

OFFICIAL
REVENUE
ESTIMATE
Methodology
FY 2019-20



June 2019

Independent Fiscal Office

About the Independent Fiscal Office

The Independent Fiscal Office (IFO) provides revenue projections for use in the state budget process along with impartial and timely analysis of fiscal, economic and budgetary issues to assist Commonwealth residents and the General Assembly in their evaluation of policy decisions. In that capacity, the IFO does not support or oppose any policy it analyzes, and will disclose the methodologies, data sources and assumptions used in published reports and estimates.

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The Independent Fiscal Office was created
by the Act of Nov. 23, 2010 (P.L.1269, No.120).

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INDEPENDENT FISCAL OFFICE

July 3, 2019

The Honorable Members of the Pennsylvania General Assembly:

This report accompanies the Independent Fiscal Office's publication entitled *Official Revenue Estimate: Fiscal Year 2019-20*. The report describes the methodologies used to produce the revenue estimates included in that publication.

Questions or comments regarding the contents of this report are welcome and may be submitted to contact@ifp.state.pa.us.

Sincerely,

MATTHEW J. KNITTEL
Director

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Introduction

This document discusses the methodologies used by the Independent Fiscal Office (IFO) to forecast various tax and non-tax revenues. It contains three parts. The first part provides an overview of the general methods used by the IFO. The second part describes the derivation of Disposable Cash Income (DCI), a constructed income measure used to forecast certain tax revenues that rely on consumption, such as sales and use taxes and lottery purchases. The third part describes the specific models used to forecast major revenue sources. All historical revenue data used by the models described in the final section can be found at the IFO's website (www.ifo.state.pa.us) under the "Data" tab.

General Methods

The methods used to forecast tax revenues can be divided into three groups: (1) cash flow, (2) basic tax liability and (3) full tax liability. For each method, projections might be made on an annual or quarterly basis. The choice of periodicity depends on the time patterns of data and whether quarterly data allow regression models to exploit pertinent information that might be masked by aggregation to an annual basis.

All regression models described in this report use the SAS statistical software package. The software uses a maximum likelihood estimation procedure that corrects for the serial correlation and heteroskedasticity often encountered in time series regressions. For all regressions, diagnostic checks were performed to confirm that regression residuals were normally distributed, uncorrelated and had constant variance over time.

Cash Flow Method

Under the cash flow method, firms act as collection agents for the Commonwealth and remit weekly or monthly tax collections based on recent transactions. Payment rules are simple and refunds are generally not paid because firms merely forward any taxes they collect. Revenues that use the cash flow method include cigarette, realty transfer, fuels, lottery and sales and use taxes. For these revenue sources, tax liability is not accrued over the calendar year. Instead, tax liability is triggered by the consumption of a particular good or service.

Basic Tax Liability Method

Under the basic tax liability method, firms accrue tax liability on a calendar year basis and remit periodic payments based on their anticipated or actual liability. Those payments include two types of remittances: an estimated payment for the current calendar year and a final or "true-up" payment attributable to the prior calendar year. For revenues that use this method, the forecasting equations project calendar year tax liability, which is then converted into cash flows, taking into account any recent overpayments or "safe harbor" payment rules. Due to payment rules and the potential for overpayment of tax liability, cash flow patterns might temporarily diverge from the underlying pattern of actual tax liability. Revenues that use the basic tax liability method include gross receipts, bank shares and insurance premiums taxes.

Full Tax Liability Method

Under the full tax liability method, projections are made for some or all of the fields reported on the tax return. The models that use this method are more complex because (1) multiple forecasts must be made to project tax liability, (2) overpayments of tax liability are common and may be pushed forward as credits into future tax years and (3) tax liability must be converted into cash flows that could span multiple fiscal years. The personal income and corporate net income taxes use this method.

In general, tax return data used for personal and corporate net income tax projections are available with a two-year lag. For this exercise, the latest year of final data is tax year 2016. (For most taxpayers, the tax year and calendar year are the same. The exception is certain firms whose accounting year ends in a month other than December.) However, based on revenues received through May 2019, analysts can construct a fairly accurate estimate of tax year 2017 and 2018 liabilities. Projections of tax liability are then made for tax years 2019 and 2020 and converted into cash flows based on payment rules and historical monthly revenue data.

Derivation of Disposable Cash Income

Personal income tax and sales and use taxes comprise roughly 75 percent of General Fund tax revenues for non-recession years. These two revenue sources are linked because the decision to purchase taxable goods is a function of wage and business income, while wage and business income are simultaneously a function of total consumer and business purchases. Hence, the methodologies used to project these tax revenues should be linked in some manner, whether directly (such as a vector autoregression) or indirectly. The methodology used by the IFO models sales and use taxes as a function of Pennsylvania Disposable Cash Income (DCI) to capture that linkage. The linkage occurs because wage and business income comprise roughly 80 percent of DCI, and the sales tax forecast uses the sum of those two income sources to make projections.

Pennsylvania DCI is equal to Cash Income less Taxes. (See **Table 1.**) Cash Income includes all income earned, received or realized by Pennsylvania residents during the calendar year. The measure is different than state personal income reported by the U.S. Bureau of Economic Analysis in the National Income and Product Accounts because personal income is a measure of “economic” income. Economic income is an appropriate and consistent measure of overall welfare, but it is less useful for projecting tax revenues because it includes certain types of income that individuals cannot spend (e.g., accruals to pension funds and certain imputed income) and, therefore, would not affect consumption-related tax revenues such as sales and use, cigarettes and table games or lottery purchases.

The most complete report of the spendable or cash income of Pennsylvania residents appears on the annual federal income tax return. The IRS publishes those data on its website.¹ However, research shows that some income is not reported on federal tax returns due to reporting errors or non-compliance. Therefore, amounts reported on Pennsylvania federal income tax returns are adjusted to account for unreported income based on IRS “tax gap” studies.² The Cash Income measure also includes all taxable and non-taxable Social Security and other transfer payments made to Pennsylvania residents as reported by the Social Security Administration.

