Tax Code Connections: How Changes to Federal Policy Affect State Revenue

Technical appendix

Overview of the tax model

The tax model used in this analysis calculates both federal and state individual income taxes to estimate the state-by-state revenue impacts of potential federal tax changes. The model calculates federal tax liability for filers in all 50 states and the District of Columbia and state tax liability for the District and the 43 states that have an individual income tax. Most states connect to the federal system in some way, which means that statutory changes at the federal level can affect state tax structures and potentially increase or decrease state tax revenue. Because each state's tax system is unique, however, a given federal change can have widely varied impacts across the states.

The model includes a database of individual "tax filing units" (a concept similar to households or families) that are representative of the U.S. population at both the national and state levels. It constructs federal and state tax returns for each unit and aggregates the calculations to derive national and state-by-state totals. This microsimulation approach has the advantage of being able to capture the multiple interactions between the federal and state tax systems and between the different components within each system, such as the standard deduction and itemized deductions.

This appendix summarizes how the 50-state model was constructed and how it is used to simulate the impacts of federal tax changes. A full technical documentation provided by Quantria Strategies, the developer of the model, is available here.

Tax units database

The model uses a database of tax units that draws its data primarily from the U.S. Census Bureau's Current Population Survey (CPS) Annual Social and Economic Supplement, an annual survey of U.S. households that collects detailed information on income, demographics, family structure, and labor force participation and is released each March. CPS data from the 2012, 2013, and 2014 releases were combined to build the tax units database. Because the CPS survey samples a fraction of U.S. households every year, each record in the CPS has a sample weight corresponding to the number of households it represents. The model began with these weights and then adjusted them to match state-level data from the U.S. Internal Revenue Service on components such as income sources and tax deductions.

Some of the tax units that were created from the CPS would not be required to file a return under federal or state law because their incomes would be below the filing thresholds in 2013. It is important to include these "nonfiler" units in the database to analyze the impact of policy changes on the entire population, not just those who file tax returns under existing law. For instance, certain investment and retirement earnings are excluded from taxable income, but if those exclusions were repealed, some individuals who normally would not file a return would be required to do so. Including nonfilers in the model is therefore necessary to understand the full impact of many policy changes.

To further extend the model's capacity to analyze tax policy and construct tax returns under both existing law and various policy change scenarios, the CPS data were supplemented with information from other sources on characteristics such as charitable contributions, mortgage interest payments, health insurance premiums, and retirement income and savings. Dollar amounts for these income and expense categories were estimated using regression-based imputation, a statistical process that estimates a value for each tax unit based on known characteristics of that unit, such as marital status, family size, and income. The supplemental data sources used in this process included the Bureau of Labor Statistics' Consumer Expenditure Survey, the Internal Revenue Service's Statistics of Income Public Use File, the Federal Reserve Board's Survey of Consumer Finances, and the Medical Expenditure Panel Survey from the U.S. Department of Health and Human Service's Agency for Healthcare Research and Quality.

The tax calculator

The tax units database was fed into a 50-state tax calculator, a computer program constructed from a detailed database of tax law provisions. The tax law database was primarily based on information collected from federal and state income tax instructions and forms for tax year 2013, although tax codes and other outside sources were consulted in some limited circumstances. This database captured the considerable variation in states' tax systems.

The model calculated federal and state income tax liabilities separately for each tax unit. This microsimulation approach enabled the model to capture interactions between different components within each tax system and between the federal and state tax systems and yielded more accurate results than calculations using only aggregate tax data. For instance, if the federal deduction for mortgage interest were eliminated, total itemized deductions would be lower. For some filers, it might still make financial sense to itemize their other deductions, but for others, the standard deduction might then be higher than their remaining itemized deductions, in which case they would switch from itemizing to the standard deduction. By determining the impact of a policy change on each individual unit's tax situation, the model was able to account for the interaction between itemized and standard deduction provisions for each unit and aggregate the results across units. In general, the model allows "tax form behavior" in response to tax changes. For example, if a deduction is scaled back or repealed, filers are able to take advantage of the provision that provides the next best treatment of the income or expense that was previously covered by that deduction, when available.

