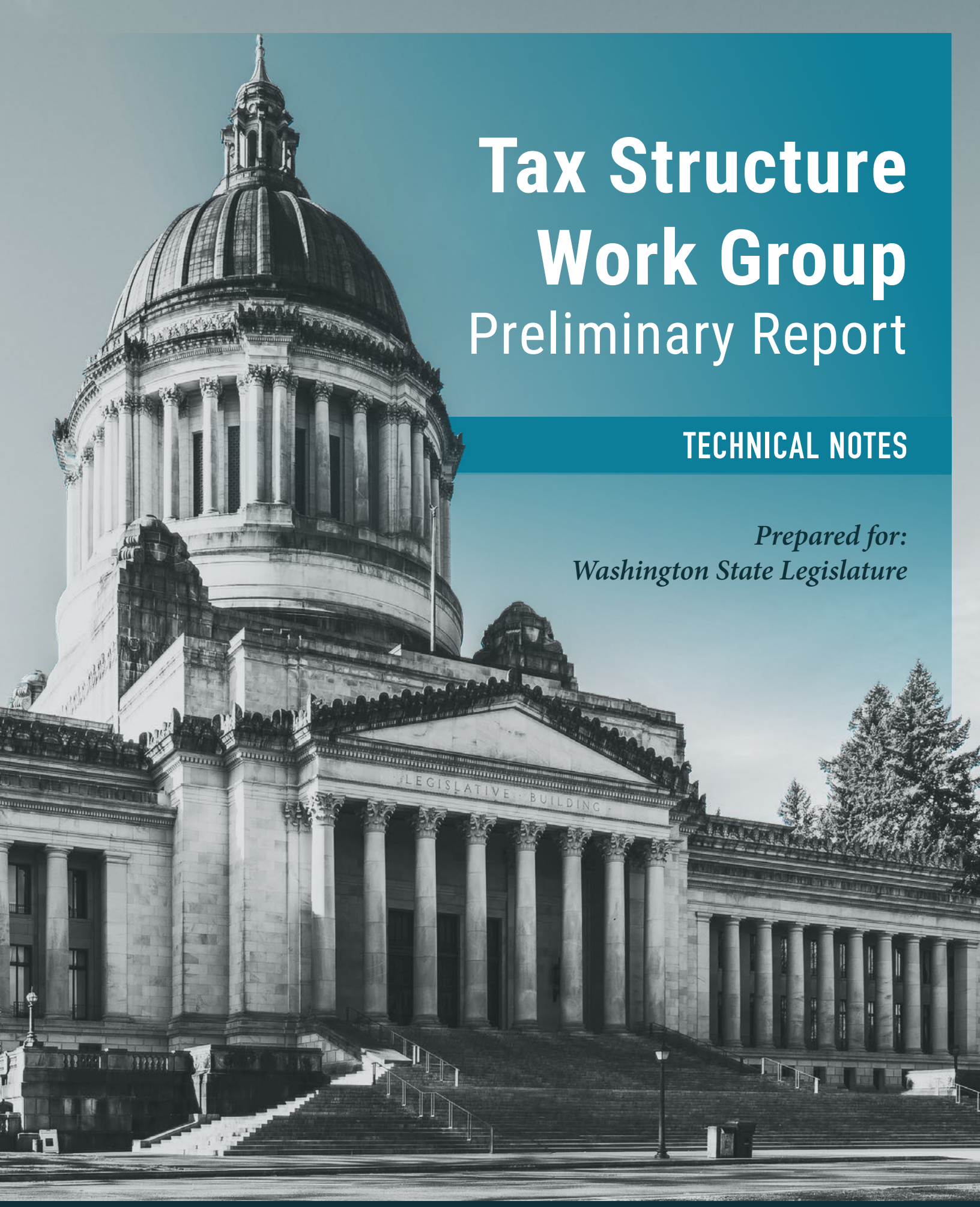

Tax Structure Work Group

Preliminary Report

TECHNICAL NOTES

Prepared for:
Washington State Legislature

The Department of Revenue conducted technical economic modeling over the course of 2019 and 2020. The work was led out of the Research and Fiscal Analysis Division. These individuals provided original study design and economic analysis as required by state law.

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Section 1: Technical Notes Introduction

Required elements of the Technical Analysis

The Technical Notes section provides a detailed summary of the data, methods, and results of the economic modeling required to support the Tax Structure Work Group. Following the 2018 House Tax Structure Work Group's (2018 House Report) recommendation to reauthorize and expand the membership of the work group, the Washington State Legislature created the 2019-2021 Tax Structure Work Group (TSWG).

The TSWG was created in the 2017-19 Operating Budget and directed to facilitate public discussions throughout the state regarding Washington's tax structure and report the results to the fiscal committees of the Legislature. The Legislature later delineated a series of technical economic modeling requests codified in Engrossed Substitute House Bill (ESHB) 1109, Section 137 (2017-19 Biennium budget proviso) and directed the Department of Revenue (DOR) to conduct a series of economic modeling on specific taxes.

The TSWG was charged with preparing a report of preliminary findings (this report) by December 31, 2020. In 2021, the TSWG will hold various public meetings to gather feedback from taxpayers and stakeholders and summarize the findings in a final summary report. Stakeholders will include, at minimum, small, start-up or low-margin business owners, their employees, and low- and moderate-income taxpayers. At least five public meetings will be held throughout Washington after the end of the 2021 legislative session.

Research Requests in the 2017-19 Biennium Budget Proviso

The 2017-19 Biennium budget proviso laid out a series of economic modeling requests as follows.

- Update the data and the research completed by the Washington State Tax Structure Study Committee as part of their report in 2002: Washington State Tax Structure Study (commonly known as the 2002 Gates Study after Bill Gates Sr., who chaired the committee).

- Estimate the tax revenue that would have been generated under new tax structures recommended in the 2002 Gates Study and the 2018 House Tax Structure Work Group report.

- Estimate the tax rates for the new tax structures that would have achieved the same tax revenue as was achieved during 2017-19 Biennium.

- Estimate impact on taxpayers by studying taxes paid by households at various income levels and taxes paid by various business activities.

- To the degree practicable, conduct an analysis of tax incidences to account for the impacts of tax shifting from businesses to consumers and landowners to renters.

- To the degree practicable, present the findings and alternatives by geographic area, in addition to statewide.

The report will also assess Washington's economic competitiveness by:

- Estimating the tax revenue that would have been generated by adopting the tax structures of border states, namely, Oregon and Idaho.

- Estimating the impact on taxpayers by comparing the effective state and local tax rates of the tax structure during the 2017-19 Biennium with various alternatives under consideration.

Practically speaking, the 2002 Washington State Tax Structure Report, the 2018 House Tax Structure Work Group Final Report, and ESHB 1109 delineated the following research requests with respect to the originating material:

1. 2002 Gates Study: Eliminate the Business and Occupation (B&O) tax and replace with a "subtraction method" Value Added Tax (VAT).

2. 2002 Gates Study: Eliminate the B&O tax, reduce the sales tax, and replace with a with a Corporate Income/Net Receipts (CINR) Tax (along with a Personal Income Tax - PIT).

3. 2002 Gates Study: Eliminate the B&O tax, reduce the sales tax, eliminate the property tax, and replace with a with a CINR Tax (along with a PIT).

4. 2002 Gates Study: Reduce or eliminate state sales, state property, and B&O taxes and replace with a PIT, estimated both a graduated and flat rate structure .

5. 2018 House Report: Eliminate the B&O tax and replace with a margins tax, modeled after the Texas Franchise Tax.

6. 2018 House Report: Eliminate the B&O tax and replace with a CINR Tax.

7. 2018 House Report: Replace the 1% revenue growth limit in the state property tax with a limit based on population growth and inflation.

8. ESHB 1109: Estimate the revenues that would have been generated during the 2017-19 Biennium had Washington adopted the tax structure of Oregon or Idaho.

9. ESHB 1109: Estimate impact on taxpayers by studying taxes paid by households at various income levels and taxes paid by various businesses.

10. ESHB 1109: Estimate impact on taxpayers by comparing the effective state and local tax rates of the tax structure during the 2017-19 Biennium with various alternatives under consideration.

It should be noted that ESHB 1109 requested "to the degree it is practicable, conduct tax incidence analysis of the various alternatives under consideration to account for the impacts of tax shifting, such as business taxes passed along to consumers and property taxes passed along to renters" and "to the degree practicable, present findings and alternatives by geographic area, in addition to statewide".

The Department of Revenue did not find it possible to address these important questions over the past year given the complexity of the question and resources it had available; however, these topics may be incorporated at a later time by the TSWG. The analyses reported her report the "first incidence" of the tax, examining the impact on whom the tax is initially imposed. A more complex and time-consuming analysis of the true economic weight of the tax, measured by the difference between real incomes before and after imposing the tax, was not conducted as part of this analysis due to time and resource constraints. These more complex analyses take into account how the tax leads to changes in prices that ultimately affect overall economic performance and the collection of taxes.

Department of Revenue Modeling and Technical Advisory Group

The Department of Revenue is responsible for all tax modeling and results. The Department created a technical advisory group to provide advice and assistance with analyzing and modeling taxes not currently part of Washington's tax structure such as a corporate income/net receipts tax, value added tax, and personal income tax.

These individuals come from a diverse background as academics, trade professionals, and tax policy researchers. They helped the Department to brainstorm data sources and develop key assumptions and approaches to take in developing the above tax models. Exhibit 1 lists the members of the technical advisory group. The Department and the technical advisory group worked to establish and refine the tax modeling from December 2019 through December 2020.

EXHIBIT 1: Technical Advisory Group
SOURCE: Washington State Department of Revenue, 2020

Member	Affiliation
Katie Baird	University of Washington Tacoma
Douglas Conrad, PhD	Professor Emeritus at the University of Washington
Lucy Dadayan, PhD	Urban Institute
Mike Nelson	Washington Society of Certified Public Accountants
Robert Hamilton	Washington State Department of Commerce
Rachelle Harris	House Finance Committee
Hart Hodges, PhD	Center for Economic and Business Research, Western Washington University
D. Patrick Jones, PhD	Eastern Washington University
Sharon Kioko, PhD	Evans School of Public Policy and Governance, University of Washington
Steve Lerch, PhD	Economic and Revenue Forecast Council
Jeff Mitchell	Senate Ways and Means Committee
Andy Nicholas	Washington State Budget & Policy Center
Pete Parcells, PhD	Economics Professor at Whitman College
Rick Peterson	Retired, former House Finance and DOR Research
Kriss Sjoblom, PhD	Washington Research Council
Nick Tucker	House Finance Committee

Organization of the Technical Notes Section

The Technical Notes section is organized into nine sections that detail the models, data, and methods used in the analysis with their respective results.

- Section 2. Taxes Analyzed
- Section 3. Value Added Tax and Margins Tax Model
- Section 4. Corporate Income/Net Receipts Tax Model
- Section 5. Personal Income Tax Model
- Section 6: Household Tax Burden Model
- Section 7: Business Tax Burden Model
- Section 8: Alternative Property Tax Analysis
- Section 9: Alternative State Tax Structures - Oregon and Idaho Tax Structures
- Section 10: Economic Competitiveness and Taxes

Section 10, specifically, represents work completed by Western Washington University to address the questions asked in the 2017-19 Biennium budget proviso. The Department entered into an interagency agreement with Western Washington to address the research request.

Section 2: Taxes Analyzed

Overview

The current state tax system is largely composed of business and occupation tax, general sales tax, selective sales tax, and property tax. Following the recommendations by the 2002 Gates Study and the 2018 House Report, tax alternatives considered in this report are value-added tax (VAT), margins tax, corporate income/net receipts (CINR) tax, and personal income tax (PIT). This section provides an overview of existing taxes and tax alternatives that are included in the models that follow. For more information, please refer to Washington State DOR's *Tax Reference Manual*.

Business and Occupation Tax (B&O Tax)

The B&O tax is applicable to gross receipts of various business activities that take place in Washington. Gross receipts are gross income, gross sales, or the value of products of businesses that have a physical presence (i.e. payroll or property) or an economic presence (i.e. more than $100,00 in combined gross receipts) in Washington. The tax rate varies from 0.138% to 1.63% depending on the classifications of business activities. More than $4.4 billion of B&O taxes was collected in Fiscal Year 2019. Almost all collections are deposited into the State General Fund. Small portions are dedicated for programs related to natural resources and addressing problem gambling.

Value-Added Tax (VAT)

The VAT is imposed on the incremental value a business adds to goods or services it sells. Although VAT is widely used in the European Union, the United Kingdom, Canada, Mexico, and Japan, the only state in the U.S. to impose a form of VAT is New Hampshire. A credit-invoice method allows businesses to claim credits for VAT already paid on the purchased inputs. So, the businesses must track their invoices to avoid double taxation. A subtraction method allows businesses to deduct from their gross receipts the cost of intermediate goods and services. This method uses annual accounts rather than individual transactions to compute the tax.

Margins Tax

The margins tax is similar to the subtraction method VAT. Business are taxed on their gross margins, which is their gross receipts minus returns and allowances and minus cost of goods sold. The Texas Franchise Tax is a form of margins tax that allows deductions for either cost of goods sold, compensation, a fixed percentage (30%) of total revenue, or a flat amount ($1 million).

The margins tax considered in the 2018 House Report and in this report are modeled after the Texas Franchise Tax.

Corporate Income/Net Receipts Tax (CINR Tax)

The CINR tax would be applicable to businesses that pay the federal corporate income tax. Pass-through entities, such as sole proprietorships and S-corporations, that are taxable through the individual income tax would not pay the CINR tax. Unlike the B&O tax, the taxable income under the CINR tax would allow various deductions for returns and allowances, cost of goods sold, salaries and wages, and various expenses related to operating a business. Federal and state tax systems include tax credits and minimum tax payments in their calculation of taxes due, but none are considered in the models to maintain simplicity.

Personal Income Tax (PIT)

The PIT in Washington would work similarly to the federal individual income tax. The taxable income for each taxpayer will be based on the adjusted gross income (AGI) minus deductions and personal exemptions. Deductions can include a standard deduction, an elderly deduction, and a disabled deduction. Also, the taxpayers will have access to an out-of-state credit for income taxes paid outside Washington and a B&O credit for taxpayers with pass-through income who paid B&O taxes. Both a flat rate tax and a graduated rate tax are considered in the models.

General Sales & Use Tax

The retail sales tax (6.5%) applies to consumer purchases of tangible goods and certain services. An additional 0.3% state sales tax applies to sales of new or used motor vehicles. The use tax, which has the same tax rate as the retail sales tax, is collected on purchases made outside Washington that are used, stored, or consumed in the state but on which no retail sales tax was collected. In Fiscal Year 2019, the retail sales and use taxes generated $11.9 billion of collections, 94% of which was the retail sales tax. Although most of the collections are deposited into the General State Fund, there are a few, small, dedicated funding streams. Many items such as groceries, prescription drugs, and certain business services are exempt from the retail sales and use taxes.

Selective Sales Taxes

Selective sales taxes apply to specific products, such as motor fuels, liquor, cigarette, cannabis products, real estate transactions, insurance premiums, and rental cars. The rates vary by product and the retail sales tax may or may not apply in addition to the selective sales tax. Over $4.1 billion of selective sales taxes were collected in Fiscal Year 2019. Many of the selective sales taxes are

dedicated to supporting specific programs. The specific selective sales taxes analyzed in the models below are alcohol beverage tax, cigarette & tobacco tax, insurance premiums tax, gasoline tax, real estate excise tax, and public utilities tax.

State Property Tax

The state property tax applies to the assessed value of all real and personal property. Real property includes land, buildings, improvements, and structures. Personal property includes machinery, equipment, supplies of businesses, non-attached mobile homes, state-assessed commercial vessels and utility property, and other movable items. Property values are determined by county assessors, who revalue all real property every year and physically inspect each property at least once every six years. Property values reflect the highest and best use of the property and 100% of market value, though exceptions exist for agricultural and timber land, designated forest land, and eligible senior citizens and disabled homeowners. There also are many other property tax exemptions. In Fiscal Year 2019, $3.4 billion of property tax was collected.

Section 3: Value Added Tax and Margins Tax Model

Overview

The model for value added tax (VAT) and margins tax estimates the revenue that would have been generated for the 2017-19 Biennium if the subtraction method VAT tax structure had been implemented as described in the 2002 Gates Study. The 2002 Gates Study proposed a 2.2% subtraction method VAT to replace the B&O tax. The model also estimates the tax rate necessary to implement a subtraction method VAT that achieves the revenues generated by the B&O tax during the 2017-19 Biennium. Similarly, the model estimates the tax rate necessary to implement a margins tax that achieves the revenues generated by the B&O tax during the 2017-19 Biennium.

The VAT imposes a tax only on the incremental value a business adds to goods or services it sells. Although VAT is widely used in other countries, the only state in the U.S. to impose a form of VAT is New Hampshire. A credit-invoice method allows businesses to claim credits for a VAT already paid on the purchased inputs. So, companies must track their invoices to avoid double taxation. A subtraction method allows businesses to deduct from their gross receipts the cost of intermediate goods and services purchased from other businesses and entities. This method uses annual accounts rather than individual transactions to compute the tax.

The margins tax is similar to the subtraction method VAT. Businesses are taxed on their gross margins, which are their gross receipts minus returns and allowances and minus cost of goods sold. The margins tax in this study is modeled after the Texas Franchise Tax, which allows deductions for either cost of goods sold, compensation, a fixed percentage (30%) of total revenue, or a flat amount ($1 million).

As an example, a food service business will purchase raw ingredients from wholesalers, prepare meals for customers, and acquire advertising services to attract more customers. The company would pay a VAT on its revenues after subtracting the costs for the raw ingredients and advertisement. The value the business adds to the raw ingredients is its preparation and service of meals. Alternatively, if a margins tax was implemented, the business would pay taxes on one of the following: the difference between total revenue and costs for the raw ingredients and advertisement, total compensation to business owners and employees, 30% of the total revenue, or $1 million, whichever is most advantageous to the business.

In general, the same model is used for both VAT and margins tax. The VAT-Margins Tax Model relies on B&O tax data matched with IRS microdata to identify the Washington tax base, but the deductions differ between the two taxes. The steps involved in the model include:

1. Clean IRS 1120/1120-S/1065 microdata and DOR B&O data.

2. Match taxpayers in IRS and DOR B&O data.

3. Calculate corporations' and partnerships' 2017 apportionment and value added tax base.

4. Calculate corporations' and partnerships' 2017 margins tax base.

5. Impute data for sole proprietors.

6. Project growth in tax bases after 2017.

7. Calculate tax revenues for proposed VAT tax rate and calculate revenue-neutral rates for VAT or margins tax to replace B&O revenues for the 2017-19 Biennium.

Key Data Sources

The data sets used for the VAT-Margins Tax Model are:

- IRS microdata for federal business tax returns of companies identified as having Washington nexus. Specifically, data from Form 1120 (C-Corps), Form 1120-S (S-Corps), and Form 1065 (Partnerships)

- Washington Department of Revenue (DOR) excise tax data

- IRS Statistics of Income (SOI) data

At the time of this analysis, the DOR had access to IRS data through the tax year (TY) 2017, and through TY 2018 for a smaller subset of taxpayers, depending on when the tax returns were filed. Tax data after TY 2017 was not available for most taxpayers, based on their filing deadline[1] and because many business taxpayers, especially large businesses, use the automatic extensions granted by completing Form 7004. Thus, the VAT-Margins Tax Model uses the most recent complete year of data, TY 2017.

The DOR excise tax data includes information on the tax bases and tax payments of businesses and others paying Washington taxes. Major excise taxes include the B&O tax, sales and use tax, and the public utility tax (PUT). Whereas the sales and use tax applies to a comparatively narrow base, the B&O tax applies broadly to the gross proceeds from sales, and other gross income of business activities sourced to Washington, with only narrow exemptions or deductions. In lieu of the B&O tax, public service businesses such as transportation and utilities companies pay the PUT tax. The DOR excise tax used in this analysis consists of B&O and PUT data[2] and includes the amounts of gross receipts, taxable income, tax due, and taxpayer identifying information such as Federal Employer Identification Number (FEIN), name, address, and North American Industry Classification System (NAICS) code. DOR's Research and Fiscal Analysis (RFA) division produces these datasets and regularly tests their validity.

[1] Businesses' federal tax filing deadlines depend on their tax year, which typically aligns with their fiscal year.

[2] The report may refer only to B&O data for simplicity.

IRS microdata provides taxpayers' total federal income, while DOR's taxable income, by its nature, relates only to the taxpayers' Washington-apportioned income. Taxpayers' Washington apportionment percentages are therefore determined by dividing the DOR taxable income (for all B&O and PUT line items) by the IRS total income.

Assumptions[3]

Timing

All TSWG estimates are for the 2017-19 Biennium, unless stated otherwise. All estimates are based on the assumption that the proposed taxes were implemented on January 1, 2003, meaning that the estimates do not factor in any "ramp up" period for compliance.

Taxpayers Subject to the Tax for Subtraction Method VAT

All businesses with Washington nexus are assumed to owe taxes on the value they add to goods and services they sell during the tax year (if the taxable amount is positive after deductions), except those that are currently exempt from the B&O tax. Taxpayers include companies that have a substantial nexus with Washington, as defined in RCW 82.04.067 and are required to file a federal tax form 1120, 1120-S or 1065 for their business activities, as well as sole proprietors.

Taxpayers Subject to the Tax for Margins Tax

All businesses with Washington nexus will potentially owe tax on their margins (if the taxable amount is positive after deductions) during the tax year, except those that are currently exempt from the B&O tax. The tax will apply on a consolidated basis, in line with Internal Revenue Code consolidation rules, to ensure that taxpayers' structure does not dictate the amount of deductions claimed. Taxpayers include companies that have a substantial nexus with Washington as defined in RCW 82.04.067 and are required to file a federal tax form 1120, 1120-S or 1065 for their business activities, as well as sole proprietors.

"Taxable Income Before Deductions"

All categories of income and business activities that are taxable under Washington's current B&O tax will be taxable under the subtraction method VAT and the margins tax, subject to allowable deductions under each tax system. The categories of taxable income include:

- Net receipts or sales
- Gross royalties

[3] Unless otherwise specified, these assumptions apply to both VAT and margins tax.

- Net gain from sale of business property
- Certain dividends and interest income.[4]

In addition, 10% of amounts classified as "Other Income" (Line 10, 7, and 5 on Form 1120, 1120-S, and 1065, respectively) are assumed to be taxable under the B&O tax.

Similarly, all income that is nontaxable under Washington's current B&O tax is considered to be nontaxable under the proposed tax systems, including proceeds from the sale and rental of real estate and other exempt or deductible business activities.

Deductions for Subtraction Method VAT

Taxpayers will deduct all purchases of intermediate goods and services available to them under the subtraction method VAT. The deductions relative to the existing B&O tax base (as modelled based on Form 1120, 1120-S, and 1065) include:

- Cost of goods sold (less cost of labor)
- Repairs and maintenance
- Interest expenses of companies whose interest income is taxable
- Advertising
- Other deductions[5]

For purposes of modelling a subtraction method VAT, Compensation of Officers, Salaries and Wages, Employee Benefit Programs, Depreciation, Depletion, and Rent Expenses are considered *not* deductible. The cost of labor is not deductible because a firm's own labor adds value to the goods or services it provides. The model also does not deduct Taxes & Licenses or Charitable Contributions from the tax base since they only reflect a transfer of a portion of an entity's value added to another entity, not a reduction in the amount of value added by the firm. In addition,

[4] The B&O tax allows a deduction for amounts derived from investments (RCW 82.04.4281). The deduction for amounts derived from investments generally does not include amounts received from loans, extension of credit, revolving credit, and installment payments, and is not available to banking, lending or security businesses. In addition, RCW 82.04.29005(1) limits taxation of loan interest under the B&O tax to loans "originated by a person located in more than ten states, or an affiliate of such person…" For the VAT-Margins Tax Model, the DOR assumed that dividends and interest income of companies engaged in financial services are taxable if the company (or consolidated group) has total U.S. income (including interest income) exceeding $4.5 billion. For the purposes of the model, companies in NAICS 52 (Finance and Insurance) or having interest income exceeding 5% of adjusted federal income are considered engaged in financial services and their interest income is treated as potentially taxable (if total income exceeds $4.5 billion). The $4.5 billion threshold was identified based on public 10-K data of a regional financial services company that operates in 10 states.

[5] "Other deductions" include expenses such as office supplies, fuel, utilities, insurance, consultant and legal fees, bank charges, meals and entertainment, and travel expenses. 90% of these deductions are assumed to be applicable under a subtraction method VAT.

the federal domestic production activities deduction and NOL deductions do not relate to costs incurred in the current period, so there is no corresponding deduction from the VAT tax base.

Calculation of deduction amounts occurs *before* multiplication by the apportionment factor. Once a taxpayer's total U.S. value added is determined, that amount is multiplied by the company's Washington apportionment. This assumes the share of each taxpayer's deductions that apply in Washington equals the share of taxable income that is attributable to Washington.

Deductions for Margins Tax

The total deductions claimed under a margins tax (before apportionment) will equal the maximum of the following possible deductions.

- Cost of goods sold (COGS)
- Total compensation
- $1 million
- 30% of total revenue

Calculation of deduction amounts occurs *before* multiplication by the apportionment factor. Once a taxpayer's total U.S. margins are determined that amount is multiplied by their Washington apportionment, effectively reducing the amount of the selected deduction by the apportionment factor. Implicitly this assumes that the share of each taxpayer's deductions that apply in Washington equals the share of taxable income that is attributable to Washington.

Apportionment

The single-factor (sales) apportionment formula currently used for the B&O tax will be the basis for determining the portion of total income and deductions that is attributable to Washington. The sales factor will apply on a consolidated basis, where applicable.

Estimated Payments

Businesses will make quarterly estimated tax payments. The estimates provided herein assume that businesses make estimated tax payments within the same fiscal quarter in which the taxable income relates.

Compliance

A compliance factor of 95% is applied for each year of the tax. It is based on the compliance level the DOR assumes for tax estimates that 1) involve a large number of new taxpayers (either individuals or businesses, 2) will take a considerable amount of time to notify the taxpayers, and 3) can ultimately identify the taxpayers with minimal collection issues. This is in addition to any non-compliance implicit in the federal tax data.

Methods

1. Clean IRS 1120/1120-S/1065 Microdata and DOR B&O Data

Identifier variables (i.e., FEIN, address, NAICS code, etc.) and data related to income, costs, and deductions were collected for taxpayers with a Washington nexus filing a Form 1120, Form 1120-S, or Form 1065 in TY 2017. The data comes from the IRS microdata.

A taxpayer's "adjusted federal income"[6] is the total taxable amount under a subtraction method VAT or a margins tax, before reducing it by deductions or applying apportionment. Adjusted federal income is the sum of the following items.

- Net receipts or sales
- Gross royalties
- Net gain from sale of business property
- Certain dividends and interest income (financial services companies only)[7]
- 10% of "other income".

Identifier variables and selected tax data (gross receipts, taxable income, and tax due) were collected from the DOR B&O tax data. The B&O data was collected for each quarter in calendar year 2016 and 2017. For a given taxpayer in a given quarter, the selected tax data is summed across all B&O and PUT line codes (e.g., adding gross receipts for the retailing, wholesaling, and manufacturing line codes).

Although individual taxpayers/sole proprietors do not file Form 1065 or Form 1120, they do appear in the B&O data. The B&O data for these taxpayers are separated and federal tax line items

[6] Adjusted federal income is a term unique to this report. It should not be used outside the context of this report without some clarification.

[7] For the VAT-Margins Tax Model, the DOR assumed that dividends and interest income of financial services companies are taxable if the company (or consolidated group) has total U.S. income exceeding $4.5 billion.

for such persons are ultimately imputed *after* matching the data for partnership and corporations in Step 2.

2. Match taxpayers in IRS and Department of Revenue B&O data

Taxpayer records in the IRS microdata and the B&O tax data are matched to determine the portion of adjusted federal income and federal deductions that are attributable to Washington under a subtraction method VAT or a margins tax. The simplest case is where a one-to-one match of FEINs exists between IRS microdata and B&O tax data. Exhibit 2 shows this case with taxpayers 1, 4, and 6.

Based on the assumptions that a) the subtraction method VAT and margins tax will use the current B&O apportionment formula, and b) all categories of income that are taxable (nontaxable) under the B&O will be taxable (nontaxable) under the VAT/margins tax,[8] it follows that taxpayers' B&O taxable income amount is also their taxable income amount (*before deductions*) under a subtraction method VAT or margins tax.[9] Therefore, the percentage of a matched taxpayer's federal tax return that is attributable to Washington equals the ratio of the taxpayer's B&O taxable income to adjusted federal income.[10] The middle panel of Exhibit 2 represents this ratio for taxpayers 1, 4, and 6 with the dark shaded portion of the bars.

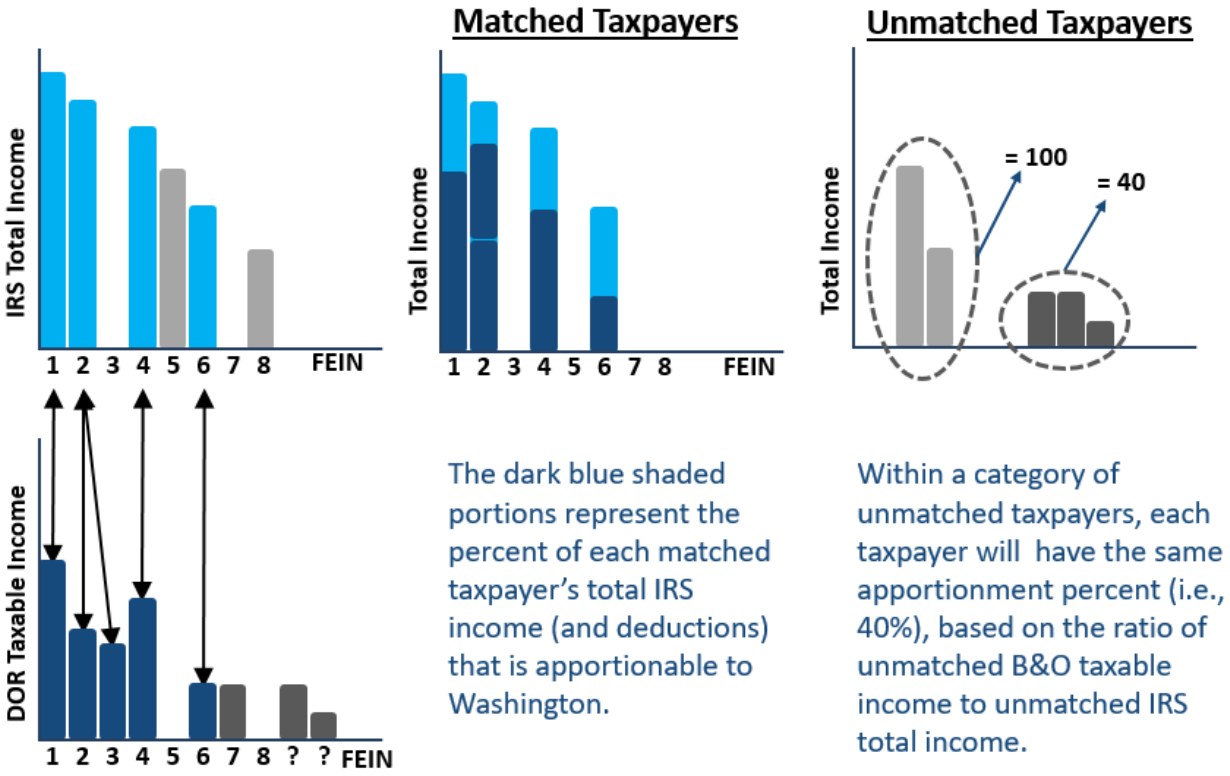
Taxpayers 2 and 3 in Exhibit 2 represent taxpayers that file a consolidated federal return but file B&O taxes separately. To determine the portion of taxpayer 2's federal return that is apportioned to Washington, the ratio of the sum of taxpayer 2 and taxpayer 3's B&O taxable income to taxpayer 2's consolidated adjusted federal income is used.