Table 1 decomposes Cash Income into six income categories: labor income (57 percent of total for 2019, includes residence adjustment), capital income (12 percent), business net income (11 percent), retirement income (10 percent) and transfer income (10 percent). The forecast projects that Cash Income will increase to \$638.6 billion in 2019 (4.4 percent) and \$664.6 billion in 2020 (4.1 percent).

Cash Income does not reflect mandatory taxes that must be remitted on income and property. Those taxes include federal, state and local income taxes; state and local property taxes; motor license fees and employee payroll taxes. Historical and projected taxes are listed at the bottom of Table 1. Federal income tax data are from the IRS. State income tax data are from the Pennsylvania Department of Revenue. Other tax

¹ See “SOI Tax Stats – Historic Table 2” (IRS).

² The “tax gap” is the difference between actual collections and the amounts that should be remitted. The IRS defines the “net misreporting percentage” as the share of true income not reported. A recent tax gap study finds the following net misreporting percentages: wage income (1 percent), net capital gains (13 percent), dividends (7 percent), interest (3 percent), S corporation and partnership income (16 percent), sole proprietorship income (64 percent), pension income (4 percent) and social security income (19 percent). See “Federal Tax Compliance Research: Tax Gap Estimates for Tax Years 2008–2010” (IRS, May 2016). These adjustments are also made by the U.S. Bureau of Economic Analysis for the corresponding elements of personal income.

data are from the U.S. Census Bureau or the U.S. Social Security Administration (payroll taxes).^{3,4}

The forecast projects that federal, state and local income, property and payroll taxes of Pennsylvania residents will total \$124.9 billion (3.4 percent increase) for 2019 and \$129.8 billion (3.9 percent increase) for 2020.

The deduction of Taxes from Cash Income yields Disposable Cash Income. That series provides the most complete measure of income that is available for spending or consumption.

³ All taxes are displayed on a cash flow basis (when they are remitted) as opposed to a liability basis (as they are accrued). See "State and Local Government Finances" (U.S. Census).

⁴ See "Annual Statistical Supplement, 2016" (U.S. Social Security Administration).

Table 1
Pennsylvania Disposable Cash Income

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Type of Income													
Wages and Salaries	\$260.4	\$254.4	\$259.6	\$269.7	\$280.0	\$285.2	\$296.4	\$308.3	\$312.5	\$324.8	\$338.2	\$352.1	\$366.6
Capital Income													
Capital Gains	14.1	8.6	12.7	13.2	21.5	16.9	23.4	26.8	22.9	29.8	32.7	34.5	34.9
Dividends	9.5	7.0	8.6	8.3	11.2	8.7	10.4	10.1	10.1	11.1	12.0	12.7	13.4
Interest-Rent-Royalty	21.2	20.0	20.5	21.5	21.7	21.5	24.0	24.5	25.5	25.6	27.2	28.6	30.0
Business Net Income ¹	47.3	44.3	47.9	50.2	55.2	54.3	57.2	59.7	60.0	61.1	67.2	70.0	73.1
Pensions and Savings	36.8	34.9	39.8	42.5	46.3	49.6	52.4	54.5	56.1	58.2	60.8	63.4	66.2
Government Transfers													
Social Security	31.2	33.9	34.8	35.7	37.8	39.4	40.8	42.3	43.2	44.3	46.3	48.1	50.4
Income Maintenance	13.9	20.0	21.6	20.2	19.7	18.7	17.6	18.0	18.0	17.7	17.9	18.2	18.7
Residence Adjustment	<u>8.6</u>	<u>7.3</u>	<u>8.0</u>	<u>7.9</u>	<u>8.2</u>	<u>8.2</u>	<u>9.0</u>	<u>8.9</u>	<u>9.5</u>	<u>10.2</u>	<u>10.4</u>	<u>10.9</u>	<u>11.3</u>
Cash Income	442.9	430.4	453.6	469.2	501.6	502.6	531.0	553.2	557.8	582.9	612.7	638.6	664.6
Growth Rate	-1.9%	-2.8%	5.4%	3.4%	6.9%	0.2%	5.7%	4.2%	0.8%	4.5%	5.1%	4.2%	4.1%
Taxes													
Federal Income	42.2	38.5	40.8	42.9	47.2	48.9	53.1	56.4	56.7	59.3	56.7	58.4	60.9
State: Income, Property, Motor	30.6	29.9	30.5	31.2	32.1	33.5	34.2	35.5	36.8	37.7	39.3	40.8	42.2
Employee Payroll (OASDI and HI)	<u>19.6</u>	<u>19.0</u>	<u>19.2</u>	<u>14.9</u>	<u>15.4</u>	<u>21.2</u>	<u>21.8</u>	<u>22.8</u>	<u>23.0</u>	<u>23.9</u>	<u>24.8</u>	<u>25.7</u>	<u>26.7</u>
Less: Total Taxes	92.4	87.4	90.5	89.0	94.7	103.6	109.1	114.7	116.5	120.9	120.8	124.9	129.8
Growth Rate	0.2%	-5.4%	3.6%	-1.7%	6.4%	9.4%	5.2%	5.3%	1.6%	3.7%	-0.1%	3.4%	3.9%
Disposable Cash Income	350.5	343.0	363.1	380.2	406.9	399.0	421.9	438.5	441.3	462.0	491.9	513.7	534.8
Growth Rate	-2.5%	-2.2%	5.8%	4.7%	7.0%	-1.9%	5.8%	3.9%	0.6%	4.7%	6.5%	4.4%	4.1%

Note: figures in dollar millions. Calendar year data. Federal income taxes are on a cash flow basis.

¹ Includes S corporation, partnership and sole proprietorship net income.

Source: Historical data are from IRS Statistics of Income Division, U.S. Census Bureau and Social Security Administration. Projections are from the IFO.