The simulation was static rather than dynamic, which means it does not account for changes in filer behavior in response to tax policy modifications (other than the tax form behavior described above) or any resulting economic impact. For example, in the above example, the simulation did not estimate how eliminating the mortgage interest deduction would affect a tax filer's homeownership decision; nor did it consider the economic impacts on the housing market. Similarly, the simulation did not include other dynamic effects such as how modifications to marginal income tax rates might affect labor supply and earned income levels, how the repeal of the exemption for municipal bond interest would affect state borrowing costs, or how the repeal of the itemized deduction for state and local taxes would affect state and local tax levels. Capital gains are the single exception: The simulation did incorporate an estimate of the effect of a tax rate change on the overall level of capital gains income, which can be sensitive to rate changes, though the impact was minimal in this simulation. It does not include any short-term effects on when investors sell assets.

Although the calculator captured most of the significant features of state tax structures, certain aspects were not included, usually because of a lack of data necessary to calculate a tax provision. Most of the omitted provisions are small in size or affect a small number of returns. Others were excluded for reasons of consistency or scope. Property tax credits (for example, "circuit breaker" credits) were not included in the model for consistency across states, because some states include these on their income tax forms while others have credits or rebates that are administered separately from the income tax system. The calculator also does not contain local income taxes. Most states have no or minimal local income taxes, but several, such as Maryland, New York, Ohio, Pennsylvania, and Kentucky, have significant ones. The simulation also does not estimate how federal tax changes would affect federal or state payroll tax revenue because they are outside the scope of the simulation. For more information on the model's coverage of federal and state tax law and expenditures, see Quantria Strategies' technical documentation.

Federal-state conformity

Most state income taxes link to some degree to the federal system, a practice known as conformity. For instance, most states start their calculations with a federal definition of income, and many offer state deductions and credits that are linked to federal deductions and credits. (See "Federal-State Links in Income Tax Calculations" below for more detail.)

The calculator was based on information gathered from state tax forms and filing instructions, rather than from the underlying tax codes. Although the forms provide a good guide to each state's tax structure, details about how a state conforms to a federal provision were unclear from the filing instructions in certain cases. For example, in some states, the calculation on the tax forms for determining the child care credit may mirror the federal calculation, but the forms and instructions may not make any reference to the federal credit. In such cases, this analysis assumed that the state conformed to the federal credit and would adhere to its repeal.

Every state that allows itemized deductions generally follows federal policy, whether by instructing filers to copy amounts directly from the federal form or by mirroring federal itemized deductions without explicitly referencing the federal form. This simulation assumed that all states with itemized deductions conformed to the federal repeal.[1]

Similar assumptions were made in relation to states' use of a federal starting point and their conformity to federal exclusions. In some special cases, states effectively build federal adjusted gross income (AGI) line by line rather than referencing it directly. In these cases, the simulation assumed that states would conform to the repeal of exclusions.[2]

For this analysis, state conformity (including the special cases described above) was taken as a given by assuming that states that conform to federal provisions would maintain their conformity—that is, they would follow the federal repeal. In reality, conformity plays out differently across states. In some states, federal changes are automatically incorporated into state law (known as "rolling conformity"), while in others, lawmakers have to pass legislation to adopt federal changes (known as "fixed-date conformity"). Further, some states automatically conform to any federal changes that have revenue impacts below a specified threshold but require legislative approval for revisions that exceed it. Ultimately, state policymakers control how their taxes conform to federal policy and the extent to which state tax systems and revenue would be affected by federal tax changes. This analysis did not attempt to predict state policy responses to federal tax changes.

Federal-State Links in Income Tax Calculations

Federal income taxes are calculated in a series of steps, and most states link, or conform, to one or more of those. Below is a summary of those steps and the major ways in which states conform. Federal and state tax codes contain nuances, many of which were included in the model but are not described here.

First, tax filers add up various taxable sources of income such as wages, investments, and pension payments to arrive at gross income, also referred to as total income on the federal form. Certain income is excluded from gross income. Examples of exclusions are the value of employer-sponsored health insurance and other employment benefits, interest from tax-exempt bonds, and the nontaxable portion of Social Security.