[8] Before factoring in deductions allowed under a subtraction method VAT or margins tax.

[9] This also assumes that the tax periods align for a given taxpayer between the IRS microdata and the B&O data.

[10] After subtracting bad debt from IRS total income to align with the calculation of B&O taxable income.

EXHIBIT 2. Simplified Representation of The Matching Process to Determine Taxpayers' Washington Apportionment Percentage



The matching process occurs in three iterations.

- First, B&O and IRS records are matched by FEIN, where possible.
- Then, B&O and IRS records of the large B&O accounts, including subsidiaries where possible, are matched based on company names and address information.
- Finally, additional matches are found by applying a broader name matching process, which ignores minor differences in names (e.g., "THE", "INC" vs "INCORPORATED") and assumes unique matches are positive matches.

In the cases where the four quarters in the matched data do not represent a calendar year, all income and IRS deduction amounts are adjusted based on the average growth in taxable income of all B&O taxpayers between the periods. By applying this adjustment, the model can treat the data as covering calendar year 2017 (before projecting forward for future periods).

About 25% of the B&O taxable income is not matched with the IRS data. The unmatched accounts for calendar year 2017 are split into 12 categories, based on the address as reported in their IRS and DOR accounts (e.g., Washington, Oregon and Idaho, or other) and based on their quartile of adjusted federal income (or quartile of B&O taxable income). Within each of these categories, the ratio of unmatched B&O income to unmatched adjusted federal income is used to determine a

single Washington apportionment percentage that is assigned to all unmatched IRS records in that group, as illustrated in Exhibit 2.

3. Calculate Corporations' and Partnerships' 2017 Apportionment and Value Added Tax Base

The apportionment percentage of each taxpayer (whether matched or imputed) is calculated based on the ratio of their B&O taxable income to their adjusted federal income.[11]

$$Wa\ Apportion\% = \frac{B\&O\ Taxable}{Adj.\ Federal\ Income}$$

The apportionment percentage is used to scale down the taxpayer's federal tax return data to represent the portion of the federal return that is attributable to Washington.

The Washington apportionment percentage and information from IRS Forms 1120, 1120-S, and 1065 are used to determine the 2017 Washington value added tax base of corporations and partnerships.

$$\begin{aligned} Total\_Value\_Added_{Wa} \\ &= Wa\ Apportion\% \times (Adj.\ Federal\ Income_{US} \\ &\quad - Cost\ of\ Intermediate\ Goods\ and\ Services_{US}) \end{aligned}$$

where $Cost\ of\ Intermediate\ Goods\ and\ Services_{US} = COGS - Cost\ of\ Labor + Advertising + Repairs + Financial\ Service\ \ Interest\ Expenses + 90\% \times Other\ Deductions$

Cost of Labor is a component of Cost of Goods Sold (COGS), but does not represent business purchases, so it should not be deducted along with the Cost of Intermediate Goods and Services. Because there is no taxpayer-level data of Cost of Labor, it is estimated to be about 7% of COGS across industries, based on 2015 IRS Statistics of Income line item estimates of Form 1125, as published by the IRS. Therefore, Cost of Intermediate Goods and Services is reduced by about 7% of COGS to account for the labor costs. Because Cost of Labor is not a component of Cost of Intermediate Goods and Services, it still remains in the value added tax base.

This interim calculation of the 2017 Washington VAT base for corporations and partnerships does not account for sole proprietor data or the forecasting of 2018 and 2019 data, which are required to estimate the potential VAT tax receipts during the 2017-19 Biennium. The calculation of the Washington value added tax base described above is repeated in Step 7 using the complete 2017-19 data.

[11] In a few instances, the computed Washington apportionment percentage is greater than 100%. Such a case is not impossible, but to avoid unintentionally magnifying extreme outliers' results, Washington apportionment is capped at 125%. To the extent this creates bias, it would reduce the estimates of Washington taxable income under a VAT or margins tax.

4. Calculate Corporations' and Partnerships' 2017 Margins Tax Base

Under the margins tax system, taxpayers are assumed to claim the largest deduction available to them. The apportionment percentage from Step 3 is applied to calculate the margins tax base.

$$\begin{aligned} &Margins\ Tax\ Deduction \\ &\quad = Wa\ Apportion\% \\ &\quad \times (Max(COGS, Compensation, \$1{,}000{,}000, Total\ Revenue \times 30\%)) \end{aligned}$$

$$Margins\ Tax\ Base_{Wa} = Wa\ Apportion\% \times (Adj.Federal\ Income - Margins\ \ Tax\ Deduction)$$

This interim calculation of the 2017 Washington margins tax base for corporations and partnerships does not account for sole proprietor data or the forecasting of 2018 and 2019 data, which are required to estimate the potential margins tax receipts during the 2017-19 Biennium. The calculation of the Washington margins tax base described above is repeated in Step 7 using the complete 2017-19 data.

5. Impute Data for Sole Proprietors

Individuals/sole proprietors account for less than 1% of B&O tax collections. However, rather than omitting this portion of the tax base altogether, this step imputes data for individuals/sole proprietors into the Washington-specific VAT and margins tax data. This calculation should yield more valid results than simply applying a factor to account for individuals/sole proprietors.

Individuals/sole proprietors are matched to partnerships in the same industry grouping[12] that are also in the same geographic region.[13] Each sole proprietor is matched to a partnership in the same industry/geography grouping with the nearest B&O taxable income. Washington income and deduction amounts of partnerships were imputed to the matched sole proprietors. The incomes and deductions of all sole proprietors are adjusted by the same percentage to ensure that the aggregate Washington income of sole proprietors remains equal to the sole proprietors' B&O taxable income (pre-matching).

6. Project Growth in Tax Bases After 2017

To determine the VAT base and margins tax base for years after the 2017 calendar year, the line items in 2017 related to each tax are multiplied by a growth factor. For the VAT tax, the DOR

[12] All B&O and IRS records are assigned one of the following industry groupings: 1) Tangible goods (e.g., Manufacturing, Wholesale, Retail); 2) Remote services (e.g., Information, Finance & Insurance); 3) In-person services (e.g., Accommodation & Food Services, Educational Services); or 4) Other.

[13] All B&O and IRS records are assigned one of the following geographic groupings: 1) Clark County; 2) Coastal/peninsula counties 3) Eastern Washington border counties; 4) Interior counties; 5) King County - East, 6) King County - North, 7) King County - Seattle, 8) King County - South, 9) Northwest counties; 10) Pierce County; 11) Snohomish County; 12) South Puget Sound; 13) Southwest Washington (excluding Clark County); 14) Tri-Cities; 15) Unclassified Washington city; 16) California; 17) Idaho; 18) Oregon; or 19) Other state/country.

assumed the value added tax base grew proportionally with Washington consumption in 2018 and 2019.[14]

$$VAT\ Line\ Item_{Wa,t} = VAT\ Line\ Item_{Wa,2017} \times \frac{C_{Wa,t}}{C_{Wa,2017}}$$

For the margins tax, the DOR assumed the margins tax base grew proportionally with Washington's B&O taxable income in 2018 and 2019. The B&O taxable income grew approximately 7% between 2017 and 2018, and then approximately 1% between 2018 and 2019. There is no obvious choice for a macroeconomic statistic that proxies the growth of the margins tax base, since taxpayers can choose between one of four deductions. The amount of B&O taxable income is selected for this purpose. As the number of B&O accounts was relatively stable between 2017 and 2019, the DOR did not model a change in the number of margins tax (or VAT) taxpayers between 2017 and 2019.

$$Margins\ Line\ Item_{Wa,t} = Margins\ Line\ Item_{Wa,2017} \times \frac{B\&O\ Taxable_{Wa,t}}{B\&O\ Taxable_{Wa,2017}}$$

Because the ERFC reports estimate Washington private wage and salary disbursements, those estimates are used specifically to index the Compensation of Officers and Salaries & Wages deductions in the margins tax data. Washington private wage and salary disbursements grew approximately 10% between 2017 and 2018 and approximately 7% between 2018 and 2019.

7. Calculate Tax Rates for the Subtraction Method VAT or Margins Tax to Replace B&O Revenues for the 2017-19 Biennium

The model calculates the revenues that would have been raised during the 2017-19 Biennium if a flat 2.2% VAT rate had been implemented. The model also calculates the flat VAT and margins tax rates needed to replace the revenues raised during the 2017-19 Biennium by the B&O tax.

[14] Since the amount of value added is equal to the return on capital plus the return on labor, value added is equal to consumption in a closed economy with zero net investment.

Findings

Exhibit 3 presents summary statistics for the subtraction method VAT.

EXHIBIT 3. VAT Model Summary Statistics: Sum of Amounts Attributable to Washington[15, 16, 17, 18]

Summary statistics are total estimated amounts attributable to Washington (in $ billions)			
Variable	2017 Calendar Year	2018 Calendar Year	2019 Calendar Year
Gross Receipts	593.8	624.5	649.6
Net Receipts	582.1	612.1	636.8
Dividend Income	6.8	7.2	7.5
Interest Income	21.9	23.1	24.0
Royalty Income	2.6	2.7	2.8
Net Gain - Form 4797	1.9	2.0	2.1
Other Income	30.6	32.2	33.5
COGS	359.5	378.0	393.3
Cost of Labor	25.0	26.2	27.3
Repairs	3.0	3.2	3.3
Bad Debts	1.7	1.8	1.9
Interest Deduction	13.5	14.2	14.8
Depreciation	20.4	21.4	22.3
Depletion	0.2	0.3	0.3
Advertising	4.3	4.5	4.7
Other Deduction	86.7	91.1	94.8
VAT Taxable Income (before deductions)	593.1	623.7	648.9
VAT Deductions	410.5	431.7	449.1
VAT Taxable Income	182.6	192.0	199.8

[15] Summary statistics in this exhibit were derived from IRS corporate income tax return data.

[16] Other Income refers to "Other Income" line items on IRS forms, and does not reflect the sum of all categories of income omitted from this exhibit. Not all IRS income line items are reported in this exhibit.

[17] Other Deduction refers to "Other Deduction" line items on IRS forms, and does not reflect the sum of all categories of deductions omitted from this exhibit. Not all IRS deduction line items are reported in this exhibit.

[18] VAT deductions are capped at VAT Taxable Income (before deductions) to ensure non-negative taxable income.

Exhibit 4 presents summary statistics for the margins tax.

EXHIBIT 4. Margins Tax Model Summary Statistics: Sum of Amounts Attributable to Washington[19, 20, 21, 22]

Summary statistics are total estimated amounts attributable to Washington (in $ billions)			
Variable	**2017 Calendar Year**	**2018 Calendar Year**	**2019 Calendar Year**
Gross Receipts	593.8	637.3	644.0
Net Receipts	582.1	624.7	631.3
Dividend Income	6.8	7.3	7.4
Interest Income	21.9	23.5	23.8
Royalty Income	2.6	2.8	2.8
Net Gain - Form 4797	1.9	2.0	2.1
Other Income	30.6	32.9	33.2
COGS	359.5	385.8	389.8
Cost of Labor	25.0	26.8	27.1
Bad Debts	1.7	1.9	1.9
Cost of Labor	25.0	26.8	27.1
Compensation Officers	12.3	13.4	14.4
Salaries	77.2	84.6	90.7
Pension	5.0	5.4	5.4
Benefits	9.7	10.4	10.5
Depreciation	20.4	21.9	22.1
Depletion	0.2	0.3	0.3
Margins Taxable Income (before deductions)	593.1	636.5	643.2
Margins Deductions	435.0	466.5	473.1
Margins Taxable Income	158.2	170.0	170.1

The results are available for each quarter in the calendar years 2017, 2018, and 2019. Taxable incomes from the second half of 2017, entire 2018, and the first half of 2019 are added to find the taxable incomes during the 2017-19 Biennium, which are presented in Exhibit 5. The estimated Washington VAT taxable income for the 2017-19 Biennium (before compliance factor) is $383.0 billion. The estimated Washington margins tax taxable income for the 2017-19 Biennium (before compliance factor) is $335.2 billion.

[19] Summary statistics in this exhibit were derived from IRS corporate income tax return data.

[20] Other Income refers to "Other Income" line items on IRS forms, and does not reflect the sum of all categories of income omitted from this exhibit. Not all IRS income line items are reported in this exhibit.

[21] Margins tax deductions capped at Margins Taxable Income (before deductions) to ensure non-negative taxable income.

[22] The summary statistics for 2018 and 2019 differ slightly compared to the same statistics in the VAT model (Exhibit 3), due to the use of different growth assumptions in the VAT and margins tax models.

EXHIBIT 5. VAT Taxable Income and Margins Tax Taxable Income, by Quarter, Fiscal Year, and Fiscal Biennium[23]

Estimate	FY2018				FY2019			
($ billions)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
VAT Taxable Income	45.8	46.6	47.1	47.8	48.4	48.7	48.9	49.7
			FY2018:	187.3			FY2019:	195.8
							Biennium:	**383.0**
Margins Tax Taxable	40.6	42.5	38.8	42.2	43.2	45.8	39.1	43.0
			FY2018:	164.1			FY2019:	171.1
							Biennium:	**335.2**

Exhibit 6 shows the estimated revenues generated with a flat 2.2% VAT rate is $8.01 billion. This is less than the $8.59 billion in B&O tax receipts during the same period. Exhibit 6 also shows that to achieve revenue neutrality during the 2017-19 Biennium, a 2.36% rate is required for the subtraction method VAT and a 2.70% rate is required for the margins tax.

EXHIBIT 6. Revenues Generated from Proposed Tax Systems (Amount in Billions)

Tax	Goal	Taxable Income (a)	Flat Tax Rate (b)	Compliance Factor (c)	Tax Receipts (d) = (a) x (b) x (c)
VAT	Revenue raised with tax rate suggested by the 2002 Gates Study	$383.01	**2.20%**	95%	**$8.01**
VAT	Revenue neutral tax rate	$383.01	**2.36%**	95%	**$8.59**
Margins Tax	Revenue neutral tax rate	$335.19	**2.70%**	95%	**$8.59**

Section 7 of the Technical Notes relies on the outputs of the VAT-Margins Tax Model to estimate tax burdens on businesses as a result of the changes in the tax structure.

[23] Numbers may not add up due to rounding.

Section 4: Corporate Income/Net Receipts Tax Model

Overview

The macro[24] model for the Corporate Income/Net Receipts (CINR) tax, or Corporate Macro Model, estimates the potential revenue impacts of Washington implementing a CINR tax system as suggested in the 2002 Gates Study. The 2002 Gates Study proposed a 3.8% personal income tax (PIT) and a 3.8% CINR tax to replace the B&O tax and reduce the retail sales tax to 3.5%. Alternatively, it proposed a 5.0% PIT and a 5.0% CINR tax to not only replace the B&O tax and reduce the retail sales tax to 3.5% but also eliminate the state property tax. The model also evaluates the tax rates needed under the two tax structures while achieving the same tax revenue during the 2017-19 Biennium. Additionally, the model estimates the CINR tax rate needed to replace the B&O tax – without any changes to retail sales tax, state property tax, or PIT – while achieving the same revenue target.

Since Washington currently does not have a CINR tax or keep track of corporate net incomes, the Corporate Macro Model must estimate the taxable incomes of corporations in Washington. The model can be broken down into the following steps.

1. Gather federal tax collections data through the U.S. FY 2019.
2. Adjust for timing differences between Washington fiscal years (which end on June 30) and U.S. fiscal years (which end on September 30).
3. Estimate the amount of federal taxable income in 2017.
4. Project growth of federal taxable income for 2018 and beyond.
5. Account for estimated effects of Tax Cuts and Jobs Act of 2017 (TCJA) on federal taxable income in 2018 and beyond.
6. Resolve unexplained differences between the model's predicted federal tax collections and actual federal tax collections.
7. Estimate the portion of federal taxable income that is attributable to Washington ("Unadjusted Apportionment").

[24] At the time of this analysis, DOR's access to corporate federal tax micro data was mostly limited to the 2017 tax year and earlier. In December 2017, President Trump signed the Tax Cuts and Jobs Act (TCJA) into law. This legislation included a reduction of the corporate income tax rate from 35% to 21% and a myriad of other provisions that dramatically changed the US corporate income tax structure. Most of the provisions of TCJA went into effect January 1, 2018, representing the most significant change to the federal corporate income tax structure in at least 30 years. In light of these changes and in the absence of microdata covering the 2018 and 2019 calendar years, the DOR elected to use a macro approach to model Washington's tax collections under a CINR tax.

8. Apply adjustments to apportionment formula to account for identifiable effects of large businesses ("Adjusted Apportionment").
9. Apply tax rates from the 2002 Gates Study and determine revenue-neutral tax rates.

Key Data Sources

A wide array of data sources were used for the Corporate Macro Model. The data sources (and corresponding usage) include, but are not limited to:

EXHIBIT 7. Data Sources for Estimating Corporate Taxable Income

Data Sources	Purpose
Internal Revenue Service (IRS) aggregate data[25]	Federal tax collections
IRS Statistics of Income (SOI) data[26]	Federal tax credits, deductions, and other line items
IRS Microdata for Washington federal corporate income tax (FTI)[27]	
Joint Committee on Taxation (JCT)[28]	Impact of federal tax reform on tax credits and deductions
Congressional Budget Office (CBO)[29]	
Bureau of Economic Analysis (BEA), Personal Consumption Expenditures[30]	Apportionment
Bureau of Labor Statistics (BLS) and Economic Revenue and Forecast Council (ERFC), Employment by Sector	
IRS SOI[31]	
U.S. Census of Governments[32]	
U.S. Department of Treasury[33]	
Securities and Exchange Commission Form 10-K[34]	Apportionment adjustments
Washington State Department of Revenue (DOR) Excise Tax Data[35]	

[25] https://www.irs.gov/statistics/soi-tax-stats-collections-and-refunds-by-type-of-tax-irs-data-book-table-1.

26 Corporation income tax return line item estimates (various years through 2016). https://www.irs.gov/statistics/soi-tax-stats-corporation-income-tax-returns-line-item-estimates.

27 Federal tax information: IRS (2017). Business Master File and Business Return Transaction File Extracts Specification Book: Extract Year 2017. Details on change in tax credits between 2017 and 2018 also relied on both the 2017 and 2018 IRS tax data extract.

28 Joint Committee on Taxation. Estimated Budget Effects of the Conference Agreement for H.R. 1, the Tax Cuts and Jobs Act, December 2017. https://www.jct.gov/publications.html?func=startdown&id=5053.

29 Congressional Budget Office. The Budget and Economic Outlook, (various years).

30 Bureau of Economic Analysis. Consumer Expenditure Survey: Personal Consumption Expenditures (2017-2018). https://apps.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrdn=4#reqid=70&step=1&isuri=1.

31 https://www.irs.gov/statistics/soi-tax-stats-historical-table-14b.

32 U.S. Census of Governments. Annual Survey of State and Local Government Finances (2017). https://www.census.gov/programs-surveys/state.html

33 U.S. Department of Treasury, usaspending.gov (2017-19).

34 Various companies (2016-2019). https://www.sec.gov/edgar/searchedgar/companysearch.html.

35 We used DOR excise tax data for information on business receipts apportioned to Washington for purposes of the B&O tax.

BEA, Before tax Corporate Profits (U.S.)[36]	Forecasts and quarterly allocations

Assumptions

In general, the assumptions described in the 2002 Gates Study are adopted in the Corporate Macro Model. Otherwise, the most common precedents among other states with a CINR tax or, more specifically, the border states of Oregon and Idaho are adopted.

Timing

All analyses completed for the TSWG is for the 2017-19 biennium, unless stated otherwise. All estimates are based on the assumption that the proposed taxes were implemented on January 1, 2003,[37] meaning that the estimates do not factor in any "ramp up" period for compliance.

Taxpayers Subject to the Tax

The CINR tax estimates described herein assume that the tax applies to businesses that are required to file a federal Form 1120 (C-corporations) or Form 1120-F (foreign corporations) for a given tax year. The tax does not apply to any businesses that do not file a Form 1120 or 1120-F, including S-corporations, partnerships, sole proprietors, or non-profit entities. The businesses must have substantial nexus with Washington, as defined in RCW 82.04.067, or be part of a group of affiliated businesses filing a consolidated federal tax return where the group includes one or more companies with substantial nexus with Washington.

Conformity to Federal Corporate Income Tax

Washington's CINR tax will be based on federal taxable income as defined in the Internal Revenue Code (IRC). Federal taxable income will equal what taxpayers file on Line 30 of Form 1120 or Line 31 of Form 1120-F. However, as the 2002 Gates Study states, estimating corporate taxable income from the federal data "would implicitly adopt all of the deductions as allowed under the federal corporate net income tax." This is particularly relevant in light of TCJA, as any elements of tax reform dealing with income or deductions will affect Washington-apportioned federal taxable income. However, tax reforms dealing with tax credits or federal alternative taxes (including deemed repatriations) should not affect CINR tax receipts.

Although some states' corporate income taxes allow for the taxation of the deemed repatriation of foreign dividends, this element of TCJA reform does not involve a change to federal taxable income, and so the estimates described herein assume Washington does not tax deemed

[36] Bureau of Economic Analysis Forecast Statistic: Before-tax corporate profits with IVA & capital consumption adjustment, billions of dollars. (2017- 2019). (Forecasts compiled by Washington Economic and Revenue Forecast Council.)

[37] The 2017-19 Biennium budget proviso states that the DOR shall "estimate how much revenue all the revenue replacement alternatives recommended in the final report would have generated for the 2017-19 Biennium if the state had implemented the alternatives on January 1, 2003." (ESHB 1109 (2019) Sec. 137(vii)(ii).)

repatriations. The federal tax on deemed repatriations is a one-time tax on foreign earnings not repatriated to the U.S. over the period 1986-2017. The tax may be paid as a lump-sum or installments of up to eight years.

Similarly, the corporate Alternative Minimum Tax (a feature of the federal corporate tax code through U.S. TY 2017) and the Base Erosion Anti-Abuse Tax (BEAT) (a feature of the corporate tax code beginning in 2018) are completely separate from federal taxable income. Therefore, we assume that neither of these features of the federal corporate tax code directly affect Washington's CINR tax base.

Apportionment

Washington's CINR tax will use single-factor (sales) apportionment to determine the portion of a business's federal taxable income that is subject to Washington's tax. Historically, states have used three-factor apportionment – which is based on a business' share of property, payroll, and sales in a particular state – to determine the taxable income attributable to a state. However, in recent years, a majority of states with a CINR tax transitioned to single-factor apportionment to account for the growth in business activities across state borders. In 2014, the Multistate Tax Commission gave up its support for the standard three-factor apportionment formula.[38] As of January 2020, only five states use the once "standard" three-factor apportionment formula. Furthermore, for purposes of computing the B&O tax, Washington generally assigns gross receipts based on sales. Gross sales are a better measure of price-weighted volume of overall producer activity, while payroll and property are better measures of labor and capital inputs. Therefore, the model calculates the aggregate share of federal taxable income attributable to Washington based on the share of U.S. sales derived from Washington household purchases, business purchases, and government purchases.[39]

Washington Credits and Deductions

The model for Washington's CINR tax does not have any tax credits or minimum tax structures and does not allow any deductions to federal taxable income. This approach follows the 2002 Gates Study which did not explicitly include any deductions or credits (except those deductions implicitly adopted by virtue of basing the tax on federal taxable income).

[38] Source: Hellerstein, Hellerstein & Swain, State Taxation ¶8.06 (Thomson Reuters/Tax & Accounting, 3rd ed. 2001, with updates through December 2019) (online version accessed on Checkpoint (www.checkpoint.riag.com) [February 20, 2020]).

[39] Washington's aggregate apportionment percentage is adjusted to account for sales that are connected with Fortune 500 companies with very high or very low federal corporate income tax incidence.

Alignment of the U.S and Washington Fiscal Years

Federal taxable income, deductions, and credits between quarters within a single U.S. fiscal year (October 1 – September 30) are assumed to grow proportionally with U.S. before-tax corporate profits. For example, for U.S. FY 2019 (ended September 30, 2019), a portion of the corporate federal taxable income during the period aligns with Washington's fiscal year ending June 30, 2019 and a portion aligns with Washington FY 2020. Assuming zero growth in the period, 75% of federal taxable income aligns with Washington FY 2019, and the other 25% aligns with Washington FY 2020. However, economic growth during the period is accounted for by distributing the taxable income across the four quarters proportionally with the U.S. corporate profits in each quarter. Exhibit 8 below illustrates this approach using hypothetical data.

EXHIBIT 8. Hypothetical Example Showing Allocation of U.S Fiscal Year Data to a Washington Fiscal Year

		US Fiscal Year 2018			
		Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep
Federal Taxable Income Apportioned to WA		40.0			
US Corporate Profits		1,000	1,010	1,020	1,030
US Corporate Profits (as % of US Fiscal 2018)		74.6%			25.4%
		Washington Fiscal Year 2018			
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	
Federal Taxable Income	(Calculated based on US Fiscal 2017)	74.6% X 40.0			

Estimated Payments

Corporations are assumed to make quarterly estimated CINR tax payments within the same fiscal quarter in which the taxable income relates. As with federal corporate income taxes, many states require corporate taxpayers to make quarterly estimated income tax payments. Therefore, although a typical corporation may not file their 2017 income taxes until April or October 2018, the jurisdiction still receives regular quarterly payments throughout 2017.

Compliance

A compliance factor of 95% is applied for each year of the tax. It is based on the compliance level the DOR uses for tax structures that 1) involve a large number of new taxpayers (either individuals or businesses, 2) will take a considerable amount of time to notify the taxpayers, and 3) can ultimately identify the taxpayers with minimal collection issues. This is in addition to any non-compliance implicit in the federal tax data.

Methods

1. Total Federal Corporate Income Tax Collections

The IRS publishes data (through the end of U.S. FY 2019), on the number of corporate income tax returns filed, gross collections amounts, and the amount of refunds issued. The collection amounts of the federal corporate income tax net of refunds are the starting point for calculating federal taxable corporate income.

2. Total Federal Corporate Income Tax Due: Adjustments for Timing

As noted above, U.S. fiscal years end on September 30, creating some alignment issues relative to Washington fiscal years ending on June 30. All data are allocated to quarters based on the BEA's estimates of the share of before-tax corporate profits earned by U.S. corporations in each quarter. Therefore, the data for Washington FY 2018 come from federal data for U.S. FY 2017 and 2018, and the data for Washington FY 2019 come from U.S. FY 2018 and 2019.

3. Estimate the amount of federal taxable income in 2017

The IRS publishes statistical estimates of aggregate line item amounts on Form 1120 by tax year. This data is available only through TY 2016 and is used to estimate the tax data for TY 2017. The following statistical estimates are collected:

- Net Receipts (Line 1c)[40]
- Total Income (Line 11)
- NOLs & Special Deductions (Line 29c)
- Taxable Income (Line 30)
- Income Tax Before Credits (Schedule J, Part I, Line 2)
- Alternative Minimum Tax (AMT) (Schedule J, Part I, Line 3)
- Total Tax (Line 31)

Then, these estimates are used to calculate Total Credits and Total Deductions. Total Credits for each tax year through 2016 are calculated as:

$$Total\ Credits_{US} = Income\ Tax\ Before\ Credits_{US} + Alternative\ Minimum\ Tax_{US} - Total\ Tax_{US}$$

[40] Line numbers refer to the location on Form 1120.

Total Deductions for each tax year through 2016 are calculated as:

$$Total\ Deductions_{US} = Total\ Income_{US} - NOLs\ and\ Special\ Deductions_{US} - Taxable\ Income_{US}$$

The collected line estimates and the calculated Total Credits and Total Deductions amounts for 2016 are used to estimate the line item estimates for TY 2017. Specifically, the line items are calculated as a function of the 2017 corporate income tax collections (from Step 1), assuming that:

- Net Receipts, Total Income, Total Deductions, Total Credits, NOLs and Special Deductions, and AMT were equal to their 3-year average % of Total Collections; and
- Individual tax credits remained equal to their 3-year average % of Total Credits.

The effective tax rate for TY 2017 is calculated as an average of effective tax rates for tax years 2012 to 2016:

$$Average\ Effective\ Tax\ Rate_{2017} = Average\left[\frac{Income\ Tax\ Before\ Credits_{US}}{Taxable\ Income_{US}}\right]_{2012-16}$$

Finally, Taxable Income, Income Tax Before Credits, and Total Tax for TY 2017 are calculated using the following equations:

$$Taxable\ Income_{US} = Total\ Income_{US} - Total\ Deductions_{US} - Special\ Deductions_{US} - NOLs_{US}$$

$$Income\ Tax\ Before\ Credits_{US} = Average\ Effective\ Tax\ Rate_{2017} \times Taxable\ Income_{US}$$

$$Total\ Tax_{US} = Income\ Tax\ Before\ Credits_{US} + AMT_{US} - Total\ Credits_{US}$$

4. Project growth of federal taxable income for 2018 and beyond

The results for TY 2017 (from Step 3) and actual and forecasted quarterly corporate profit statistics (through 2019) are used to project the growth of federal taxable income for 2018 and 2019. In this step, the impacts of TCJA – which came into effect in 2018 – are temporarily disregarded, essentially producing a "hypothetical" model that simulates what federal tax collections might have looked like apart from tax reform. Steps 5 and 6 account for the effects of TCJA on federal taxable income.

The growth of the following items is assumed to be proportional to the projected growth of corporate profits through 2019:

- Net Receipts
- Total Income
- Taxable Income
- Special Deductions & NOLs

- Total Credits
- AMT

Then, using the equations above, Total Deductions, Total Income Before Credits, and Total Tax for 2018-2019 are calculated.

5. Account for estimated effects of TCJA on federal taxable income in 2018 and beyond

The tax data for TY 2018 and beyond are adjusted to account for the effects of TCJA provisions on the model. The effects of the tax reform are incorporated into the model by using JCT estimates of the budget impacts of TCJA, as illustrated in Exhibit 9. All provisions affecting C-corporations with a non-zero budget impact in Fiscal Years 2018 and 2019 are included. They are:[41]

- Reduction in the maximum corporate federal income tax rate from 35% to 21%.
- 41 provisions affecting taxable income (primarily deductions, some affecting total income).
- Three reduced or eliminated credits.
- Two new alternative taxes and the repeal of an existing alternative tax.

EXHIBIT 9. Budget Impacts of TCJA Provisions and Relationship to the Model

Type of Provision	Budget Impact	Implementation in Model
Total Income	+ *X*	Increase Total Income by *X / 0.21*
New Deduction	- *X*	Increase Deductions by *X / 0.21*
Reduced or Eliminated Credit	+ *X*	Decrease Credits by *X*
Alternative Tax	+ *X*	Increase Alternative Taxes by *X*

A few tax provisions are modeled differently than as described in Exhibit 9.

Reduction in Tax Rate: The model can compute the direct budget impact of the reduction in the tax rate by simply changing the tax rate in the counterfactual model and calculating the change in the income tax. This results in a somewhat larger negative calculated budget impact than the JCT estimates. This is explainable because the reduced tax rate (as captured in the JCT estimates) also causes a corresponding decrease in tax credits, especially foreign tax credits, which partially offsets the lost income from the reduced tax rate (i.e., the reduction in credits has a positive impact on federal budget). Therefore, the foreign tax credits in the model are reduced by the difference between the two estimates of the budget impact on the tax reduction.

