

# GUEST ANALYSIS

## Potential Economic Impact of Washington state's 2025 tax increases

*Economic model shows tax increases are likely to reduce state's economic growth, wages and investment*

Dr. Badri N Gopalakrishnan, Dr Karthikeyan Chandramohan & Ajayanand Chari,  
Infinite Sum Modeling LLC  
March 2026

### Key Takeaways

1. Washington state legislators adopted a range of new taxes in the 2025 legislative session, including an increase in B&O taxes, a B&O tax surcharge, an increase in capital gains taxes, an increase in the estate tax, and a range of other taxes.
2. Applying a macroeconomic model they used to analyze impacts for the Washington State Department of Natural Resources and to estimate the impact of the Trump Administration's tariffs, Infisum Sum Modeling estimated the impact of those taxes on Washington's economy
3. These new taxes are projected to reduce economic growth in Washington state by up to half a percent of GDP – almost \$4.5 billion in 2026, growing to t0 \$11.3 billion by 2029.
4. The 2025 tax increases will reduce wages for Washington residents by an estimated \$1.78 billion in 2026 to about \$4.46 billion in 2029.
5. Investment in the state may fall steeply – a reduction of about 1% in FY2026 to over 2% in FY 2029. This is larger than GDP losses – in the tune of \$2.4-\$5.8 billion USD.
6. The model shows that initially the consumer price index rises due to these taxes in FY 2026. However, due to a slump in demand that follows the tax hikes, the subsequent years may see a small drop in prices.

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# Potential Economic Impact of Washington state's 2025 tax increases

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## Tax proposals in Washington state and their implications

In 2025 Washington state introduced a series of tax proposals focused on widening the sectoral scope of taxation and increasing taxes on specific services as well increasing taxes on wealth accumulation. Supporters claimed these policies are aimed at improving the fiscal health of the state, improving service delivery with respect to health and education outcomes and in part to reduce wealth inequality within the state.

To be precise, House Bill 2081 serves as a cornerstone of this effort by restructuring the Business and Occupation tax framework to generate revenue. The tax raises the surcharge on goods for manufacturers, retailers, and wholesalers to 0.5 percent. It specifically targets businesses earning over 5 million dollars in service income by increasing their service tax rate from 1.75 percent to 2.1 percent. Furthermore, the bill applies a dedicated surcharge on large corporations that generate annual revenues exceeding 250 million dollars.

House Bill 2081 also significantly expands the definition of taxable services to capture industries that were previously outside the tax net. The legislation amends the scope of the sales tax to include security services, temporary staffing agencies, and interactive live presentations such as lectures. The digital service sector faces new tax obligations as well, with website design and custom software development now classified as taxable services under the widened statutory definitions.

Senate Bill 5813 introduced substantial changes to capital gains and estate taxation to address wealth accumulation. The act imposes a new 2.90 percent excise tax on long term capital gains exceeding 1 million dollars, which applies retroactively to January 1, 2025. This new levy complements the existing structure where capital gains between 270,000 dollars and 1.27 million dollars are taxed at 7 percent, and amounts exceeding 1.27 million dollars are taxed at 9.9 percent. The bill concurrently adjusts estate taxes for properties valued at more than 1 million dollars by establishing new tax slabs ranging from 10 percent to 35 percent depending on the valuation.

The state further refined its revenue collection mechanisms through Senate Bill 5794 and House Bill 2077. Senate Bill 5794 focuses on reducing tax expenditures by eliminating 780 distinct tax exemptions.

House Bill 2077, often referred to as the Tesla tax, establishes a new framework for taxing zero emission vehicle credits. This legislation mandates annual reporting of credit activities and levies a 2 percent excise tax on the sale of surplus credits. Additionally, it imposes a 10 percent tax on banked credits, although specific provisions are included for manufacturers that bank or sell fewer than 25,000 credits in a model year.

## Brief Methodological Overview

We employ a Computable General Equilibrium model, inspired by Global Trade Analysis Project (GTAP) model in order to determine the impact of change in tax slabs and expansion of scope of tax. We undertake this by splitting Washington state's GDP from the USA and then we utilize Input-Output table updated to 2025, starting from the latest publicly available Input-Output data published by Washington state for the year 2012.

Our model is a multiregional and multi-sector model, with three regions – Washington State, rest of USA and rest of the world. This model accounts for linkages between economic agents—including households, governments, and the rest of the world. This widely used modelling approach was designed and developed by the Centre for Global Trade Analysis, Purdue University (Hertel, 1997<sup>1</sup>).

