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fund Washington's future"*

Household Tax Burden Model

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Research & Fiscal Analysis

Model Overview

Goal: Estimate average household tax burden by income and region

- Multiple excise tax categories
- Property tax
- Estimate tax burdens under current law or alternative policies

Two Models

- Excise Tax Model
- Property Tax Model

Tax Burden on Households (2014)

Major State and Local Taxes

Current Law

Household Income

	\$0	\$15,000	\$25,000	\$35,000	\$45,000	\$55,000	\$70,000	\$85,000	\$105,000	over
	\$15,000	\$25,000	\$35,000	\$45,000	\$55,000	\$70,000	\$85,000	\$105,000	\$140,000	\$140,000+

Retail Sales Tax	\$905	\$1,170	\$1,453	\$1,690	\$1,988	\$2,340	\$2,729	\$3,217	\$3,832	\$5,908
Alcoholic Beverages Taxes	\$55	\$63	\$78	\$93	\$98	\$119	\$125	\$143	\$167	\$239
Cigarette & Tobacco Taxes	\$156	\$177	\$194	\$197	\$204	\$211	\$198	\$193	\$166	\$119
Insurance Premiums Tax	\$22	\$36	\$47	\$55	\$67	\$74	\$83	\$94	\$107	\$138
Gasoline Tax	\$132	\$184	\$233	\$273	\$311	\$349	\$392	\$427	\$467	\$498
Public Utility Taxes	\$113	\$140	\$157	\$171	\$186	\$199	\$217	\$236	\$258	\$324
Property Tax	\$804	\$1,089	\$1,307	\$1,524	\$1,896	\$2,230	\$2,678	\$3,102	\$3,824	\$6,130
Total Tax	\$2,187	\$2,859	\$3,469	\$4,003	\$4,749	\$5,522	\$6,422	\$7,413	\$8,821	\$13,354

Tax as % of Income	26.5%	14.2%	11.5%	10.0%	9.5%	8.9%	8.3%	7.8%	7.3%	5.9%
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Data Sources

IRS Individual Income Tax Data

- All federal tax returns for Washingtonians in 2017 calendar year

County Property Tax Rolls

- Provided to Department of Revenue by all Washington counties
- Has property values of all land parcels in Washington

American Community Survey (ACS)

- Produced by US Census Bureau
- Nationally representative survey of American households on many topics

County Property Tax Rolls Data

Data point for every land parcel in Washington

- Information about property values, buildings, locations
- Usually includes physical addresses
- Usually includes locally assessed value and property tax exemptions

We focus on single-family units

- Includes residential condominiums and vacation homes
- Single-family units might be owned by households
- Multi-family units are presumed to be rentals

Property Tax Model

1. Join IRS Individual Income Tax Data with County Property Tax Rolls data using addresses
2. Estimate home ownership based on conditional probability distribution
3. Estimate taxable property value for each Washington household (when unavailable)
4. Estimate property tax burdens
5. Aggregate tax burdens by income decile and geographic region

Joining Datasets: Households and Properties

We join the datasets on address

- We find parcel matches for about 56% of the unique addresses in the IRS dataset
- About 67% of WA households live in single-family units (ACS 2017)
- This accounts for about 72% of taxable property value

Limitations

- Sometimes only mailing addresses are available
- Sometimes addresses are missing
- Year mismatch in datasets
 - Tax returns filed in 2018
 - Properties assessed in 2016
- Human errors such as misspelled city names

Estimating Home Ownership

We do not always know whether a household owns their residence

- Senior Tax Exemption implies ownership
- Mortgage interest deduction implies ownership
- About 57.6% home ownership in WA (ACS 2017)

We estimate home ownership as a conditional distribution

- Probit model
- Covariates include income, family size, geographic region
- We assume home ownership if $P(\text{ownership} | X) \geq 0.8$
- This assumption leads to 57.5% estimated home ownership rate

Estimating Taxable Value

Not all households merge to parcels

- About 83% of households living in single-family units are successfully merged with parcel data
- Some portion of the remaining 17% are homeowners for whom we have no taxable property value data

We estimate taxable value with linear regression

- Saturated model
- Covariates include income, family size, geographic region, predicted home ownership, senior tax exemption
- Natural cubic spline for income (six knots)
- Adjusted R^2 of 0.27

Adjustments

- We multiplicatively adjust property tax burdens so they sum to total property tax revenues
- Adjustments are applied statewide, by region, or by county

$$\text{Adjustment} = \text{Actual Total Tax Revenue} / \left(\frac{\text{Estimated HH Tax Revenue}}{\text{Estimated HH \%}} \right)$$

- Adjustment for Washington state property taxes is about 0.81
- Adjustment for Washington local property taxes is about 0.88

Policy Considerations

- State property tax levy rates changed substantially between 2017 and 2019
- Before 2018, Washington had a budget-based property tax system
 - Budget-based means levy held fixed, rates adjusted to meet levy
 - Statewide tax rate was about \$1.90 per \$1,000 of taxable value in 2017
- For taxes due in 2018, Washington adopted a rate-based system and an additional “part 2” tax
 - Rate-based means levy adjusted to meet target rate
 - Target rate for taxes due in 2018 was \$2.70
 - Target rate for taxes due in 2019 was \$2.40

Questions?