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General Fund Methodologies

Cigarette Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$1,024	\$977	\$927	\$912	\$1,262	\$1,198	\$1,121	\$1,063
Growth Rate	-4.3%	-4.6%	-5.1%	-1.7%	38.4%	-5.0%	-6.4%	-5.2%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

Effective August 1, 2016, the tax rate is 13 cents per cigarette or \$2.60 per pack (20 cigarettes per pack). Previously, the tax rate was 8 cents per cigarette or \$1.60 per pack.

Base

The tax is imposed per cigarette or little cigar weighing less than 4 lbs. per thousand.

Transfers

Annual transfers of \$30.730 million and \$25.485 million are made to the Children’s Health Insurance Program (CHIP) and the Agricultural Conservation Easement Purchase (ACEP) Fund, respectively. For any fiscal year in which the revenue deposited into the Local Cigarette Tax Fund (Philadelphia cigarette tax) is less than \$58 million, an amount equal to \$58 million less actual fiscal year collections will be transferred from General Fund cigarette tax revenues to the Local Cigarette Tax Fund by July 15th following the end of the fiscal year. The first transfer occurred in July 2017 and the amount for July 2019 is projected to be \$18.4 million.

Exemptions

Exemptions include sales to veterans’ organizations if cigarettes are purchased for gratuitous issue to veteran patients in federal, state or state-aided hospitals, sales to voluntary unincorporated organizations of military forces personnel and sales to retail dealers located in Veterans’ Administration hospitals for sales to patients.

Methodology

Collections for FY 2018-19 are based on revenues for the first eleven months of the current fiscal year. Base consumption for FY 2019-20 is projected using a Holt-Winters additive smoothing model incorporating rate-adjusted quarterly data for 2003Q1 through 2019Q2. The projected tax base is then converted to a cash estimate by adjusting to the current cigarette tax rate. The estimate is then reduced to account for the impact of the annual Philadelphia cigarette tax transfer and the transfers to CHIP and to ACEP.

Corporate Net Income Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$2,423	\$2,502	\$2,811	\$2,842	\$2,751	\$2,879	\$3,381	\$3,472
Growth Rate	19.8%	3.2%	12.4%	1.1%	-3.2%	4.6%	17.4%	2.7%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 9.99 percent.

Base

The tax is levied on federal taxable income, modified by certain additions (e.g., certain federal “bonus” depreciation) and subtractions (e.g., foreign income). Firms that file a consolidated federal income tax return must report on a separate company basis for Pennsylvania corporate net income tax (CNIT) purposes. Multistate firms apportion net income using market-based sourcing rules and a 100 percent sales factor.

Transfers

None.

Exemptions

All pass-through business entities (S corporations, partnerships and sole proprietors) and non-profit corporations are exempt from CNIT. Limited liability companies that elect to be taxed as partnerships for federal tax purposes are also exempt from tax. Banks, savings and loan agencies and insurance companies remit other corporate levies in lieu of the CNIT.

Methodology

The CNIT model is a simplified full tax liability model. The model uses the latest corporate payment data to assign estimated and final payments to the tax year from which they originate. Gross tax liability by tax year is then extrapolated to future years using the growth in (national) domestic profits of non-financial corporations. The base tax year from which this extrapolation is made is currently tax year 2018. The model then converts tax liability to fiscal year cash flows based on historical payment patterns.

Financial Institution Taxes

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$351	\$318	\$294	\$330	\$323	\$371	\$385	\$387
Growth Rate	29.0%	-9.6%	-7.5%	12.2%	-2.3%	15.1%	3.8%	0.5%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 0.95 percent for banks and trust companies, and 11.5 percent for mutual thrift institutions.

Base

The tax on banks and trust companies is levied on the (apportioned) value of capital stock shares as of January 1. The tax on mutual thrift institutions is levied on net income.

Transfers

None.

Exemptions

Shares held by tax-exempt entities and credit unions are not subject to tax.

Methodology

The bank and trust company tax forecast utilizes a structural model, which incorporates the growth of bank equity capital and recent revenue collections. Statutory changes to the bank shares tax effective January 1, 2014 include (1) the reduction of the tax rate from 1.25 percent to 0.89 percent, (2) the elimination of the six-year moving average to calculate the tax base and (3) requiring interstate apportionment of tax liabilities based solely on receipts. The bank shares tax rate increased from 0.89 percent to 0.95 percent effective January 1, 2017.

The mutual thrift institution tax forecast utilizes state GDP to predict future tax liabilities from recent revenue collections. Tax year payments are converted to fiscal year receipts based on the historical split between estimated and regular payments.

Gross Receipts Tax

Gross Receipts Tax Historical and Projected Revenues								
	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$1,306	\$1,279	\$1,262	\$1,305	\$1,231	\$1,150	\$1,249	\$1,214
Growth Rate	-1.8%	-2.1%	-1.4%	3.4%	-5.7%	-6.6%	8.6%	-2.8%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 59 mills for electric light, water power and hydroelectric companies, and 50 mills for telecommunications and transportation companies.

Base

The tax is levied on gross receipts from certain sales.

Transfers

Revenues are net of the 0.25 mill transfer to the Alternative Fuels Incentive Grant Fund.

Exemptions

Gross receipts (1) of public utilities owned or operated by a municipality to the extent the receipts are derived from business done within the municipality, (2) derived from the sale of electricity by an electric light company which are attributable to the recovery of purchase energy costs, clean-up costs and investment write-off costs due to damage to a nuclear generating facility or (3) of electric cooperatives, are exempt from tax.

Methodology

The gross receipts tax (GRT) forecast utilizes a basic tax liability model. The model projects tax year receipts for three sectors: electric, telecommunications and transportation using historical trends and related economic data. Tax year receipts are then broken out into fiscal year receipts based on historical splits between estimated and regular payments. The increase in gross receipts tax collections in FY 2018-19 was primarily the result of strong estimated payments (tax year 2019) for the electric sector and final payments (tax year 2018) for the telecommunications sector. According to data from the U.S. Energy Information Administration (EIA), Pennsylvania electric receipts increased in 2017 (1.0 percent) and 2018 (3.1 percent) which was attributable to higher prices (2017) and demand (2018). The FY 2019-20 forecast assumes (1) growth in the electric sector is partially offset by timing factors which pulled revenue into FY 2018-19, but will reverse in FY 2019-20 and (2) the continued erosion of telecommunications receipts due to the shift to data services (not subject to GRT) and the bundling of telecommunication services for a flat fee.