Our model is impactful in performing a comprehensive evaluation of a policy or regulatory shock. On the production side, the model assumes perfect competition and constant returns to scale. The production for every sector and region in the model is identified and represented by a Constant Elasticity of Substitution (CES) function. It also works on the basis of the Armington assumption and so, each firm employs a CES composite of domestic and imported intermediate goods in fixed proportions with endowment factors or value-added commodities like land, labor, capital, natural resources, etc.

On the demand side of the model, total income is distributed following a fixed share across households, government, and savings expenditure. The model captures supply-demand linkages and equates them by accounting for changes in production, consumption, exports, and imports.

There are several applications of the model we customize and develop in this paper, in terms of tax and tariff policies; see for example – Gopalakrishnan et al (2025 2) on Trump 2.0 tariffs on agricultural sectors, Akintola et al (20253)

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1 *Global Trade Analysis: Modeling and Applications*, T.W. Hertel (ed.), published in 1997 by Cambridge University Press.

2 Gopalakrishnan, B.N., Gopinath, M. and Kumar, K. (2026), India–United States Agricultural Trade Under the America-First Agenda. *Agribusiness*. <https://doi.org/10.1002/agr.22046>

3 Akintola A, Ganguly I, Gopalakrishnan BN, Wheeler K. 2025. U.S. Proposed Tariff on the Wood Sector within North America. *Journal of Forest Business Research* 4(2): 65-94. <https://doi.org/10.62320/jfbr.v4i2.80>

on forestry sectors, Gopalakrishnan et al (20214) on fossil fuel subsidy reforms in Russia’s provinces, Ganguly et al (20185) on economic impact of Mt Adams Community Forest for Washington State Department of Natural Resources. This modeling framework has been utilized by us to provide comprehensive evidence-based advise for decision making for over hundred client organizations across the world, including UN, World Bank, US government, EU, Asian Development Bank, African ExIm Bank, Governments of Saudi Arabia, UAE, India, Cyprus, etc., McKinsey, KPMG, PWC, Harvard Medical School, and many others.

We have also published several top peer reviewed papers using the base modeling framework (GTAP) that has been employed in this study, in journals such as Nature, Network and Spatial Economics, British Medical Journal: Tobacco Control, Agricultural Economics, Energy Economics, Economic Modelling, Applied Economics, Applied Economics Letters, Business Economics, Journal of Economic Studies, Network and Spatial Economics, Information Technology and Management, Economic Systems Research, Journal of Economic Structures, Journal of Food and Agricultural Economics, Journal of Applied Economic Research, Groundwater and Sustainable Development. Engineering Design Graphics Journal, Journal of Southeast Asian Economies, Foreign Trade Review, Journal of Quantitative Economics, Margin, Vision, Indian Economic Journal, Empirical Economics Letters, Lakes and Reservoirs Research and Management, German Journal of Agricultural Economics, etc.

## Overview of macroeconomic results

**Table 1: GDP impact**

Category	2026		2027		2028		2029	
	% Change	Absolute Change in million USD	% Change	Absolute Change in million USD	% Change	Absolute Change in million USD	% Change	Absolute Change in million USD
Big B&O	-0.18	-1561	-0.54	-4932	-0.58	-5455	-0.58	-5686
State Sales Tax on Services	-0.11	-937	-0.17	-1557	-0.17	-1628	-0.17	-1694
Cap Gains/Estate	-0.03	-292	-0.03	-259	-0.03	-253	-0.03	-251
Tax Preferences	-0.01	-126	-0.04	-339	-0.04	-361	-0.04	-382
Tesla	0.00	0	-0.04	-366	-0.05	-477	-0.05	-471
Local Sales Tax on Services	-0.05	-455	-0.09	-811	-0.09	-845	-0.09	-876
Prop Tax - K-12	-0.12	-1045	-0.14	-1276	-0.19	-1746	-0.20	-1907
Total	-0.51	-4416	-1.05	-9539	-1.15	-10765	-1.16	-11267

Each of the proposed tax hikes may lead to notable losses in GDP compared to the baseline as shown in table 1 above. 2026 losses may add up to half a percent of GDP – almost 4.5 billion \$, while this may almost triple to 11.3 billion by 2029.

