tobacco Excise Tax, Retail Sales Tax, and MSA Revenue

Changes in tobacco product sales will affect the amount of revenue that state and local governments receive from tobacco products. First, Chmura collected data on state and local excise tax rates of various tobacco products. Then, estimated changes in tobacco product sales were used to determine the effect on state and local revenue. Changes in tobacco excise tax revenue were estimated for each state. For local effects, Chmura used the average excise tax rates of tobacco products to estimate local excise tax changes in each state and congressional district.

Changes in tobacco product sales will likely lead to changes in ancillary retail sales, which will then affect state and local sales tax revenue. Chmura collected data on state and local sales tax rates and applied those to estimated changes to retail sales. This allowed for an assessment of changes in state and local sales tax.

The change in cigarette sales volume will affect revenue received by states under the Tobacco Master Settlement Agreement. Similarly, revenue for four states (Florida, Minnesota, Mississippi, and Texas) that are not part of the MSA will also be affected, as they have their own settlement agreements with tobacco manufacturers. The total payment for states under settlement agreements is based on the total cigarette sales volume for each year (adjusted for inflation). Chmura conducted research on the MSA and other settlement agreements to understand how annual payments are calculated. Based on the estimated changes in cigarette sales volume, Chmura assessed the changes in MSA revenue payable to each state.

A1.4. Literature on Tobacco Product Price Elasticity

An increase in the tobacco federal excise tax will result in an increase in the sales price of tobacco products, as federal taxes are passed along to consumers. How a price change affects consumer behavior can be captured by the economic concept of price elasticity. Price elasticity is defined as the percentage change in consumer purchases caused by a one percent change in price. For example, if the price elasticity for cigarettes is -0.4, it means a 1% increase in the price of cigarettes will lead to a 0.4% decline in cigarette sales volume.

There has been extensive research on the price elasticity of cigarettes. Price elasticities vary based on geographic regions, price levels, and other considerations such as cross-border purchases, where purchases in other jurisdictions with different tax rates are available. For example, in a comprehensive survey of the literature on the economics of smoking conducted by Chaloupka and Warner in 2000, it was concluded that the price elasticity for cigarettes without a cross-border purchase option is -0.4, making demand inelastic, when the elasticity is less than one.²² A 2004 study by Huang, Yang, and Hwang estimated the price elasticity for cigarettes using data from 42 states and Washington, D.C. from 1961 to 2002. Their results

²² Source: The Economics of Smoking, by F. J. Chaloupka and K. E. Warner, Handbook of Health Economics, Vol. 1, edited by A. J. Culyer and J. P. Newhouse. North-Holland, Amsterdam, pp. 1539-627.

indicate that the price elasticity of demand is -0.41.²³ Similarly, in a study of price sensitivity in Canada where there are limited price variations among different jurisdictions, it was reported that the price elasticity was between -0.45 and -0.47.²⁴

Due to the differences in regulatory frameworks among states and cities in the United States, recent studies on consumer behaviors have paid particular attention to the effect of cross-border purchase options on cigarette demand. For example, a 2008 study by Lovenheim considered the effect of cross-border purchasing²⁵ and concluded that if a cross-border purchase is possible, there will be no consumption changes with respect to price changes where consumers live, as they simply purchase cigarettes elsewhere. This study also estimated that price elasticity without the cross-border purchase option is between -0.44 and -0.53, which is consistent with other elasticity estimates.

A 2009 study by Connelly, Goel, and Ram modeled changes in state cigarette sales with respect to state prices, also allowing for cross-border purchases.²⁶ Home-state price elasticity was estimated at -1.67, a much larger value because elasticity is examined at the state level when cross-border purchases are available. This elasticity estimate, where cross-border purchases are not possible, is more germane to this study because the proposed federal excise tax will apply to all states—there will be fewer incentives for consumers to conduct cross-border purchases.