Inheritance Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$845	\$877	\$1,002	\$962	\$978	\$1,019	\$1,044	\$1,070
Growth Rate	2.1%	3.8%	14.2%	-4.0%	1.6%	4.2%	2.5%	2.4%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is based on the beneficiary's relationship to the decedent. Transfers of property to lineal heirs are taxed at 4.5 percent; transfers to siblings are taxed at 12 percent and transfers to all other persons (excluding spouses and certain parents) are taxed at 15 percent. The tax must be paid within nine months following the decedent's death, with a discount of 5 percent allowed if paid within three months.

Base

The value of property at the time of the decedent's death, as well as the value of certain transfers made during the decedent's lifetime.

Transfers

None.

Exemptions

Property transferred to a spouse or to a parent from a child under 21 years of age is exempt from the tax. Additionally, transfers to governmental entities, veteran organizations, charitable or fraternal organizations and transfers of family farms and equipment for the business of agriculture are exempt.

Methodology

The regression uses a log transformation with fiscal year inheritance tax revenues as the dependent variable and nominal national GDP and the S&P 500 Index as the independent variables. The regression also includes a dummy variable for the former estate tax.⁵ The regression uses historical data from FY 1988-89 through FY 2018-19. The estimate for FY 2018-19 is based on collections for the first eleven months of the fiscal year.

⁵ The estate tax was a pick-up tax that allowed Pennsylvania to absorb the maximum credit for state inheritance and estate taxes permitted under federal law. The Pennsylvania estate tax was equal to the difference between the state taxes paid and the maximum federal credit. The American Taxpayer Relief Act of 2012 extended the deduction for the estate tax but did not reintroduce the credit.

Insurance Premiums Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$447	\$432	\$454	\$465	\$433	\$451	\$443	\$467
Growth Rate	-2.5%	-3.3%	5.1%	2.3%	-6.7%	4.0%	-1.7%	5.3%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 2 percent on gross premiums (along with any applicable retaliatory tax), 3 percent on surplus lines insurance and 5 percent on marine insurance.⁶

Base

The tax is imposed on gross premiums of domestic and foreign insurance companies with business transactions in Pennsylvania. Gross premiums are considered to be premiums, premium deposits or assessments. For marine insurance companies, underwriting profits are taxed in lieu of premiums. The surplus lines insurance tax is imposed on the insured party instead of the insurance company.

Transfers

Revenues from foreign fire insurance companies are deposited into the Fire Insurance Tax Fund and revenues from foreign casualty insurance companies are deposited into the Municipal Pension Aid Fund.

Exemptions

Purely mutual beneficial associations, nonprofit hospitals and medical associations are exempt from tax. Additionally, canceled policies, premiums for reinsurance, annuity considerations and dividends, earnings of participating members in mutual or stock insurance companies and premiums written by automobile insurance companies for extraordinary medical benefit coverage are exempt from tax.

Methodology

The forecast utilizes a basic tax liability model to project estimated, regular and other payments by tax year. Tax year liabilities are adjusted for the application of Innovate PA and Pennsylvania Life and Health Insurance Guaranty Association (PLHIGA) tax credits and converted to fiscal year cash collections based on historical data.

⁶ A retaliatory tax is imposed on companies incorporated in other states that impose a higher burden on Pennsylvania companies doing business there.

Liquor Tax

Liquor Tax Historical and Projected Revenues

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$311	\$321	\$334	\$348	\$362	\$372	\$383	\$396
Growth Rate	4.4%	3.1%	4.2%	4.1%	4.0%	2.7%	3.1%	3.5%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 18 percent of the net retail purchase, which includes the wholesale cost of the product, plus any mark-up, handling charge and federal tax.

Base

The tax is levied upon all liquors sold by the Liquor Control Board.

Transfers/Exemptions

None.

Methodology

The liquor tax forecast is a structural model based on a growth rate that takes into account recent trends in revenue collections. Beginning in FY 2016-17, collections include the impact of liquor modernization (Acts 39 and 85 of 2016).

Malt Beverage Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$25	\$25	\$24	\$25	\$24	\$24	\$23	\$23
Growth Rate	-2.9%	-0.2%	-2.5%	1.9%	-2.2%	-1.1%	-3.4%	0.0%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is two-thirds cents per half pint or eight fluid ounces; in larger quantities, the rate is one cent per pint or 16 fluid ounces. The rate has remained constant since 1947.

Base

The malt beverage tax is levied upon malt or brewed beverages manufactured and sold for use in Pennsylvania, or manufactured outside of Pennsylvania but sold for importation and use in Pennsylvania.

Transfers/Exemptions

None.

Methodology

The malt beverage tax forecast is a structural model based on a growth rate that takes into account recent trends in revenue collections. This revenue source is generally unresponsive to economic conditions. Beginning in FY 2017-18, revenues are reduced by \$2 million for the reinstated Brewer's Tax Credit.

Other Tobacco Taxes

Other Tobacco Taxes Historical and Projected Revenues								
	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$0	\$0	\$0	\$0	\$84	\$119	\$130	\$135
Growth Rate	n.a.	n.a.	n.a.	n.a.	n.a.	42.0%	9.2%	3.5%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 55 cents per ounce of smokeless, pipe or roll-your-own tobacco. The tax is imposed at a rate of 40 percent of the wholesale price of e-cigarette products.

Base

The tax is imposed per ounce of smokeless, pipe and roll-your-own tobacco products and on the wholesale price of e-cigarettes (vapor-producing devices and liquid cartridges).

Transfers

None.

Exemptions

Products that are exported for sale outside the Commonwealth are exempt from the other tobacco products tax.