- 4 Gopalakrishnan, B.N., S Chakravarthy S Marudhachalam, S Varadhan, A Vijayakumar, A Bakhtizin and I Rostovtseva (2021). General Equilibrium Effects of Energy Subsidy Reforms in Russian Provinces. Chapter 2 in A Sanghi and J Steinbuks ed. Energy Subsidies in Russia. World Bank Group. Available Online at <https://documents1.worldbank.org/curated/en/099125011302110190/pdf/P1750280ca1db807e08cea076ac354e401b.pdf>
- 5 I Ganguly, M Webster, J McLaughlin, F Pierobon, BN Gopalakrishnan, B Bormann, O Jacobs, C Comfort and G Kaemingk (2018). Economic Impacts of Mt Adams Community Forests. Department of Natural Resources, State of Washington.

**Table 2: Investment impact**

Category	2026		2027		2028		2029	
	% Change	Absolute Change in \$ Mn	% Change	Absolute Change in \$ Mn	% Change	Absolute Change in \$ Mn	% Change	Absolute Change in \$ Mn
Big B&O	-0.32	-797	-0.98	-2526	-1.04	-2798	-1.05	-2925
State Sales Tax on Services	-0.17	-415	-0.27	-690	-0.27	-723	-0.27	-754
Cap Gains/Estate	-0.18	-452	-0.16	-400	-0.15	-393	-0.14	-390
Tax Preferences	-0.03	-64	-0.07	-173	-0.07	-184	-0.07	-195
Tesla	0.00	0	-0.07	-191	-0.09	-250	-0.09	-247
Local Sales Tax on Services	-0.08	-202	-0.14	-359	-0.14	-375	-0.14	-390
Prop Tax - K-12	-0.19	-460	-0.22	-562	-0.29	-770	-0.30	-843
Total	-0.96	-2389	-1.90	-4901	-2.05	-5492	-2.06	-5745

Table 2 shows that the investment may fall steeply from about 1% in FY2026 to over 2% in FY2029. This is much higher than the GDP losses – in the tune of 2.4-5.8 billion USD, because the industries get hit more than overall GDP and hence they hesitate to invest more.

**Table 3: Consumer Prices Index**

Category	2026	2027	2028	2029
	% Change	% Change	% Change	% Change
Big B&O	-0.008	-0.024	-0.025	-0.025
State Sales Tax on Services	0.012	0.019	0.019	0.019
Cap Gains/Estate	-0.026	-0.022	-0.021	-0.020
Tax Preferences	-0.001	-0.002	-0.002	-0.002
Tesla	0.000	-0.011	-0.014	-0.013
Local Sales Tax on Services	0.006	0.010	0.010	0.010
Prop Tax - K-12	0.018	0.021	0.027	0.029
Total	0.001	-0.009	-0.006	-0.003

Table 3 shows the impact on consumer price index. Initially, a large part of the impact is positive, wherein the CPI rises due to these taxes in FY 2026. However, due to a slump in demand that follows the tax hikes, the subsequent years may see a small drop in prices, purely as a response to demand contraction.

Table 4 shows the impact on labor. The impact of Big B&O is the largest among all in each of the years. Labor decreases significantly in the first two years, with the decrease stabilizing over the next two years. Cumulating across all, the total decrease in labor is reflected in a considerable loss of wage bill of 1.78 billion in 2026 to about 4.46 billion in 2029. Forestry sector, which is an important part of the Washington state economy, is expected to decrease by 21.69 million USD in 2026 to 48.67 million USD in 2029, as seen in table 5. The impact of capital gains/estate taxes is opposite to that of others in that the magnitude of the decrease reduces over the years, both in labor and forestry output.

**Table 4: Unskilled and skilled labor employment and wage bill impact**

Category	2026		2027		2028		2029									
	Unskilled Labor		Skilled Labor		Unskilled Labor		Skilled Labor									
	% Change	Wage Bill Change in \$ mn	% Change	Wage Bill Change in \$ mn	% Change	Wage Bill Change in \$ mn	% Change	Wage Bill Change in \$ mn								
Big B&O	-0.26	-646.70	-0.23	-693.63	-0.79	-1963.48	-0.71	-2105.69	-0.84	-2091.11	-0.76	-2242.53	-0.84	-2102.02	-0.76	-2254.22
State Sales Tax on Services	-0.15	-372.14	-0.15	-429.94	-0.24	-594.36	-0.23	-686.66	-0.24	-598.41	-0.23	-691.31	-0.24	-600.47	-0.23	-693.69
Cap Gains/Estate	-0.05	-129.75	-0.04	-121.59	-0.04	-110.56	-0.04	-103.63	-0.04	-104.27	-0.03	-97.72	-0.04	-99.59	-0.03	-93.34
Tax Preferences	-0.02	-52.06	-0.02	-55.84	-0.05	-135.16	-0.05	-144.97	-0.06	-138.38	-0.05	-148.41	-0.06	-141.16	-0.05	-151.41
Tesla	0.00	0.00	0.00	0.00	-0.05	-122.91	-0.04	-126.09	-0.06	-154.47	-0.05	-158.50	-0.06	-147.08	-0.05	-150.94
Local Sales Tax on Services	-0.07	-180.78	-0.07	-208.88	-0.12	-309.50	-0.12	-357.56	-0.12	-310.64	-0.12	-358.91	-0.12	-310.45	-0.12	-358.69
Prop Tax - K-12	-0.16	-406.73	-0.16	-465.28	-0.19	-477.58	-0.18	-546.28	-0.25	-629.31	-0.24	-719.78	-0.27	-662.72	-0.26	-757.97
Total	-0.72	-1788.17	-0.67	-1975.16	-1.49	-3713.55	-1.38	-4070.88	-1.61	-4026.58	-1.49	-4417.16	-1.63	-4063.48	-1.51	-4460.25