[41] This list includes the dividends received deduction (described below) as a provision primarily affecting taxable income.

Dividends Received Deduction: Under TCJA, except in cases of passive income or low taxed income, corporate taxpayers can now fully deduct dividends received from foreign affiliates. Thus, a significant amount of foreign tax credits are eliminated.[42] As with the reduction in the tax rate, the budget impact of the Dividends Received Deduction includes an offsetting change in foreign tax credits. Further reductions to foreign tax credits (and correspondingly increased special deductions) for TY 2018 and beyond in the model are determined by using the aggregate ratio of 2018 foreign tax credits to 2017 foreign tax credits in FTI data. Only a subset of 2018 FTI data was available. Therefore, the comparison between 2018 and 2017 foreign tax credits was based only on taxpayers appearing in both years' data.

6. Resolve unexplained differences between predicted and actual federal collections

The modelling of the TCJA provisions (Step 5) significantly reduces the gap between the model's calculated federal total tax collections and the actual tax collections. However, without further adjustment, the model still overestimates total tax for FY 2018 and slightly underestimates total tax for FY 2019. The remaining gap in the model is attributed to the two most likely explanations.

1. Tax collection from deemed repatriation fell below the JCT projections. This may be due to administrative difficulties related to processing the deemed repatriation payments.[43] It may also be due to more companies than expected electing to pay the deemed repatriation tax over eight years rather than choosing the one-time payment option.

2. Taxable income fell below forecasts. This may be explained, for example, by companies accelerating deductible expenses when TCJA passed in December 2017 (which is in the first quarter of U.S. FY 2018) in anticipation of the reduced tax rate going into effect in January 2018.

The Corporate Macro Model attributes 50% of the unexplained difference between predicted collections and actual collections to an overestimation of deemed repatriations and 50% to an underestimation of deductions. Accordingly, the model for 2018 and 2019 was adjusted to bring the predicted collections and actual collections into alignment, with 50% of the budget impact connected to the change to alternative tax and 50% connected to the change to deductions.

7. Washington-Apportioned Federal Taxable Income ("Unadjusted Apportionment")

As it relates to the Corporate Macro Model, the term "apportionment" is used loosely to refer to the share of all U.S. federal taxable income that is attributable to Washington under a given apportionment method. Most states with a CINR tax now use single-factor (sales) apportionment,

[42] Dividends received deduction (DRD) is a new provision enacted via the TCJA that allows taxpayers to claim deductions for dividends from foreign affiliates, whereas previously taxpayers could only claim a credit for the taxes paid on the dividends. The DRD provision indirectly reduces the amount of foreign tax credits that would be claimed.

[43] Treasury Inspector General for Tax Administration. "Implementation of the Tax Cuts and Jobs Act Deemed Repatriation Tax Presented Significant Challenges." May 22, 2019. https://www.treasury.gov/tigta/auditreports/2019reports/201934033_oa_highlights.html.

and Washington most likely would use single-factor (sales) to apportion corporate income. The model's initial step in estimating Washington apportionment is assuming that each dollar of business receipts leads to the same increment of federal taxable income. Based on that assumption, the percentage of federal taxable income attributable to Washington is equal to the percentage of U.S. businesses' domestic receipts derived from a Washington buyer. The Unadjusted Apportionment Formula is:[44,45]

$$Unadj.\,Apportion_{Wa} = \frac{Consumption_{Wa} + Business\ Purchases_{Wa} + Government\ Purchases_{Wa}}{Consumption_{US} + Business\ Purchases_{US} + Government\ Purchases_{US}}$$

Portions of Consumption, Business-to-Business Purchases, State & Local Government Purchases, and Federal Contracts attributable to Washington range between 2.35% and 2.55%. When weighted, this yields an unadjusted apportionment percentage of about 2.40% in Washington FY 2018 and 2.44% in Washington FY 2019.

8. Washington-Apportioned Federal Taxable Income (with Apportionment Adjustments)

The apportionment equation in the previous step relied on the simplifying assumption that each dollar of business receipts leads to the same amount of federal taxable income. Clearly, this is not the case. For example, a low-margin distributor may have very high turnover and so achieve high gross receipts, but their taxable income will generally be low. In addition, companies with similar margins may claim deductions and credits at different rates for any number of reasons.

If companies earning a disproportionate share of their revenue in Washington have relatively high taxable income per dollar of revenue, then a positive adjustment to apportionment is necessary. Alternatively, if they have relatively low taxable income per dollar of revenue, then a negative adjustment is necessary.

According to 2015 SOI data, the 2,273 businesses with over $1 billion of business receipts accounted for over 80% of corporate taxable income.[46] Given the concentration of corporate taxes among the very largest businesses, a significant improvement to the apportionment estimate is possible by performing adjustments to account for the extent to which each company in the Fortune 500:[47] a) has high/low tax taxable income per dollar of revenue and b) attains a large share of its revenue from Washington.

The formula for adjusting the apportionment calculation for a series of large companies is:

[44] The equation below disregards the effect of consumption that occurs out of state, such as tourism expenses. The equation also disregards companies' sales to non-U.S. customers.

[45] Washington's single-factor apportionment for the B&O tax apportions service income based on where the customer receives the benefit of the service. There are complicated rules that guide the benefit received determination, which are ignored in this analysis.

[46] https://www.irs.gov/statistics/soi-tax-stats-corporation-income-tax-returns-line-item-estimates. (Table 3.1)

[47] Fortune 500 companies represent the 500 largest U.S. companies, by revenue.

$$Adjusted\ Apportion_{Wa} = \ Unadj.Apportion_{Wa} + \sum_{i} \frac{\alpha_i(\beta_i - 1)(X_{US\ Avg})R_{Wa}}{TI_{US\ Total}},$$

where α_i = The "excess" percentage of all Washington spending going to company i beyond the Unadjusted Apportionment;[48]

$$\beta_i = \frac{X_i}{X_{US\ Avg}}, with\ X = \text{Taxable Income per dollar of net revenue;}$$

R_{Wa} = Total revenue of all corporations sourced from Washington; and

$TI_{US\ Total}$ = Total U.S. taxable income

The adjustments can be positive or negative depending on whether β_i is greater or smaller than 1 (i.e., whether the adjustment applies to a company with a high or low rate of federal taxable income relative to the average rate of federal taxable income among all large corporations).

The data for calculating adjusted apportionment comes from the Form 10-K data of all public Fortune 500 companies and some additional large, Washington-based companies. For each large taxpayer, the following data were collected:

- Net revenue
- U.S. (or N. American) revenue
- Total cash paid for income taxes (net of refunds)
- Provision for US federal income taxes
- Provision for US state and local taxes
- Provision for foreign taxes

The total cash paid for income taxes (net of refunds) is used to estimate the total amount of income taxes due (federal, state and local, and foreign) in a given tax year. Then, each taxpayer's provisions for federal, state and local, and foreign taxes is used to estimate the percentage of cash paid for income taxes that relates to federal taxes. The estimate of federal income taxes paid is divided by the statutory corporate tax rate in that tax year to arrive at an estimate of the taxpayer's federal taxable income. [49] Each taxpayer's federal taxable income is then divided by its net U.S.

[48] As noted above, the unadjusted apportionment was 2.40% and 2.44% for FY 2018 and FY 2019, respectively. Therefore a company with 7.40% of its revenue sourced to Washington in FY 2018 would have α_i = 7.40% - 2.40% = 5.0%.

[49] This method does not rely on a taxpayer's federal tax provision data to directly estimate the amount of federal tax due in a given year. The tax provision data is less indicative of the total tax in a year than the total cash paid for income tax data, as the tax provisions will systematically overstate the amount of tax due each year. The amount by which it overstates tax due may vary systematically depending on how aggressive or conservative a particular taxpayer is. Cash paid for income taxes may not always capture the correct tax period, but it does not systematically overstate or understate the amount of taxes paid.

(or North American) revenue in the same year, yielding X_i (taxable income per dollar of net revenue). $X_{US\ Avg}$ is simply the weighted average value of X_i among all of the public Fortune 500 companies. Finally, the DOR excise tax data and the U.S. (or North American) revenue data are used to estimate α_i (the "excess" percentage of all Washington spending paid to company i).

This process yields a negative apportionment adjustment for 2017 and 2019, and a larger positive apportionment adjustment for 2018. The aggregate effect of these adjustments on apportionment over the period is a slight increase in apportionment during the 2017-19 Biennium. The adjusted apportionment is 2.54% for Washington FY 2018 and 2.53% for Washington FY 2019.

9. Apply tax rates and determine revenue neutral rates

A flat PIT and CINR tax rate of 3.8% and 5.0% are applied to the taxable income attributable to Washington to estimate the tax revenue raised during the 2017-19 Biennium. The model also calculates the flat PIT and CINR tax rates needed to replace the revenues raised during the 2017-19 Biennium by the taxes that would be reduced or replaced under the two structures. It also calculates a flat CINR tax rate needed to replace the revenues raised during the 2017-19 Biennium by the B&O tax.

Findings

In summary, Steps 1 to 6 used 2016 data, growth estimates, and adjustments related to TCJA to convert federal corporate income tax collections to federal corporate taxable income. Steps 7 and 8 find the portion of the taxable income that is attributable to Washington. The results of these calculations are shown in Exhibit 10.Exhibit 10. Calculation of Taxable Income Attributable to Washington, 2017-19 Biennium (Amounts in Billions)

EXHIBIT 10. Calculation of Taxable Income Attributable to Washington, 2017-19 Biennium (Amounts in Billions)

Estimate	Formula	Washington Fiscal 2018	Washington Fiscal 2019	
Total federal corporate income tax collections	a	232.12	212.72	
Add back: Federal corporate income tax credits	b1	113	85.86	
Less: Alternative tax payments (primarily Deemed Repatriation)	b2	30.5	51.68	
Weighted average federal corporate income tax rate	c	28.70%	21.00%	
Total federal taxable income	$d = \frac{a + b1 - b2}{c}$	1,097.25	1,175.73	
Unadjusted Washington Apportionment %	e	2.40%	2.44%	
Net Adjustments to Washington Apportionment %	f	0.14%	0.09%	
Adjusted Washington Apportionment %	g = e + f	2.54%	2.53%	**Washington 2017-19 Biennium:**
Taxable Income Attributable to Washington	**h = g x d**	**27.61**	**29.6**	**57.21**

The results of Step 9 are presented in Exhibit 11, for which the estimates for PIT collections and the revenues to replace come from the PIT model.

EXHIBIT 11. Estimation of Washington Corporate Income/Net Receipts Tax Under Tax Alternatives, 2017-19 Biennium (Amounts in Billions)

Amount	Formula	Eliminate B&O, Reduce RST to 3.5% (w/ PIT)	Flat 3.8% Income Tax (w/ PIT)	Eliminate B&O + State Property Tax, Reduce RST to 3.5% (w/ PIT)	Flat 5.0% Income Tax (w/ PIT)	Eliminate B&O (CINRT only)
B&O revenues to replace	a	8.59		8.59		8.59
RST/use tax revenues to replace	b	10.2		10.2		-
State property tax revenues to replace	c	-		6.03		-
Total revenues to replace	**d = a + b + c**	**18.79**		**24.82**		**8.59**
Corporate taxable income attributable to Washington	e	57.21	57.21	57.21	57.21	57.21
Revenue-neutral (or proposed) tax rate	**f**	**3.59%**	**3.80%**	**4.75%**	**5.00%**	**15.80%**
Compliance factor	g	95%	95%	95%	95%	95%
Corporate tax collections	h = e × f × g	1.95	2.07	2.58	2.72	8.59
Personal income tax collections	i	16.84	17.8	22.24	23.42	-
Total tax collections	**j = h+ i**	**18.79**	**19.87**	**24.82**	**26.14**	**8.59**

Corporate Income/Net Receipts Tax Option A (Personal Income Tax Option E)

The goal of CINR tax structure Option A is the same as the goal of PIT Option E (see Section 5), that is, to reduce the retail sales and use tax from 6.5% to 3.5% and replace the B&O tax with a new, flat rate CINR tax and a new, flat rate PIT. The Corporate Macro Model (along with the PIT model) estimates a flat 3.59% rate for the two taxes that would have replaced the $18.79 billion raised by the replaced taxes during the 2017-19 Biennium. The CINR tax would have raised $1.95 billion and the PIT would have raised $16.84 billion.

The 3.80% tax rate suggested in the 2002 Gates Study would have resulted in $19.87 billion in revenue during the 2017-19 Biennium, $1.08 billion more than the $18.79 billion raised by the replaced taxes during the 2017-19 Biennium. The CINR tax would have raised $2.07 billion and the PIT would have raised $17.80 billion.

Corporate Income/Net Receipts Tax Option B (Personal Income Tax Option F)

The goal of CINR tax structure Option B is the same as the goal of PIT Option F (see Section 5), that is, to reduce the retail sales and use tax from 6.5% to 3.5%, eliminate the state property tax, and replace the B&O tax with a new, flat rate CINR tax and a new, flat rate PIT. The Corporate Macro Model (along with the PIT model) estimates 4.75% for the two taxes would have replaced

the $24.82 billion raised by the replaced taxes during the 2017-19 Biennium. The CINR tax would have raised $2.58 billion and the PIT would have raised $22.24 billion.

The 5.00% tax rate suggested in the 2002 Gates Study would have resulted in $26.14 billion in revenue during the 2017-19 Biennium, $1.32 billion more than the $24.82 billion raised by the replaced taxes during the 2017-19 Biennium. The CINR tax would have raised $2.72 billion and the PIT would have raised $23.42 billion.

Corporate Income/Net Receipts Tax Option C

The goal of CINR tax structure Option C is to replace the B&O tax with a new, flat rate CINR tax. No other taxes, including the PIT, would be affected. The Corporate Macro Model estimates a 15.8% CINR tax would have replaced the $8.59 billion raised by the B&O tax during the 2017-19 Biennium. The 2018 House Report did not recommend any tax rate for a CINR tax that would replace the B&O tax only.

EXHIBIT 12. Revenue Neutral Rates (2017-19 Biennium)

Revenue Neutral Rates (2017-19 Biennium)								
Option	State Sales/ Use Tax	State Property Tax	New Taxes	B&O Tax	Corporate Income/ Net Receipts Tax (and PIT) Rate	CINRT Revenue	PIT Revenue	Total Replaced Revenue
A	Reduce rate to 3.5%	Maintain current law	CINRT and PIT	Eliminate	3.59%	$2.0 B	$16.84 B	$18.79 B
B	Reduce rate to 3.5%	Eliminate	CINRT and PIT	Eliminate	4.75%	$2.6 B	$22.24 B	$24.82 B
C	Maintain current rate (6.5%)	Maintain current law	CINRT	Eliminate	15.80%	$8.59B	$0	$8.59 B

EXHIBIT 13. Revenue Raised from CINR Tax and PIT Proposed in 2002 Gates Study (2017-19 Biennium)

Revenue Raised from CINR Tax and PIT Proposed in 2002 Gates Study (2017-19 Biennium)								
Option	State Sales/ Use Tax	State Property Tax	New Taxes	B&O Tax	Proposed CINR Tax/PIT Rate	Revenue Replacement Target	Total Revenue	Revenue Beyond Target
A	Reduce rate to 3.5%	Maintain current law	CINRT and PIT	Eliminate	3.80%	$18.79 B	$19.87 B	$1.08 B
B	Reduce rate to 3.5%	Eliminate	CINRT and PIT	Eliminate	5.00%	$24.82 B	$26.14 B	$1.32 B

Section 7 of the Technical Notes relies on the outputs of the Corporate Macro Model to estimate tax burdens on businesses as a result of the changes in the tax structure.

Section 5: Personal Income Tax Model

Overview

The model for the personal income tax (PIT) estimates the PIT rates needed to have achieved the same tax revenue during 2017-19 Biennium while reducing or eliminating certain state taxes. The TSWG modeled three potential replacement alternatives for the PIT model, which include a flat rate PIT, a graduated rate PIT, and a flat rate PIT coupled with a corporate income/net receipts (CINR) tax at the same rate. For each of these alternatives, two goals of the PIT model are to:

1. Estimate how much revenue the PIT replacement alternatives in the report would have generated for the 2017-19 biennium if implemented on Jan 1, 2003.

2. Estimate the tax rates necessary to implement all of the recommended revenue replacement alternatives in order to achieve the actual revenues generated during the 2017-19 biennium.

To achieve its first goal, the PIT model includes a tax collection calculation, which will be detailed under the methods section. The second goal of the model includes three objectives related to six tax structures that were investigated or discussed in the Gates 2002 study and 2018 Tax Structure Work Group report. These tax structures will be referred to as "Options". Each objective will model one of the PIT replacement alternatives and estimate the tax rates necessary to maintain revenue neutrality under their associated Options. The Options include reductions and eliminations of the state retail sales and use tax, the state property tax, and the state business and occupation (B&O) tax. See Exhibit 14 for an outline of all the objectives and alternatives used in the PIT model.

EXHIBIT 14. Objectives and Options

Objectives	
Objective 1: Model a flat rate PIT and estimate the tax rates necessary to maintain revenue neutrality under Options A through D. **Objective 2:** Model a graduated rate PIT and estimate the tax rates necessary to maintain revenue neutrality under Options A through D.	**Option A:** Reduce the state sales/use tax to 3.5% **Option B:** Reduce the state sales/use tax to 3.5% and eliminate the state property tax. **Option C:** Eliminate the state sales/use tax. **Option D:** Eliminate the state sales/use tax and eliminate the state property tax.
Objective 3: Model a flat rate PIT coupled with a corporate income/net receipts (CINR) tax with the same rate. Estimate the tax rates necessary to maintain revenue neutrality under Options E and F.	**Option E:** Reduce the state sales/use tax to 3.5% and replace the state B&O tax with a state CINR tax. **Option F:** Reduce the state sales/use tax to 3.5%, eliminate the state property tax, and replace the state B&O tax with a state CINR tax.

Options A-F

Options	State Sales/Use Tax		State Property Tax		State CINR Tax		State B&O Tax		Personal Income Tax
	Reduce rate to 3.5%	Eliminate	Current Law	Eliminate	None	PIT rate	Current Law	Eliminate	
Option A	X		X		X		X		Find revenue neutral rate or rates for each Option.
Option B	X			X	X		X		
Option C		X	X		X		X		
Option D		X		X	X		X		
Option E	X		X			X		X	
Option F	X			X		X		X	

Key Data Sources

The primary data source for the PIT model was the IRS federal individual income tax return microdata for TY 2017. Another data source included a personal income forecast listing forecasted growth rates for various components of personal income and growth in the number of returns filed. The personal income forecast is primarily composed of forecasts published by the Economic & Revenue Forecast Council (ERFC).

Assumptions

We consider in the model that, as a feature of the proposed tax, all income sourced in Washington, including nonresident income, would be subject to the income tax and all income of Washington residents is subject to tax, even if sourced outside of Washington. We also assumed that, of those who filed a federal income tax return, 95% complied. Information on nonresident payments and timing of payments was collected from the Oregon Department of Revenue's Personal income Tax Statistics for TY 2017, as well as state inflow and outflow of earnings information from the U.S Department of Commerce's Bureau of Economic Analysis.

Standard Deductions and Exemptions Assumptions

As an input of the PIT model's tax collection calculation, the taxable income is the adjusted gross income (AGI) of each tax filer reported for federal tax purposes minus standard deductions and personal exemptions. There are different standard deductions based on one's filing status as single, joint, head-of-household, elderly, or disabled.

In addition to the standard deductions, a personal exemption is also subtracted from the AGI in order to find the taxable income. One personal exemption is allowed for each primary filer, spouse filer, and their dependents. Therefore, a married couple with two children would receive four personal exemptions.

The TSWG used the standard deduction and exemptions provided in the Gates 2002 study. Deductions, exemptions, and tax bracket cut points listed in the Gates 2002 study were assumed to be the amounts for TY 2003 and were adjusted for inflation. In order to adjust these values for inflation, the TSWG produced a Consumer Price Index (CPI) growth series that listed annual growth rates from 2005 through 2030, using data from the U.S. Bureau of Labor Statistics (Exhibit 15).

EXHIBIT 15. Deductions and Standard Exemptions

	Deductions				
Tax Year	Joint	Single	Head of Household	Elderly and Disabled	Personal Exemption
2017	12,500	6,250	8,750	1,250	3,650
2018	12,750	6,375	8,950	1,300	3,700
2019	12,950	6,475	9,050	1,300	3,750

Source: TSWG PIT Workbook, 2020 E0426-1 RevWork

Other important data sources and assumptions used for the PIT model will be discussed in the overview of the B&O credit, out-of-state credit, and disabled deductions models within the methods section.

Methods

Building the PIT model required four major steps, discussed below. However, the PIT model required additional sub-models and calculations, which will be discussed after the overview of the four major steps.

1. Identify 2017-19 biennial revenues for three major excise taxes.

The first step involved obtaining 2017-19 biennial revenues from the Economic & Revenue Forecast Council for the three taxes that would be reduced or eliminated (state retail sales and use tax, state property tax, and state B&O tax).

EXHIBIT 16. Excise Taxes: 2017-19 Biennial Revenues to Replace (In Millions)[50]

Retail Sales & Use Tax: Amount to replace if state rate is reduced to 3.5 percent			
	Fiscal 2018	Fiscal 2019	Biennium
Retail sales**	10,231	11,108	21,339
Use**	693	756	1,449
	Total revenues, current law		22,789
Amount to replace if state rate is reduced to 3.5 percent	4,899	5,306	10,205

Property Tax & BNO tax: Amount to replace if eliminated			
Tax	Fiscal 2018	Fiscal 2019	Biennium
Property (State School Levy)	2,721	3,307	6,027
Business & Occupation	4,151	4,436	8,587

Note 1: The retail sales and use tax rates are the same, as different rates could encourage out-of-state purchases.
Source: TSWG PIT Workbook, 2020 E0426-1 RevWork

2. Obtain revenue targets for each structure.

In this step, the TSWG calculated the revenues that would need to be collected for each structure in which the existing taxes would be reduced or eliminated, in order to replace the 2017-19 biennial revenues collected by each of the existing taxes. For example, reducing the state retail sales tax to 3.5% would create a $10.2 billion revenue shortfall for Option A to replace. Alternatively, reducing the state retail sales tax to 3.5% and eliminating the state property tax would leave $16.2 billion in revenues for Option B to replace, as the elimination of the state property tax added another $6 billion revenue shortfall. See Exhibit 17 for more specifics on revenues that would need to be replaced under each structure.

[50] It is important to note that while state property tax legislature implemented in 2017 made significant changes to the state property tax, the changes only affected three quarters of the 2017-19 Biennium. Therefore, the numbers represented here may be different than what they would be if a 2002 Gates Study estimate were to eliminate the property tax today.

EXHIBIT 17. Total Revenues to Replace for Each Alternative (In Billions)

Options	Retail Sales Tax	RST amount to replace	Property Tax	Property Tax amount to replace	BNO Tax	BNO amount to replace	Total Revenues to replace
A	Reduce to 3.5%.	10.2	Maintain.	0		0	10.2
B		10.2	Eliminate.	6.0		0	16.2
C		22.8	Maintain.	0		0	22.8
D	Eliminate	22.8	Eliminate.	6.0	Maintain.	0	28.8
E	Reduce to 3.5%.	10.2	Maintain.	0		0	18.8
F		10.2	Eliminate.	6.0	Eliminate.	-	24.8

Source: TSWG PIT Workbook, 2020 E0426-1 RevWork

3. Build the PIT model.

Built the PIT model using the main data sources and several other data sources required for the B&O credit, out-of-state credit, and disabled deduction models. The credit and deduction models will be plugged into the overall tax collection calculation, which is discussed in more detail after the fourth step.

4. Flat Rate and Graduated Rate models: Find rates that most closely meet revenue targets.

At this stage, the TSWG compared estimated revenues for different rates with the revenue targets identified in order to select a rate that came closest to hitting the revenue target; the chosen rates can be seen in Exhibit 19 and Exhibit 20.

Calculating Tax Collections:

In order to calculate the personal income tax due, the TSWG first started by calculating the taxable income, which required subtracting deductions and exemptions from the Adjusted Growth Income (AGI), also known as the tax base. The amount of the standard deduction depends upon each taxpayer's filing status (see Exhibit 15).

[Taxable Income] = AGI – Deductions – Exemptions

- Deductions = [Standard Deduction] + [Elderly Deduction] + [Disabled Deduction]
- Exemptions = [Personal Exemption] x [Count of filer, spouse, dependents]

Gross Tax = [Tax Rate] x [Taxable Income]

Credits = [B&O Credit][4] + [Out-of-State Credit]

Tax Due = Tax – Total Credits

For the graduated rate PIT model, three income brackets were used to calculate taxable income, each of which were subject to a different tax rate. In order to divide taxable income across the income brackets, we used income cut points for each filer status. Exhibit 18 shows the income cut points for joint filers, single filers, and head of household filers. For joint filers in TY 2017, Rate 1

would apply to those making less than 62,550, Rate 2 would apply to those making between 62,550 and 151,550, and Rate 3 would apply to those who make over 151,550.

EXHIBIT 18. Graduated Rate Income Cut Points

	Joint Filers		Single Filers		Head of Household Filers	
Tax Year	Joint 1	Joint 2	Single 1	Single 2	Head of HH 1	Head of HH 2
2017	62,550	151,550	31,275	75,775	41,850	75,800
2018	63,800	154,600	31,900	77,300	42,700	77,300
2019	64,750	156,950	32,375	78,475	43,300	78,500

Source: TSWG PIT Workbook, 2020 E0426-1 RevWork

The calculation of taxable income was useful for the second step of the calculation, which was to determine the gross tax. The gross tax was calculated by multiplying the tax rate by the taxable income. Once this was achieved, the TSWG calculated the total credit amount by adding together the B&O credit[51] and out-of-state credit[52]. The total credit amount was capped at the amount of the gross tax. The last step of calculating tax due required subtracting the total credits from the gross tax. In order to estimate the collections amount, the TSWG randomly selected taxpayers to assume as noncompliant and set their collections to zero. Tax collection information for each AGI level is shown in Exhibit 23.

Models Involved in the Tax Due Calculation

As seen in the tax collection calculation, there are several credits and deductions that must be subtracted from each filer's AGI in order to find the taxable income for each filer. In order to input the correct values for the B&O credit, out-of-state credit, and disabled deduction, the TSWG had to create models for each.

B&O CREDIT MODEL

The state B&O tax is a gross receipts tax on the value of products, gross proceeds of sale, or gross income of a business. Businesses have to pay the tax regardless of whether they have profits or are operating at a loss. Each business is taxed according to the activities they engage in and may be subject to more than one B&O tax rate.

There are many pass-through businesses that pay an individual income tax. Pass-through businesses include some LLCs, corporations, partnerships, and sole proprietorships. By applying a B&O credit against the PIT, the total effective tax rate for business income cannot be higher than the PIT rate.

The Options for the PIT in the Gates 2002 study feature a credit for any amount of B&O tax paid; hence the subtraction of the B&O credit from the tax collection calculation. The TSWG relied on

[51] The B&O credit is based on the amount of B&O tax paid on the taxable amount.

[52] The out-of-state credit is based on the amount of income tax paid to a different jurisdiction on the taxable income.

legislation from 2003 to define the B&O credit. The B&O credit cannot exceed the smaller of 1) the amount of B&O tax paid or 2) the amount of personal income tax multiplied by a fraction where the numerator is the taxpayer's AGI attributable to activities subject to B&O tax and the denominator is the taxpayer's AGI as modified by the PIT.

There were two separate methods involved in calculating the B&O tax credit, from which the lower credit amount was selected and plugged into the overall tax due calculation. The first method required multiplying each individual's share of net profits by the B&O tax due. The second method consisted of finding the proportion of an individual's AGI that came from a business and multiplying that by the PIT due. The two amounts produced by each method were estimated for each tax return that showed business income, using several data sources. Overall, data sources for the B&O credit model included K-1 forms data, form 1040 returns data, and businesses income tax data for TY 2017 from the IRS, as well as excise tax data from the Department of Revenue, and the September 2020 B&O revenue forecast data from the Economic Revenue Forecast Council.

OUT-OF-STATE CREDIT MODEL

In FY 2017, personal income taxes accounted for 36% of state tax collections nationally. Among the 43 states that levy a personal income tax, Washington's neighbor states Oregon and Idaho tax the income of nonresidents if it is sourced within their state.

Oregon's PIT tax rates are among the highest within the United States and are progressive, with higher-income taxpayers subject to higher rates. In modeling the potential out-of-state credits for Washington, the DOR assumed that the patterns relating to the amount of out-of-state credit taken by Washington residents would be the same as they have been for Oregon residents.

Based on 2003 legislation, the Washington out-of-state credit would apply against the PIT for the amount of any income tax imposed by another state. The credit amount would not exceed the lesser of the amount of tax paid to other jurisdictions or the amount of tax due, multiplied by a fraction where the numerator is the taxpayer's AGI subject to tax in the other jurisdiction and the denominator is the taxpayer's AGI as modified by the PIT.

The TSWG used Oregon summary statistics for nonresident tax payments and out-of-state credits in order to inform estimates for the Washington returns microdata. Similar to the B&O Credit Model, the out-of-state credit model included two separate calculations, from which the lower credit amount was selected and plugged into the overall tax due calculation. The first calculation estimated the amount of out-of-state tax each individual paid, while the second calculation multiplied the proportion of an individual's AGI that was sourced out-of-state by the Washington PIT tax due.

DISABLED DEDUCTION CREDIT MODEL

While the 2002 Gates Study recommended a $1,000 deduction for disabled filers, the study did not describe the deduction. Moreover, 2003 legislation did not include the disabled deduction feature. Therefore, the TSWG disabled deduction credit model bases the disabled deduction qualification on the definition of "disabled" provided by the American Communities Survey (ACS). The ACS classifies a person as disabled if the survey response indicates a difficulty with hearing, vision, cognition, mobility, self-care, or independent living.[53]

The disabled deduction model also follows certain assumptions based on information gathered about age and disability status from the ACS. The data provided by the ACS informed the model's equation, which identified the relationship between age and disability status. This equation informed DOR's assumption for the purposes of this model that that the use of age as the sole predictor of disability reasonably approximates the true likelihood of disability when considered in the aggregate. Using this information, the DOR estimated the likelihood of disability status for each filer based on their age and subsequently used this estimate to assign an assumed disability status for each filer.

Findings

Revenue-Neutral Rates

The revenue neutral rates produced by the PIT model are shown in two exhibits, representing a flat rate model for Options A-F and a graduated rate model for Options A-D. For each tax structure, the TSWG calculated the tax rate needed to replace the 2017-19 biennial revenues collected by each of the existing taxes. The exhibits included also show revenues that would have been collected if the rates proposed in the Gates 2002 study were used instead. For the graduated rate model, each rate tier (Rate 1, 2, and 3) is applied to a different income bracket. See Exhibit 18 for these graduated rate income cut points.

