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# INCORPORATING STATE ANALYSIS INTO THE TAX POLICY CENTER'S MICROSIMULATION MODEL: DOCUMENTATION AND METHODOLOGY

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ABSTRACT

The Urban-Brookings Tax Policy Center's (TPC) microsimulation model produces revenue and distributional estimates of the U.S. federal tax system. This paper describes a re-weighting procedure that allows the model to be used for analysis of taxes at the state level. We construct state weights such that distributions of key tax variables in our database match state distributions published by the Internal Revenue Service's Statistics of Income Division. The model can now examine federal taxes at the state level, state income taxes, and often over-looked interactions between federal and state tax policies. We analyze three federal policy proposals by state and two state policy proposals to demonstrate the new capabilities.

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## INTRODUCTION

The Urban-Brookings Tax Policy Center's (TPC) microsimulation model produces revenue and distributional estimates of the U.S. federal tax system. The model allows TPC scholars to document how federal tax policies affect families with different incomes and family structures and how potential policy changes would affect both taxpayers and federal revenues. This paper describes features recently added to the model that allow analysis of taxes at the state level. The model can now examine federal taxes at the state level, state income taxes, and often over-looked interactions between federal and state tax policies.

The TPC tax model is a powerful tool for tax policy analysis. It calculates tax liability for a representative sample of households, both under current law and under alternative policies. Based on these calculations, the model estimates how different tax policy choices would affect revenues, the distribution of tax burdens, and marginal effective tax rates. TPC has used the model to analyze a broad range of federal policy options, from modifying specific provisions of the tax code to making comprehensive reforms. The model is similar to those used by the Congressional Budget Office (CBO), the Joint Committee on Taxation (JCT), and the Treasury's Office of Tax Analysis (OTA).[1]

Microsimulation models produce estimates based on individual or household level data rather than aggregate information. The TPC tax model calculates tax liability using detailed information for each tax unit in its database.[2] National weights attached to individual sample tax units make it possible to calculate estimates for the entire population by summing the products of individual estimates and the national weights.

TPC has recently extended the tax model to allow state-level analysis by developing additional weights that indicate each tax unit's importance for each state. The new weights divide each observation's national weight into 52 state weights (50 states, District of Columbia, and other areas).[3] For example, an observation may represent 500 tax units nationally, 60 units in California, 50 units in New York, 1 unit in New Hampshire, and so on, with all of its state weights summing to five hundred. These weights allow us to distribute national estimates of revenue and distributional effects of federal tax policies across individual states. Not only can we analyze a wide array of federal policy proposals in detail for particular states, we can also determine which states would be disproportionately affected. We can also use the state-weighted database as an input to state income tax calculators, allowing analysis of changes in state income tax policies.

We impute state weights to the tax model database using a method proposed by Schirm and Zaslavsky (1997). The method guarantees that derived state weights sum up to national weights, and that state-weighted totals for specific observed characteristics match state targets.

With a comprehensive set of state targets, the latter constraint ensures that the state-weighted tax model database is representative of all states. Despite the lack of recent public use tax records drawn to be representative of states, this reweighting approach allows us to use the most recent tax information available in the Internal Revenue Service (IRS) Public Use File (PUF) and various other published statistics. A useful byproduct of this approach is that we can use the full sample for every state, providing enough observations for detailed distributional analysis and analysis of proposals affecting small segments of the population, particularly high-income tax filers.

Despite great interest, little capacity exists to analyze revenue and distributional effects of tax policy for individual states. The CBO and JCT models only produce national estimates of federal taxes. OTA has developed state weights for producing federal revenue estimates by state but does not calculate state taxes or make its distributional estimates available to the public. Some state revenue departments have their own microsimulation models but their models apply only to their own states and their outputs are usually confidential. The National Bureau of Economic Research and John Bakija of Williams College have developed state income tax calculators, but both require users to provide state-representative data. The Institute on Taxation and Economic Policy (ITEP) has a microsimulation model and a state-representative sample that allow both federal and state analysis. The ITEP model relies on a sample of federal tax records from 1988 that was drawn to be representative at the state-level.[4] The Pew Charitable Trusts have recently developed a microsimulation model for state-level analysis based on household survey data with imputations from the PUF and published IRS tabulations of federal tax items by state.[5]

With our state modelling capabilities, we join ITEP and the Pew Charitable Trusts in addressing the shortage of state-level tax analysis. An advantage of our model is that it is based on a recent sample of federal tax records and is calibrated to match an extensive set of federal income tax information at the state level. As a result, our model is likely to produce estimates of policy proposals' impacts at the state level comparable to ones that could have been produced using the most recent IRS population data.