**Table 5: Output changes in forestry**

Category	2026		2027		2028		2029	
	% Change	Abs Change in million USD	% Change	Abs Change in million USD	% Change	Abs Change in million USD	% Change	Abs Change in million USD
Big B&O	-0.11	-7.86	-0.32	-23.95	-0.34	-25.52	-0.35	-25.65
State Sales Tax on Services	-0.06	-4.11	-0.09	-6.56	-0.09	-6.61	-0.09	-6.63
Cap Gains/Estate	-0.03	-2.50	-0.03	-2.13	-0.03	-2.01	-0.03	-1.92
Tax Preferences	-0.01	-0.63	-0.02	-1.64	-0.02	-1.68	-0.02	-1.71
Tesla	0.00	0.00	-0.02	-1.52	-0.03	-1.91	-0.02	-1.82
Local Sales Tax on Services	-0.03	-1.99	-0.05	-3.41	-0.05	-3.43	-0.05	-3.42
Prop Tax - K-12	-0.06	-4.61	-0.07	-5.41	-0.10	-7.14	-0.10	-7.52
Total	-0.29	-21.69	-0.60	-44.63	-0.65	-48.28	-0.66	-48.67

**Table 6: Price change in forestry**

Category	2026	2027	2028	2029
	% Change	% Change	% Change	% Change
Big B&O	-0.12	-0.35	-0.37	-0.37
State Sales Tax on Services	-0.05	-0.08	-0.08	-0.08
Cap Gains/Estate	-0.03	-0.03	-0.03	-0.03
Tax Preferences	-0.01	-0.02	-0.02	-0.03
Tesla	0.00	-0.02	-0.03	-0.03
Local Sales Tax on Services	-0.02	-0.04	-0.04	-0.04
Prop Tax - K-12	-0.06	-0.07	-0.09	-0.09
Total	-0.29	-0.62	-0.67	-0.67

Table 6 shows the price changes in the forestry sectors alone. These changes are higher compared to the overall price index. The decrease in price is highest in the case of Big B&O in all the years. The decrease ranges from nil for Tesla tax in 2026 to 0.37 in case of Big B&O in 2029.