EXHIBIT 19. Flat Rate PIT Models: Estimate Revenue-Neutral Rates

Options	Revenues to replace	Rate, 2020 model	Rate, 2002 model	Estimated revenues, 2020 model
Option A	$ 10,200,000,000	2.30%	2.60%	$11,500,000,000
Option B	$ 16,200,000,000	3.64%	3.80%	$16,900,000,000
Option C	$ 22,800,000,000	5.08%	5.50%	$24,700,000,000
Option D	$ 28,800,000,000	6.40%	6.70%	$30,200,000,000
Option E	$ 18,800,000,000	3.59%	3.80%	$19,900,000,000
Option F	$ 24,800,000,000	4.75%	5.00%	$26,100,000,000

Note: For the "Estimated revenues, 2020 model", the revenues were estimated by using the 2002 rate in the 2020 model. Revenues are rounded to the nearest million for Exhibits 19 and 20.
Source: TSWG PIT Workbook, 2020 E0426-1 RevWork

[53] U.S. Census Bureau (n.d.) American Community Survey and Puerto Rico Community Survey 2018 subject definitions. (https://www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html)

EXHIBIT 20. Graduated Rate PIT Models: Estimate Revenue-Neutral Rate

			Rates, 2020 model			Rates, 2002 model			
Options		Revenues to replace	Rate 1	Rate 2	Rate 3	Rate 1	Rate 2	Rate 3	Estimated revenues, 2020 model
Option A	$	10,200,000,000	1.18%	2.49%	3.80%	1.00%	2.70%	4.50%	800,000,000
Option B	$	16,200,000,000	1.85%	3.90%	5.96%	2.20%	3.50%	6.00%	16,500,000,000
Option C	$	22,800,000,000	2.58%	5.44%	8.31%	2.70%	5.70%	8.70%	23,800,000,000
Option D	$	28,800,000,000	3.25%	6.86%	10.47%	NA	NA	NA	NA

Note: For the "Estimated revenues, 2020 model", the revenues were estimated by using the 2002 rate in the 2020 model. See Exhibit 18 for the graduated rate income cut points.
Source: TSWG PIT Workbook, 2020 E0426-1 RevWork

Tax Collections by AGI Category

The following exhibits display tax collections information for TY 2017 and for each AGI category, with a flat PIT rate of 3.64%. Tax collections information is relatively similar from 2017-19; for that reason, we will only focus on TY 2017. As shown in Exhibit 21, $238 billion of $292 billion in AGI was taxable. Total tax collections came to $7 billion, with $0.2 billion representing nonresident collections. Exhibit 22 shows that, of the gross tax of $8.7 billion, net tax due represents $7.8 billion and B&O and out-of-state credits represent $0.8 billion together.

In Exhibit 23, the data shows that the effective rate of the PIT is progressive across income categories, with lower tax rates associated with lower incomes. There are two reasons for this. First, the deductions and the exemption (i.e. the adjustments) greatly reduce tax liability for those with lower incomes, but figure as a fraction of gross income for those with the highest incomes. Second, taxpayers with higher incomes make greater use of the B&O and out-of-state credits, and because of this, those with an AGI over $500,000 have a lower effective rate than those with slightly lower incomes.

EXHIBIT 21. AGI, Taxable, and Collections, TY 2017 (Flat Rate PIT at 3.64%)

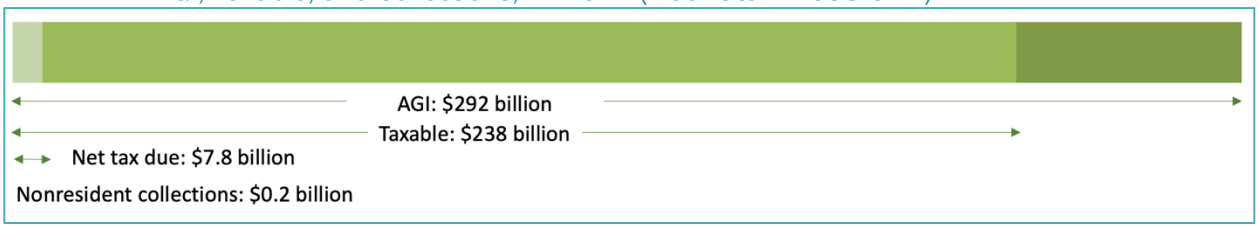


EXHIBIT 22. Gross Tax, Credits, and Net Tax, TY 2017 (Flat Rate PIT at 3.64%)

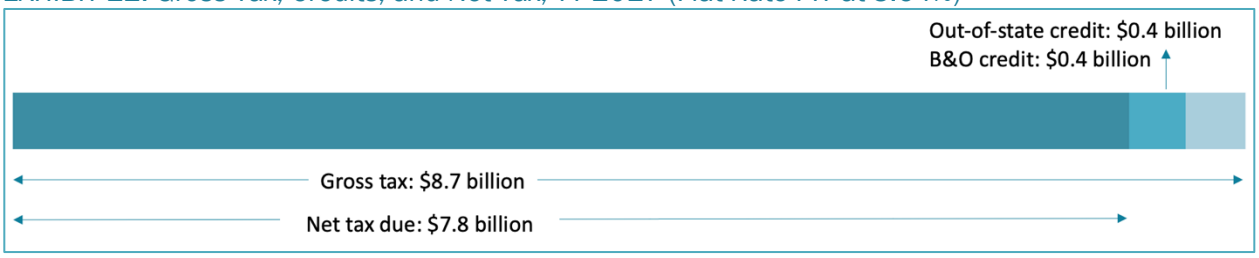


EXHIBIT 23. Tax Year 2017 Collections (Residents) by AGI Level, with Flat Rate PIT at 3.64%

	Tax Year 2017						
AGI Level	Number Federal Returns	Effective Tax Rate	Net Tax Due	Out of State Credit	B&O Credit	Adjustments as Percent of AGI	Total Tax Collected
Loss to $0	42,500	0.00%	0	0	0	NA	0
$1 to $5K	174,968	0.00%	0	0	0	100%	0
$5K to $10K	195,360	0.00%	10,684	165	339	100%	11,386
$10K to $15K	195,995	0.40%	8,391,154	308,816	452,360	90%	8,601,301
$15K to $20K	193,365	1.03%	29,988,097	948,042	1,353,785	74%	30,333,482
$20K to $25K	197,719	1.46%	55,595,340	1,549,394	2,090,847	63%	55,881,072
$25K to $30K	195,165	1.80%	83,210,572	2,246,747	2,694,176	55%	83,180,387
$30K to $35K	183,610	2.09%	106,829,541	2,593,142	3,229,778	48%	106,587,841
$35K to $40K	164,501	2.30%	121,871,294	2,716,641	3,576,276	43%	121,315,905
$40K to $45K	147,385	2.47%	132,935,841	3,023,658	3,871,501	39%	132,235,563
$45K to $50K	135,048	2.60%	143,437,727	3,509,891	4,273,272	35%	142,028,018
$50K to $60K	235,195	2.74%	304,326,973	7,398,021	8,914,037	32%	301,051,169
$60K to $70K	198,802	2.87%	318,702,374	8,039,643	9,533,157	28%	314,236,462
$70K to $80K	171,443	2.96%	327,981,894	8,823,344	9,871,184	26%	322,729,796
$80K to $90K	149,083	3.04%	331,518,279	9,486,585	10,017,611	24%	325,304,843
$90K to $100K	129,191	3.09%	327,529,007	9,938,055	9,970,151	22%	320,894,147
$100K to $250K	664,754	3.30%	2,808,726,303	99,869,652	111,452,490	15%	2,731,048,799
$250K to $500K	109,573	3.43%	1,101,839,543	53,996,406	79,641,298	7%	1,060,876,030
More than $500K	40,689	2.76%	1,641,392,781	207,138,564	161,036,905	2%	1,341,865,780

Source: TSWG PIT Workbook, 2020 E0426-1 RevWork

Section 6: Household Tax Burden Model

Overview

The Household Tax Burden Model is used to simulate tax burdens under current law or the alternative tax policies. This type of model is a microsimulation model that simulates the effect of taxation policy for Washington households. The output of the model is an exhibit with estimates of the average household tax burden by income deciles for each major consumer tax. Additionally, the model reports household tax burden measured as a share of income within each income decile. This model uses the PIT model and property tax and real estate excise tax data to estimate the household tax burden for the personal income tax (PIT) and the real estate excise tax. Prior to modeling, the TSWG gathered, formatted, and validated all data sources used in the model. Additionally, the TSWG determined the taxability of expenditures from the Consumer Expenditure Survey in Washington.

The Household Tax Burden Model has three use cases:

1. Estimate and report household tax burdens, measured as the total tax imposed on a household from state and local sources
2. Estimate the household tax burden as a share of household income
3. Model the tax burden from alternative rates and types of taxation

The model estimates household tax burden for the following taxes under current law and in each of the alternative tax scenarios.

- State and Local Retail Sales & Use Tax
- Alcoholic Beverages Tax
- Cigarette & Tobacco Tax
- Insurance Premiums Tax
- Gasoline Tax
- Real Estate Excise Tax
- Public Utility Taxes
- State and Local Property Tax
- Personal Income Tax

- Capital Gains Tax

The total amount of taxes paid by each household constitutes the household tax burden. Current household taxes not included here account for a small fraction of tax receipts and are omitted from the analysis.

Key Data Sources

The Household Tax Burden Model relies on many different data sources as well as the outputs from the PIT model. The primary data sources used for the Household Tax Burden Model are included in Exhibit 24:

Exhibit 24. Data Sources for Household Burden Analysis

Data Source	Purpose
IRS Individual Income Tax Data	Personal Income
County Property Tax Rolls	Property Valuations and Property Tax Districts
Bureau of Labor Statistics - Consumer Expenditure Survey	Consumer Spending Profile for Households
Real Estate Excise Tax Data	Taxable Property Sales

ADDITIONAL DATA SOURCES ARE INCLUDED BELOW:

- Economic and Revenue Forecast Council
    - Table 3.11 – pub. November 2019
    - Taxable Excise – February 2020
    - Taxable Public Utilities – February 2020
    - Table 2.1 – November 2019
- Transportation Revenue Forecast Council
    - Detailed Tables, Table A.3 – February 2020
- Washington State Department of Transportation
    - Annual Historical Average Fuel Price – 2017

- Office of Financial Management
    - April 1 Population Estimates – 2010-2019
- Department of Revenue
    - Local Property Tax Levy Forecast – 2017-19
    - Local Retail Sales and Tax Rates – 2017
    - Cigarette Tax Evasion Estimate – FY2017
    - Spirits Sales Activity as Reported to the State – FY2017
- Bureau of Economic Analysis
    - Per Capita Personal Income by County – 2016-2018
- Municipal Taxes and Fees Survey – 2016, 2018
- IMPLAN – 2019

Assumptions

IRS Individual Income Tax Data Assumptions

A primary assumption in using the IRS Individual Income Tax Data is that the population of Washington residents filing federal income taxes are representative of the state as a whole. It is possible that these estimates are underrepresenting low income and no income households that do not file federal income taxes. This is an important consideration when evaluating the tax burden on households in the lowest decile.

A challenge in developing the Household Tax Burden Model is that the IRS Individual Income Tax Data is reported at the tax unit level, and the Consumer Expenditure Survey Data is provided for consumer units. In order to use both of these datasets it is assumed that taxpayers reporting the same address in the IRS Individual Income Tax Data belong to the same household, with some exceptions for group homes and college dorms.

Total household expenditures are highly correlated with household income, but it is necessary to estimate household expenditures by expenditure category for the household tax burden model. There is less correlation between individual expenditure categories and aggregate household income which presents a challenge. A statistical model was developed to predict the consumption by expenditure category but is limited in what data is available for that model.

CES and IRS Income Data Connection Assumptions

Since the Consumer Expenditure Survey is a national survey of spending habits, it is assumed that Washingtonians have similar habits as Americans more broadly.

Connection IRS Individual Income tax and Property Tax Rolls Assumptions

Estimating property tax burdens requires IRS Individual Income Tax Data to be joined to the Property Tax Rolls data by matching addresses. The two datasets have different time horizons with the Property Tax Rolls Data measuring assessed property values in the calendar year 2016, with the Income Tax Data representing tax returns from TY 2017. It is assumed that housing mobility will not meaningfully bias the results.

The Household Tax Burden Model doesn't predict or estimate the change in economic behavior that might result of a change in taxation policy. While changes in taxation might affect household decision making around expenditures, estimating this response is outside the scope of the analysis. The DOR assumed fixed economic behavior when analyzing tax burden with this model.

Methods

The first step in the model is to estimate the tax base. The tax base is used to estimate the tax revenue from each of the taxes modeled. For excise taxes, we developed a statistical matching model to estimate expenditures in each expenditure category, using data from both the Consumer Expenditure Survey and the IRS Individual Income Tax Data. Households are matched using the following variables: total household income, total household wage income, family size, number of minors (under age 18) in household, and number of aging persons (over age 64) in household. The result of this matching model is a household estimate of the expenditures in every expenditure category.

The real estate excise tax was estimated by joining taxable property sales to households using both the REET data and the County Tax Roles data. To estimate property tax, first, the County Property Tax Rolls data was joined to the IRS Individual Income Tax Data. Then the probability of home ownership was estimated as well as the property values of households missing property value data. Both the PIT and capital gains tax revenue was estimated using the developed models. After estimating the household tax base, the next step is to estimate the household tax burden.

For modeling the burden on taxes that currently exist, adjustments are applied to make sure the estimated total revenues from each tax equals the actual total revenue collected in FY 2017. Then, revenues from Fiscal Years 2018 and 2019 are used to inflate estimates and arrive at an estimate for the 2017-19 Biennium. Household tax burden is estimated using the following three equations:

$$Unadjusted\ HH\ Tax\ Burden = \ HH\ Tax\ Base * Tax\ Rate$$

$$Unadjusted\ Total\ Revenue = \frac{Unadjusted\ HH\ Tax\ Burden}{\%\ HH}$$

$$Adjusted\ Household\ Tax\ Revenue = Unadjusted\ HH\ Tax\ Burden * \frac{Actual\ Total\ Revenue}{Unadjusted\ Total\ Revenue}$$

Tax rates are first applied to the household tax base to estimate the unadjusted household tax burden. For each tax, the statewide household tax revenue estimates are divided by the percentage of statewide revenues that can be attributed to households. The percentage estimates for statewide revenues attributed to households comes from IMPLAN data. This is the unadjusted total tax revenue for each tax. The final step is to multiply the household tax burden estimate for each tax by the ratio of actual revenues to the estimated total revenues. This is done to make sure that the estimated total and household tax burdens align with actual revenues collected in FY 2017.

The base year of data from the joined Individual Income Tax Data and the Consumer Expenditure Survey Data is 2017, but the purpose of this model is to estimate tax revenues during the 2017-19 Biennium. The tax burden estimates are inflated using actual tax revenue data provided by the Washington State Economic and Revenue Forecast Council and internal Department of Revenue data. This is done to make sure that after adjustments, the estimated total tax revenues match actual revenues in Fiscal Years 2018 and 2019.

Findings

For each Gate estimate, the household tax burden was estimated by income decile. With regard to the PIT model, the household burden rates are estimated for the revenue neutral flat tax rate as well as the revenue neutral graduated tax rates for Options A-D. Options E and F are modeled only using the revenue neutral flat tax rate for the PIT. All the estimates for tax burden are reported for the 2017-19 Biennium. A high-level summary of each of the Options is included in Exhibit 25:

EXHIBIT 25. Options for the Personal Income Tax and Corporate Income/Net Receipts Tax

Options	State Sales/Use Tax		State Property Tax		CINR Tax		B&O Tax		Personal Income Tax
	Reduce rate to 3.5%	Eliminate	Current Law	Eliminate	None	PIT rate	Current Law	Eliminate	
Option A	X		X		X		X		Find revenue neutral rate or rates for each Option
Option B	X			X	X		X		
Option C		X	X		X		X		
Option D		X		X	X		X		
Option E	X		X			X		X	
Option F	X			X		X		X	

Option A

In Option A, the state sales tax is reduced to 3.5% without changes to the state property tax, CINR tax, or B&O tax. Option A introduces a PIT and solves for revenue neutrality in response to the reduction in the state sales tax rate. The revenue neutral flat rate would be 2.3 percent and the graduated rate structure would include the following rates: 1.18%, 2.49%, and 3.80%. Exhibit 26 contains the estimated household tax burden when using a flat PIT.

EXHIBIT 26. Household Tax Burden with Flat PIT (Option A)

2017 Household Income	$0.00	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00
	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00	∞
Total Tax Amount										
Option A Flat PIT	$2,853	$3,710	$4,983	$6,371	$7,711	$9,215	$10,618	$12,433	$15,491	$29,633
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$652	-$331	$16	$291	$641	$1,117	$1,581	$2,327	$3,500	$11,757
Tax as a Percent of Income										
Option A Flat PIT	0.0%	7.5%	6.5%	6.0%	5.6%	5.3%	4.9%	4.6%	4.3%	3.0%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	-0.7%	0.0%	0.3%	0.5%	0.6%	0.7%	0.9%	1.0%	1.2%

Introducing a flat PIT while reducing the sales tax rate to 3.5% would shift the household tax burden slightly to higher income households. Only households earning above $146,000 would see an estimated tax burden increase 1% or more than their current tax burden. The highest income group would see an increase of 1.2%.

The household tax burden for Option A using a graduated PIT rate is included in Exhibit 27:

EXHIBIT 27. Household Tax Burden with Graduated PIT (Option A)

2017 Household Income	$0.00	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00
	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00	∞
Total Tax Amount										
Option A Graduated PIT	$2,781	$3,374	$4,404	$5,636	$6,802	$8,192	$9,623	$11,503	$14,964	$35,616
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$725	-$667	-$564	-$444	-$268	$94	$585	$1,398	$2,974	$17,740
Tax as a Percent of Income										
Option A Graduated PIT	0.0%	6.8%	5.7%	5.3%	5.0%	4.7%	4.5%	4.3%	4.2%	3.6%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	-1.4%	-0.7%	-0.4%	-0.2%	0.1%	0.3%	0.5%	0.8%	1.8%

Using a graduated PIT rate increases the household tax burden for higher income households more than the previous flat tax rate. The highest household income bracket sees an increase in tax burden of 1.8%, where it was 1.2% with the flat rate. Using the graduated rate consolidates the number of income bins seeing a tax increase, with only households making above $74,000 having any increase.

Option B

Option B also includes a reduction in the sales tax rate to 3.5%, the introduction of a PIT, and eliminates the state property tax. The PIT rate is solved for revenue neutrality using both a flat tax rate and a graduate rate structure. The revenue neutral flat PIT rate is 3.64% and the graduated rate structure has rates of 1.85%, 3.90%, and 5.96%.

EXHIBIT 28. Household Tax Burden with Flat PIT (Option B)

2017 Household Income	$0.00	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00
	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00	∞
Total Tax Amount										
Option B Flat PIT	$2,164	$3,438	$4,903	$6,347	$7,863	$9,590	$11,359	$13,656	$17,502	$36,313
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$1,341	-$602	-$64	$267	$794	$1,492	$2,321	$3,551	$5,511	$18,437
Tax as a Percent of Income										
Option B Flat PIT	0.0%	7.0%	6.4%	6.0%	5.7%	5.6%	5.3%	5.1%	4.9%	3.6%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	-1.2%	-0.1%	0.3%	0.6%	0.9%	1.1%	1.3%	1.5%	1.8%

The results from Option B with the flat tax rate are more progressive than Option A's household tax burdens when using the flat PIT rate. For Option B with a flat PIT, the highest earning households' tax burden increases by 1.8%, with a 1.2% reduction in tax burden for households making between $17,000 and $30,000.

EXHIBIT 29. Household Tax Burden with Graduated PIT (Option B)

2017 Household Income	$0.00	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00
	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00	∞
Total Tax Amount										
Option B Graduated PIT	$2,048	$2,901	$3,976	$5,167	$6,398	$7,936	$9,733	$12,117	$16,571	$45,657
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$1,458	-$1,139	-$992	-$913	-$671	-$162	$696	$2,012	$4,581	$27,781
Tax as a Percent of Income										
Option B Graduated PIT	0.0%	5.9%	5.2%	4.9%	4.7%	4.6%	4.5%	4.5%	4.6%	4.6%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	-2.3%	-1.3%	-0.9%	-0.5%	-0.1%	0.3%	0.7%	1.3%	2.8%

When using a graduated PIT rate for Option B, the tax burden shifts to the higher income earning households. The highest household income bin (households making more than $208,000) see an

increase in their household tax burden by 2.8%, which is 1.0% more than when a flat PIT is applied.

Option C

In Option C, the state sales tax is eliminated, and a PIT is introduced. The revenue neutral PIT rate is found for both a flat PIT and a graduated structure. The flat PIT rate is 5.08% and the graduated rates are 2.58%, 5.44%, and 8.31%.

EXHIBIT 30 . Household Tax Burden with Flat PIT (Option C)

2017 Household Income	$0.00	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00
	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00	∞
Total Tax Amount										
Option C Flat PIT	$2,100	$3,355	$5,061	$6,802	$8,579	$10,674	$12,663	$15,411	$19,966	$44,874
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$1,406	-$686	$93	$722	$1,510	$2,576	$3,625	$5,306	$7,975	$26,997
Tax as a Percent of Income										
Option C Flat PIT	0.0%	6.8%	6.6%	6.4%	6.2%	6.2%	5.9%	5.7%	5.6%	4.5%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	-1.4%	0.1%	0.7%	1.1%	1.5%	1.7%	2.0%	2.2%	2.7%

When applying the flat tax rate, the household tax burden increases for households making above $30,000. The only households seeing a reduction in their tax burden are households making between $17,000 and $30,000. Households making above $115,000 see a 2.0 to 2.7% increase in their household tax burden.

EXHIBIT 31. Household Tax Burden with Graduated PIT (Option C)

2017 Household Income	$0.00	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00
	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00	∞
Total Tax Amount										
Option C Graduated PIT	$1,937	$2,604	$3,761	$5,144	$6,525	$8,352	$10,379	$13,246	$18,645	$58,054
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$1,568	-$1,437	-$1,206	-$936	-$544	$254	$1,341	$3,141	$6,655	$40,178
Tax as a Percent of Income										
Option C Graduated PIT	0.0%	5.3%	4.9%	4.8%	4.8%	4.8%	4.8%	4.9%	5.2%	5.8%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	-2.9%	-1.6%	-0.9%	-0.4%	0.1%	0.6%	1.2%	1.9%	4.0%

When using the graduated rates, the tax burden is much more progressive with the most significant increase in tax burden occurring at the top of the household income distribution. With the graduated rates, the highest income group sees an increase in their tax burden of 4.0%. On the other end of the income distribution, households making between $17,000 and $30,000 see a decrease in their household tax burden by 2.9%.

Option D

Option D has a PIT introduced while eliminating both the state sales tax and the state property tax. Without the sales tax and the property tax, the revenue neutral PIT flat tax rate and graduated tax rates are much higher than in Options A-C. The flat PIT is 6.4% and the graduated rates are 3.25, 6.86 and 10.47%.

EXHIBIT 32. Household Tax Burden with Flat PIT (Option D)

2017 Household Income	$0.00	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00
	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00	∞
					Total Tax Amount					
Option D Flat Rate	$1,410	$3,082	$4,984	$6,782	$8,731	$11,048	$13,403	$16,643	$22,005	$51,739
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$2,096	-$958	$16	$702	$1,662	$2,950	$4,365	$6,538	$10,014	$33,863
					Tax as a Percent of Income					
Option D Flat Rate	0.0%	6.2%	6.5%	6.4%	6.4%	6.4%	6.2%	6.2%	6.1%	5.2%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	-1.9%	0.0%	0.7%	1.2%	1.7%	2.0%	2.4%	2.8%	3.4%

The results for the flat PIT rate have household tax burden increasing for households making above $44,000, with the reduction in tax burden only occurring for households making between $17,000-$30,000. Households making between $92,000-$115,00 see an increase in tax burden of 2.0% which is a larger increase in tax burden than what the highest income earning households see in either Option A or Option B when using a flat PIT.

EXHIBIT 33. Household Tax Burden with Graduated PIT (Option D)

2017 Household Income	$0.00	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00
	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00	∞
					Total Tax Amount					
Option D Graduated PIT	$1,204	$2,132	$3,334	$4,679	$6,128	$8,106	$10,507	$13,894	$20,322	$68,442
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$2,301	-$1,909	-$1,634	-$1,401	-$942	$8	$1,469	$3,789	$8,331	$50,566
					Tax as a Percent of Income					
Option D Graduated PIT	0.0%	4.3%	4.3%	4.4%	4.5%	4.7%	4.9%	5.1%	5.7%	6.8%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	-3.9%	-2.1%	-1.3%	-0.7%	0.0%	0.7%	1.4%	2.3%	5.1%

Using the graduated rates shifts the tax burden dramatically with the highest income households seeing a tax burden increase of 5.1%. This would more than double the percentage of taxes being paid as a percentage of income for this household group from 1.8% under current law to 6.8%. Households making between $17,000-$74,000 would see decreases in household tax burden by at least 0.7%, with households making between $17,000-$30,000 seeing a decrease in tax burden by 3.9%.

Option E

Options E-F differ from Options A-D in that the B&O tax is eliminated. In Option E the state sales tax is reduced to 3.5% and a flat PIT and CINR (Corporate Income/Net Receipts) tax are introduced. The flat rate for the PIT and CINR tax is 3.59%.

EXHIBIT 34. Household Tax Burden with Flat PIT and CINR Tax (Option E)

2017 Household Income	$0.00	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00
	$17,000.00	$30,000.00	$44,000.00	$58,000.00	$74,000.00	$92,000.00	$115,000.00	$146,000.00	$208,000.00	∞
					Total Tax Amount					
Option E Flat PIT and CINR Tax	$2,960	$4,146	$5,757	$7,496	$9,212	$11,145	$13,060	$15,560	$19,778	$41,596
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$546	$105	$789	$1,416	$2,142	$3,047	$4,022	$5,455	$7,787	$23,720
					Tax as a Percent of Income					
Option E Flat PIT and CINR Tax	0.0%	8.4%	7.5%	7.1%	6.7%	6.5%	6.1%	5.8%	5.5%	4.2%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	0.2%	1.0%	1.3%	1.6%	1.8%	1.9%	2.0%	2.2%	2.4%

The household tax burden effects of Option E are concentrated in the higher income earning households. The top income group sees an increase in their tax burden of 2.4%. Households making above $30,000 all see an increase in household burden above 1%, nearing 2% with households making over $74,000.

Option F

Option F differs from Option E in that Option F eliminates the state property tax, in addition to the reduction in state sales tax to 3.5% and the introduction of a flat PIT and flat CINR tax. The revenue neutral flat rate for both taxes is 4.75%.

EXHIBIT 35. Household Tax Burden with Flat PIT and CINR Tax (Option F)

2017 Household Income	$0.00 $17,000.00	$17,000.00 $30,000.00	$30,000.00 $44,000.00	$44,000.00 $58,000.00	$58,000.00 $74,000.00	$74,000.00 $92,000.00	$92,000.00 $115,000.00	$115,000.00 $146,000.00	$146,000.00 $208,000.00	$208,000.00 ∞
					Total Tax Amount					
Option F Flat PIT and CINR Tax	$2,264	$3,836	$5,601	$7,356	$9,204	$11,313	$13,538	$16,453	$21,359	$47,460
Current Law	$3,506	$4,041	$4,968	$6,080	$7,069	$8,098	$9,038	$10,105	$11,991	$17,876
Difference	-$1,242	-$205	$633	$1,276	$2,135	$3,215	$4,500	$6,348	$9,368	$29,583
					Tax as a Percent of Income					
Option F Flat PIT and CINR Tax	0.0%	7.8%	7.3%	6.9%	6.7%	6.6%	6.3%	6.1%	5.9%	4.7%
Current Law	0.0%	8.2%	6.5%	5.7%	5.1%	4.7%	4.2%	3.7%	3.3%	1.8%
Difference	0.0%	-0.4%	0.8%	1.2%	1.6%	1.9%	2.1%	2.4%	2.6%	3.0%

For Option F, household tax burden is estimated to increase for all measured income groups except for households making below $30,000. The tax increase rises across the rest of the income groups, with households making $30,000-$44,000 estimated to see their tax burden increase by 0.8% and the highest income earning households seeing an estimated increase of 3.0%.

Summary of Tax Burden for Each Option

Looking at the tax burden results across all of the 2002 Gates Study estimates, certain trends are apparent. Using a graduated PIT rate increases the tax burden for higher income households relative to a flat PIT rate. Option F shifts the tax burden more towards households as the tax burden increases for almost all measured household income groups. Option A is the most modest in its effects on household tax burden, estimated to cause the smallest deviation from current law.