The rest of this paper is structured as follows. Section II describes the TPC tax model and Section III lays out Schirm and Zaslavsky's methodology for imputing state weights. Section IV explains how we implemented the imputation on TPC's tax model and shows how closely state-weighted tabulations from the tax model database match targets derived from published IRS tables for inputs to calculating federal income tax liability such as wages, deductions, etc. Section V further assesses how well the tax model database represents states by comparing calculated tax values against IRS tabulations. Section VI demonstrates the capabilities of the state-weighted model by examining the baseline distribution of federal tax burden and the state-level effects of three federal policy changes. Section VII discusses how we can simulate state income

taxes by combining the state-weighted tax model database with state calculators. Section VIII concludes the study.

## OVERVIEW OF TPC TAX MODEL[6]

The TPC tax model's primary data source is the 2006 PUF, which contains 145,858 records with detailed information from federal individual income tax returns filed in the 2006 calendar year. Because 2011 is the base-year of the model, we employ a two-step process to create a file containing a sample of the tax filing population representative at the national level for the 2011 tax year. In the first step of the process, we use published tax data to calculate per-return average growth rates for types of income, deductions, and other items reported on tax returns between 2006 and 2011 by adjusted gross income (AGI) class. We then use these growth rates to adjust the dollar amounts on each PUF record. In the second step of the process, we use a constrained optimization algorithm to reweight the records in order to match an extensive set of about 100 national targets for both return counts and dollar amounts. We refer to the resulting file as the 2011 "Look-Alike Public Use File" or LAPUF.

Next, we add additional information on demographics and sources of income that are not reported on tax returns through a constrained statistical match of the LAPUF with the March 2012 Current Population Survey (CPS) produced by the U.S. Census Bureau and the Bureau of Labor Statistics. That match also generates a sample of tax units not filing income tax returns ("non-filers"). The complete dataset combines filers from the LAPUF and non-filers from the CPS, allowing distributional analysis on the entire population, which includes both filers and non-filers under current law.[7] We then augment the tax model database by imputing wealth, education, consumption, health, and retirement-savings variables for each record in the matched LAPUF-CPS file.[8] The resulting file is the full tax model database, which is a nationally representative sample of the population for calendar year 2011.

In order to carry out revenue and distribution analysis for future years, we extrapolate or "age" the 2011 data. For the years from 2012 to 2026, we age the data based on CBO projections for the growth of various types of income; CBO and JCT baseline revenue projections; IRS estimates of future growth in the number of tax returns; JCT estimates of the distribution of tax units by income; and Census data on the size and age-composition of the population. A two-step process produces a representative sample of the filing and non-filing population in years beyond 2011. We first inflate the dollar amounts of income, adjustments, deductions, and credits on each record by their appropriate forecasted per capita growth rates. We use the CBO's forecast for per capita growth of each major income source, such as wages, capital gains, and non-wage income (interest, dividends, Social Security benefits, and others). We assume that most other items grow at CBO's projected growth rate for per capita personal income. In the second stage of

the extrapolation, we use a linear programming algorithm to adjust the weights on each record so that the major income items, adjustments, and deductions match aggregate targets. We also adjust the overall distribution of income to match published information from the Statistics of Income (SOI) division of the Internal Revenue Service (IRS) for 2012 and published estimates of the 2015 distribution from JCT. We extrapolate recent trends to obtain projected distributions for other years beyond 2015 and modify those distributions in order to hit CBO's published forecasts for baseline individual income tax revenue.

Based on the extrapolated data set, we can simulate policy options using a detailed tax calculator that captures most features of the U.S. federal individual income tax system. Additionally, we calculate payroll taxes for Social Security and Medicare and expected estate taxes as well as distribute CBO projections of corporate income tax and excise tax liability to individuals.

## STATE WEIGHT IMPUTATION: METHODOLOGY

To impute state weights to the Tax Model database, we adapt a constrained, parametric regression methodology proposed by Schirm and Zaslavsky (1997). The methodology imposes two constraints: The summation of each observation's state weights must be identical to its national weight, and the weighted totals of variables chosen as explanatory variables in the regression specification match their targeted totals within a specified tolerance level. Its parametric nature is specified with an identifying assumption that state weights as a proportion of national weights must be identical for all observations with similar characteristics. These constraints and parametric specification together bring about a unique solution to the state weights (Schirm and Zaslavsky, 2001, page 9).