Methodology

Other tobacco products tax revenues are projected using tobacco product shipment and quarterly revenue data for 2016Q3 through 2019Q2. The smokeless, pipe and roll-your-own tax base was calculated by projecting national shipments of other tobacco products, then adjusting for the population of Pennsylvania. The e-cigarette revenue projection is based on e-cigarette smoking prevalence, population and other tobacco products inflation.

Personal Income Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Withheld	\$8,523	\$8,744	\$9,072	\$9,391	\$9,614	\$10,037	\$10,447	\$10,875
Non-withheld	<u>2,848</u>	<u>2,693</u>	<u>3,036</u>	<u>3,115</u>	<u>3,050</u>	<u>3,362</u>	<u>3,601</u>	<u>3,765</u>
Total	11,371	11,437	12,107	12,506	12,664	13,399	14,048	14,640
Growth Rate	5.3%	0.6%	5.9%	3.3%	1.3%	5.8%	4.8%	4.2%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 3.07 percent.

Base

The tax is levied upon the taxable income of resident and non-resident individuals, estates and trusts and pass-through business entities. Eight income categories comprise taxable income: (1) compensation for labor services (e.g., wages, salaries, options, bonuses), (2) net business profits, (3) net capital gains, (4) rent and royalty income, (5) dividends, (6) interest, (7) gambling and lottery proceeds and (8) gains or income distributed from estates or trusts. Losses may only be used to offset gains within the same category of income.

Transfers

None.

Exemptions

Major exemptions include: qualified distributions from certain savings plans (e.g., 401k and Individual Retirement Accounts), pensions, all gains from sales of principal residences, contributions made to Health Savings Accounts and Archer Medical Accounts, any payments made by employers on behalf of employees for health or life insurance, life insurance proceeds, unemployment compensation, worker's compensation, compensation for certain military service and most educational grants and scholarships.

Methodology

The personal income tax (PIT) model is a full tax liability model that projects values for each of the eight income categories that comprise taxable income. The model makes projections from the latest year that tax data are available (preliminary 2017 data) through 2020 and then applies the single tax rate to total projected taxable income to determine calendar year tax liability. Tax liability is then converted into payments on a fiscal year cash flow basis.

Tax return data show that wage-salary income comprises the majority of Pennsylvania personal taxable income (approximately 78 percent), while business net income (10 percent) and dividends, capital gains, interest and other taxable income sources (12 percent combined) comprise the residual amount. Tax on wage and salary income is largely remitted through employer withholding. Tax on business net income,

rents, estate income and other types of non-wage income are remitted through quarterly estimated payments (roughly 55 percent of non-withheld income) and the April final payment (45 percent of non-withheld income).

Although tax return data are not yet available for 2018, revenues through May 2019 may be used to estimate the 2018 tax year liability. Taxable compensation (generally wages) that will be reported on tax returns can be predicted accurately based on the very high correlation between withholding remittances and reported wage income. For non-wage income, estimated and annual payment data can inform the level of income that will be reported, but not the composition of that income (e.g., net business profits versus capital gains), so judgment must be used to estimate the composition of this type of income. Once the model establishes taxable income and payments for the appropriate tax years, the various categories of income can be projected based on the economic forecast.

Estimation of PIT Income Sources

The personal income tax model has two components based on income type and manner of remittance: wage income (withholding) and non-wage income (estimated and annual payments).

Wage Income: The growth rate of wages-salaries from the economic forecast is used as an extrapolator to predict future withholding remittances and taxable compensation.

Non-Wage Income: To predict non-wage income and the resulting estimated and final payments, the model projects all non-wage income categories separately for each tax year. All regressions use annual data and the same historical time period (1997-2017).⁷ The forecast uses the methodologies listed below to project the liabilities associated with each of the income categories reported on the Pennsylvania tax return.

- Net Business Income: A regression model that uses the log of business net income as the dependent variable and the log of state GDP as the primary independent variable was used to inform growth rates in tax years 2018 through 2020. Adjustments to the growth rates for tax year 2017 through 2019 were made to account for a shift in business profits from tax year 2017 to 2018 and 2019 by high-income tax filers who delayed the realization of income at the end of 2017 in anticipation of lower federal tax rates in 2018.
- Net Capital Gains (Including Sale of Property) and Dividends: The forecast assumes that both series return to a historical share of state GDP over the next five years. Similar to net business income, growth rate adjustments were made for tax years 2017 through 2019 to account for behavioral impacts due to the anticipation of lower federal tax rates in 2018.
- Interest Income: Interest income is primarily a function of the average growth rates of various short- and long-term interest rates. The model projects interest income based on a regression that uses the log of interest income as the dependent variable and two independent variables including the log of state GDP and the log of a computed five-year weighted average rate for (1) the three-month treasury bill, (2) the one-year treasury bill and (3) the five-year treasury note.
- Rents, Royalties, Patents and Copyrights: The model assumes that the overall growth in royalty payments tracks with the projected growth in natural gas prices. The yearly growth rates of the residual income (i.e. rents, patents and copyrights) is extrapolated based on the current forecast of state GDP.

⁷ Only preliminary data are available for 2017.

- Estates and Trusts and Gambling and Lottery Earnings: These income categories comprise less than one percent of Pennsylvania taxable income and are extrapolated based on the current forecast of state GDP.

Tax Year Payments into Fiscal Year Cash Flow

After calculating the total payments for each tax year, the model then converts this payment stream into a fiscal year cash flow based on recent years of remittance data. The model utilizes adjustments to account for: (1) the split between estimated and final payments for non-wage income, (2) the typical withholding, quarterly and annual payment pattern for non-recession years and (3) the impact of various tax law changes, such as the impact of Act 43 of 2017 changes on nonresident withholding.

Realty Transfer Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$339	\$375	\$414	\$482	\$478	\$514	\$534	\$568
Growth Rate	15.9%	10.8%	10.2%	16.4%	-0.8%	7.6%	3.8%	6.3%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 1 percent, customarily divided equally between buyer and seller.