EXHIBIT 36. Summary of Household Tax Burden for Each Option

Options Key	State Sales/Use Tax		State Property Tax		CINR Tax		B&O Tax	
Options	Reduce Rate to 3.5%	Eliminate	Current law	Eliminate	None	PIT Rate	Current Law	Eliminate
Option A	X		X		X		X	
Option B	X			X	X		X	
Option C		X	X		X		X	
Option D		X		X	X		X	
Option E	X		X			X		X
Option F	X			X		X		X

2017 Household Income	$0	$17,000	$30,000	$44,000	$58,000	$74,000	$92,000	$115,000	$146,000	$208,000
	$17,000	$30,000	$44,000	$58,000	$74,000	$92,000	$115,000	$146,000	$208,000	∞
					Tax as a Percent of Income					
Option A Flat PIT Difference	0.0%	-0.7%	0.0%	0.3%	0.5%	0.6%	0.7%	0.9%	1.0%	1.2%
Option A Graduated PIT Difference	0.0%	-1.4%	-0.7%	-0.4%	-0.2%	0.1%	0.3%	0.5%	0.8%	1.8%
Option B Flat PIT Difference	0.0%	-1.2%	-0.1%	0.3%	0.6%	0.9%	1.1%	1.3%	1.5%	1.8%
Option B Graduated PIT Difference	0.0%	-2.3%	-1.3%	-0.9%	-0.5%	-0.1%	0.3%	0.7%	1.3%	2.8%
Option C Flat PIT Difference	0.0%	-1.4%	0.1%	0.7%	1.1%	1.5%	1.7%	2.0%	2.2%	2.7%
Option C Graduated PIT Difference	0.0%	-2.9%	-1.6%	-0.9%	-0.4%	0.1%	0.6%	1.2%	1.9%	4.0%
Option D Flat PIT Difference	0.0%	-1.9%	0.0%	0.7%	1.2%	1.7%	2.0%	2.4%	2.8%	3.4%
Option D Graduated PIT Difference	0.0%	-3.9%	-2.1%	-1.3%	-0.7%	0.0%	0.7%	1.4%	2.3%	5.1%
Option E Flat PIT & CINR Tax Diff	0.0%	0.2%	1.0%	1.3%	1.6%	1.8%	1.9%	2.0%	2.2%	2.4%
Option F Flat PIT & CINR Tax Diff	0.0%	-0.4%	0.8%	1.2%	1.6%	1.9%	2.1%	2.4%	2.6%	3.0%

EXHIBIT 37. Change in Household Burden with a Flat Rate PIT

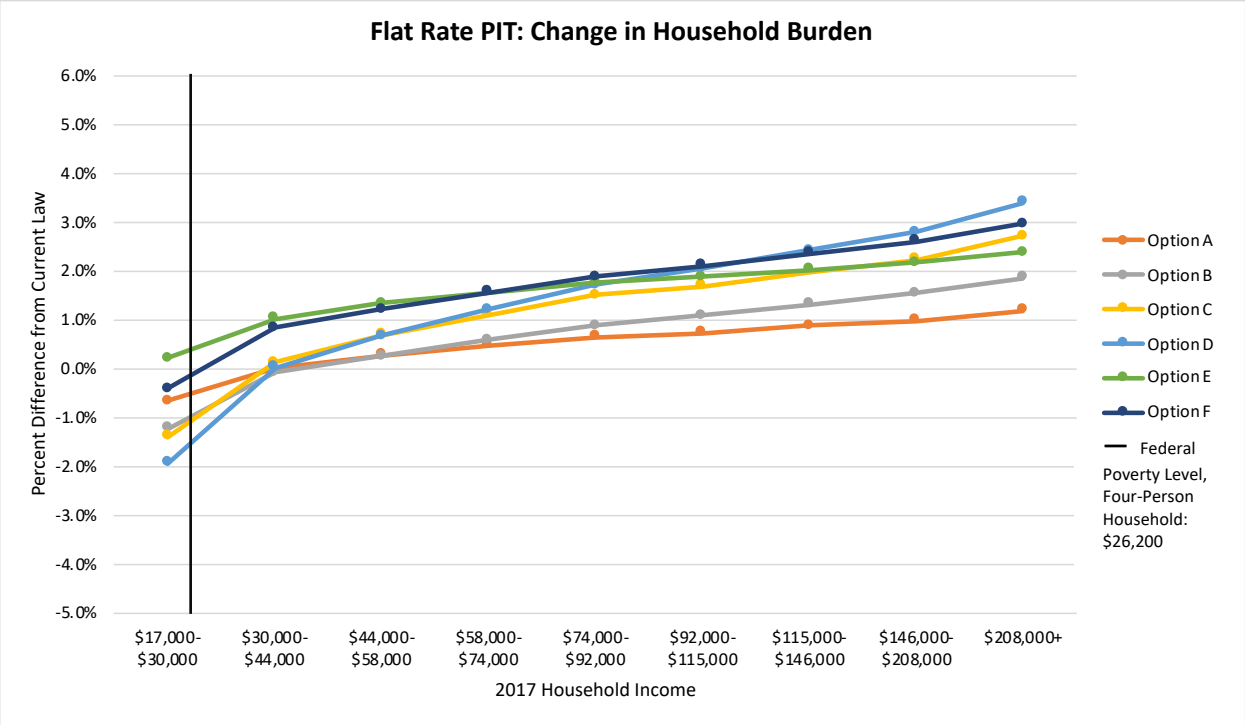
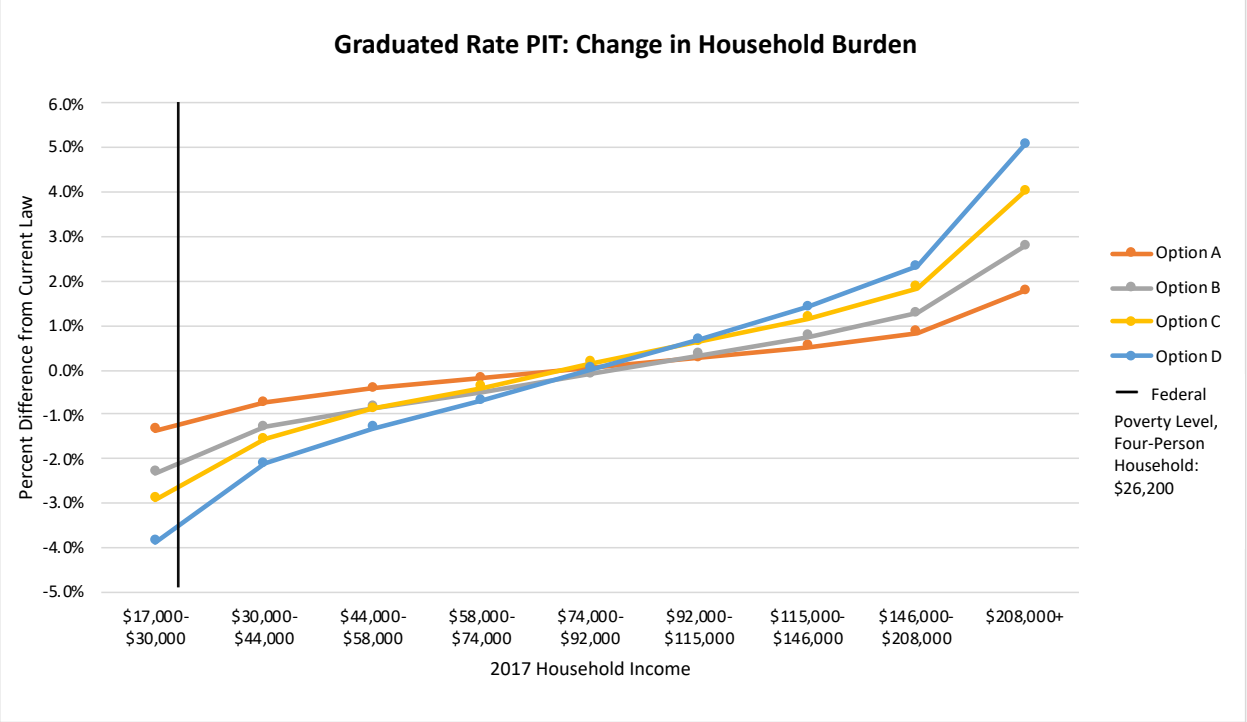


EXHIBIT 38. Change in Household Burden with a Graduated Rate PIT



Section 7: Business Tax Burden Model

Overview

For each business tax that was analyzed – CINR tax, subtraction method VAT, and margins tax – as well as for the existing B&O tax, a microsimulation model is used to assess the impact of tax burden on specific groups of taxpayers. Tax incidences are reported as a percentage of total business revenue in Washington and by NAICS sectors and size of total U.S. revenue.

Key Data Sources

Industry groupings are based on NAICS sector data as classified in IRS microdata for federal corporate income. Income groupings are based on U.S. gross income as calculated from the IRS microdata. More specifically, adjusted federal income as defined in the VAT-Margins Tax Model is used for the income groupings. For the purposes of estimating the Washington tax incidence ratio, the analysis is performed on the matched IRS microdata and B&O data described in Chapter 2. To extend the tax incidence analysis to the CINR tax, we also draw Line 30 (Taxable Income) from the IRS microdata for companies filing Form 1120.

Methods and Assumptions

The findings from the VAT-Margins Tax Model, which are based on microdata, can be disaggregated to estimate tax incidences – tax paid as a share of B&O gross income for various groupings of industry and U.S. gross income. The same method cannot be replicated for the Corporate Macro Model because it is not based on microdata. However, the Taxable Income line item on Form 1120 (Line 30) can be used in place of VAT taxable income or margins tax taxable income to estimate businesses' relative tax incidences.

Because the latest year of full IRS microdata is for 2017, tax incidences are estimated only for the 2017 calendar year, not for the 2017-19 Biennium. Tax incidences are calculated only for taxpayers whose IRS data and B&O records were successfully matched. This limits the analysis to approximately 75% of Washington's total business revenue.

The analysis relies on the IRS microdata to identify NAICS sector classification of taxpayers. However, the classification (and tax data) in the IRS microdata is available for consolidated tax filers and a separate NAICS classification is not available for the individual entities within each consolidated tax filing. Although the NAICS sector classifications in DOR's B&O data may be more specific to the business activities performed in Washington, it is not used in this analysis because the calculation of tax incidence does not distinguish between entities within a consolidated group.

A taxpayer's total income category is classified based on its 2017 U.S. gross income (in the IRS microdata), whether the income is apportioned to Washington or not.

The tax incidences of business tax alternatives are compared to taxpayers' baseline tax paid under the current B&O tax. The B&O tax incidence is calculated based on the tax paid values in the B&O data, as matched to the IRS microdata. This allows a more direct comparison of the differences in tax incidence under the alternative tax structures since it will also use the IRS microdata's classifications of NAICS and U.S. gross income.[54]

Findings

Tax Incidence for Corporate Income/Net Receipts Tax

Exhibit 39 and Exhibit 40 show tax burden as a share of total business revenue by size of U.S. gross income and by NAICS sectors for a) the current B&O tax, b) the two CINR tax systems that are paired with a PIT, and c) the CINR tax that replaces B&O tax.

EXHIBIT 39. Tax Burden as a Share of Total Business Revenue by Size of 2017 U.S. Income Revenue (Current B&O and CINR Tax Alternatives).

U.S. Gross Income	Current Business & Occupation Tax	3.59% Corporate Income/Net Receipts Tax	4.75% Corporate Income/Net Receipts Tax	15.80% Corporate Income/Net Receipts Tax
Under $250k	0.47%	0.03%	0.05%	0.15%
$250k - $1 million	0.76%	0.03%	0.04%	0.12%
$1 - $3 million	0.71%	0.03%	0.05%	0.15%
$3 - $10 million	0.60%	0.06%	0.08%	0.25%
$10 - $50 million	0.50%	0.04%	0.05%	0.17%
$50 - $250 million	0.43%	0.03%	0.04%	0.12%
Over $250 million	0.42%	0.19%	0.26%	0.85%
All Sizes	0.49%	0.11%	0.15%	0.49%

[54] However, this is a somewhat indirect way of estimating taxes paid as a percentage of total business revenue under the current structure. The 2017 taxes paid as a percentage of total business revenue could also be calculated directly using the 2017 B&O data and the B&O classifications. This captures more accurately the actual tax incidence of the B&O tax, but it is an apples-to-oranges comparison with the alternative tax structures, since those calculations may have different classifications of NAICS and total income for the same taxpayer. The results from the two approaches are similar, and thus provide some validation of the modeling. The results presented in this analysis use the former approach, which allows a consistent comparison with the alternative tax structures.

EXHIBIT 40. Tax Burden as a Share of Total Business Revenue by NAICS Sector (Current B&O and CINR Tax Alternatives).

Sector Description	Current Business & Occupation Tax	3.59% Corporate Income/Net Receipts Tax	4.75% Corporate Income/Net Receipts Tax	15.80% Corporate Income/Net Receipts Tax
Health Care & Social Services	1.27%	0.03%	0.05%	0.15%
Real Estate and Rental & Leasing	1.08%	0.04%	0.06%	0.19%
Utilities	1.00%	0.05%	0.06%	0.21%
Educational Services	0.97%	0.03%	0.04%	0.13%
Administrative Support & Waste Management	0.96%	0.05%	0.06%	0.21%
Finance & Insurance	0.90%	0.17%	0.23%	0.77%
Arts, Entertainment & Recreation	0.84%	0.01%	0.01%	0.04%
Professional, Scientific & Technical Services	0.79%	0.04%	0.06%	0.19%
Information	0.71%	0.21%	0.28%	0.93%
Other Services	0.69%	0.02%	0.03%	0.10%
Transportation & Warehousing	0.55%	0.03%	0.05%	0.15%
Management of Companies	0.54%	0.95%	1.26%	4.19%
Retail Trade	0.51%	0.07%	0.09%	0.31%
Accommodation & Food Services	0.50%	0.02%	0.03%	0.10%
Mining, Oil	0.47%	0.04%	0.05%	0.16%
Construction	0.45%	0.02%	0.02%	0.08%
Agriculture, Forestry, Hunting & Fishing	0.37%	0.04%	0.05%	0.17%
Manufacturing	0.28%	0.22%	0.30%	0.99%
Wholesale Trade	0.28%	0.04%	0.05%	0.17%
All Industries	**0.49%**	**0.11%**	**0.15%**	**0.49%**

TAX INCIDENCE FOR SUBTRACTION METHOD VAT AND MARGINS TAX

Exhibit 41 and Exhibit 42 show tax burden as a share of total business revenue by size of U.S gross income and by NAICS sectors for the current B&O tax, VAT, and margins tax.

EXHIBIT 41. Tax Burden as a Share of Total Business Revenue by Size of 2017 U.S Income (Current B&O, VAT, and Margins Taxes).

U.S. Gross Income	Current Business & Occupation Tax	2.36% Value Added Tax	2.70% Margins Tax
Under $250k	0.47%	0.40%	0.00%
$250k - $1 million	0.76%	1.01%	0.00%
$1 - $3 million	0.71%	0.91%	0.77%
$3 - $10 million	0.60%	0.67%	0.77%
$10 - $50 million	0.50%	0.49%	0.57%
$50 - $250 million	0.43%	0.38%	0.43%
Over $250 million	0.42%	0.38%	0.52%
All Sizes	0.49%	0.49%	0.49%

EXHIBIT 42. Tax Burden as a Share of Total Business Revenue by NAICS Sector (Current B&O, VAT, and Margins Taxes).

Sector Description	Current Business & Occupation Tax	2.36% Value Added Tax	2.70% Margins Tax
Health Care & Social Services	1.27%	1.36%	0.77%
Real Estate and Rental & Leasing	1.08%	0.73%	0.64%
Utilities	1.00%	0.87%	0.70%
Educational Services	0.97%	0.96%	0.62%
Administrative Support & Waste Management	0.96%	0.71%	0.52%
Finance & Insurance	0.90%	1.05%	0.67%
Arts, Entertainment & Recreation	0.84%	0.87%	0.73%
Professional, Scientific & Technical Services	0.79%	0.77%	0.58%
Information	0.71%	0.58%	0.74%
Other Services	0.69%	0.96%	0.57%
Transportation & Warehousing	0.55%	0.52%	0.45%
Management of Companies	0.54%	0.18%	0.23%
Retail Trade	0.51%	0.46%	0.52%
Accommodation & Food Services	0.50%	1.00%	0.92%
Mining, Oil	0.47%	0.52%	0.54%
Construction	0.45%	0.48%	0.40%
Agriculture, Forestry, Hunting & Fishing	0.37%	0.37%	0.35%
Manufacturing	0.28%	0.33%	0.46%
Wholesale Trade	0.28%	0.25%	0.27%
All Industries	**0.49%**	**0.49%**	**0.49%**

Section 8: Alternative Property Tax Analysis

Overview

Analysis specified in ESHB 1109

Until 2017, the state property tax was "budget-based". Taxing districts determined a budget for each fiscal year and then set a total property tax levy that would be required to fund the budget. State law limited the annual growth in property taxes to the lesser of 1% or the implicit price deflator (commonly referred to as the 1% limit).

In 2017, Washington temporarily switched to a rate-based system for its property tax to increase funding for schools. The levy rate was set at $2.70 per $1,000 of assessed value for TY 2018, 2020, and 2021 and $2.40 for TY 2019. The increase in the property tax rate followed the state supreme court's decision in McCleary v. State of Washington, which found the state was not meeting its constitutional requirement to provide adequate educational services to all children. The state property tax levy returns to the 1% budget-based limitation in the tax year 2022.

The Department of Revenue estimated how much revenue would have been generated for the 2017-19 Biennium if—rather than having enacted a 1% annual growth limit— the state had tied property tax limits to the growth in population and inflation since January 1, 2003. The Department of Revenue has created two analyses to understand better the impact of these changes to account for recent changes to the State Property Tax:

- With McCleary changes. The analysis considers the fundamental changes to the state property tax that resulted in a two-part levy that fixed the levy rate over tax years 2018-2021 before returning both parts of the levy to the 1% limit rule in 2022.

- Without McCleary changes. The analysis considers that the changes above never took place and 1% limit rule remained in place.

Washington Property Tax System: Budget-Based

Washington's property tax was determined by a budget-based system until TY 2018 (local property taxes continue to be budget-based). In budget-based systems, each taxing district determines a budget for each fiscal year and then sets the total property levy that would be needed to fund the budget. (In 2019, there were 1862 taxing districts in Washington.) The county assessor's office determines the property tax rates by dividing the levy amount for each taxing district by the total taxable value of all real and personal property in the taxing district.

Levy Rate = Levy Amount / Market Value

By state law, the allowable levy amount cannot increase by more than 1% each year, plus a portion of the value for new construction; improvements; newly constructed wind turbines, solar, biomass, and geothermal facilities; and increase in the value of state-assessed property. As a result of this 101% levy limit, the allowable levy rate can drift downward over time because the assessed market value often grows faster than the levy limit. Each taxing district must ask its voters for a "levy lid lift" to restore the levy rate to the statutorily allowed maximum levy rate. The statutory maximum regular property tax rate is $3.60 (per $1,000 of assessed value) for the state levy. There is a separate statutory maximum aggregate of $5.90 for the total of local levies, and a minimum of $0.50 is allocated for other all other levies. These three rates make up the constitutional 1% limit, or the $10 limit, which requires the total property levy to be under $10 per $1,000 of value.

The property tax levied on individual property owners is determined by multiplying the assessed value of the individual's properties by the levy rate. A common misunderstanding is that the 101% limit applies to individual properties. The limit applies to a taxing district's total levy amount, which in turn determines the levy rate that is used to calculate the property tax owed on the market value of each individual property.

Property Tax Owed = Assessed Market Value x Levy Rate

Changes to the State Property Tax Due to McCleary: Rate-Based

In 2017, Washington temporarily switched to a rate-based system for its property tax to increase funding for schools (Engrossed House Bill 2242). The levy rate is $2.70 (per $1,000 of assessed value) for TY 2018, 2020, and 2021 and $2.40 for TY 2019 through ESSB 6614. Without the change, the state property tax rate is estimated to have been about $1.76 per $1,000 value. The increase in the property tax rate was due to the state supreme court's decision in McCleary v. State of Washington that the state had failed to meet its constitutional duty to fully fund basic education. The following specific provisions were made in the law[55]:

- An additional second part was added to the levy for collection year 2018 and thereafter.
- For taxes due in collection years 2018 through 2021, the aggregate levy rate is $2.70 per thousand dollars assessed value.
- Part 1 of the levy is not subject to the levy growth limit in chapter 84.55 RCW for collection years 2019, 2020, and 2021.
- Part 2 of the levy is not subject to the levy growth limit in chapter 84.55 RCW for collection years 2019, 2020, and 2021.
- The levy rates from the 2018 collection year are fixed for the 2019, 2020, and 2021 collection years.

[55] Department of Revenue, Levy Manual, 2020 Update.

- Individuals who qualify for the senior citizen/disabled person property tax exemption are exempt in full from Part 2 of the levy.
- Farm machinery and equipment is exempt from Part 2 of the levy (also exempt in Part 1 prior to the change).
- For collection year 2022 and thereafter, the aggregate rate limit is $3.60 per thousand dollars assessed value.
- For collection year 2022 and thereafter, both parts of the levy are subject to the levy growth limit in chapter 84.55 RCW.

The actual levy rate taxpayers see can be different than the levy rate because the levy rate is adjusted to account for difference in assessed value across counties for properties with the same market value. The actual levy rate is determined by dividing the levy rate by a ratio comparing assessed value to market value. Properties with assessed values that are lower than market values will be taxed at a rate higher than the levy rate so that all properties with the same market value are taxed the same amount regardless of their assessed values.

Key Data Sources

There are three main data sources used in this analysis.

Historical State Property Levy Collections

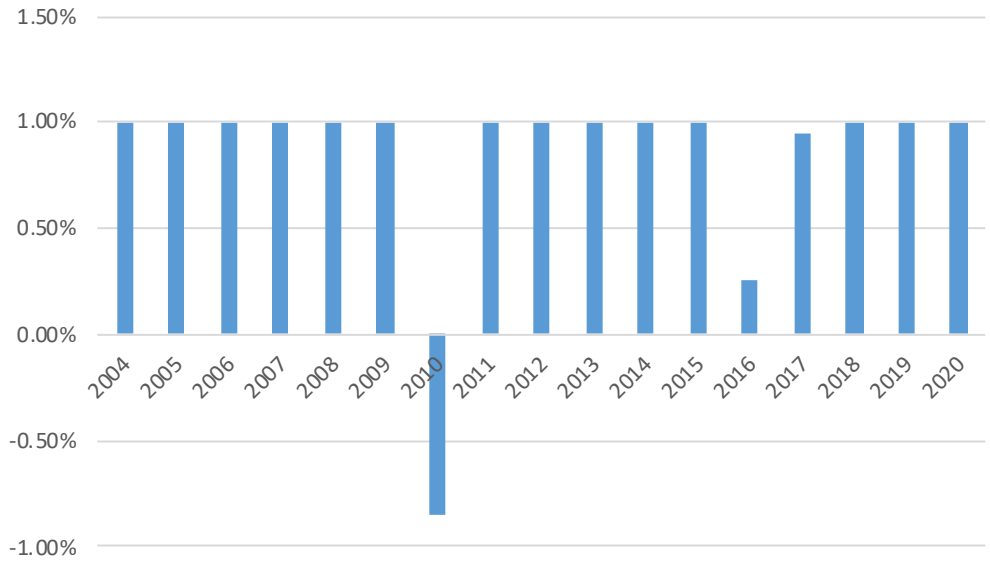
As a point of comparison, the Department of Revenue has documented State Property Tax levies for calendar TY 2004 through 2020. Exhibit 43 summarizes the current law for both the budget- and rate-based portions of the state law.

EXHIBIT 43: State Property Tax Collections
Source: Department of Revenue, Property Tax Statistics, 2020.

Prior to McCleary: 1% Growth Rate Limitation

Prior to McCleary, the growth in the levy was limited by an amount equal to the lesser of the implicit price deflator or 1%. The historical percent rate used, as well as what it would have been in 2018 -2020, is shown in Exhibit 44. The state levy returns to the 1% budget-based limitation in TY 2022.

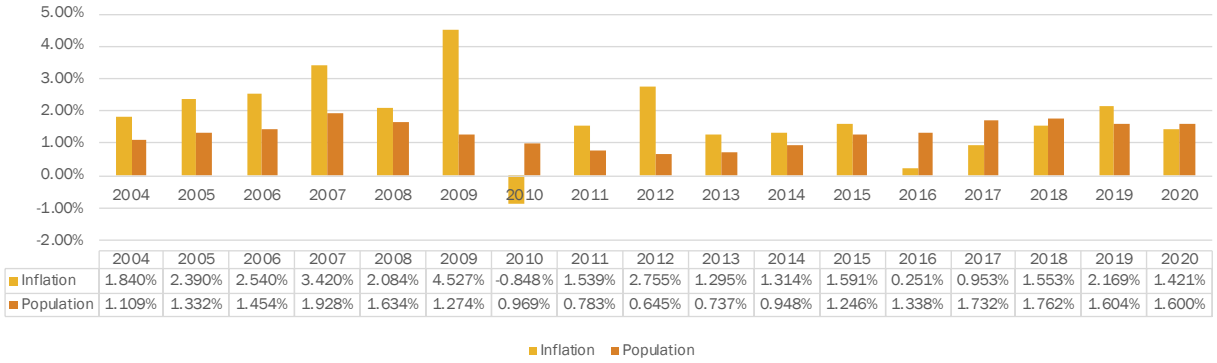
EXHIBIT 44: Levy Growth Limitation Rate – "1% Limit"
Source: Department of Revenue, Property Tax Statistics, 2020.



Changes in Inflation and Population Growth Rates

The analysis asks to estimate the impact if the 1% revenue growth limit on regular property taxes was replaced with a limit based on population growth and inflation. The individual annual growth rates for inflation and population growth are shown in Exhibit 45.

EXHIBIT 45: Population and Inflation Growth Rates (Tax Year)
Source: Office of Financial Management (population) Department of Revenue (inflation), 2020.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Inflation	1.840%	2.390%	2.540%	3.420%	2.084%	4.527%	-0.848%	1.539%	2.755%	1.295%	1.314%	1.591%	0.251%	0.953%	1.553%	2.169%	1.421%
Population	1.109%	1.332%	1.454%	1.928%	1.634%	1.274%	0.969%	0.783%	0.645%	0.737%	0.948%	1.246%	1.338%	1.732%	1.762%	1.604%	1.600%

Methods and Assumptions

There are two analyses that examine the alternative revenue impacts to the State Property Tax described below.

No McCleary: Budget-Based Methods

This analysis contemplates the property tax without the changes made in 2017 as if the state levy remained budget-based with the 1% limit in place. There are three main steps in this analysis.

1. Define what property tax revenues would have been if there was "no McCleary". The current law (and historical collections) cap levy growth at the lessor of implicit price deflator or 1% growth (and do not consider the changes to the two-part system per EHB 2242 in 2017 for Calendar Year 2018-2020). These values are used as the starting point for considering differential rates of growth of the property tax if the state had implemented this alternative on January 1, 2003.

2. Estimate what revenues would have been generated with a population and inflation rate limit factor. Inflation means the percentage change in the implicit price deflator (IPD) per RCW 84.55.005.[56] The population growth rate is defined by the April 1st population

[56] Implicit price deflator for personal consumption expenditures for the United States as published for the most recent twelve-month period by the bureau of economic analysis of the federal department of commerce by September 25th of the year before the taxes are payable.

estimate produced by the Office of Financial Management. This new combined population and inflation rate is used to limit levy growth in the following year's taxes.

3. The analysis uses an estimate of the five-year average of calendar year to fiscal year collection percentages to estimate Calendar Year 2020 taxes.

Rate-Based Methods

The rate-based analysis considers the changes made in 2017 keeping with the fixed combined rate of $2.70 per $1,000 for the second part of the State Property Tax. The analysis uses the same inflation and population growth rates as in the budget-based approach above to estimate alternative tax revenues with the following notable adjustments.

- This analysis assumes the changes put in place from EHB 2242 that split the State Property Tax into two parts.
- The first part of the property tax assumes current law and collections per the change.
- The Legislature created a second part to the state levy beginning with TY 2018 at a combined rate of $2.70 per $1,000 true and fair value.
- The Legislature lowered the combined rate to $2.40 per $1,000 true and fair value for TY 2019.

Findings

Estimate of Alternative Property Tax Collections – with and without McCleary Changes

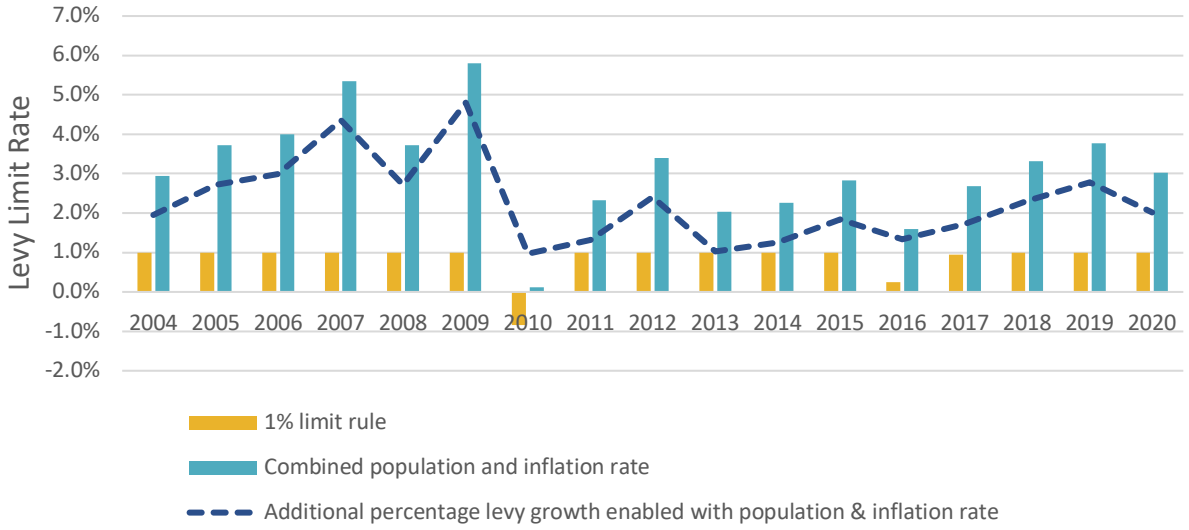
Exhibit 46 shows an estimate of what the State Property Tax would have been if the McCleary changes were not put into place relative to what has actually been collected (both historically, and with the McCleary changes) as the baseline for the comparison. The chart shows no difference in revenues until the changes that began in tax year 2017.

EXHIBIT 46: Property Tax Collection without McCleary Changes Relative to Current Law Collections (with McCleary)

Source: Department of Revenue, 2020.

The analysis uses the historical rate of inflation plus the historical rate of population growth in Washington as the basis for levy growth limitation (replacing the current law). The cumulative level of these rates is shown in Exhibit 47.

EXHIBIT 47: Inflation and Population Growth Rate Limitation
Source: Department of Revenue, 2020.



A summary of the different revenue analysis approaches is summarized in Exhibit 48.

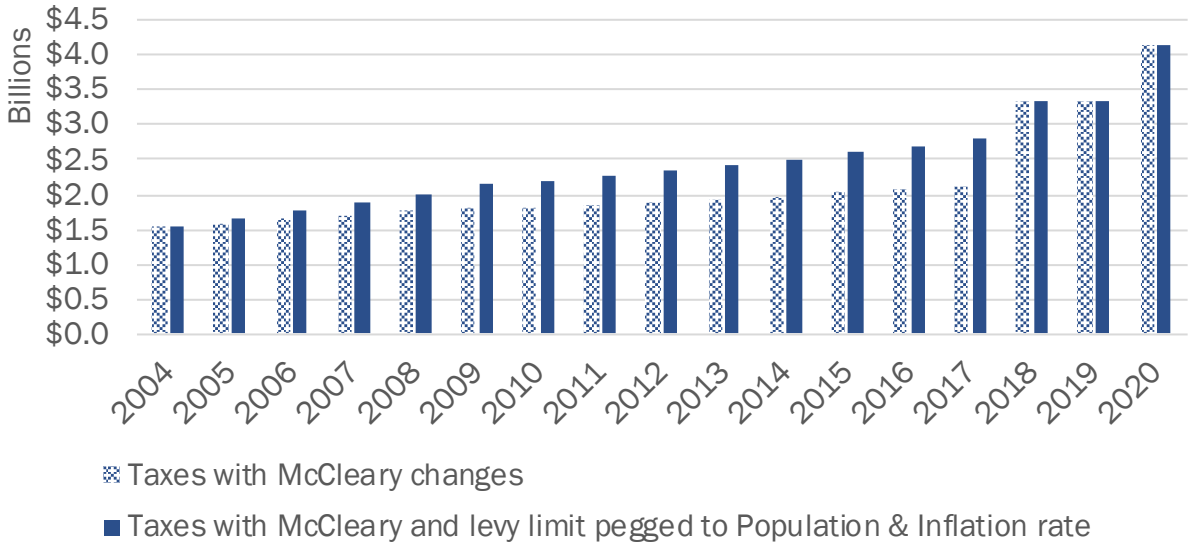
EXHIBIT 48: Summary of Property Tax Estimates
Source: Department of Revenue, 2020.

State Property Tax Levy: Budget-Based Approach (No McCleary)				
Fiscal Year	**1% Limit**	**Population-Inflation**	**Revenue Difference**	**Percent Difference**
FY 2017	$2,147,000,000	$2,878,000,000	$731,000,000	34.0%
FY 2018	$2,208,000,000	$3,030,000,000	$822,000,000	37.2%
FY 2019	$2,272,000,000	$3,181,000,000	$909,000,000	40.0%

State Property Tax Levy: Rate-Based Approach (with McCleary)				
Fiscal Year	**Current Law**	**Population-Inflation**	**Revenue Difference**	**Percent Difference**
FY 2017	$2,766,000,000	$3,091,000,000	$324,000,000	11.7%
FY 2018	$3,340,000,000	$3,346,000,000	$6,000,000	0.2%
FY 2019	$3,761,000,000	$3,767,000,000	$6,000,000	0.2%

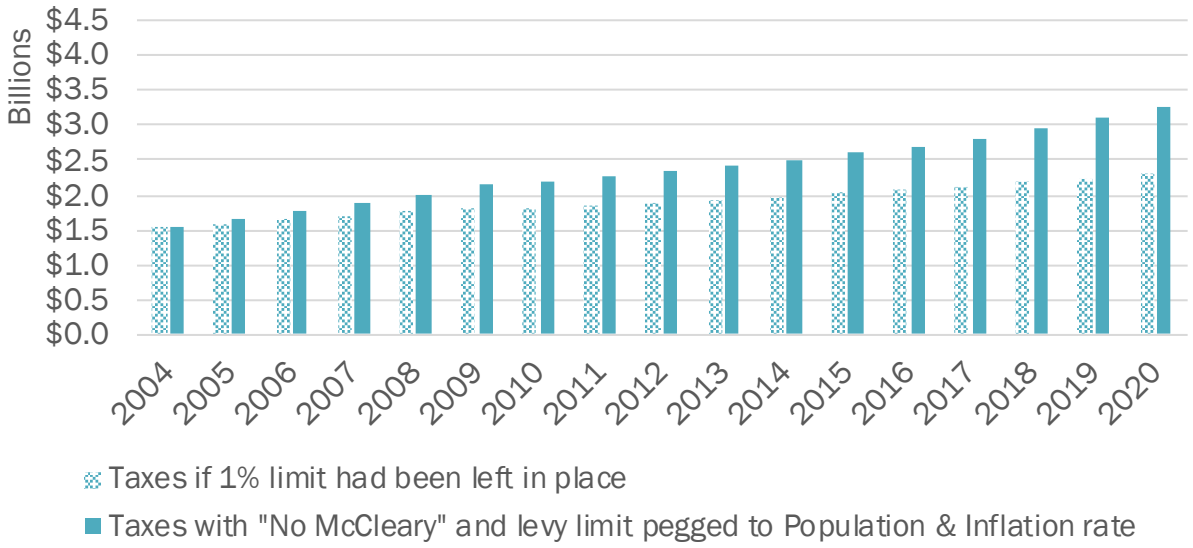
With McCleary, the state levy changed to a rate-based system; therefore, the rate is set and would be the same regardless of the growth rate factor used prior to going to a rate-based system. Exhibit 46 shows that the population and inflation growth factor limitation would have significantly increased state revenue in the years prior to going to a rate-based tax system in 2017. However, there is little difference in tax revenue because the tax rate is the same for TY 2017 to TY 2019 due to the McCleary change.