**Table 7: Output Changes in select prominent sectors**

Big B&O						
Sector	2026		2027		2028	
	% Change	Abs Change in million USD	% Change	Abs Change in million USD	% Change	Abs Change in million USD
Vegetables, fruit, nuts	-0.01	-0.52	-0.03	-1.58	-0.03	-1.68
Wood products	-0.16	-11.53	-0.47	-35.07	-0.50	-37.36
Aerospace manufacturing	-0.25	-288.68	-0.77	-875.81	-0.82	-932.66
Retail/Wholesale Trade	-0.18	-370.53	-0.56	-1125.47	-0.59	-1198.67
Information Technology	-0.20	-402.86	-0.61	-1224.11	-0.64	-1303.77
Healthcare Services	-0.17	-221.50	-0.52	-672.77	-0.56	-716.52
State Sales Tax on Services						
Sector	2026		2027		2028	
	% Change	Abs Change in million USD	% Change	Abs Change in million USD	% Change	Abs Change in million USD
Vegetables, fruit, nuts	-0.01	-0.42	-0.01	-0.67	-0.01	-0.67
Wood products	-0.07	-5.44	-0.12	-8.69	-0.12	-8.75
Aerospace manufacturing	-0.10	-118.66	-0.17	-189.51	-0.17	-190.80
Retail/Wholesale Trade	-0.10	-197.94	-0.16	-316.17	-0.16	-318.33
Information Technology	-0.13	-257.98	-0.20	-412.08	-0.21	-414.88
Healthcare Services	-0.12	-158.48	-0.20	-253.10	-0.20	-254.82
Cap Gains/Estate						
Sector	2026		2027		2028	
	% Change	Abs Change in million USD	% Change	Abs Change in million USD	% Change	Abs Change in million USD
Vegetables, fruit, nuts	0.00	0.24	0.00	0.21	0.00	0.20
Wood products	-0.05	-3.34	-0.04	-2.85	-0.04	-2.68
Aerospace manufacturing	-0.02	-18.13	-0.01	-15.45	-0.01	-14.57
Retail/Wholesale Trade	-0.04	-77.03	-0.03	-65.66	-0.03	-61.91
Information Technology	-0.05	-97.00	-0.04	-82.67	-0.04	-77.95
Healthcare Services	-0.03	-40.74	-0.03	-34.72	-0.03	-32.74
Tax Preferences						
Sector	2026		2027		2028	
	% Change	Abs Change in million USD	% Change	Abs Change in million USD	% Change	Abs Change in million USD
Vegetables, fruit, nuts	0.00	-0.04	0.00	-0.11	0.00	-0.11
Wood products	-0.01	-0.93	-0.03	-2.41	-0.03	-2.46
Aerospace manufacturing	-0.02	-23.25	-0.05	-60.34	-0.05	-61.79
Retail/Wholesale Trade	-0.01	-29.83	-0.04	-77.42	-0.04	-79.27
Information Technology	-0.02	-32.42	-0.04	-84.17	-0.04	-86.17
Healthcare Services	-0.01	-17.83	-0.04	-46.28	-0.04	-47.39
Tesla						
Sector	2026		2027		2028	
	% Change	Abs Change in million USD	% Change	Abs Change in million USD	% Change	Abs Change in million USD
Vegetables, fruit, nuts	0.00	0.00	0.00	0.08	0.00	0.10
Wood products	0.00	0.00	-0.02	-1.38	-0.02	-1.73
Aerospace manufacturing	0.00	0.00	-0.01	-12.52	-0.01	-15.76
Retail/Wholesale Trade	0.00	0.00	-0.04	-75.22	-0.05	-94.55
Information Technology	0.00	0.00	-0.04	-71.83	-0.04	-90.30
Healthcare Services	0.00	0.00	-0.03	-41.79	-0.04	-52.54

Local Sales Tax on Services						
Sector	2026		2027		2028	
	% Change	Abs Change in million USD	% Change	Abs Change in million USD	% Change	Abs Change in million USD
Vegetables, fruit, nuts	0.00	-0.20	-0.01	-0.35	-0.01	-0.35
Wood products	-0.04	-2.64	-0.06	-4.52	-0.06	-4.54
Aerospace manufacturing	-0.05	-57.64	-0.09	-98.68	-0.09	-99.05
Retail/Wholesale Trade	-0.05	-96.14	-0.08	-164.61	-0.08	-165.22
Information Technology	-0.06	-125.33	-0.11	-214.56	-0.11	-215.34
Healthcare Services	-0.06	-76.99	-0.10	-131.80	-0.10	-132.29
Prop Tax - K-12						
Sector	2026		2027		2028	
	% Change	Abs Change in million USD	% Change	Abs Change in million USD	% Change	Abs Change in million USD
Vegetables, fruit, nuts	0.00	-0.26	-0.01	-0.30	-0.01	-0.40
Wood products	-0.08	-6.16	-0.10	-7.23	-0.13	-9.54
Aerospace manufacturing	-0.11	-127.72	-0.13	-149.98	-0.17	-197.69
Retail/Wholesale Trade	-0.12	-244.91	-0.14	-287.63	-0.19	-379.22
Information Technology	-0.12	-249.38	-0.14	-292.84	-0.19	-386.02
Healthcare Services	-0.11	-147.91	-0.13	-173.71	-0.18	-229.02

Table 7 shows the output changes in select sectors in Washington. The output of Washington state in these sectors is considerable, among the top, and is of importance. Information Technology and Retail/Wholesale trade are the most impacted sectors in Washington when any of the taxes are imposed. The vegetables, fruit, and nuts sector is the least impacted both in absolute as well as percentage terms.