Base

The tax is levied upon the actual consideration or price of real property and contracted-for improvements to property transferred by deed, instrument, lease or other writing. The tax is due upon the presentation of the document for recording, or 30 days after the acceptance of the document, whichever comes first. The tax is remitted to the county recorder of deeds and forwarded to the Commonwealth.

Transfers

General Fund tax revenues are net of a 15 percent transfer to the Keystone Recreation, Park and Conservation Fund. Beginning in July 2016, revenues equal to the lesser of (1) \$25.0 million or (2) forty percent of the difference between revenues collected in the prior fiscal year and \$447.5 million are transferred annually to the Housing Affordability and Rehabilitation Fund. The transfer for FY 2019-20 is projected to be \$25 million.

Exemptions

Government entities are exempt from the tax as are certain transfers among family members, family farms, religious organizations, nonprofit industrial development agencies, volunteer organizations and transfers between shareholders and partners. The exempt status of one party does not relieve other parties from the full amount of tax due.

Methodology

The realty transfer tax projection uses a cash flow model and forecasts revenues using a log transformation

and quarterly data, with revenues as the dependent variable and the residential tax base as the independent variable. The residential tax base is equal to Pennsylvania existing home sales multiplied by the Pennsylvania median existing home sales price. The regression uses data from 2011Q1 through 2019Q2. Although the model does not directly incorporate an economic variable to represent the business portion of the tax base, it is assumed that revenues for that portion closely correlate with residential sales.

Sales and Use Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Non-Motor	\$7,726	\$7,892	\$8,167	\$8,448	\$8,638	\$8,989	\$9,624	\$9,996
Motor	<u>1,168</u>	<u>1,238</u>	<u>1,326</u>	<u>1,347</u>	<u>1,367</u>	<u>1,393</u>	<u>1,495</u>	<u>1,548</u>
Total	8,894	9,130	9,493	9,795	10,004	10,381	11,119	11,544
Growth Rate	1.4%	2.7%	4.0%	3.2%	2.1%	3.8%	7.1%	3.8%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 6 percent.

Base

The tax is levied upon the retail sale of tangible personal property and certain services. Use tax is levied upon tangible personal property and taxable services purchased outside the Commonwealth but used therein if tax was not paid at time of purchase. A hotel occupancy tax is levied upon room rentals of less than 30 days by the same person.

Transfers

General Fund tax revenues are net of (1) a transfer of 0.947 percent to the Public Transportation Assistance Fund and (2) a transfer of 4.4 percent to the Public Transportation Trust Fund beginning in FY 2007-08. An additional transfer to the Public Transportation Trust Fund will begin in FY 2022-23. This transfer is based on the greater of: (1) the ratio of \$450 million to FY 2021-22 sales tax receipts multiplied by current year sales tax receipts or (2) \$450 million. Beginning in FY 2016-17 and thereafter, transfers are made to the Commonwealth Financing Authority for debt service payments. The amount and timing of the transfers is determined by the State Treasurer and Secretary of the Budget.

Exemptions

Major exemptions include: food (ready-to-eat food is not exempt), most footwear and clothing, textbooks, prescription and non-prescription drugs, sales for resale and residential heating fuels. All government and non-profit purchases are also exempt.

Methodology

The sales and use tax model is a quarterly cash flow model with two components: non-motor vehicle and motor vehicle. Most non-motor sales and use taxes are remitted monthly, based on actual collections from

the prior month and anticipated collections for the current month. For motor vehicle purchases, the sales tax remittance occurs when the application for title is made.

The non-motor vehicle regression uses a log transformation, quarterly data and three explanatory variables: wage and business net income, the housing price index and certain business purchases that are subject to sales tax (e.g., computers, software and communications equipment).⁸ The motor vehicle regression uses a log transformation, quarterly data and two explanatory variables: wage and business net income and Pennsylvania new car and light truck registrations. Motor and non-motor model projections are gross of any transfers, which are deducted from projections to derive net flows to the General Fund.

Gaming Taxes

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$89	\$90	\$96	\$100	\$121	\$123	\$133	\$154
Growth Rate	-6.7%	2.0%	6.0%	4.5%	20.4%	2.0%	7.8%	16.0%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The table games tax rate is 14 percent during the first two years following commencement of table games and 12 percent thereafter. An additional 34 percent tax is levied on fully automated electronic gaming tables. Act 84 of 2016 temporarily increased the table games tax rate from 12 percent to 14 percent, effective July 1, 2016 and expiring on June 30, 2019. A tax rate of 15 percent is imposed on fantasy contests, 14 percent on iGaming (table games only), 42 percent on video gaming terminals (VGTs) and 34 percent on sports betting.

Base

The tax is levied upon the gross table game revenue of licensed gaming entities. The base includes the total cash received from contest fees, table game play and rake collected, less cash paid out to fund prizes distributed to players as a result of a table game win, including funds used to purchase annuities and personal property distributed as prizes.

Transfers

If the Secretary of the Budget certifies that the balance in the Budget Stabilization Reserve Fund exceeds \$750 million, the revenues from the table games tax are deposited into the Property Tax Relief Fund.

Exemptions

None.

⁸ Business purchases are based on U.S. investment data from the Bureau of Economic Analysis. State level data on business purchases are not available.

Methodology

The FY 2018-19 estimate is based on current trends and historical collection patterns through May. The full fiscal-year estimate is then grown by the increase in state GDP for Arts, Entertainment and Recreation for FY 2019-20 and adjusted for new revenues attributable to gaming expansion.

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Motor License Fund Methodologies

Motor Licenses and Fees

	2013	2014	2015	2016	2017	2018	2019	2020
Veh. Reg. & Titling	\$688	\$686	\$728	\$720	\$758	\$776	\$734	\$788
Reg. Other States	87	96	96	123	122	139	146	152
Operators' Licenses	61	54	76	71	70	68	74	73
Spec. Hauling Permit	28	27	37	33	32	37	37	38
REAL ID	0	0	0	0	0	0	2	30
Other Misc.	28	31	14	15	19	27	10	-54
Total	893	894	951	963	1,001	1,046	1,003	1,027
Growth Rate	0.0%	0.2%	6.4%	1.2%	3.9%	4.5%	-4.1%	2.4%

Note: figures in dollar millions. Years are fiscal year ending.