EXHIBIT 49: Comparison of Rate-Based Property Tax Analysis – with McCleary
Source: Department of Revenue, 2020.



However, the results are much different when comparing the impact of the two limit factors without the McCleary changes (Exhibit 50). If the growth limit factor were pegged to the population and inflation limitation factor, state property revenue would have been approximately 37% higher as compared to using the 1% growth limit factor over the 2017-19 Biennium. This comparison gives a clearer picture of the impact of changing the growth limit factor on state property tax revenues. The impact would have resonated through all the intervening years if put in place in 2003.

EXHIBIT 50: Comparison of Budget-Based Property Tax Analysis – No McCleary
Source: Department of Revenue, 2020.



Section 9: Alternative State Tax Structure: Oregon and Idaho Tax Structure

Overview

The creation of the Tax Structure Work Group ESHB 1109 during the 2019 legislative session directed the Department of Revenue (DOR) to analyze our economic competitiveness with border states with respect to estimating the revenues that would have been generated during the 2017-19 Biennium, had Washington adopted the tax structure of those states, assuming the economic tax base for the 2017-19 Biennium as reported by the economic and revenue forecast council.

The tax environments in all three states are complex. With this context, the DOR has undertaken an analysis of the major tax sources in each state. The analysis of an exhaustive list of tax revenues is beyond the scope of what can be accomplished during the research time. Regardless, the focus on major taxes provides some comparative point of reference of the key differences between the states.

EXHIBIT 51: Comparative List of Major Taxes Analyzed in Washington, Oregon, and Idaho
Source: Department of Revenue, 2020

Tax Source	Washington	Oregon	Idaho
Retail Sales Tax	X		X
Property Tax	X	X	X
Business & Occupation Tax	X		
Public Utility Tax	X		
Real Estate Excise Tax	X		
Gas Tax	X	X	X
Cigarette Tax	X	X	X
Corporate Income/Net Receipts Tax		X	X
Personal Income Tax		X	X

Key Data, Assumptions, and Methods

General Methodological Approach

The approach taken by the DOR analysis generally follows the following methodological structure. However, both the modeling of the personal income tax (PIT) and corporate income/net receipts (CINR) tax used methods described in the relevant sections of the Technical Notes.

1. Document FY 2018 and 2019 Washington State tax revenues for the selected major state taxes.

2. Identify and approximate comparative state tax rates applicable to relevant segments of Washington State's tax base for both state and local portions.

3. Transform Washington State respective tax bases to adjust to identified relevant Oregon or Idaho tax law and exemptions and/or deductions.

4. Estimate alternative Oregon and Idaho tax revenues by applying respective rates to the transformed Washington State tax bases.

The following section discuss these methods and underlying data for the specific taxes analyzed.

Tax Data and Findings

PERSONAL INCOME TAX

Washington does not have a PIT. Both Oregon and Idaho levy a PIT. Generally, the analysis uses summary tax data from Oregon and Idaho to model the relationship between adjusted gross income (AGI) and tax collected for residents of those states.[57] DOR analysts applied these models to 2017 IRS data for Washington[58] residents to estimate tax collections for Washington residents. The average tax collected for various income categories is shown in Exhibit 52.

[57] Oregon Department of Revenue, 2017 and 2018 Personal Income Tax Statistics and Idaho State Tax Commission, 2017 and 2018 Idaho Resident Individual Income Tax Returns

[58] IRS Form 1040 returns for Tax Year 2017

EXHIBIT 52: Oregon and Idaho Average Tax Per Number of Filers Collected by Income Category
Source: Oregon Department of Revenue and Idaho Tax Commission, 2020

Federal AGI Level		Oregon		Idaho	
Min.	Up To	2017	2018	2017	2018
$0	$5,000	$20	$19	$4	$7
$5,000	$10,000	$110	$114	$13	$7
$10,000	$15,000	$284	$303	$55	$17
$15,000	$20,000	$522	$551	$166	$99
$20,000	$25,000	$802	$833	$328	$257
$25,000	$30,000	$1,109	$1,160	$513	$449
$30,000	$35,000	$1,426	$1,498	$714	$652
$35,000	$40,000	$1,738	$1,822	$899	$868
$40,000	$45,000	$2,037	$2,136	$1,098	$1,082
$45,000	$50,000	$2,330	$2,439	$1,333	$1,313
$50,000	$60,000	$2,700	$2,837	$1,670	$1,658
$60,000	$70,000	$3,260	$3,387	$2,172	$2,128
$70,000	$80,000	$3,870	$4,008	$2,726	$2,659
$80,000	$90,000	$4,496	$4,630	$3,308	$3,182
$90,000	$100,000	$5,176	$5,302	$3,929	$3,775
$100,000	$250,000	$9,209	$9,351	$6,984	$6,686
$250,000	$500,000	$25,639	$25,940	$20,177	$18,319
$500,000	…or more	$104,752	$103,351	$84,837	$81,010

The DOR assumed that 95% of Washingtonians who filed a federal income tax return would comply with a state income tax. All individuals who filed a federal return would be required to file, even if net tax due is zero. Income of nonresidents was not included in this analysis.

Exhibit 53 summarizes the impact of applying Oregon and Idaho's PIT to Washington's tax base. As stated before, the state of Washington does not have a PIT. Using Oregon's tax structure, it is estimated that Washington could raise 39 billion dollars in tax revenues over the biennium. Likewise, using Idaho's tax structure, it is estimated that Washington could raise 28 billion dollars over the biennium.

EXHIBIT 53: Comparison of Personal Income Taxes
Source: Department of Revenue, 2020

	Washington	Oregon	Idaho
FY 2018	$0	$18,701,000,000	$13,611,000,000
FY 2019	$0	$20,657,000,000	$14,324,000,000
Total (FY 18-19)	$0	$39,358,000,000	$27,935,000,000
Difference (FY 18-19)		**$39,358,000,000**	$27,935,000,000

CORPORATE INCOME/NET RECEIPTS TAX

Washington does not have a CINR tax. Both Oregon and Idaho levy a flat CINR tax as follows:

- Idaho had a flat tax rate of 6.925% on taxable income beginning in calendar year 2018. Prior to 2018, Idaho's flat tax rate was 7.4%.

- For Oregon, a tax rate of 7.6% on taxable income applies, except for taxable income less than $1 million, where the rate is 6.6%.

The macro model for CINR tax (Corporate Macro Model) was used to model the implications of using Oregon or Idaho's corporate tax structures (please see a fuller description of this model in a previous section of the technical notes). Since Washington currently does not have a CINR tax or keep track of corporate incomes, the Corporate Macro Model estimates the taxable income of corporations in Washington. The CINR model was adapted to make Idaho and Oregon-specific changes. These are listed below.

The following key assumptions are made for the modeling of Idaho's CINR tax:

- This estimate assumes that Washington had a tax structure identical (to the extent practical) to Idaho's during the 2017-19 Biennium.

- Each business subject to the tax pays a flat tax on the portion of U.S. taxable income that is attributable to Washington, subject to the additions, subtractions, and credits described below.

- Dividends-received deductions (DRD) from federal returns are added back to the federal taxable income amount to conform with Idaho rules.

- The aggregate amount of DRDs filed on Washington corporate returns equals the aggregate amount of DRDs on federal tax returns (as estimated by JCT), multiplied by the weighted average Washington apportionment of all federal CINR tax filers.

- Washington's tax, like Idaho's conforms to the Internal Revenue Code Section 965 taxation of "deemed repatriations."

- The aggregate deemed repatriation amount attributable to Washington equals the aggregate deemed repatriation amount on federal tax returns (as estimated by JCT), multiplied by the weighted average Washington apportionment of all federal CINR income tax filers.

- The Washington tax estimates do not include revenues related to the federal Base Erosion Anti-abuse tax, the federal Alternative Minimum Tax, or any other tax not described above.

- The treatment of Washington Tax Credits:

    - In the 2017-19 Biennium, taxpayers may claim corporate tax credits that reduce Washington tax receipts by a total of $515 million. This is modelled to conform with the following Idaho tax credits (following Idaho's tax expenditures report):

        - Investment Tax Credit (ITC).
        - Credit for Washington Research Activities (WRA). Credit for Contributions to Washington Youth & Rehabilitation Facilities (CWYRF)
        - Credit for Contributions to Washington Educational Entities (CWEE)
    - The Washington tax expenditure on each of the above credits equals Idaho's reported tax expenditure on the same credit in the same year, after adjusting for the ratio of Washington total gross domestic product (GDP) to Idaho total GDP.
    - Two-thirds of the ITC and the Credit for WRA are claimed by businesses subject to the Washington CINR tax.
    - Ten percent of the Credit for CWYRF and the Credit for CWEE are claimed by businesses subject to the Washington CINR tax.
- The treatment of income offsets includes:
    - The amount of additions related to adding back federal NOL and bonus depreciation deductions offset the corresponding subtractions from applying the same deductions based on Idaho rules.
    - Taxpayers make quarterly estimated tax payments that approximate the tax due in the same quarter (adjusted for compliance factor). Revenue forecasts do not account for any penalties for underpayment of estimated tax.

The following key assumptions are made for the modeling of Oregon's CINR tax:

- The Washington minimum tax for C corporations follows Oregon's with minimum tax amounts ranging from $150 for businesses with less than $500,000 of Washington sales to a minimum tax of $100,000 for businesses with more than $100 million of Washington sales.
- The Washington minimum tax for S corporations follows Oregon's, with a minimum tax amount of $150 for all S corporations with Washington nexus.
- The total amount of Washington minimum tax payments increases the amount of tax collections by approximately 9% relative to a tax structure that does not include a minimum tax.
- The following conditions apply to the treatment of Washington Tax Credits:
    - In the 2017-19 Biennium, taxpayers may claim corporate tax credits that reduce Washington tax receipts by a total of $262 million. This is modelled to conform

with the following Oregon tax credits (following Oregon's tax expenditures report):

- Business Energy Facilities, Conservation & Renewables
- Low Income Community Investments Credit
- Affordable Housing Lender's Credit
- Qualified Research Activities Credit
- Electronic Commerce Enterprise Zone Credit
- Fire Insurance Credit
- Energy Conservation Projects Credit
- Transportation Projects Credit
- Agriculture Workforce Housing Construction Credit
- Renewable Resource Equipment Manufacturing Facilities Credit
- Bovine Manure Credit
- Production or Collection of Biomass Credit
- Life and Health IGA Assessments Credit
- Employer Provided Dependent Care Assistance Credit
- Development Account Donation Credit
- Pollution Control Credit

The Washington tax expenditure on each of the above credits equals Oregon's reported tax expenditure on the same credit during the 2017-19 Biennium after adjusting for the ratio of Washington total gross domestic product (GDP) to Oregon total GDP.

Exhibit 54 summarizes the impact of applying Oregon and Idaho's CINR taxes to Washington's tax base. The state of Washington does not have a CINR tax. Using Oregon's tax structure, it is estimated that Washington could raise 4.9 billion dollars in tax revenues over the biennium. Likewise, using Idaho's tax structure it is estimated that Washington could raise 4.4 billion dollars over the biennium.

EXHIBIT 54: Comparison of CINR Taxes
Source: Department of Revenue, 2020

	Washington	Oregon	Idaho
FY 2018	$0	$2,274,000,000	$2,022,000,000
FY 2019	$0	$2,589,000,000	$2,337,000,000
Total (FY 18-19)	$0	$4,863,000,000	$4,359,000,000
Difference (FY 18-19)		**$4,863,000,000**	**$4,359,000,000**

RETAIL SALES TAX

Washington State levies a state retail sales tax of 6.5% for both FY 2018 and 2019. The effective combined local rate (computed by dividing local sales taxes collected as percentage of all retail sales) was 2.82% in FY 2018 and 2.83% in FY 2019. The state of Oregon does not have a retail sales tax at the state or local level. Idaho has a similar tax to Washington with the following allowances:

- The state portion in Fiscal Years 2018 and 2019 was 6%. There is no local retail sales tax.
- Food purchases that are tax-exempt in Washington are taxable in Idaho.
- This revenue estimate assumes that other than food exemption, the tax bases in the states are similar. The estimated tax base on basic food in Washington State is $1,754,000,000 in FY 2018 and $1,772,000,000 in FY 2019.

After the adjustment in tax bases, the estimate accounts for the difference in tax rates.

Exhibit 55 summarizes the impact of applying Oregon and Idaho's retail sales taxes to Washington's tax base. Since the state of Oregon does not have a retail sales tax, Washington would collect approximately $23 billion less at the state level and approximately $10 billion less at the local level. Idaho only levies a state sales tax and the application of that to Washington would generate approximately 1.7 billion dollars less in sales tax revenue over the biennium.

EXHIBIT 55: Comparison of Retail Sales Taxes (State and Local)
Source: Department of Revenue, 2020

	Washington		Oregon		Idaho	
	State	Local	State	Local	State	Local
FY 2018	$10,994,000,000	$4,776,000,000	$0	$0	$10,148,000,000	$0
FY 2019	$11,936,000,000	$5,189,000,000	$0	$0	$11,018,000,000	$0
Total (FY 18-19)	$22,930,000,000	$9,965,000,000	$0	$0	$21,166,000,000	$0
Difference(FY 18-19)			**-$22,930,000,000**	**-$9,965,000,000**	**-$1,764,000,000**	**-$9,965,000,000**

PROPERTY TAX

Washington, Oregon, and Idaho all have a property tax. The main distinction is that Washington is the only state with a state level property tax. Both Oregon and Idaho property tax are limited to local taxing jurisdictions. The key rate differences between the states are listed in Exhibit 56.

Both the effective state rate and local rates have been computed to represent effective level of property tax rates at both the state and local level.

EXHIBIT 56: State and Local Property Tax Rate (Per $1,000 of Assessed Value) Comparisons

Source: - Idaho State Tax Commission website, Oregon Department of Revenue website, Department of Revenue, State Property Tax Statistics, 2020

	Washington		Oregon		Idaho	
	State	Local	State	Local	State	Local
Tax Year 2018	$2.70	$8.66	$0.00	$10.89	$0.00	$12.98
Tax Year 2019	$2.40	$7.37	$0.00	$10.53	$0.00	$12.41

Assessments for real and personal property for the state of Washington are adjusted to meet the conditions in Oregon and Idaho. Exhibit 57 summarizes the end results of these transformations.

EXHIBIT 57: Washington State Taxable Assessed Valuation

Source: - Idaho State Tax Commission website, Oregon Department of Revenue website, Department of Revenue, State Property Tax Model, 2020

	Washington	
	State	Local
Tax Year 2018	$1,239,180,088,651	$1,142,524,041,737
Tax Year 2019	$1,395,363,237,411	$1,285,129,541,655

	Oregon Adjustment	
	State	Local
Tax Year 2018	$1,253,533,577,725	$1,156,877,530,811
Tax Year 2019	$1,411,734,861,562	$1,301,501,165,806

	Idaho	
	State	Local
Tax Year 2018	$1,082,401,900,207	$985,745,853,292
Tax Year 2019	$1,234,824,134,652	$1,124,590,438,896

The following specific conditions have been accounted for in the analysis.

For Oregon estimate, the following conditions have been considered:

- The passage of Measure 5 and Measure 50 in Oregon have created taxable value increase limits and levy limits on real property. Since Oregon implemented these limits, the aggregate level of market value growth has exceeded taxable value growth.
- For this analysis, it is assumed that market value and taxable value are the same. However, it should be noted that taxable value will likely grow at a slower rate than market value in the future.
- A data abstract from the state was used to adjust Washington real property valuation because Oregon has no Senior exemption program. The result of this exemption is an increase in the taxable value base of the property in the Oregon scenario.

For Idaho estimate, the following conditions have been considered:

- The analysis used the personal property tax data from Washington counties to reduce all personal property parcel value to zero or by $100,000 since the first $100,000 of personal property is exempt in Idaho. The Washington state personal property tax estimate is lowered by this amount.

- The analysis used the real property tax data from Washington counties to apply the lesser of 50% or $100,000 Idaho Homestead exemption to all owner-occupied single-family residential properties. The Washington state real property tax estimate is lowered by this amount.

After these tax base adjustments, Oregon and Idaho property tax rate are applied to calculate revenue impact.

Exhibit 58 summarizes the impact of applying Oregon and Idaho's property taxes to Washington's tax base. The state of Oregon only levies property taxes on the behalf of local jurisdictions. The application of Oregon's property tax laws would result in approximately 7 billion dollars less in state property tax revenues and an increase in approximately 7 billion dollars in local property tax revenues. Likewise, Idaho's similar structure to the state of Oregon would result in 7 billion dollars less in state property tax revenues and approximately 7.3 billion dollars more in local property tax revenues over the biennium.

EXHIBIT 58: Comparison of Property Taxes (State and Local)

Source: Idaho State Tax Commission website, Oregon Department of Revenue website, Department of Revenue, State Property Tax Model, 2020

	Washington		Oregon		Idaho	
	State	Local	State	Local	State	Local
Tax Year 2018	$3,346,000,000	$9,894,000,000	$0	$12,598,000,000	$0	$12,795,000,000
Tax Year 2019	$3,349,000,000	$9,471,000,000	$0	$13,705,000,000	$0	$13,956,000,000
Total (FY 18-19)	$6,695,000,000	$19,365,000,000	$0	$26,303,000,000	$0	$26,751,000,000
Difference (FY 18-19)			**-$6,695,000,000**	**$6,938,000,000**	**-$6,695,000,000**	**$7,386,000,000**

BUSINESS AND OCCUPATION TAX

Oregon and Idaho do not have a Business and Occupation Tax.

PUBLIC UTILITY TAX

Oregon and Idaho do not have a state level Public Utility Tax.

REAL ESTATE EXCISE TAX

Oregon and Idaho do not have a state level Real Estate Excise Tax.

GAS TAX

Oregon and Idaho both levy a gas tax based on gallons purchased similar to the state of Washington. Exhibit 59 summarizes these rates.

EXHIBIT 59: Comparison of Gas Tax Rates

Source: WSDOT, 2020

January 1, 2017	Washington	Idaho	Oregon
State Excise Tax	$ 0.494	$ 0.320	$ 0.300
Other State Taxes/Fees	$ 0.001	$ 0.010	$ 0.011
Total State Rate	**$ 0.495**	**$ 0.330**	**$ 0.311**

January 1, 2018	Washington	Idaho	Oregon
State Excise Tax	$ 0.494	$ 0.320	$ 0.340
Other State Taxes/Fees	$ 0.001	$ 0.010	$ 0.028
Total State Rate	**$ 0.495**	**$ 0.330**	**$ 0.368**

January 1, 2019	Washington	Idaho	Oregon
State Excise Tax	$ 0.494	$ 0.320	$ 0.340
Other State Taxes/Fees	$ 0.001	$ 0.010	$ 0.028
Total State Rate	**$ 0.495**	**$ 0.330**	**$ 0.368**

Oregon changed their gas tax on January 1, 2018, requiring two calculations for FY 2018. The consumption of gas in the state was apportioned to reflect this change for the Oregon calculation. Current gas purchases and net gas tax proceeds are shown in Exhibit 60.

EXHIBIT 60: Washington State Gas Purchased and Tax Proceeds

Source: Department of Revenue, 2020

Fiscal Year	Gallons	Gas Tax
2018	2,784,000,000	$1,378,000,000
2019	2,729,000,000	$1,351,000,000

Exhibit 61 summarizes the impact of applying Oregon and Idaho's gas taxes to Washington's tax base. All three states have similar tax structures for the gas tax. The application of Oregon and Idaho gas tax structures would result in fewer tax collections by approximately 780 million dollars and 910 million dollars respectively over the biennium.

EXHIBIT 61: Comparison of Gas Taxes

Source: Department of Revenue, 2020

	Washington	Oregon	Idaho
FY 2018	$1,380,000,000	$950,000,000	$920,000,000
FY 2019	$1,350,000,000	$1,000,000,000	$900,000,000
Total (FY 18-19)	$2,730,000,000	$1,950,000,000	$1,820,000,000
Difference (FY 18-19)		**-$780,000,000**	**-$910,000,000**

CIGARETTE TAX

Washington, Oregon, and Idaho all levy a tax on cigarettes. The tax is based on the number of packs purchased. These rates are summarized in Exhibit 62.

EXHIBIT 62: Comparison of Cigarette Tax Rates
Source: Department of Revenue, 2020

Fiscal Year	Washington	Oregon	Idaho
FY 2018	$3.025	$1.330	$0.570
FY 2019	$3.025	$1.330	$0.570

Current gas purchases and net gas tax proceeds are shown in Exhibit 63. Washington has a significantly higher tax rate than the state of Oregon and there is likely some avoidance of the tax that results in a shift of sales due to the relative tax rates between the states. Oregon's population is 55% of Washington's, however, Oregon sells 34 million more cigarette packs than Washington annually. To adjust for this issue in the analysis, cigarettes sold in both states are combined and apportioned on a population basis. The result of that analysis revises the basis of cigarette packs sold to 176,022,862 in FY 2018 and 167,398,707 in FY 2019.

EXHIBIT 63: Washington State Cigarettes Purchased and Tax Proceeds
Source: Department of Revenue, 2020

Fiscal Year	Taxed Packs	Cigarette Tax
FY 2018	119,500,000	$361,000,000
FY 2019	113,100,000	$342,000,000

Exhibit 64 summarizes the impact of applying Oregon and Idaho's cigarette taxes to Washington's tax base. All three states have similar tax structures for the cigarette tax. The application of Oregon and Idaho tax structures would result in fewer tax collections by approximately 247 million dollars and 508 million dollars respectively over the biennium.

EXHIBIT 64: Comparison of Cigarette Taxes
Source: Department of Revenue, 2020

	Washington	Oregon	Idaho
FY 2018	$361,000,000	$234,000,000	$100,000,000
FY 2019	$342,000,000	$223,000,000	$95,000,000
Total (FY 18-19)	$703,000,000	$457,000,000	$195,000,000
Difference (FY 18-19)		**-$246,000,000**	**-$508,000,000**

Summary of Tax Changes

Exhibit 65 Summarizes the impact of applying Oregon and Idaho's tax structure to tax revenues to the state of Washington. Overall, the application of both states' tax structures would generate more tax revenues to the state of Washington with Idaho outperforming Oregon's in terms of total collections.

EXHIBIT 65: Summary Comparison of State Impact of OR and ID Tax Structures
Source: Department of Revenue, 2020

	Washington	Oregon	Idaho
FY 2018	$21,839,000,000	$22,154,000,000	$26,799,000,000
FY 2019	$23,027,000,000	$24,473,000,000	$29,655,000,000
Total (FY 18-19)	$44,866,000,000	$46,627,000,000	$56,454,000,000
Difference (FY 18-19)		**$1,761,000,000**	**$11,588,000,000**

Tax	Washington	Oregon	Idaho
Retail sales tax	$22,930,000,000	$0	$21,166,153,846
Property tax	$6,694,800,000	$0	$0
B&O tax	$8,597,000,000	$0	$0
Public utility tax	$843,000,000	$0	$0
Real estate excise tax	$2,369,000,000	$0	$0
Gas tax	$2,729,000,000	$1,949,000,000	$1,819,000,000
Cigarette tax	$703,000,000	$457,000,000	$195,000,000
Corporate income tax	$0	$4,863,000,000	$4,359,000,000
Personal income tax	$0	$39,358,000,000	$27,935,000,000

If Washington adopted Idaho or Oregon's tax codes, total collections would have increased. Idaho's code would have generated more revenue than Oregon's. The key driver of the finding is threefold. First, Washington does not have a personal income tax. Second, Washington has experienced strong growth in personal incomes since the late 1980s making the application of Oregon's and Idaho's personal income tax rates very revenue productive — this is particularly true in the Oregon context where the highest marginal personal income tax rate is 9.9%. Lastly, Idaho also maintains a state level sales tax. Even though the tax rate is lower than Washington's, Idaho does not exempt the purchase of "basic food", this makes the retail sales base effectively larger than is currently the case in Washington.

While not shown in the data here, a large distinction in the Oregon and Idaho tax structure analysis is "who the levier of the tax is", namely, whether it is a state or local tax. The analysis here just considers the state portion, and not the local portion. Due to the nature of the statewide tax structure in these places, the tax structure may favor the state revenue perspective at the expense of local governments. For example, while the analysis suggests that the state would generate $1.8 billion more revenue with Oregon's structure, it would do so while also generating

$4.0 billion less for local governments. While Oregon has no state property tax, there is a property tax used to fund local governments, such as cities and schools. Likewise, for Idaho, the state would generate $12.6 billion more revenue while also generating $3.5 billion less to local governments due to the same property tax issue.

Section 10: Economic Competitiveness and Taxes

Western Washington University addressed the questions asked in the 2017-19 Biennium budget proviso. The Department entered into an interagency agreement with Western Washington to produce this report.

Introduction

This report analyzes Washington's economic competitiveness relative to other states and explores the relationship between economic competitiveness and the tax burden on residents of different states in the U.S. The first section defines competitiveness and then shows how Washington compares to other states based on different measures of economic competitiveness. We consider a variety of different metrics, including an experimental series from the U.S. Bureau of Labor Statistics (BLS) that measures labor productivity and an index that combines several different components of competitiveness. The competitiveness index is based largely on Michael Porter's Diamond Model of competitiveness and economic prosperity.[59]

Being more economically competitive might mean being more productive or being more innovative, which can lead to increased productivity and increased prosperity. In "The Competitiveness of Nations", Michael Porter argued that economic competitiveness depended on a country's ability to innovate and to upgrade – which goes beyond having low interest rates or a strong or weak currency. In short, Porter focused on the generation and sharing of knowledge. His diamond model highlights the interplay between firm strategy, industry structure, demand conditions, and supporting industries to explain why firms in one country can be more competitive than firms in another.

Over time, many policy makers and researchers began applying some of the same ideas about the competitiveness of nations to regions and states. Many imagined that industry clusters could play a role in competitiveness or that policies could be designed to improve competitiveness. For example, policies that improve graduation rates or labor force readiness might improve competitiveness. And maybe policies that change the tax burden might change competitiveness.

Of course, there is no single definition or means of measuring economic competitiveness, so this report starts with a definition from the World Economic Forum and assesses different ways of measuring competitiveness. In each case, we show how Washington compares to other states.

[59] See Porter (1990) and Porter (2004)

The second section of the report provides a review of the literature that discusses the relationship between economic competitiveness and tax burden. The third section offers a quantitative analysis of the relationship, using different measures of competitiveness. The report concludes with a discussion about the empirical findings.

The report was prepared as part of an Interagency agreement between Washington State Department of Revenue and Western Washington University's Center for Economic and Business Research. As such, we highlight Washington State when reviewing different measures of competitiveness and consider other states often referenced by policy makers in Washington.

Defining and Measuring Competitiveness

The World Economic Forum defines economic competitiveness as, "the set of institutions, policies and factors that determine the level of productivity of a country." [60] While that definition focuses on the competitiveness of countries, it is possible to apply it to the competitiveness of regions or states. Like countries, states have different sets of institutions and policies that influence the type and level of economic activity in the state – noting that no state acts independently of the others or is free of larger national and global trends.

Labor productivity is one obvious measure of productivity and therefore competitiveness, but other metrics deserve consideration as well. For example, economic theory broadly suggests that wages should reflect productivity, and perhaps knowledge (human capital). As such, wages or income deserve attention. In addition, increased productivity would presumably result in higher output, which might be measured with state gross domestic product (GDP). And it is possible to combine some of these measures into an index of competitiveness.

We consider in the following subsections the following metrics: GDP, median income, labor productivity, and net business openings. All can be viewed as possible ways to measure competitiveness, with each metric having different strengths and weaknesses. (That is, one metric may be more appropriate than the others depending on the setting. For example, state GDP might offer a quick way to compare overall economic activity in one state versus another, but analysts or policy makers would need to keep in mind what GDP captures and does not capture. GDP values can swing significantly in many states depending on resource prices – such as the price of oil – and are not adjusted for factors such as environmental change or cost of living.) We can measure competitiveness with labor productivity, but have to remember there are different ways to measure labor productivity and a single measure of labor productivity can mask differences across industry sectors.

[60] https://www.weforum.org/agenda/2017/09/what-is-economic-competitiveness/

We think it is important to consider different measures of competitiveness – especially if the goal is to determine how a given policy might affect competitiveness. How a policy influences competitiveness could depend on how you measure competitiveness.

By most metrics, Washington has a relatively competitive economy. GDP and income are relatively high, as is labor productivity and net business openings. Some imagine that Washington benefits from having no income tax. But others worry about the regressive sales tax – and a long-standing debate continues about whether and how Washington might change its tax system. (The "Tax Alternatives for Washington State" was published in 2002.) However, it is not clear that reducing the tax burden or changing the tax structure in particular ways would improve competitiveness. For example, Massachusetts ranks as more competitive than Washington based on several different metrics yet has a higher tax burden.

This comparison between Washington and Massachusetts may be instructive as it reminds us that competitiveness is not synonymous with lower taxes. Competitiveness depends on a wide set of institutions, of which taxes are just one part. One important question is what the public receives for the taxes it pays. It is possible that higher or lower taxes could promote competitiveness. In addition, states like Oregon with a very different tax structure have similar labor productivity and other measures of competitiveness as Washington, suggesting that one tax structure may not be better than another in terms of promoting competitiveness (though per capita GDP and median income are higher in Washington).

GDP

The desire for a state to be competitive is presumably a desire for greater affluence, which can be measured by state gross domestic product or personal income. (It may be important to note that a higher GDP, all else held constant, implies a higher quality of life. But GDP by itself is not a measure of quality of life.)

Exhibit 66 shows real GDP per capita from 2000 through 2018. In particular, it shows GDP per capita for the states with the highest and lowest recorded GDP, as well as data for Washington. Data come from the U.S. Bureau of Economic Analysis (BEA).