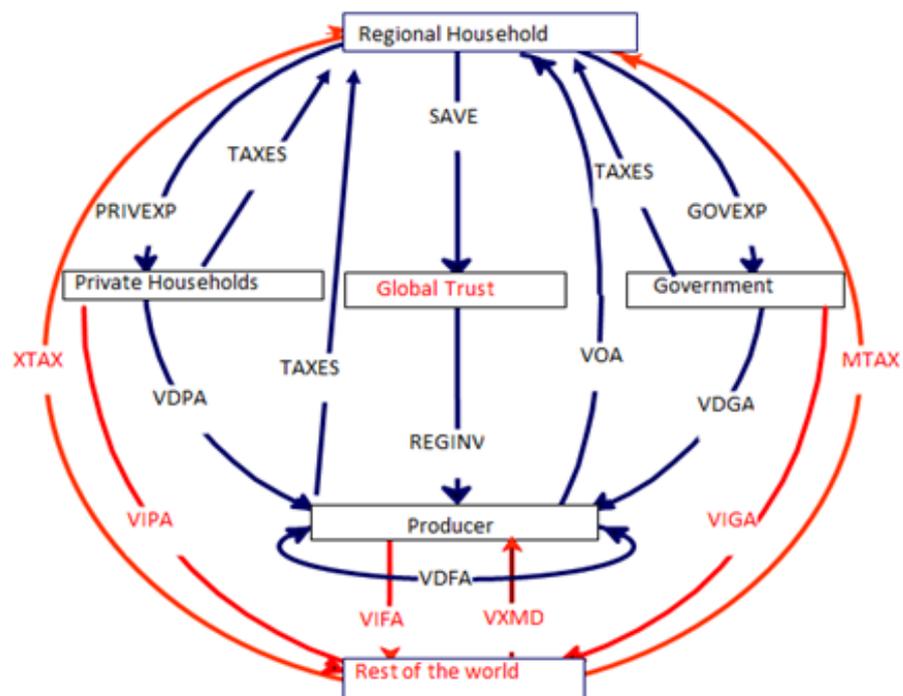
## Conclusion

The study analyzed the impact of different taxes, namely Big B&O, State Sales Tax on Services, Cap Gains/Estate, Tax Preferences, Tesla, Local Sales Tax on Services and Prop Tax - K-12 in Washington state. The study determines that the negative impact of Big B&O is expected to be more than others, with State Sales Tax on Services and Prop Tax - K-12 following it in that order.

The GDP of the state is expected to decrease cumulatively about 4 billion in 2026 to 11 billion in 2029. Prices are expected to decrease with output also decreasing, suggesting that demand is taking a hit, bringing down supply, as a result of these taxes.

## Appendix: Technical details on the model and data

Here, the regional household receives factor payments (VOA) from different agents including private households, firms, and the government for the supply of factors like land, labor, and capital. The residual that remains after households' expenditure on private consumption and government consumption is savings. The model is based on the Cobb-Douglas utility function that preserves the share of private consumption and government consumption. Global trust accumulates savings and then distributes them across different regions as investments and this happens based on the rate of returns. This becomes a capital input to the firms that also use factor inputs (VOA) and intermediate inputs from domestic (VDFA) as well as imported (VIFA) to produce the output. This output caters to the consumption demand of private households (VDPA), and the government (VDGA) and serves as an intermediate input to firms (VDFA). The private household and the governments can consume from the domestic output (VDPA/VDGA) as well as from imports (VIPA/VIGA) the consumption of which is governed by the Armington assumption. The international transactions in the figure are marked in red and the domestic transactions are differentiated in blue color



The behavioral equations in the model dictate production, private consumption, exports, imports, and market-clearing conditions that equate supply with demand. Elasticities determine the substitution between various input and output parameters in the production and consumption behavioral equation.

## Washington's Input-Output Table of 2012

The 2012 Washington Input Output Study provides a detailed framework for understanding the complex economic interactions within the state. This study produced a detailed 52 sector model that maps the flow of goods and services across the economy. While this model shares similarities with global frameworks like the GTAP sectoral model, the Washington state model maintains distinct differences tailored to the specific industrial composition of the region.