Filers may then subtract certain expenses to calculate their AGI. Deductible expenses include college tuition, interest payments on student loans, and contributions to individual retirement accounts. These subtractions from income are sometimes called "adjustments" or "above-the-line deductions" because they are listed above the line for AGI on the tax form. Most states with an income tax use federal AGI as the starting point for their tax calculations and in doing so conform to federal exclusions and adjustments to income. Notably, exceptions occur when states selectively decouple from individual exclusions or adjustments by adding those amounts back to income.

AGI is then further reduced by additional deductions to arrive at taxable income. First, filers choose either to take the standard deduction—a predetermined amount based on filing status—or to itemize deductions for specific expenses. Twenty-three states and the District of Columbia allow filers to claim itemized deductions that are generally based on the federal versions by copying them directly from their federal forms. Two other states have tax credits that are based on federal itemized deductions.

In addition to the standard or itemized deductions, filers may also subtract fixed exemption amounts for each member of their household. Income remaining after all deductions and exemptions are subtracted is called taxable income. Six states use federal taxable income as their starting point and thereby conform to federal itemized deductions, standard deductions, and personal exemptions in addition to the exclusions and adjustments incorporated into federal AGI. When these six states are added to the list of those that directly link to or offer a credit for federal itemized deductions, the total number of such states is 31 plus the District.

The next step in the federal income tax calculation is to apply the tax rate schedule to taxable income to determine the initial amount of taxes owed before any credits are subtracted. States do not conform to this particular step of the federal calculations, because each state has its own tax rate schedule.

Continued on the next page

Filers then subtract any available credits to determine final taxes owed. Credits directly reduce tax liability, in contrast to deductions, which lower liability by reducing taxable income. Some credits—known as nonrefundable credits—cannot reduce a filer's tax liability below zero, but others—called refundable credits—can result in a negative liability or payment to the filer.

Federal tax credits are available for different purposes, such as offsetting child care expenses or supplementing the earnings of low-income workers. States provide many different types of credits, some of which are tied to federal counterparts. The most significant such linkage is to the federal earned income tax credit. Twenty-three states and the District offer an earned income tax credit that is calculated as a percentage of the federal version.

A few states are connected to federal policy in a way that does not involve conformity to specific federal provisions. Six states—Alabama, Iowa, Louisiana, Missouri, Montana, and Oregon—permit filers to deduct their final federal income tax liability from their state taxable income.* For individual filers, this has the effect of partly offsetting a federal tax increase or decrease: A federal increase would result in a larger deduction on their state returns and lower state liability (all else equal), while a federal cut would result in higher state taxes. In this way, these six states are affected by any policy change that alters total federal tax liability, including rate changes.

* The deduction is capped in Missouri and Oregon. Montana's deduction is capped, available only to filers who claim itemized deductions, and was assumed to remain in effect as the state's only itemized deduction in the simulation.

Analytical scenario

The policy simulation in this analysis involved eliminating major federal personal income tax expenditures to understand the extent to which states are connected to these provisions and to estimate the revenue impact on states of such changes. The U.S. Treasury counts 169 provisions in its list of personal and business-related tax expenditures.[3] Of these, the reform scenario eliminated 42 personal tax expenditures, which together account for roughly 80 percent of the total forgone federal revenue associated with all personal tax expenditures from 2015 to 2024.[4] The remaining expenditures are relatively small or cannot be easily modeled because of data limitations. (See Table 1 on the next page.)

In brief, the scenario included the following changes to federal policy:

- Eliminated 42 significant nonbusiness individual income tax expenditures.
- Reduced federal tax rates by an equal proportion, about 40 percent, across each tax bracket to offset the revenue increase resulting from the repeal of expenditures.
- Repealed the alternative minimum tax for simplicity, to reduce interaction effects, and because many tax reform proposals have proposed eliminating it.