EXHIBIT 66. Real, Per Capita GDP (2012 $), 2000 – 2019
SOURCE: US BEA

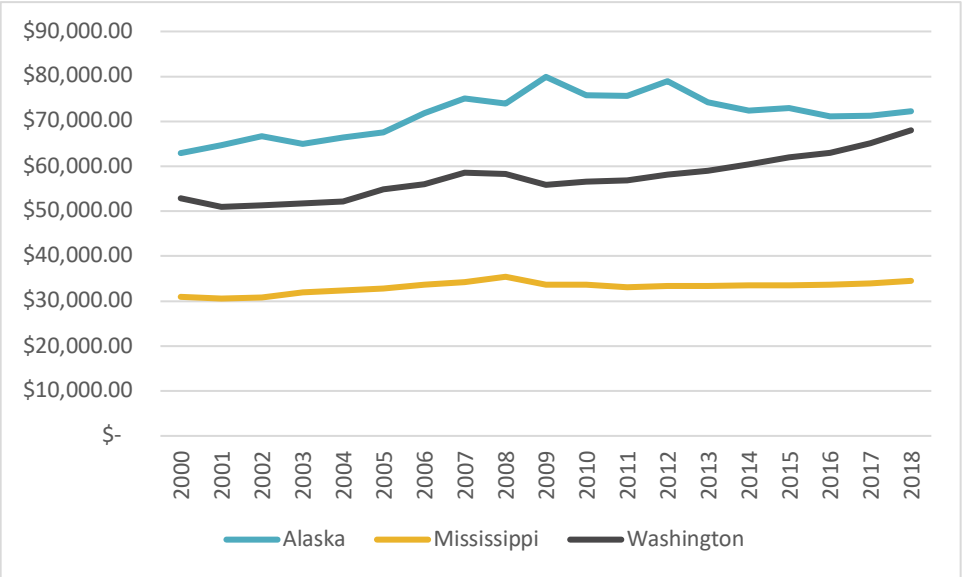


Exhibit 67 shows Per Capita GDP for Washington and a sample of other states for several years. The sample includes neighboring states and other states sometimes referenced by policy makers in Washington. (For each metric for measuring competitiveness, we show graphically the information for Washington, as well as the highest and lowest ranked states to show the range with that metric. We also show specific values for the sample states to provide additional detail for the given metric.)

EXHIBIT 67. Real, Per Capita GDP for Select States and Years
SOURCE: US BEA

State	GDP per capita (2012 $)				
	2015	2016	2017	2018	2019
Washington	62,024	63,025	65,169	68,007	69,761
California	62,403	63,853	66,331	68,970	70,662
Idaho	38,216	38,954	39,482	40,274	40,566
Massachusetts	69,343	70,192	71,553	73,529	75,258
Nevada	47,238	47,744	48,397	49,476	50,043
New York	69,814	70,781	72,434	73,508	75,131
Oregon	47,811	49,132	50,349	51,786	52,726
South Carolina	38,819	39,423	40,204	40,755	41,457
Texas	58,113	57,327	58,182	59,827	61,682

Washington's per capita GDP ranked number 7 (8 counting the District of Columbia) in 2019. While the state has relatively high per capita GDP and/or income on average, the high income is largely confined to King County – and to some degree San Juan County. Most of the counties in the state have income below the national average. Of course, this urban-rural divide in terms of

income is visible in other states as well. Economic activity over the past decade has been very pronounced in key metro areas, including Seattle, San Francisco, and other recognizable "superstar" cities. Economic activity has been more muted in rural areas and many smaller metro markets, and that difference gets obscured when looking at state level averages.[61]

In general, economic activity does not happen evenly or affect people in different regions the same. Policy makers need to understand regional differences when looking at different measures of competitiveness, noting that state level indicators may hide important regional differences.

The growth in per capita GDP in Washington over the past decade has been relatively strong, especially over the last decade. The rapid change in recent years reminds us that we may want to look at the change in the growth in GDP, not just the level of GDP.

Exhibit 68 shows the annual percent change in real per capita GDP (2001-2018) for the state with the highest and lowest average growth rates, plus the state of Washington.

EXHIBIT 68. Percent Change in Real, Per Capita GDP
SOURCE: US BEA

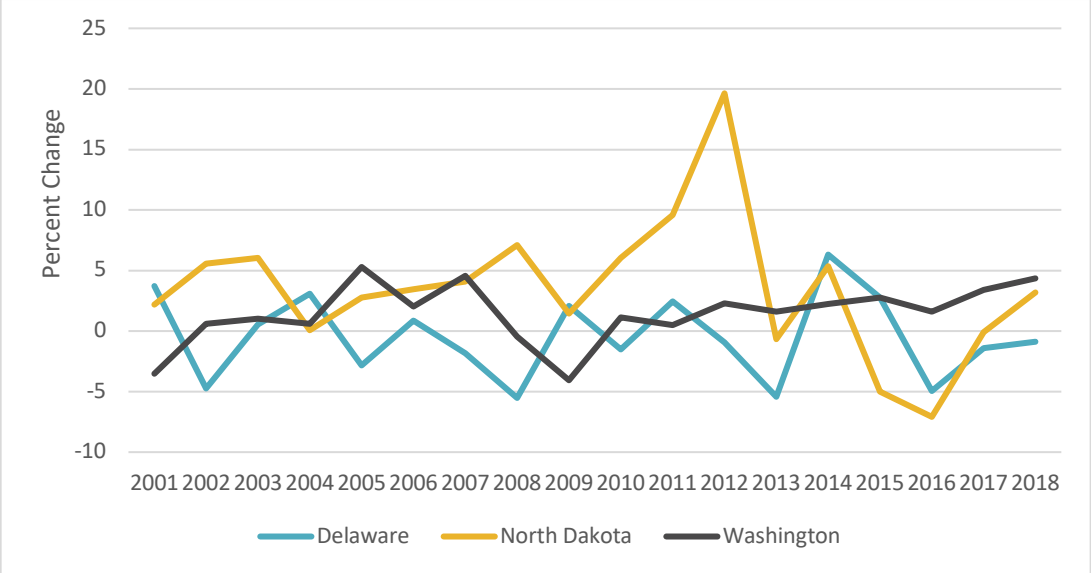


Exhibit 68 also shows the high degree of variability in the change in real per capita GDP year to year. Several times during this period, the state with the lowest average GDP growth has higher growth than the state with the highest average.

North Dakota has the highest average increase in per capita GDP over this time period due to the increase in GDP with the shale oil boom. This finding serves as a reminder that different states

[61] For additional information on the divide, see for example https://www.stlouisfed.org/on-the-economy/2019/july/looking-urban-rural-divide-economic-growth

and regions experience changes in GDP or affluence due to technological change and large macroeconomic trends – not just state policies.

Median Household Income

Given how GDP figures can be influenced by capital intensive industries such as oil (production or refining), we also look at income as a possible measure of affluence and competitiveness. Where GDP describes overall output or income, household income shows what households actually earn.

Exhibit 69 shows median household income, by state, from 2000 through 2018.

EXHIBIT 69. Median Household Income (2018 $)
Source: US Census

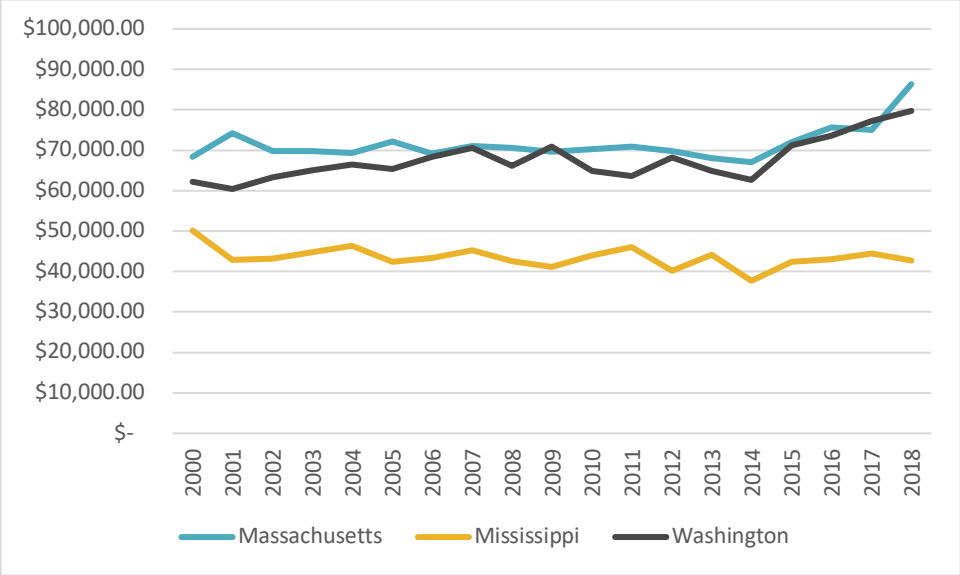


Exhibit 70 shows median household income for the sample states from 2014 through 2018 (the most recent years for which data were available).

EXHIBIT 70. Median Household Income for Select States and Years
Source: US Census

State	Median Household Income (2018 $)				
	2014	2015	2016	2017	2018
Washington	62,714	71,271	73,573	77,256	79,726
California	64,221	67,448	69,729	71,459	70,489
Idaho	56,737	54,716	59,189	61,676	58,728
Massachusetts	67,049	71,926	75,620	75,012	86,345
Nevada	52,954	55,123	58,003	57,929	61,864
New York	57,662	61,480	64,288	63,969	67,274
Oregon	62,509	64,478	61,879	66,185	69,165
South Carolina	47,702	49,137	56,858	56,311	57,444
Texas	57,201	59,856	60,844	60,740	59,785

Washington ranked 4th in real household income in 2018 (5th including the District of Columbia).

Washington had the highest increase in median household income over this period, while Mississippi had the smallest increase. As noted above, economic activity after the 2008-09 recession has been most striking in superstar cities, including Seattle. Growth in sectors such as Information and Professional and Business Services has been exceptional in Seattle with all of the companies focusing on cloud computing, software design, and related industry sectors. Many of the workers at Amazon are actually classified in the Retail sector, but Amazon's influence in cloud storage and other more tech-oriented sectors is obvious. Amazon, along with Microsoft, Tableau, Cray, Redfin, Convoy, Pitchbook, and other companies that have done so well over the past decade lie behind the growth in median household income in Seattle, pushing up the overall average in the state - visible in Exhibit 69 (especially 2013 through 2018).

The data here do not consider income inequality, which might matter in determining the competitiveness of an area. A recent study by the Organization for Economic Cooperation and Development noted that income inequality in Washington had increased noticeably in recent decades. The authors note that the difference in hourly wages between the top and bottom 10 percent of earners in 1980 was approximately $26 per hour, compared to $43 per hour 2018 (after adjusting for inflation). Nationwide, the gap between the top and bottom 10 percent of earners in 2018 was $37 per hour.[62]

Labor Productivity

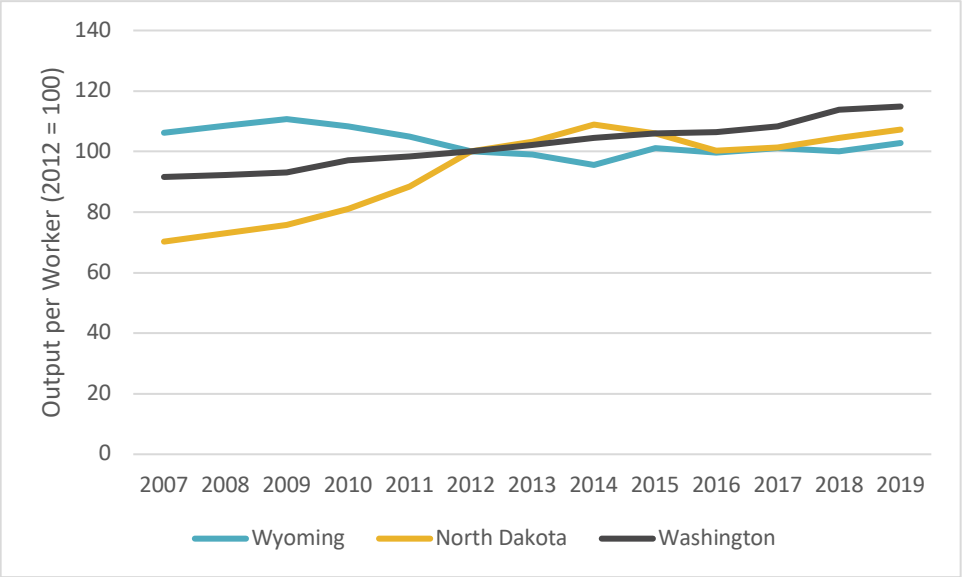
Economic theory implies that the growth in income in Seattle should be supported by a growth in productivity as well – to help explain the growth in income. Moreover, Michael Porter's work

[62] OECD (2020) "Labour Market Relevance and Outcomes of Higher Education in Four U.S. States" https://doi.org/10.1787/38361454-en

on competitiveness, along with work by the World Economic Forum suggests that competitiveness overall is tied to or is aligned with productivity.

Exhibit 71 shows labor productivity for the states with the highest and lowest average productivity, plus Washington State. In particular, the exhibit shows U.S. Bureau of Labor Statistics (BLS) experimental data of labor productivity for nonfarm labor in the U.S. covering the period 2007 through 2019.[63] We show output per worker in each state, with output measured in 2012 dollars.

EXHIBIT 71. Labor Productivity (2012 = 100)
SOURCE: US BLS



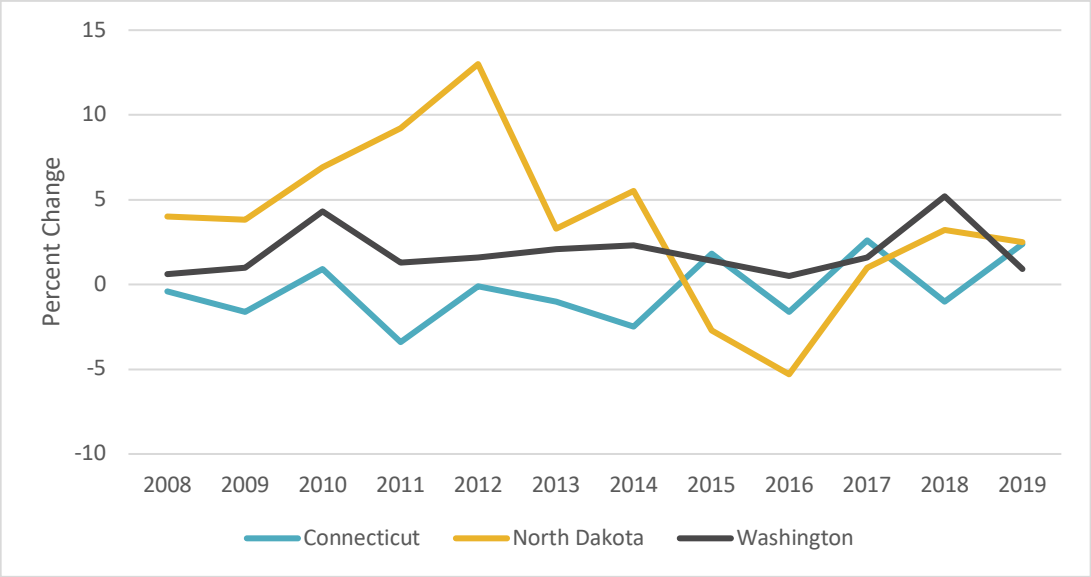
As with GDP, changes in labor productivity in a given state may depend on changes in resource use at the national or global level (for example, the decline in labor productivity in Wyoming and increase in labor productivity in North Dakota coincide with the decline in the demand for and production of coal in Wyoming and increase in shale oil production in North Dakota). The exhibit also shows the increase in labor productivity in Washington, consistent with the growth in cloud computing and related gains in other sectors.

As noted, Figure 4 shows labor productivity, where productivity is output per worker. The BLS also reports labor productivity defined as output per hour worked. The two different measures do give different patterns – though Washington still shows strong labor productivity regardless of the measure. (Colorado ranks number one in 2019 in output per hour worked, with Washington ranked second. Washington is the top ranked state in 2019 in terms of output per worker.)

[63] For a description and summary analysis of the data, see: https://www.bls.gov/opub/mlr/2019/article/bls-publishes-experimental-state-level-labor-productivity-measures.htm

The BLS also reports that labor productivity measures do tend to converge over time, where states with lower levels of initial productivity reported faster rates of growth and vice versa. As such, we show in Exhibit 72 the annual percent change in labor productivity.

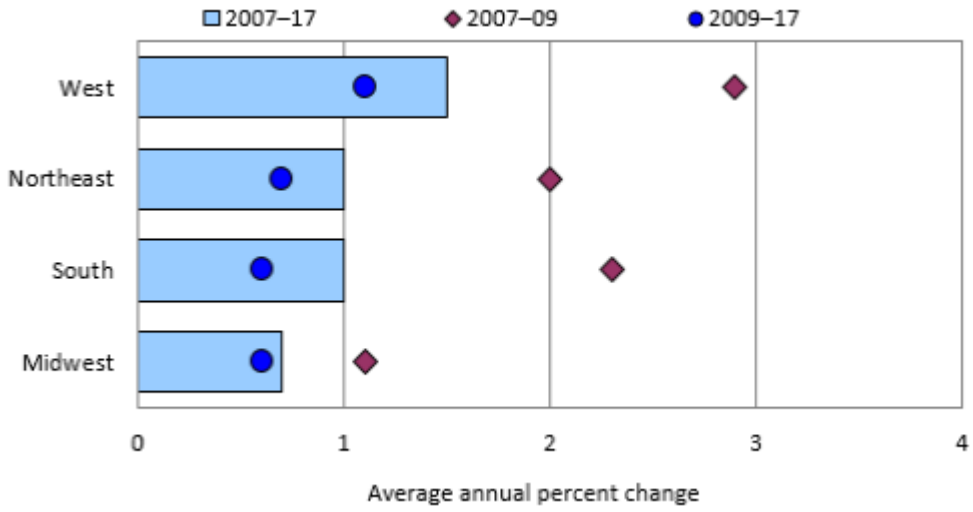
EXHIBIT 72. Year Over Year Change in Labor Productivity
SOURCE: US BLS



The decline in labor productivity in North Dakota coincides with declines in the price of crude oil. The consistency in the change in labor productivity in Washington is almost certainly due to the industry mix in Washington – especially Seattle. Natural resource economies see swings in production. States with large finance and insurance sectors can see particular patterns. Software development and cloud computing has seen relatively steady growth over this period.

The BLS also highlights how labor productivity has grown more in the west in recent years than in other parts of the country. They summarize the regional differences in Exhibit 73 (see footnote 4 for source).

EXHIBIT 73. Labor Productivity, by Census Region, Average Annual Percent Change, 2007-2017
SOURCE: US BLS



One question is whether tax structure affects labor productivity (or competitiveness in general). Exhibit 74 shows labor productivity in Oregon and Washington – two states with very different tax structures, though very similar productivity measures.

EXHIBIT 74. Labor Productivity in Washington and Oregon
SOURCE: US BLS

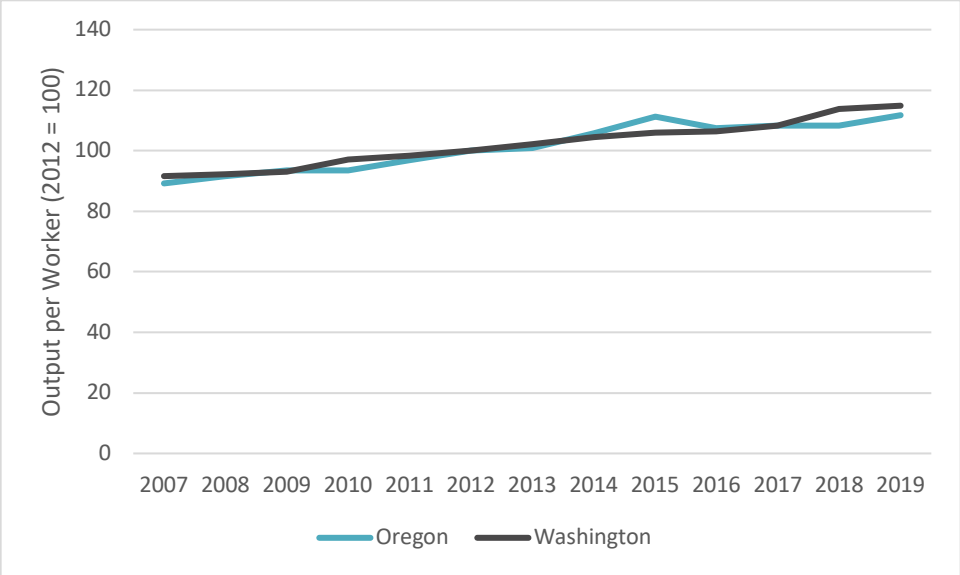


Exhibit 75 shows labor productivity for the sample states over the most recent five years for which data were available.

EXHIBIT 75. Labor Productivity for Select States and Years
SOURCE: US BLS

State	Output per Worker (2012 = 100)				
	2015	2016	2017	2018	2019
Washington	106.0	106.5	108.2	113.9	114.9
California	105.0	105.1	108.1	111.1	113.9
Idaho	101.0	102.1	103.6	105.5	105.0
Massachusetts	103.8	103.8	104.7	107.2	108.8
Nevada	95.6	95.7	95.3	96.8	96.4
New York	97.8	98.0	98.8	98.1	99.3
Oregon	103.6	104.7	107.4	109.1	110.9
South Carolina	100.2	100.9	103.0	103.4	104.9
Texas	105.0	103.9	105.0	106.8	110.0

Net Business Openings

To the extent that economic competitiveness makes a place more desirable, increased competitiveness could result in greater immigration and/or business openings. Unfortunately, the rate of immigration does not appear to be a very helpful metric as most migration figures show a percentage of the population that has moved across state lines, where the numbers depend critically on the size of the state. Not surprisingly, California tends to have the lowest rate of immigration and Wyoming the highest, due simply to the population of each state. Net business openings (new establishments created minus closures) may be more telling.

Exhibit 76 shows the states with the highest and lowest net opening rate, along with Washington.

EXHIBIT 76. Business Births Minus Deaths, 2000-2014
SOURCE: US BLS

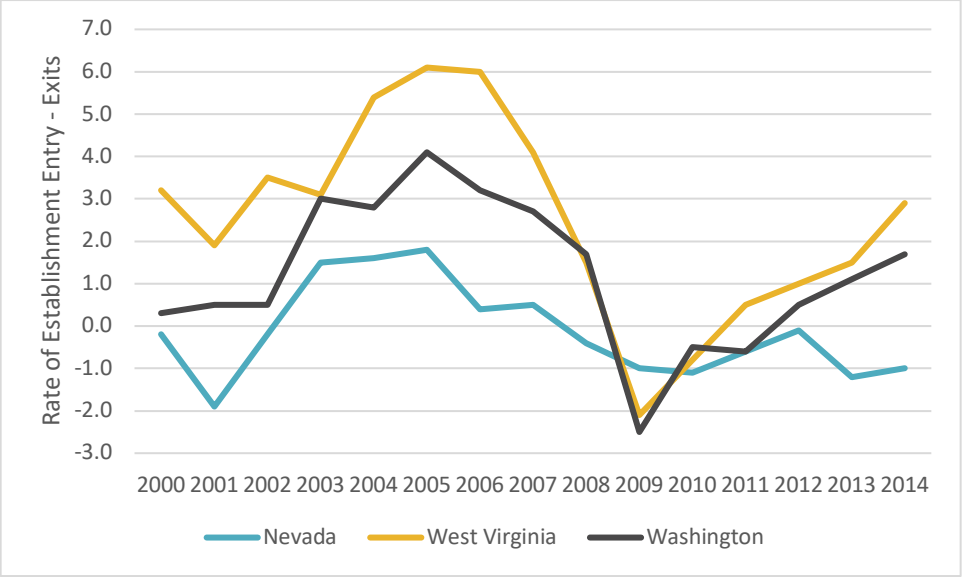


Exhibit 77 shows Net Business Openings for the sample states in the most recent five years for which data were available.

EXHIBIT 77. Net Business Openings for Select States and Years
SOURCE: US BLS

State	Business Births – Business Deaths				
	2010	2011	2012	2013	2014
Washington	-0.5	-0.6	0.5	1.1	1.7
California	-0.8	0.7	1.2	1.0	2.0
Idaho	-1.5	-1.7	0.7	0.6	2.2
Massachusetts	-0.3	0.6	1.2	0.5	1.1
Nevada	-0.8	0.5	1.0	1.5	2.9
New York	-1.6	0.0	0.4	-0.3	0.4
Oregon	1.0	1.0	2.1	1.8	2.0
South Carolina	-1.0	-0.8	0.5	0.6	1.0
Texas	0.8	1.3	2.1	1.8	2.6

Note: Washington's rate of net business creation in 2014 ranked 10th in the country. The rate and rank fluctuates regularly. Moreover, high rates of business closure for short periods is not necessarily a sign of a weak economy. Businesses may close because they are acquired by other businesses and owners may close a business because they have better alternatives, including opening another business.

Exhibit 76 clearly shows the faster rate of business closures in Nevada and Washington with the 2008-09 recession, as well as the faster recovery in those states. The exhibit also shows the sluggishness in net business openings in Washington following the 2001 recession. (The 'dot.com' bust in 2001 was very challenging for Washington given the role of Microsoft and other tech companies in the state's economy at that time. In addition, the terrorist attack on September 11, 2001 hurt the travel and tourism industries, as well as aerospace, which are important in Washington – making the period from 2001 through 2003 or 2004 particularly slow in metro Washington. It would have been interesting to see labor productivity during that period, but the BLS data series on productivity does not go back that far in time.)

Beacon Hill Institute Competitiveness Index

In this subsection, we show an index of economic competitiveness prepared by the Beacon Hill Institute.[64] We note that researchers at the Economic Policy Institute have cast doubt on the value of this and similar indexes[65]; still we thought it was worth including an example of a business climate or competitiveness index in this assessment. The Beacon Hill index (published annually for almost 20 years) combines metrics that account for government and fiscal policy, security,

[64] For a detailed description of the index, see: http://beaconhill.org/economic-competitiveness/

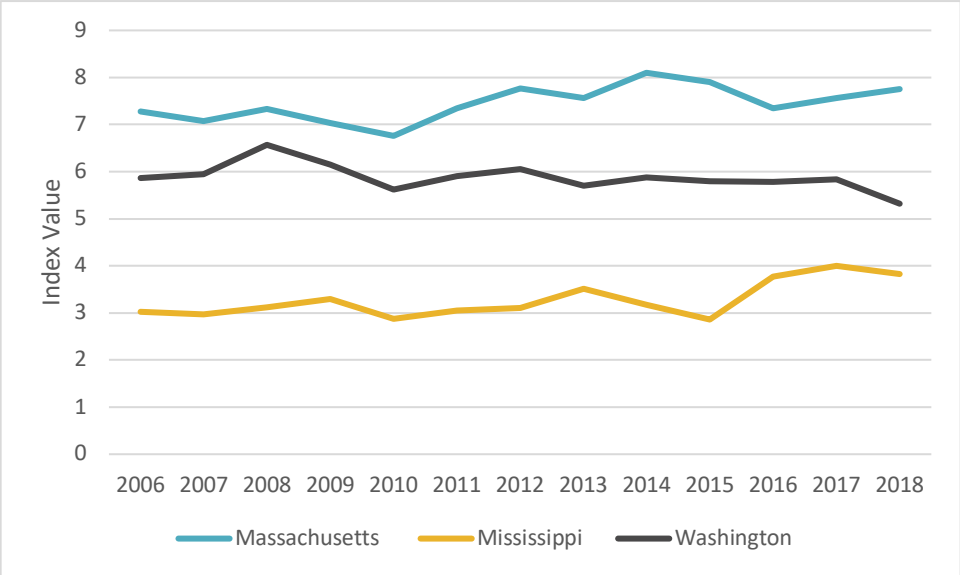
[65] See https://www.epi.org/publication/books_grading_places/

infrastructure, human resources (especially labor force), technology, openness, business incubation, and environmental quality.

Criticisms of this sort of index note that there are no guidelines for exactly what to consider and how to weight the different components. Given the 'ad hoc' nature of such indexes, it would be possible to generate a wide range of results – making any one ranking a bit suspect. Still, we wanted to have one such index in the set of metrics for competitiveness when asking questions about how changes in tax policy might affect economic competitiveness.

Exhibit 78 shows the index value from 2006 through 2018 for the state with the lowest index score and, separately, the highest index score. The exhibit includes index values for Washington.

EXHIBIT 78. Beacon Hill Competitiveness Index, 2006-2018



Washington tends to receive positive competitiveness rankings in areas such as high-speed internet infrastructure, venture capital, openness, and the state's bond rating. At the same time, the state receives less positive rankings for road infrastructure, graduating students in STEM (science, technology, engineering, and math) programs, and unemployment insurance payments. It also may be important to note that this index gives Washington a low score for its high minimum wage. In some sense the high wage could be seen as making the state less competitive. But the reverse is also true, reminding us that measuring competitiveness is hardly an objective science.

Adding Oregon to the exhibit shows that Oregon and Washington differ slightly in terms of competitiveness, even though they differ significantly in terms of tax structure. Exhibit 79 is the same as Exhibit 78, but with Oregon included.

EXHIBIT 79. Beacon Hill Competitiveness Index

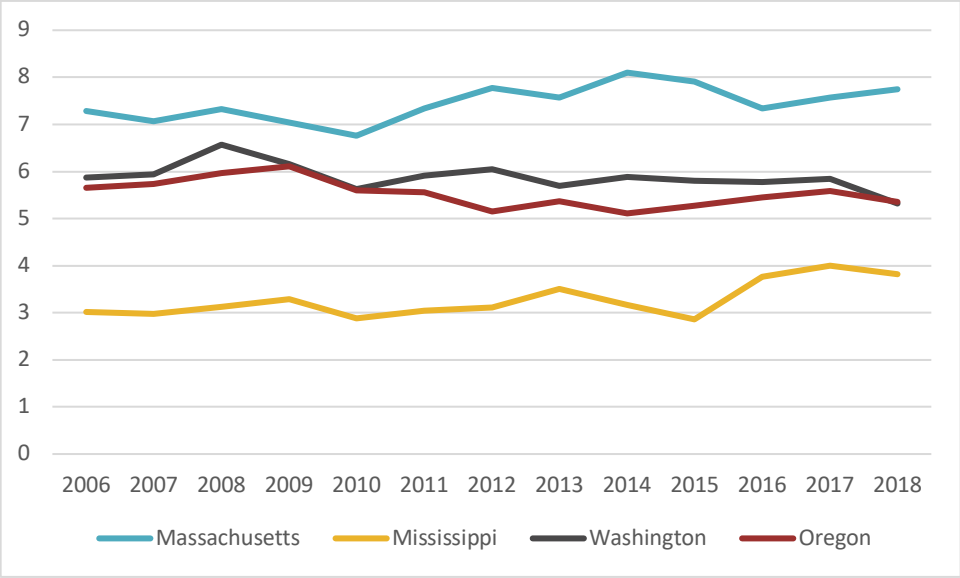


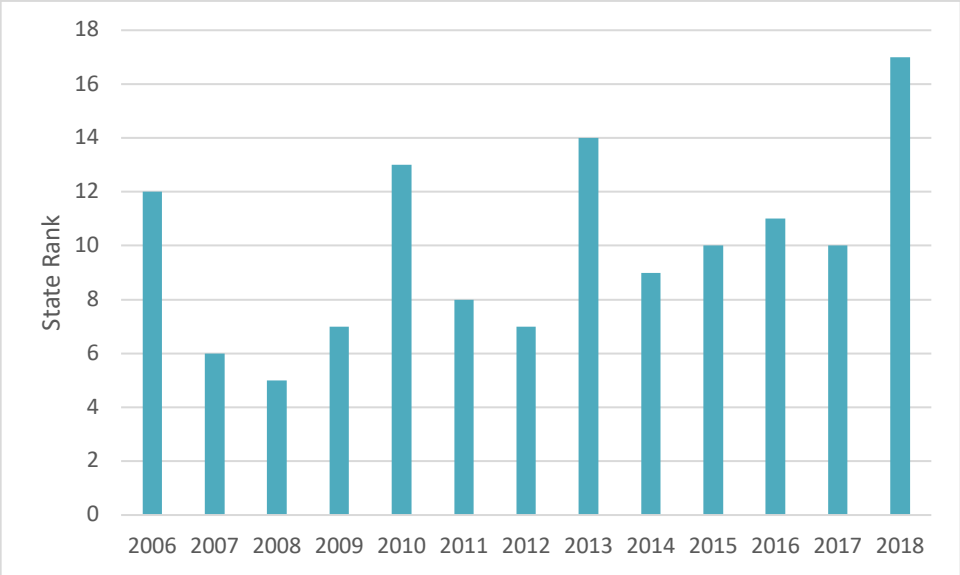
Exhibit 80 shows the competitiveness rank for the sample states from 2014 through 2018.