**Table 1: The Washington state's IO table with 52 sectors**

Industry Name	NAICS Code
1. Crop Production	111
2. Animal Production	112
3. Forestry and Logging	113 (Incl. DNR and USFS.)
4. Fishing, Hunting and Trapping	114
5. Mining	21
6. Electric Utilities	2211 (Incl. local public utilities and Bonneville Power Administration)
7. Gas Utilities	2212
8. Other Utilities	2213 (Incl. local public utilities)
9. Highway, Street and Bridge Construction	2373
10. Other Construction	236-238 except 2373
11. Food, Beverage and Tobacco Manufacturing	311, 312
12. Textiles and Apparel Mills	313, 314, 315
13. Wood Product Manufacturing	321
14. Paper Manufacturing	322
15. Printing and Related Activities	323
16. Petroleum and Coal Products Manufacturing	324
17. Chemical Manufacturing	325
18. Nonmetallic Mineral Products Manufacturing	327
19. Primary Metal Manufacturing	331
20. Fabricated Metals Manufacturing	332
21. Machinery Manufacturing	333
22. Computer and Electronic Product Manufacturing	334
23. Electrical Equipment Manufacturing	335
24. Aircraft and Parts Manufacturing	3364
25. Ship and Boat Building	3366 (Incl. federal Puget Sound Naval Shipyard)
26. Other Transportation Equipment Manufacturing	3361, 3362, 3363, 3365, 3369
27. Furniture Product Manufacturing	337
28. Other Manufacturing	316, 326, 339
29. Wholesale	423-425
30. Non-Store Retail	454
31. Retail	44-45 except 454
32. Air Transportation	481
33. Water Transportation	483 (Incl. WA State Ferry System)
34. Truck Transportation	484
35. Other Transportation/Postal Offices	482, 485, 486, 487, 491, 492 (Incl. local transit and U.S Postal System)
36. Support Activities for Storage, Transportation and Warehousing	488, 493
37. Software Publishers & Data Processing, Hosting and Related Services	5112, 5182
38. Telecommunications	517
39. Other Information	5111, 512, 515, 516, 519
40. Credit Intermediation and Related Activities	521, 522
41. Other Finance and Insurance	523, 524, 525

42. Real Estate and Rental and Leasing	53
43. Legal /Accounting and Bookkeeping / Management Services	5411, 5412, 5416, 5418, 5419, 55
44. Architectural, Engineering and Computing Services	5413, 5414, 5415, 5417
45. Educational Services	61
46. Ambulatory Health Care Services	621
47. Hospitals	622
48. Nursing and Residential Care Facilities, Social Assistance	623, 624
49. Arts, Recreation and Accommodation	71, 721
50. Food Services and Drinking Places	722
51. Administrative/Employment Support Services	561
52. Waste Management/ Other Services, and Agriculture Services	562, 81, 115

The core of the 2012 table relies on mapping specific transactions that fuel the state economy. These transactions are categorized into several primary groups that define how money circulates. First, the model accounts for Washington personal consumption expenditure, which tracks the spending habits of households within the state. Second, it includes private investment outlays, representing the capital that businesses pour back into the economy to foster growth.

Government spending is another critical pillar. The table details expenditures by state and local governments, capturing the public sector’s contribution to economic demand. Furthermore, the model tracks sales by Washington sectors to the federal government, highlighting the state’s role in supplying national needs. Beyond domestic borders, the framework analyzes sales by Washington sectors to customers elsewhere in the United States and to foreign markets, providing a clear picture of the state’s export strength. On the supply side, the table provides estimates of payments for labor income, other value added costs, and purchases that Washington industries make from suppliers outside the state or from foreign countries.

### **Broad sectoral composition of the Washington’s IO table**

The strength of the 2012 model lies in its granular approach to industry classification. The study utilized the North American Industry Classification System or NAICS to define 46 specific industry categories that feed into the broader 52 sector model. The primary sector is well represented, with distinct categories for crop production, animal production, forestry and logging, fishing, and mining.

The utility and construction landscape is equally detailed. It separates electric, gas, and other utilities, while distinguishing between heavy civil engineering projects like highway and bridge construction and other general construction activities. Manufacturing forms a substantial portion of the model, covering diverse activities from food and beverage production to heavy industry. This includes wood and paper manufacturing, chemical processing, and the production of nonmetallic mineral products. The model pays specific attention to the state’s advanced manufacturing capabilities, with separate categories for computer and electronic products, aircraft and parts, and ship and boat building.

The service and trade economy is broken down into wholesale and retail trade, with a specific distinction for non-store retailers. Transportation is analyzed across air, water, and truck modes, alongside support activities for storage and warehousing. The information sector includes software publishers, telecommunications, and data processing. Finally, the financial and professional

services landscape is mapped through credit intermediation, real estate, legal services, engineering, educational services, and ambulatory health care.

## **Sources used to develop Washington state's IO table**

The robust IO table of Washington state required integrating data from diverse authoritative sources including Bureau of Economic Analysis, World Institute for Strategic Economic Research export 2012 database & Washington state's economic census of 2012.