Table 1

Treatment of Select Tax Expenditures and Tax Provisions in the Simulation

Provision	Action	Treatment
Alternative minimum tax	**Repealed**	
Exclusions		
• **Tax-exempt interest**	Repealed	Treated all exempt interest as taxable interest at the federal level. All states were assumed to be decoupled from federal treatment of municipal bond interest because many have their own policies for taxing interest from other states' bonds and exempting their own.
• **Nontaxable Social Security benefits**	Repealed	Treated all exempt Social Security income as taxable Social Security income.
• **Income received from workers' compensation**	Repealed	Added a new income category for workers' compensation to the federal 1040 form.
• **Employer-provided health insurance premiums**	Repealed	Added to wages on the federal 1040 form.
• **Exclusion of interest on life insurance savings**	Repealed	Added a new income category to the federal 1040 form.
• **Defined benefit retirement plans: deferral of tax on contributions and investment earnings**	Repealed	Added to pension income. All current-year contributions taxed; all current-year investment earnings taxed; all distributions exempt.
• **Defined contribution retirement plans: deferral of tax on contributions and investment earnings**	Repealed	Added to pension income. Includes inside buildup on individual retirement accounts. All current-year contributions taxed; all current-year investment earnings taxed; all distributions exempt.
• **Capital gains on home sales**	Repealed	Added to capital gains income. See "Reduced rates for capital gains and qualified dividends" below for general treatment of capital gains.
• **Step-up in basis at death for capital gains**	Repealed	Added to capital gains income. See "Reduced rates for capital gains and qualified dividends" below for general treatment of capital gains.

Continued on the next page

Provision	Action	Treatment
• **Imputed rental income**	Not repealed	The U.S. Treasury considers imputed rent to be a tax expenditure, but the Joint Committee on Taxation (JCT) does not classify it as such because "the measurement of imputed income for tax purposes presents administrative problems and its exclusion from taxable income may be regarded as an administrative necessity."
• **Exclusion of Medicare benefits**	Not repealed	Not modeled. JCT considers the exclusions for Part A, B, and D benefits to be a tax expenditure, but the U.S. Treasury does not.
Reduced rates for capital gains and qualified dividends	**Repealed**	**Taxed as ordinary income. The simulation included an estimate of the effect of a tax rate change on the long-term level of capital gains realizations.**
Itemized deductions	**Repealed**	**All itemized deductions were repealed. Although some are not considered tax expenditures (such as unreimbursed employee expenses), these make up a small fraction of itemized deductions.**
• **Medical expense deduction**	Repealed	
• **Taxes paid**	Repealed	
• **Mortgage interest deduction**	Repealed	
• **Investment interest expense**	Not modeled	Not modeled because of data limitations.
• **Charitable donations**	Repealed	
• **Casualty and theft loss**	Not modeled	Not modeled because of data limitations.
• **Miscellaneous itemized deductions subject to limitation**	Repealed	Some of these deductions are not tax expenditures, such as unreimbursed employee expenses.
• **Other miscellaneous deductions**	Repealed	
Adjustments (above-the-line deductions)		
• **Educator expenses**	Not repealed	Not modeled because of data limitations.
• **Business expenses of reservists, etc.**	Not repealed	Not modeled because of data limitations.
• **Health savings account**	Not repealed	Not modeled because of data limitations.

Continued on the next page

Provision	Action	Treatment
• **Moving expenses**	Not repealed	Not modeled because of data limitations.
• **Portion of self-employment tax**	Not repealed	The model included this deduction, but it was not repealed because neither JCT nor the U.S. Treasury classifies it as a tax expenditure.
• **Self-employed, simplified employee plans (SEP), savings incentive match plans for employees (SIMPLE), and qualified plans**	Repealed	
• **Self-employed health insurance expenses**	Repealed	
• **Penalty on early withdrawal of savings (e.g., certificates of deposit)**	Not repealed	Not modeled because of data limitations.
• **Alimony paid**	Not repealed	Not modeled because of data limitations.
• **IRA contributions**	Repealed	
• **Student loan interest**	Repealed	
• **Tuition and fees**	Repealed	
• **Domestic production activities**	Not repealed	The scenario did not repeal business tax expenditures.
Standard deduction and personal exemption	**Not repealed**	**These are part of the JCT's and U.S. Treasury's normal tax and are thus not considered tax expenditures.**
• **Parental personal exemptions for student over 19**	Repealed	
Credits		
• **Foreign tax credit**	Not repealed	Not modeled because of data limitations.
• **Child and dependent care credit**	Repealed	
• **Education credits**	Not repealed	Not modeled because of data limitations.
• **Retirement savings contribution credit**	Repealed	
• **Child tax credit (refundable and nonrefundable)**	Repealed	
• **Earned income tax credit**	Repealed	
• **Residential energy credit**	Not repealed	Not modeled because of data limitations.