Rates

Act 89 of 2013 increased many of the fees imposed by Title 75 and tied future increases to the rate of inflation. In general, fees are adjusted on July 1st of any calendar year ending in an odd number. The adjustment is based on the percentage change in the consumer price index for all urban consumers (CPI-U) for the 24-month period ending on the January 31st prior to the increase. The fee increases effective July 1, 2019 were determined based on the change in the CPI-U for the period February 1, 2017 to January 31, 2019, or 3.6539 percent.

Vehicle Registration Fees: Fees vary depending on the vehicle type and weight. Two of the most common fees are passenger cars at \$37 and motorcycles at \$19. These fees will increase to \$38 and \$20 respectively, effective July 1, 2019. Registration fees for trucks and truck tractors range from \$62 to \$2,244 (depending on weight) and will range from \$64 to \$2,326 effective July 1, 2019.

Vehicle Titling Fees: The current fee of \$53 will increase to \$55 on July 1, 2019. This category was fully transitioned to the Public Transportation Trust Fund and the Multimodal Transportation Fund beginning with FY 2017-18.

Registration Fees Received from Other States/International Registration Plan (IRP): Proportional registration fee of trucks and other large commercial vehicles that travel over state lines.⁹

Operators' License Fees: Varies depending on type and length of license. Two common fees are the four-year license renewal (\$30.50) and the four-year commercial license renewal (\$94.50). The four-year commercial license renewal will increase to \$98.50 on July 1, 2019.

⁹ It is proportional based on the miles traveled in each state or province (Canada). For example, if a truck that weighs 80,000 lbs. drives 25 percent of its total miles in Pennsylvania, Pennsylvania would receive 25 percent of the normal Pennsylvania registration fee for that truck.

Special Hauling Permit Fees: Fees are equal to a base amount of \$36 or \$75 (depending on width) plus a factor for weight and miles traveled (4 cents multiplied by weight in tons and total miles traveled). These fees will increase to \$37 or \$78 (depending on width) effective July 1, 2019. The factor for weight and miles traveled will remain the same.

REAL ID: The one-time fee to upgrade an operator's license to a REAL ID is \$30.¹⁰

Base

Vehicle Registration Fees: Most are annual per vehicle.

Vehicle Titling Fees: Fee paid when a vehicle is sold or transferred (in most cases).

Registration Fees Received from Other States/IRP: Annually per truck or large commercial vehicle, based on the proportion of miles driven in Pennsylvania in the previous one-year period.

Operators' License Fees: Fee paid by all individuals who are residents of Pennsylvania and operate a motor vehicle. Most fees are generated by four-year licenses.

Special Hauling Permit Fees: Operators that move certain loads or vehicles (e.g., oversized or overweight) over Pennsylvania roads.

REAL ID: Pennsylvania residents that opt to upgrade their current operator's license to a REAL ID.

Transfers

A portion of the registration fee for trucks exceeding 26,000 lbs. is deposited into the Highway Bridge Improvement Restricted Account. The amount placed in this account ranges from \$72 to \$180 per registration depending on truck weight.

Exemptions

Exemptions from vehicle registration fees include certain farm equipment, golf carts, mobile homes, vehicles moved solely by human or animal power and certain construction equipment. Exemptions from commercial operator license fees include military personnel who operate commercial vehicles for military purposes, firefighters or emergency squad members who operate various emergency vehicles and drivers operating farm equipment.

Methodology

Vehicle Registration and Titling: The FY 2018-19 vehicle registration and titling estimate is based on year-to-date collections projected through the end of the current fiscal year. The FY 2019-20 estimate utilizes a structural model based on historical collection patterns and adjusted for fee increases imposed under Act 89 of 2013. Additionally, there will be an increase of \$27.7 million for a prior year adjustment related to the phase-in of transfers to the Public Transportation Trust Fund and the Multimodal Transportation Fund

¹⁰ Beginning October 1, 2020, Pennsylvanians will need a REAL ID-compliant driver's license, photo identification (ID) card, or another form of federally-acceptable identification (such as a valid passport or military ID) to board a domestic commercial flight or enter a federal building or military installation that requires ID. See <https://www.dmv.pa.gov/REALID/Pages/default.aspx>.

under Act 89 of 2013.

Registration Fees from Other States/IRP: The FY 2018-19 estimate is based on year-to-date collections projected through the end of the current fiscal year. The FY 2019-20 estimate utilizes a structural model based on historical collection patterns and adjusted for fee increases imposed under Act 89 of 2013.

Operators' Licenses: Operators' license revenue does not appear to be significantly linked to any economic variable, but it does contain a small four-year cyclical component. The FY 2018-19 estimate is based on year-to-date collections projected through the end of the current fiscal year. The FY 2019-20 estimate utilizes a structural model based on historical collection patterns.

Special Hauling Permit Fees: The FY 2018-19 estimate is based on year-to-date collections projected through the end of the current fiscal year. A structural model is used to forecast growth for FY 2019-20.

REAL ID: The FY 2018-19 is based on year-to-date collections projected through the end of the current fiscal year. The FY 2019-20 estimate is from the 2019-20 Executive Budget.

Other Miscellaneous Fees: The FY 2018-19 estimate is based on year-to-date collections projected through the end of the current fiscal year. The FY 2019-20 estimate utilizes a structural model based on historical collection patterns. Additionally, there will be a reduction of \$63.2 million for a prior year adjustment related to the phase-in of transfers to the Public Transportation Trust Fund and the Multimodal Transportation Fund under Act 89 of 2013.