To be exact, the industrial data is extracted from 2012 economic census: industrial shipment data for industrial data, Washington insurance commissioner: revenue and margins of insurance businesses and the Bureau of Economic Analysis (BEA): 2012 U.S. Input-Output (Use) Table, etc.

On the other hand the value added data on wages, GDP and intermediate value addition was sourced from BEA's 2012 data. Correspondingly, the personal consumption expenditure data was also derived from Bureau of Economic Analysis: 2012 national income and product accounts.

On the other hand, the government spending data of local and state government was obtained from census bureau – 2012 state and local government expenditures series. Similarly, the federal government's spending was obtained from census bureau – 2012 federal government expenditures reports.

The investment related data was taken from census bureau's building permit report, Washington department of revenue's taxable sales database & Washington dept. of revenue – abstract of county assessed values report. Finally, the IO table pertaining to trade was sourced from 2012 database of world institute for strategic economic research export.

These were supplemented by income data, gross domestic product figures, and various reports from trade associations and government entities. The primary datasets included the 2012 Economic Census.

The structure of final demand comprising personal consumption expenditures, investment, state and local government, federal government, exports to other states in the United States, and foreign exports was analyzed for each sector using data from the 2002 and 2007 Washington input-output models. Additionally, the share of intermediate sales by sector from both models was documented. Through these analyses, a draft sales distribution for each sector was determined. Other values derived using this method include value added, labor income and total purchases. Initial estimates of total intermediate purchases and imports were also made based on this methodology.

Nonetheless, the Washington state's IO table of 2012 adjusted exports and imports to achieve balanced intermediate sales and purchases distributions. Similarly, the analysts also adjusted the total intermediate sales and purchases so that these totals were identical.

## Methodology used to develop Washington's IO table

The methodology for estimating the 2012 interactions involved a projection from historical data. The columns from the 2007 intermediate transactions matrix were divided by the total intermediate purchases for each sector. This calculation yielded coefficients that documented the share of purchases each sector made from every other sector. These coefficients were then multiplied by the 2012 total intermediate purchases to generate the new estimates.

A central tenet of the IO model is the assumption of homogeneity, implying that all establishments within a single sector utilize similar production processes and purchasing patterns. This process is necessary because industries evolve. New industries emerge while older ones may decline or change their production processes to adapt to new technologies.

However, the IO concept assumes that every industrial sector is homogeneous, meaning all establishments within a sector share similar production processes and purchasing patterns. In cases with data limitations the makers of IO tables are forced to adopt data from more aggregate industrial sectors to maintain statistical validity.

In order to update the relationships between industries, the study utilized the 2007 intermediate transactions matrix as a baseline. The columns of this matrix were divided by the total intermediate purchases in each sector to derive coefficients representing the share of purchases. These coefficients were then multiplied by the 2012 total intermediate purchases to generate the updated 2012 estimates.

A key utility of the Input Output table is the calculation of impact multipliers. An impact multiplier is defined as the ratio of an industrial sector's total impact to its direct impact. These single numbers serve as quick references for summarizing total economic effects. They allow analysts to estimate broader outcomes for total jobs, employment, labor income, and total output based on a direct change in one industry. For example, a total jobs multiplier indicates the total number of jobs generated across the entire economy for every million dollars of direct output change in a specific industry. While useful for summary measures, these multipliers lack minute industrial details.

It is important to note that the Washington state GDP values calculated in this study differ slightly from those reported by the Bureau of Economic Analysis. This discrepancy arises because the Input Output model accounts for the transfer of certain value added dollars from state and local or federal government to specific private sectors. Industries such as ship and boat building, courier services, ferry systems, and forestry often receive these public sector transfers. Conversely, the model deducts state and local transfers if they are made to entities located outside of Washington state. This accounting adjustment ensures a more accurate reflection of the value actually generated and retained within the local economy.

## Shocks in the model

We used the variable for output tax - 'to' to shock on different tradable commodities in different ways based on the type of tax. With respect to the taxes

on estate taxes, we simulate it via shocking the endowments pertaining to land and capital.

**Published by Washington Policy Center in collaboration with Infinite Sum Modeling**

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Infinite-Sum Modeling Inc. (ISM) is a leading economic modeling firm providing advice to a wide range of clients including government and non-governmental organizations, and companies. We provide rigorous and tested model-backed advice in the areas of macroeconomic analysis and forecasting, applied economics, infrastructure and climate policy, trade policy, energy policy, environmental policy, labor policy and business & investment strategy.