EXHIBIT 80. Beacon Hill Competitiveness Index for Select States and Years

State	Index Value				
	2014	2015	2016	2017	2018
Washington	5.88	5.8	5.78	5.84	5.32
California	4.92	4.54	5.32	5.61	5.32
Idaho	5.33	5.24	6.14	6.12	6.28
Massachusetts	8.1	7.91	7.34	7.57	7.75
Nevada	3.85	3.9	4.95	4.16	4.52
New York	4.98	4.86	4.76	4.63	5.02
Oregon	5.11	5.27	5.45	5.59	5.35
South Carolina	4.45	4.35	5.13	5.2	4.92
Texas	6.13	5.81	6.1	6.36	6.7

Exhibit 81 shows Washington's rank each year using the Beacon Hill Index. In this case, a lower rank means a state is more competitive (with a score of 1 meaning that state is the most competitive).

EXHIBIT 81. Beacon Hill – Index Rank for Washington[66]



Additional Metrics to Consider

Other metrics to consider when thinking about competitiveness include cost of living, unemployment rates, and poverty. In fact, many of the states that have high competitiveness ranks also have high cost of living and sometimes high unemployment. The latter can be due to unemployed people leaving less competitive states and moving to more competitive states in hopes of finding a better career path.

Hawaii has the highest cost of living of the 50 states, followed by New York and the District of Columbia. California, New Jersey, and Massachusetts also have a slightly higher cost of living than Washington – with Washington being the seventh most expensive state (or 8th if you include the District of Columbia).

[66] The 2018 Beacon Hill report gives Washington a rank of 19. The data we used was rounded to two decimal places, so we had several states tied with the same score and rank of 17.

EXHIBIT 82. COST OF LIVING FOR SELECT STATES AND YEARS
SOURCE: US BEA

State	Regional Price Parity by State				
	2014	2015	2016	2017	2018
Washington	104.9	105.2	106.1	106.8	107.8
California	113.7	113.8	114.7	115	115.4
Idaho	93.6	93.3	92.2	92.2	92.5
Massachusetts	107.3	107.6	109.2	109	109.7
Nevada	97.5	97.3	96	96.5	97.5
New York	115.7	115.8	116.4	116	116.4
Oregon	98.8	98.5	100.5	100.5	101.1
South Carolina	90	90.3	90.7	90.7	91.1
Texas	96.5	96.7	96.6	96.8	96.8

As with any statistics, it is important to remember what the data actually reveal. In this case, it is important to remember that the cost of living for a state obscures regional differences. The cost of living in many urban centers (e.g., Seattle) is typically well above the state average while the cost of living in rural areas can be much less.[67]

While Washington has a relatively high cost of living, it has a relatively low poverty rate. Data from the U.S. Census shows that only seven states had a lower rate in 2018. Exhibit 83 shows the poverty rate for the sample states for 2014 through 2018.

EXHIBIT 83. Poverty Rate for Select States and Years
SOURCE: US Census

State	Poverty Rate by State				
	2014	2015	2016	2017	2018
Washington	12	11.4	11	9.9	8.6
California	15.8	13.9	13.9	12.4	11.9
Idaho	12.4	12.3	11.1	11.7	11.5
Massachusetts	13.6	11.5	9.6	10.6	8.7
Nevada	17	13	10.1	13.7	13
New York	14	14.2	11.9	13.4	11.1
Oregon	14.4	11.9	11.8	10.2	9.7
South Carolina	16.5	14.3	14.1	15.6	12.8
Texas	16.4	14.7	13.8	13.4	13.7

[67] Cost of living data are available for several counties and metro areas in Washington. Cost of living in some areas is 10% below the national average, which the cost of living in Seattle is 50% above the national average. (Figures from the C2ER period cost of living survey.)

The various potential measures of competitiveness shown above suggest that Washington is highly competitive. It has relatively high GDP, household income, and labor productivity. However, it is also true that competitiveness is too complex to measure with a single metric and it is not clear how to combine the various components of competitiveness into a single index. Care or a degree of skepticism is necessary when referring to indexes like the Beacon Hill Index presented here. It is also not clear how to consider factors such as income inequality or that a considerable portion of the income growth seen in Washington over the last decade has been mostly in the Seattle metro area.

Still, a review of measures of competitiveness is useful. It gives insights and sets the stage for a discussion about the merits of policy initiatives to improve competitiveness. For example, the rankings above make you wonder why certain states are highly ranked in most categories and vice versa. Policy makers in all states have similar interests or goals, and often make similar decisions, with very different outcomes.

Next, we focus on whether taxes play a role in determining the competitiveness of a given state. In particular, we consider whether policy makers can increase competitiveness by decreasing the tax burden or altering the tax structure in their state.

Washington is clearly competitive – but why? And how might any changes in tax policy affect competitiveness?

Tax Structure and Tax Burden

In the literature section below, we show the findings from studies that explore the determinants of competitiveness, as well as from studies that explore the relationship between competitiveness and tax structure. For context, we show here the tax burden for residents of the reference states, as well as the tax burden on businesses. We also show the share of tax revenue by source for different states.

Tax Burden on Individuals and Households

WalletHub (a personal finance social media/website) prepares a report that shows the percentage of total personal income that residents pay towards state and local taxes. The following exhibit shows the tax burden and rank for each of the reference states from their report on June 24, 2020.[68] We include Alaska to show the data for the state with the lowest tax burden.

[68] https://wallethub.com/edu/states-with-highest-lowest-tax-burden/20494/

EXHIBIT 84. Tax Burden
SOURCE: Wallethub 2020 Report

Rank (1 = highest)	Sate	Total Tax Burden	Property Tax Burden	Income Tax Burden	Sales & Excise Tax Burden
1	New York	12.28%	4.44% (6)	4.40% (1)	3.44% (26)
13	California	9.27%	2.68% (30)	3.56% (5)	3.03% (34)
22	Massachusetts	8.76%	3.60% (13)	3.17% (7)	1.99% (45)
27	Nevada	8.39%	2.17% (42)	0.00% (44)	6.22% (2)
28	Oregon	8.34%	3.09% (20)	4.20% (2)	1.05% (50)
29	**Washington**	**8.32%**	**2.59% (34)**	**0.00% (44)**	**5.73% (3)**
32	Texas	8.20%	3.95% (9)	0.00% (44)	4.25% (9)
37	Idaho	7.93%	2.44% (36)	2.31% (24)	3.18% (31)
41	South Carolina	7.48%	2.88% (24)	1.98% (32)	2.62% (42)
50	Alaska	5.16%	3.71% (12)	0.00% (44)	1.45% (46)

While there may be some temptation to think a low rank (high score in this case) is desirable, having a low rank is not necessarily a good thing. The WalletHub rankings do not consider the effectiveness or equity of taxes. For example, it matters whether a state has revenues sufficient to meet the needs it has identified as being important, and it may matter whether the tax structure is regressive or progressive.

WalletHub has published reports in the past that ranked state tax systems in terms of their fairness. Their 2014 study noted that Washington had the highest tax burden on low income

households.[69] (WalletHub said they do not maintain old reports, so they could not provide a history of what prior studies found. They only offered to share their most recent data, which is provided here.)

It may also be important to note that the index does not account for differences in the tax burden between cities or regions within a given state.

The Tax Foundation also provides rankings of tax burden, but their series ends in 2012 (it covers the period 1977 through 2012).[70] They have more recent data on tax rates rather than tax burden.

Kiplinger's also publishes a report that shows the 'tax friendliness' of each state. They use income and sales tax rates reported by the Tax Foundation, as well as other taxes such as fuel taxes (collected by the American Petroleum Institute), taxes on alcohol and tobacco, and taxes on inheritance and gifts.[71]

These different rankings and reports make it seem as though there is a single best tax structure or optimal tax burden, which is not true. Certain businesses and/or individuals might prefer one type of tax over another. And different businesses and individuals might prefer different tax burdens to support different public programs. Moreover, several articles (cited below) show there is little linkage between tax structure and positive economic outcomes, such as higher household incomes or lower unemployment. The Tax Policy Center even notes that the size and use of exemptions and deductions can be as important as the published tax rate.[72] The University of Indiana reached a similar conclusion when studying taxes in that state. They concluded that the complexity and inconsistency of how taxes applied to different groups was as much a concern to tax payers as the overall rate.[73]

In any event, a casual glance at the tax burden as estimated by WalletHub and several of the components of competitiveness shown above reveals that tax burdens may not be highly correlated with competitiveness. States with low tax burdens do not rank routinely as the more competitive states, inviting questions about the relationship between tax burden or tax structure and competitiveness.

In the assessment below, we use a time series of tax burden data. The District of Columbia has been collecting data on the tax burden for households in the largest city in each state since 2000 (most recent data available at the start of this project was 2018). The series shows tax burden by income group, with household income levels of $25,000, $50,000, $75,000, $100,000, and $150,000 per year. The data do not capture the variability in tax burden from urban to rural areas in a given state, but do provide a consistent time series and show the tax burden on a significant number of

[69] https://www.accountingtoday.com/news/reports-rank-state-tax-system-fairness-and-international-tax-competitiveness

[70] See for example https://taxfoundation.org/publications/state-local-tax-burden-rankings/

[71] https://www.kiplinger.com/kiplinger-tools/taxes/t055-s001-kiplinger-tax-map/index.php

[72] https://www.taxpolicycenter.org/publications/using-tax-structure-state-economic-development/full

[73] https://projects.cberdata.org/reports/TaxConferenceFinalReport.pdf

people in each state. Moreover, we assume the variation in taxes within a state due to local taxes is not as large as the variation across states. These data are available at https://cfo.dc.gov/page/tax-burdens-comparison.

Tax Burden on Businesses

Exhibit 85 shows the state corporate income tax rates in 2020 for the reference states.

EXHIBIT 85. Corporate Tax Rates for Select States (2020)
SOURCE: Tax Policy Center

	Tax Rate (%)	Note
Washington	0	Washington charges a gross receipts tax
California	8.84	
Idaho	6.9	
Massachusetts	8.0	
Nevada	0	Nevada charges a gross receipts tax for business with receipts above $4 million
New York	6.5	
Oregon	6.6 – 7.6	Oregon has multiple brackets
South Carolina	5.0	
Texas	0	Texas imposes a franchise tax or margin tax

Data for other states and years are available at https://www.taxpolicycenter.org/statistics/state-corporate-income-tax-rates

In the analytical section below, we consider tax rates as a factor that can influence competitiveness. For states with multiple corporate tax rates and brackets, we use the average rate. We do not consider franchise and gross receipts taxes.

Share of Revenue

When analyzing the ways tax burden may influence competitiveness, we also consider share of revenue state governments receive from state income and sales taxes.

EXHIBIT 86. Source of State Tax Revenues (2019)
SOURCE: US Census

	Percent of Total			
	Property Tax	**General Sales Tax**	**Total Income Tax**	**Corporate Tax**
Washington	0.12	0.59	0	0
California	0.02	0.22	0.60	0.07
Idaho	0	0.39	0.40	0.06
Massachusetts	0	0.21	0.63	0.09
Nevada	0.03	0.56	0	0
New York	0	0.17	0.64	0.05
Oregon	0	0	0.77	0.07
South Carolina	0	0.31	0.46	0.04
Texas	0	0.60	0	0

For many states, specific sales taxes (on items ranging from cigarettes and alcohol to amusement) and other specific taxes (including franchise and gross receipts taxes) make up a noticeable portion of total revenue. In addition, transfer payments are often a significant part of state revenue. Data for more states and years can be found at https://www.census.gov/programs-surveys/stc/data/datasets.html.

Literature Review

This review summarizes the findings in articles that assess the factors that influence economic competitiveness and, separately, that explore how taxes (tax structure or tax burden) affect competitiveness and/or economic growth. We include articles that highlight the connection between taxes and competitiveness at the national level but focus more on state level competitiveness.

Several articles show that certain variables, such as environmental quality and the ability to attract talent, are positively correlated with measures of competitiveness. For example, Akpinar et. al. (2017) show that the presence of clusters (i.e., concentrations of businesses in related industries), environmental attractiveness, and the ability to attract talent are positively related to measures of competitiveness such as GDP per capita. Their work supports widely referenced models of competitiveness such as Michael Porter's Diamond Model (Porter, 1990) and the related Emerald Model[74].

Akpinar et. al. include lagged dependent variables in their model and explore how the components of competitiveness affect GDP per capita over time. Their approach reminds us that

[74] See for example, https://www.emerald.com/insight/content/doi/10.1108/CR-02-2016-0014/full/html?skipTracking=true

what matters is whether certain policy decisions are likely to facilitate sustainable growth or competitiveness over time, not whether there might be a short term, temporary boost.

Unfortunately, Akpinar et. al. do not test other measures of competitiveness. Nor do they discuss whether policy makers really have control over the variables they consider. For example, the authors highlight the role of clusters in enhancing competitiveness. Hodges et. al. (2004) show, however, that policy makers have limited ability to create clusters. Akpinar et. al. also suggest that policy makers could strive "to attract advanced education institutions," but this idea is similar to the idea of creating clusters in that it is not reliably affected by policy.

Numerous articles focus on the linkages between tax rates – especially the corporate tax rate – and international competitiveness. Bazel and Mintz (2017) describe how changes in corporate taxes could alter the competitive position of the U.S. The Brookings Institute and Urban Institute's Tax Policy Center also has briefings that focus on taxes and international competitiveness.[75] And the leap seems simple enough to imagine that policy makers could alter taxes at the state level to improve competitiveness – but the interplay between taxes and the competitiveness of states is complex. Moreover, there is not clear empirical foundation for arguing that tax policy has a strong causal relationship with competitiveness. It may be that investments in health care, education, infrastructure, the environment, and working conditions have at least as much influence on competitiveness as taxes. Exogenous factors beyond the control of policy makers may also be at least as important as taxes.

Dye and Feiock (1995) analyzed data from 1950 through 1989 and found that the adoption of an income tax had a statistically significant and negative impact on personal income. They note that national economic conditions had the largest influence on personal income, but that the adoption of an income tax was still important and the burden of proof should be on those saying that the tax structure does not affect income. We note that they did not control for differences in industry mix or other factors that can explain differences in income growth (as illustrated above). Focusing on Canadian provinces rather than U.S. states, Ferede and Dahlby (2012) also find that taxes matter when looking at growth. In particular, they found that higher corporate income tax rates were associated with lower private investment and slower economic growth. On the other hand, Hungerford (2018) found no evidence that higher corporate tax rates hurt growth.

One area where this back and forth about how taxes relate to growth is always visible is in debates surrounding 'supply side economics', As Arthur Laffer famously argued, higher tax rates can cause the tax base to shrink and tax revenues to decline, and that a tax cut could increase the tax base and tax revenue overall – ultimately helping with economic growth. [76] Of course, this theoretical possibility depends on having a sufficiently high tax rate as a starting point. The math is rather straightforward. (See for example, Fullerton (2016)). Fedeli (2017) and many others point out that the relationship between tax rates and tax revenues is quite nuanced – filled with possible illusions and questions about the role of budget restrictions, how tax revenues are used, and

[75] https://www.taxpolicycenter.org/briefing-book/how-does-tax-system-affect-us-competitiveness

[76] See for example, https://www.econlib.org/library/Enc/SupplySideEconomics.html

more. Fedeli considers the case where a state may have debts to pay and also want to encourage growth. He notes that whether a reduction in the tax burden or reduction of the debt is likely to help economic growth depends on a variety of factors, including the relative size of each. He also recognizes that rules that require a balanced budget can be problematic, and that either deficits or higher taxes to correct for deficits can improve growth depending on the underlying conditions.

One part of the supply side argument is that higher marginal tax rates reduce the payoff people receive from work, reducing the labor supply. Critics of this idea suggest that the after-tax wage elasticity of labor supply is low, which means changes in tax rates have very small effects on labor supply. Prescott (2004) summarizes this argument and notes that long run elasticity is greater and that changes in tax rates have larger impacts on long run labor inputs. He found that the shortfall in France's labor inputs compared with the U.S. is explained by differences in the two countries' tax rates – giving weight to the idea that lower marginal tax rates can increase long run labor supply more than critics of the supply side model have suggested in the past.

Goolsbee (1999) adds to this discussion, highlighting that we need to consider the elasticity of taxable income, not just the elasticity of labor supply. He works through challenges in estimating the elasticity of taxable income and concludes one is not likely to raise tax revenues by cutting tax rates. He also reminds us that different tax policies affect these elasticities differently. Again, one has to recognize that there is no simple relationship between taxes and economic activity.

Deskins and Hill (2010) stress that the relationship between taxes and economic growth appears to have weakened over time. They find that some of the negative relationship between taxes and growth that was visible in the data decades ago no longer hold. Similarly, Hungerford (2018) studies corporate tax rates in the more recent past and finds no evidence that higher corporate tax rates hurt economic growth. Gale et. al. (2014) and Gale et. al. (2015) also find that the effects of tax cuts on economic growth are ambiguous – casting doubt on whether higher taxes hurt growth or lower taxes help growth. Gale and his coauthors also note that studies of how taxes might affect growth often leave unanswered questions about equity.

Jones (1995) shows how complicated discussions can be regarding taxes and economic growth. He offered that economic growth in the U.S. exhibits no large persistent changes, drawing into question what effect changing certain policy variables really has on the rate of growth. But he also noted recently (Jones, 2019) that taxing high-income earners in a world where new ideas drive economic growth could slow innovation. He wonders rhetorically that if that idea is true, whether the optimal tax rate on top earners could be negative in extreme cases. Jones also stresses the fact that time matters. He offers that if a policy change causes people to shift from producing goods to producing ideas, the near-term effect could be a decline in production, but the longer-term effect could be positive when increased innovation materializes. We note that ideas and innovation do not come solely from the top earners and ask if lower- and middle-income households could drive economic growth through innovation if the burden of health care, housing, and other factors was not so heavy. That is, we do not wonder if the optimal tax rates

on the top earners might theoretically be negative, but rather what tax structure is likely to result in the greatest amount of innovation.

Besci (2000) offered that whether lowering taxes could result in higher tax revenue depends on government investment relative to government consumptions, as well as the productivity of public capital. He notes that many analyses of taxes and economic growth assume the economy is in steady state. In fact, it is not clear that the economy is operating in equilibrium. (He notes that the Laffer Curve itself – an illustrative sketch of how tax rates might correspond to tax revenues – can also shift over time with external shocks.) Finally, he points out that the effects of tax policy might be miscalculated if the policy is designed without reference to expenditure policy. Put another way, analyzing the pros and cons of a change in tax rates or tax policy has to include an assessment of the resulting changes in expenditures or benefits.

Bivens and Blair (2017) worry about the equity dimensions of changes in tax rates. They note that any gains from tax cuts that might materialize (they focus on corporate taxes) would almost certainly not be distributed evenly. Leachman and Mazerov (2015) examine states that have lowered their tax burden in recent years and find that employment growth in those states has lagged the national rate. They also offer a review of the academic literature, focusing on whether state income taxes affect growth. Most of the articles find little to no connection between income taxes and growth, echoing to some extent Jones (1995).

Cline et. al. (2011) create a tax competitiveness index, with an emphasis on how tax structure affects business location decisions. They suggest that policy makers can attract businesses and improve competitiveness by having a better tax structure. (Ernst and Young updates the state tax ranking each year.) However, Fisher (2005) reviews a number of competitiveness and business climate indexes, ultimately concluding that none of the indexes really provide a good measure of what they claim to reveal. Moreover, he worries that the various indexes are really just attempts by advocacy groups to influence policy in particular ways. One of the indexes he reviews and discounts is the Beacon Hill Index considered in this study.

Ketels (2016) also reviews different competitiveness frameworks and describes the role of social institutions and connections within an economy. While he does not seem to have any problems with broad competitiveness frameworks or indexes, he does express concern with how they might be used. In particular, he worries that competitiveness indexes can drive public policy even though there has been little discussion about whether it is better to focus on the weaknesses in a region or its strengths, or whether a given policy decision might really push an area up in the rankings. Finally, he notes that equity issues may matter and may not be reflected in an index.

Kolko et. al. (2013) also review different indexes, especially indexes that measure business climate. The authors find that indexes that focus on productivity do not predict economic growth, while indexes that emphasize costs and taxes predict growth (as measured by employment growth). They also find that less spending on welfare and transfer payments, and simpler corporate tax structures can point to faster economic growth. But they ask about the objective of

the growth if the benefits are not shared. That is, they ask about the importance of equity in discussions of growth.

Barro (2019) reminds us to think about different types of taxes and the burden those taxes place on different groups. By design, his model has a progressive income tax and evenly distributed sales tax. That structure may not reflect the conditions in a given state, but his discussion remains instructive, in that it shows how changes in tax policy can alter the tax burden. He finds that property taxes generally improve social welfare relative to income and sales taxes, but the magnitude of the gains depends on the availability of deductions. The Gates Study (Gates, 2002), focusing on the tax structure in Washington, concluded that the sales tax in Washington was regressive and the property tax burdensome. They even recommended replacing the property tax, as well as reducing the sales tax and raising revenue with a new income tax. Their findings were consistent with Barro, in that policy makers need to consider a tax structure that generates stable and adequate revenues, while balancing equity and efficiency criteria.

Quantitative Analysis

In this section, we explore whether the various factors that appear to affect competitiveness have the same influence on different measures of competitiveness. We also analyze how taxes relate to competitiveness. Our objective is to help elected officials and agency staff make better decisions about taxes. For example, if the state needs additional revenue or wants revenue to be more stable over time, they might consider revisions to taxes. Or maybe the state might decide it wants a more equitable (less regressive) tax structure. Regardless of the objective, if changes to taxes are to be considered, decision makers should know how the tax burden on different households relates to economic competitiveness, whether household or corporate tax rates seem to have a stronger relationship with competitiveness, or whether factors other than taxes actually drive competitiveness.

We ask whether variables such as environmental attractiveness (using the proportion of energy produced in each state that comes from renewable sources – following Akpinar et. al., 2017), investments in education, cost of living, and other factors influence competitiveness. We also assess the correlation between competitiveness and the tax burden on households, the corporate tax rate, and the share of revenues that come from different taxes.

One issue we have to address with the data is that many of the variables have clear trends over time. For example, GDP per capita tends to increase over time, as does employment and even the tax burden on lower income households. These trends can make it seem like the variables are highly correlated in ways that are spurious. (Population and inflation both tend to increase over time, but one would not think of those two variables as being directly related in an economically meaningful way.)

We experiment with standard procedures for dealing with serial correlation (when a given variable is clearly related to past values of the same variable). However, rather than transform

the series that are non-stationary, we note that serial correlation does not cause the regression results to be biased. Serial correlation means the results are not efficient and we have to be careful when determining which variables are significant. To address this problem, we compute standard errors that are robust to serial correlation, using the "White Period" option in the EViews software package[77]. In addition, we account for time in the model (using a time fixed effect specification).

We also note that different states or regions of the country have characteristics that affect competitiveness differently – such as climate, differences in infrastructure, and different industries present in the area. Akpinar et. al. (2017) note the importance of clusters in explaining competitiveness. We do not have data on all the different clusters that exist in different states. Nor do we have variables that capture differences in infrastructure or other factors that may influence competitiveness. To address this issue, we include variables in the model to account for regional or spatial effects. Specifically, we include dummy variables for different regions of the country (noting, for example, whether a state is in the New England or Mid-Atlantic area). The dataset is not large enough to support dummy variables for each state in the models. The explicit assumption our using these spatial fixed effects is that there are certain characteristics about a region that do not change significantly over the study period.

Our general model assumes competitiveness is a function of the tax burden on households, the tax structure or ways that states generate tax revenue, and factors such as educational attainment, the attractiveness of an area, and poverty.

The first research question is whether it matters how you measure competitiveness.

We run the model with several specifications, using different measures of competitiveness and explore the impacts of different specific control variables. Measures of competitiveness include GDP per capita, median household income, labor productivity, and the Beacon Hill competitiveness index. Specific controls include whether or not a state has an income tax, cost of living, poverty rate, college enrollment, and environmental attractiveness.

We find environmental attractiveness (measured by the percentage of energy produced by renewable sources, to copy Akpinar et. al.) is correlated with different measures of competitiveness, consistent with Akpinar et. al. (2017). However, we notice that the sign of the coefficient changes depending on the measure of competitiveness and/or what other variables are included in the model. In particular, we find that the sign and statistical significance of environmental attractiveness depends critically on whether spatial dummies are included in the model. In the end, we do not report results for environmental attractiveness, assuming that factor is captured by the spatial fixed effects in the model.

We also find that the presence of an income tax affects competitiveness. That finding is consistent with Dye and Feiock (1995). However, if we focus on the latter part of the sample period, we see the significance of having an income tax decline and become insignificant. That finding is

[77] See Huber (1967) and (1980)

consistent with the work of Deskins and Hill (2010). And while we find that tax burden is sometimes correlated with competitiveness, that finding depends critically on how you measure competitiveness. The significance of tax burden also seems to decline if we focus on the latter half of the sample period. These findings echo those of Jones (1995), Gale et. al. (2014), and Gale et. al (2015).

We do not show results from models with a dichotomous (Y/N) income tax variable. Instead, we show results for models with the share of tax revenues from different sources. States without an income tax report no tax revenue from income taxes.

Exhibit 87 shows regression results with different measures of competitiveness. It illustrates how different variables appear to be significant depending on how you measure competitiveness.

EXHIBIT 87. Sample Results

	Measure of Competitiveness			
	GDP/capita	Median HH Income	Employment	Beacon Hill Index
Constant	77,780.7 *	93,485.7	145.4 *	7.2 *
Tax Burden:				
HH Income 25K	-54,080.6 *	-14,158.1	-432.7	0.7
HH Income 50K	-184,294.6	-23.0	-15,443.7 *	-5.0
HH Income 75K	333,541.6	179,772.8 *	17,356.7	-19.0
HH Income 100K	175,977.8	-37,358.2	33,866.7 *	23.7
HH Income 150K	-349,850.7 *	-106,145.9	-37,935.8 *	-11.6
Share of revenues from:				
Sales tax	-1,887.6	-407.6	440.0 *	-0.4
Income tax	-1,653.6	-308.0	59.3	-0.03
Corporate tax	108.4	-2,291.0	1 018.0 *	-0.3
Population Density	14.7 *	2.4 *	-0.03	-0.0
College Enroll / Cap	0.003 *	0.003 *	0.004 *	0.0
Poverty Rate	-858.2 *	-2,127.9 *	-7.3	-0.2
Adjusted R^2	0.895	0.79	0.97	0.46
Sample	2001 - 2018	2001 - 2018	2001 - 2018	2005 - 2018

Notes:

(a) Model is run with spatial dummy variables (typically all significant) and time fixed effects, as well as White Period standard errors.

(b) Numbers marked with * are significant at the 95% level

The second research question is whether there is a robust relationship between taxes and competitiveness.

For this research question we analyze what happens when we consider different combinations of variables to explain competitiveness. We also focus on median household income and employment as the measures of competitiveness. We set aside GDP per capita because of how GDP can be influenced by specific resource endowments more than policy decisions. We also set

aside the Beacon Hill Index because of the limited correlation between the index and different variables in the model.

We explore models that do not include the tax burden on households, but which maintain variables that capture the share of revenues generated by different taxes. We include these options in case a) there are concerns that the tax burden on households in the largest cities is not a good proxy for tax burden overall, and/or b) policy makers want to focus on the source of tax revenue rather than the burden – because that is what they can control most directly.

Exhibit 88 shows the results of the additional model specifications.

EXHIBIT 88. Focusing on HA Income as Measure of Competitiveness

	Measure of Competitiveness			
	Median HH Income		Employment	
Constant	21,477.1	19,971.8	-2,595.6	-2,608.3
Tax Burden:				
HH Income 25K	-5,630.7		-444.9	
HH Income 50K	19,783.4		-19,779.2 *	
HH Income 75K	77,555.2		16,333.0	
HH Income 100K	29,009.9		44,869.6 *	
HH Income 150K	-110,142.5 *		-43,917.3 *	
Share of revenues from:				
Sales tax	-806.5	-1,319.1	569.2 *	583.0 *
Income tax	-837.8	-1,083.2	160.7	156.0
Corporate tax	-3,835.9	-5,498.2	1,542.0 *	1,558.5 *
Population Density	0.9 *	0.8 *	-0.02	-0.03
College Enroll / Cap	-0.0	-0.0	0.004 *	0.004 *
Poverty Rate	-1,612.3 *	-1,640.4 *	-3.99	-6.5
Cost of Living	604.5 *	618.5 *	1.5	-0.5
Labor Productivity	5.0	13.5	25.4	26.6 (c)
Adjusted R^2	0.85	0.85	0.97	0.97
Sample	2008 - 2018	2008 - 2018	2008 - 2018	2008 - 2018

Notes:

(a) Model is run with spatial dummy variables and time fixed effects, as well as White Period standard errors.
(b) Numbers marked with * are significant at the 95% level
(c) Coefficient is significant at the 90% level

Findings and Discussion

We do not find a robust relationship between taxes and competitiveness. In particular, the share of revenue from sales, income, and corporate taxes does not appear to be correlated with median household income. However, the share of revenue from different sources is correlated with employment, but the indication is that more tax revenue can lead to more employment – counter to the supply side argument that cutting taxes can lead to economic growth. This finding is consistent with Hungerford (2018), Gale et. al. (2014), and Gale et. al. (2015).

The relationship between the tax burden on households and competitiveness is also unclear. Some model specifications support the findings of Jones (2019) – concluding that reducing taxes on higher income households could improve competitiveness. However, other model specifications point to a different relationship between tax burden and competitiveness. Some models suggest it could be helpful to raise taxes on middle income households, while other models suggest it could be beneficial to reduce taxes on lower income households.

Reducing the tax burden on lower income households could improve competitiveness because lowering taxes on those households leads immediately to more spending (as those households spend virtually all of their income) and stimulates economic activity. Perhaps taxing more highly the middle-income group supports the supply of public services in a way that taxing the poor and much higher income groups does not, and the improved public services help make the area more competitive.

The fact that competitiveness may be correlated in different ways (with opposite sign) with the tax burden on different income groups may help explain conflicting results in the literature. Results in previous research based on average tax burden or any single measure of tax burden could be difficult to interpret. It is not clear if the relationship between tax burden and competitiveness for one group might dominate the relationship between tax burden and competitiveness for the other groups when focusing on just one measure of tax burden, such as the overall average.

The different results illustrate how one can reach different conclusions about how taxes relate to competitiveness. One only needs to change the statistical models in small ways to generate different results. We conclude that the connection between tax burden and competitiveness is weak or ambiguous. This ambiguity is consistent with the findings in the review provided by Leachman and Mazerov (2015), adding to the general consensus in the literature that tax structure and/or tax burden is, at best, only loosely connected with competitiveness.

We also note that non-tax related variables, such as college enrollment and poverty rate are typically significant. It seems that measures that reduce poverty and/or that increase college participation could increase competitiveness.

In the end, the results suggest that there is no clear, strong relationship between tax burden, nor tax structure or tax type and competitiveness, or at least not a robust relationship that might serve

as a foundation for policy decisions. Variables other than tax structure or tax burden play vital roles and potentially stronger or more consistent roles in explaining competitiveness.

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