A 2016 study by Tauras, Pesko, Huang, et al. examined the price elasticity of demand for cigarettes at different price levels. Their results indicate that the absolute value of the price elasticity of cigarette demand monotonically increased with price. Essentially, this indicates that the higher the price of cigarettes, the bigger the effect that a price increase from that price point will have on demand. At a price of \$6.50, they estimated that the price elasticity of cigarettes is -1.14.²⁷

Most research has indicated that the price elasticity of cigarettes is around -0.4 without the option of cross-border purchases. These results are more germane to this report, as the new federal excise tax will increase prices in all states and congressional districts. This will allow few opportunities for consumers to engage in price shopping in other jurisdictions.

While there are extensive studies on the price elasticity of cigarettes, there are only a few recent studies related to the price elasticity of other tobacco products such as cigars, smokeless tobacco, and E-vapor products. Some studies suggest that those products may have a higher price elasticity than cigarettes. For example, a 2018 paper by Fruits summarized the research on price elasticity of E-cigarettes, with median own price elasticity being -1.1.²⁸

²³ Source: New Evidence on Demand for Cigarettes: A Panel Data Approach, by Bwo-Nung Huang, Chin-wei Yang, and Ming-jeng Hwang, *International Journal of Applied Economics* 1(1), pp. 81-97.

²⁴ Source: Estimating Price Elasticities When There is Smuggling: The Sensitivity of Smoking to Price in Canada, by J. Gruber, A. Sen, and M. Stabile, *Journal of Health Economics*, 22(5)821-42. 2003.

²⁵ Source: How Far to the Border? The Extent and Impact of Cross-Border Casual Cigarette Smuggling, by M. F. Lovenheim, *National Tax Journal*, March 2008.

²⁶ Source: Demand for Cigarettes in the United States: Effects of Prices in Bordering States and Contiguity with Mexico and Canada, by R. T. Connelly, R. K. Goel, and R. Ram, *Applied Economics*, 41:2255-60. 2009.

²⁷ Source: The Effect of Cigarette Prices on Cigarette Sales: Exploring Heterogeneity in Price Elasticity at High and Low Prices, National Bureau of Economic Research Working Paper 22251, May 2016.

²⁸ Source: Vapor Products, Harm Reduction, and Taxation: Principles, Evidence, and a Research Agenda, International Center of Law and Economics, October 2018. <https://laweconcenter.org/wp-content/uploads/2018/10/Harm-Reduction-White-Paper-v9.1-181001.pdf>

Appendix 2: Glossary

Input-Output Analysis: an examination of business-business and business-consumer economic relationships capturing all monetary transactions in a given period, allowing one to calculate the effects of a change in an economic activity on the entire economy (impact analysis).

Direct Impact: economic activity generated by a project or operation. For construction, this represents activity of the contractor; for operations, this represents activity by tenants of the property.

Overhead: construction inputs not provided by the contractor.

Indirect Impact: secondary economic activity that is generated by a project or operation. An example might be a new office building generating demand for parking garages.

Induced (Household) Impact: economic activity generated by household income resulting from direct and indirect impacts.

Ripple Effect: the sum of induced and indirect impacts. In some projects, it is more appropriate to report ripple effects than indirect and induced impacts separately.

Multiplier: the cumulative impacts of a unit change in economic activity on the entire economy.

Elasticity: the percentage change in consumer purchases caused by percentage change in price

Retail Sales: the sales of merchandise or services at retail establishments. When used in this report, retail sales are defined as either the volume of sales or the value of sales in dollar terms. Furthermore, the value of sales can be classified more broadly as gross receipts or more narrowly as retailers' revenue.

Gross Receipts: the amount of retail sales based on sales volume times the price of the tobacco product without sales tax. That price includes many pass-through items, such as cost of products paid to manufacturers and wholesalers, and excise taxes to federal, state, and local governments.

Retailers' Revenue: the retail sales amount that excludes payments to manufacturers or wholesalers, and also excludes taxes paid to federal, state and local governments. In essence, this is the margin for retail merchants. It is used by the retail to pay for items such as rent, utilities, and payroll.

Economic Output: defined as the total revenue or sales for businesses. It includes values of intermediary products, labor income, other costs, and profits.

Labor Income: defined as the total compensation paid to workers. It includes wages and salaries, plus benefits such as health insurance paid by employers.