Oil Company Franchise Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$445	\$534	\$747	\$837	\$904	\$1,018	\$1,005	\$1,000
Growth Rate	-2.8%	20.0%	39.9%	12.0%	8.0%	12.7%	-1.3%	-0.5%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate is 153.5 mills for liquid fuels (gasoline) and 208.5 mills for fuels (diesel) applied to the average wholesale price (AWP) of liquid fuels and fuels, and expressed on a cents-per-gallon basis. Prior to January 1, 2014, the average wholesale price was capped at \$1.25 per gallon and the tax rate had been 19.2 cents per gallon for gasoline and 26.1 cents per gallon for diesel. Act 89 of 2013 increased the AWP to \$1.87 per gallon effective January 1, 2014, and \$2.49 per gallon effective January 1, 2015. The AWP is a minimum of \$2.99 per gallon effective January 1, 2017 (no cap).

For the 12-month period ending September 30, 2018, the Department of Revenue determined the actual AWP to be \$2.04 per gallon. Therefore, the AWP used to calculate the 2019 OFT rates was the statutory minimum of \$2.99 per gallon and the tax rates are 45.9 cents per gallon for liquid fuels and 62.4 cents per gallon for fuels. Bus companies may apply for a reimbursement credit equal to 55 mills of the tax (roughly 16.4 cents per gallon at the current AWP).

Base

The tax is imposed on a cents-per-gallon basis on all liquid fuels and fuels as defined by statute.

Transfers

57 mills (roughly 17.0 cents per gallon at the current AWP) is deposited into the Motor License Fund (MLF) as unrestricted revenue. Beginning in FY 2015-16, \$35 million of the unrestricted portion of the tax is transferred to the Multimodal Transportation Fund. The remaining portion of the tax reflects restricted receipts and is deposited into various restricted revenue accounts, distributed to municipalities, etc. The projections listed above correspond to unrestricted receipts that remain in the MLF.

Exemptions

Exemptions include fuel that is delivered to: the federal government, the Commonwealth, a political subdivision, a volunteer fire or ambulance company, volunteer rescue squad, a second class county port authority or a nonpublic nonprofit school. The tax is also not imposed on fuel used in aircraft or aircraft engines.¹¹

Methodology

The FY 2018-19 OFT estimate is based on year-to-date collections projected through the end of the fiscal

¹¹ Aviation gasoline and jet fuel are taxed separately and revenue is deposited into a restricted revenue account.

year. FY 2019-20 collections are estimated by applying the appropriate tax rates to projections of gasoline and diesel fuel consumption.

Act 89 Oil Company Franchise Tax

	2013	2014	2015	2016	2017	2018	2019	2020
Revenue	\$0	\$307	\$735	\$718	\$718	\$679	\$680	\$675
Growth Rate	n.a.	n.a.	139.7%	-2.3%	-0.1%	-5.4%	0.1%	-0.8%

Note: figures in dollar millions. Years are fiscal year ending.

Rate

The tax rate was 64 mills effective January 1, 2014, 49 mills effective January 1, 2015, 48 mills effective January 1, 2016, 41 mills effective January 1, 2017 and 39 mills effective January 1, 2018. The rate is applied to the AWP of liquid fuels and fuels, and expressed on a cents-per-gallon basis. The AWP is a minimum of \$2.99 per gallon effective January 1, 2017 (no cap). The current rate is 11.7 cents per gallon.

Base

The tax is imposed on a cents-per-gallon basis on all liquid fuels (gasoline) and fuels (diesel) as defined by statute.

Transfers

Tax revenue is deposited into the Motor License Fund (MLF) and 4.17 percent of the tax is transferred to the Liquid Fuels Tax Fund. The projections shown in the table only reflect the unrestricted portion of the tax.

Exemptions

Exemptions include fuel that is delivered to: the federal government, the Commonwealth, a political subdivision, a volunteer fire or ambulance company, volunteer rescue squad, a second class county port authority or a nonpublic nonprofit school. The tax is also not imposed on fuel used in aircraft or aircraft engines.¹²

Methodology

The FY 2018-19 Act 89 OFT estimate is based on year-to-date collections projected through the end of the fiscal year. FY 2019-20 collections are estimated by applying the appropriate tax rates to projections of gasoline and diesel fuel consumption.

¹² Aviation gasoline and jet fuel are taxed separately and revenue is deposited into a restricted revenue account.

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Lottery Fund Methodology

Lottery Fund Net Revenues

	2013	2014	2015	2016	2017	2018	2019	2020
Net Revenue	\$1,759	\$1,766	\$1,729	\$1,844	\$1,698	\$1,794	\$2,013	\$2,016
Growth Rate	3.8%	0.4%	-2.1%	6.7%	-7.9%	5.6%	12.2%	0.1%

Note: figures in dollar millions. Years are fiscal year ending.

Products

The Pennsylvania Lottery sells terminal-based and instant ticket games at over 9,000 retailers across the Commonwealth. Beginning in 2018, players have access to online lotto games through the iLottery platform.

Methodology

The Lottery Fund projection uses different modeling techniques depending on recent sales history and the type of product. The instant ticket forecast is based on recent trends for (1) ticket sales as a share of Disposable Current Income and (2) per capita sales for residents aged 18 or older. The forecast reflects the impact of income growth, population growth and higher market saturation. Various numbers games (Pick 2, Pick 3, Pick 4, Pick 5, Wildball) are combined into a single series as sales data reveal evidence of a long-term trend decline. This decline is forecasted to continue through FY 2019-20. The forecast for in-state lotto games (Treasure Hunt, Cash 5, Match 6, Raffle) is based on trends for per capita sales for residents aged 18 or older. FY 2019-20 projections for multi-state lotto games (Powerball, Mega Millions, Cash4Life) are forecast based on historical levels and growth in Disposable Current Income and residents aged 18 or older.

The Lottery forecast for FY 2018-19 is based on year-to-date collections through May. The forecast for FY 2019-20 assumes that prizes and commissions paid comprise a recent historical share of total ticket sales. The estimate assumes the continuation of the transfer from the Gaming Fund at historical levels (roughly \$145 million per annum). The FY 2018-19 estimate includes expansion of Lottery sales in the form of iLottery and monitor games. The FY 2019-20 estimate assumes that sales of these new products decelerate as the market stabilizes.