Note: Some of the entries on this list cover a category and include more than one tax expenditure. The repealed categories include 42 of the tax expenditures estimated by the U.S. Treasury. For technical descriptions of these tax expenditures, see Office of Management and Budget, *Fiscal Year 2016 Analytical Perspectives of the U.S. Government*, http://www.gpo.gov/fdsys/pkg/BUDGET-2016-PER/pdf/BUDGET-2016-PER.pdf.

Federal tax expenditures with the largest impacts on state revenue

The analysis estimated the share of the nationwide state revenue impact that is attributable to selected groups of tax expenditures. (See Figure 2 in the report.) The groups are:

- Employer-provided health insurance exclusion and deductions for self-employed plans.
- Pensions and savings tax preferences, including defined benefit and defined contribution plans (employer and employee contributions and inside buildup) and IRAs. The group also includes self-employed retirement plans.
- Capital gains and dividends tax preferences, including preferential tax rates on all varieties of capital income; the excluded portion of home sales; the step-up basis of inherited assets; and qualified dividends. This group does not include tax-exempt municipal bond interest.
- Itemized deductions.
- Earned income tax credit.
- Other provisions and interaction effects—the difference between the revenue impact of the repeal of all of the tax expenditures included in the main simulation and the sum of each of the above groupings. This group thus represents all the tax expenditures eliminated in the full simulation that are not listed above as well as any net interaction effects between tax expenditure groups when they are all repealed simultaneously.

Peer review of the model

The model used for this analysis was designed by Quantria Strategies LLC with input and review from Pew. It was peer reviewed by Michael Udell of District Economics Group LLC and Michael Allen, associate commissioner for tax policy, and David Gunter, tax economist, both from the Maine Office of Tax Policy Research, to verify its suitability for estimating the types of policy changes considered in this analysis.

The analysis and the simulation it is based on were peer reviewed by Michael Ettlinger, director of the Carsey School of Public Policy at the University of New Hampshire, and Jon Bakija, professor of economics at Williams College.

Neither the reviewers nor their organizations necessarily endorse the model, the results of the simulation, or the content of this report. Pew has not reviewed the model's suitability for use in other types of analyses.

Endnotes

1 Some states allow state-specific itemized deductions in addition to the federal itemized deductions. These state deductions are often small, and many were not included in the calculator because of a lack of data. Although these deductions have no federal counterpart, for the sake of simplicity they were assumed to be repealed in the simulation with one noteworthy exception: Montana allows an itemized deduction for certain federal taxes paid, and these deductions were retained as the state's only itemized deduction in the simulation.

2 The most significant examples are Arkansas, Iowa, and Massachusetts. Consistent with this assumption, the Federation of Tax Administrators indicates that Iowa and Massachusetts use a federal starting point. Notably, Massachusetts is decoupled from several federal tax provisions because the state links to the Internal Revenue Code as it stood on Jan. 1, 2005, and, to the extent possible, the model accounts for these nuances. Arkansas' tax forms reference certain federal income sources, such as farm and rental income, but not others. For purposes of this simulation, the state is assumed to conform to the repeal of the federal exclusions and adjustments. See Federation of Tax Administrators, "State Personal Income Taxes: Federal Starting Points" (Jan. 1, 2015).

3 Office of Management and Budget, "Fiscal Year 2016 Analytical Perspectives of the U.S. Government" (Feb. 2, 2015), http://www.gpo.gov/fdsys/pkg/BUDGET-2016-PER/pdf/BUDGET-2016-PER.pdf.

4 The repealed provisions include any refundable portion of tax credits, which the Office of Management and Budget classifies as outlays. Summing tax expenditures often provides a reasonably good estimate of the total cost of tax expenditures, but it does not capture potential interactions among those expenditures or possible behavioral responses of filers to the repeal or modification of any single one.

For further information, please visit:

pewtrusts.org/fiscal-federalism

Contact: Jeremy Ratner, communications director
Email: jratner@pewtrusts.org
Project website: pewtrusts.org/fiscal-federalism