To be specific, the parametric specification is a Poisson regression. Define $W^h$ as observation $h$'s federal weight, $w_s^h$ as $h$'s state weight for state $s$ ($s$ = 1 to $S$, where $S$ is the number of states) and thus $\sum_s w_s^h = W^h$, $\underline{x}^h = \left(x_1^h, x_2^h, \dots, x_k^h, \dots x_K^h\right)$ as $h$'s observed characteristics where $K$ is the number of characteristics accounted for in the estimation, $X_{ks}$ as the state $s$'s weighted total of $x_k$, i.e. $X_{ks} = \sum_h w_s^h x_k^h$, $\underline{X}_s = (X_{1s}, X_{2s}, \dots, X_{ks}, \dots X_{Ks})$, $\delta^h$ as $h$'s state-independent constant, and $\underline{\beta}_s = (\beta_{1s}, \beta_{2s}, \dots, \beta_{ks}, \dots \beta_{Ks})$ as the state-specific coefficient estimates for state $s$. The regression specification is as follows:

$$w_s^h = \exp\left(\underline{\beta}_s' \underline{x}^h + \delta^h\right) \quad (1)$$

Notice that the state share $w_s^h / W^h$ does not depend on $h$'s idiosyncratic parameter $\delta^h$, i.e. state shares only depend on $h$'s characteristics $\underline{x}^h$. To see this, it can be derived from (1) that

$\frac{w_s^h}{W^h} = \frac{\exp\left(\underline{\beta}_s' \underline{x}^h\right)}{\sum_q \exp\left(\underline{\beta}_q' \underline{x}^h\right)}$ which is not a function of $\delta^h$. This identifying assumption, with the two aforementioned constraints:

$$\sum_s w_s^h = W^h \tag{2}$$

$$\sum_h w_s^h x_k^h = X_{ks} \tag{3}$$

bring about a unique set of state weights.[9]

We estimate this constrained model using a maximum likelihood, iterative two-step approach. Denote $\delta_{(i)}^h$ as the household-specific constant and $\underline{\beta}_{s(i)}$ as the state-specific coefficient estimates derived from the $i^{th}$ iteration.[10] In the first step of the $i^{th}$ iteration, we substitute (1) into (2) to obtain:

$$\delta_{(i)}^h = ln\left(\frac{W^h}{\sum_s \exp\left(\underline{\beta}_{s(i-1)}' \underline{x}^h\right)}\right)$$

Then, in the second step of the $i^{th}$ iteration, we derive $\underline{\beta}_{s(i)}$ using a Newton-Raphson method. That is, based on $\underline{\beta}_{s(i-1)}$ and the remaining distances between the targeted and derived totals, $\underline{d}_s \equiv \underline{X}_s - \sum_h w_s^h \underline{x}^h$ with $\underline{d}_s = (d_{1s}, d_{2s}, \ldots, d_{ks}, \ldots d_{Ks})$:

$$\underline{\beta}_{s(i)} = \underline{\beta}_{s(i-1)} + D_{s(i)}^{-1} \underline{d}_{s(i)}$$

with the first-order partial derivative matrix $D_{s(i)} \equiv \sum_h w_{s(i)}^h \underline{x}^h \underline{x}^{h'}$, and $w_{s(i)}^h = \exp\left(\underline{\beta}_{s(i-1)}' \underline{x}^h + \delta_{(i)}^h\right)$. The iterations continue until every difference ($d_{ks}$ for all $k$ and $s$) is within a pre-specified tolerance level. Finally, we calculate state weights using equation (1) with the derived coefficient estimates of $\delta^h$ and $\underline{\beta}_s$.

## STATE WEIGHT IMPUTATION: IMPLEMENTATION

To estimate the Schirm and Zaslavsky's constrained model, we stratify observations in the tax model database for tax year 2011 into nine groups based on Adjusted Gross Income (AGI) and perform the estimation for each AGI group separately.[11] Not only does the estimation by AGI group reduce the computational burden through a substantial reduction in the number of observations involved, but it also allows us to match state targets by AGI group, greatly improving the ultimate quality of the state-weighted database. For instance, targeting by state-

AGI group allows us to capture variations across states in the composition of income among high income returns.

Table 1 lists the targeted variables in our estimations by AGI group. Targeted variables are either the number of returns with non-zero values for an item or the total amount of the item on federal individual income tax returns for tax year 2011. The estimation process uses these targets as explanatory variables and targeted totals by state as constraints. Targets were derived from state tables produced by the IRS' Statistics of Income Division (SOI).[12] We target between 39 and 51 variables in each AGI group including most of the items needed to calculate federal income taxes.[13] Targets include number of returns and joint returns; number of exemptions;[14] wages, interest, dividends, capital gains, business income, and numerous other income components; AGI; and state and local income tax deduction, state and local sales tax deduction, real estate tax deduction, mortgage interest deduction, charitable deduction, and other deductions. Generally we did not target calculated tax outcomes such as tax liability and credits. However, to better capture variation in head of household status across states and income groups, and the interaction of marital status and presence of dependents, we also targeted the Earned Income Tax Credit.[15]

We have to address three additional issues when implementing the estimation procedure. First, because SOI state tabulations are only available for families filing tax returns, we cannot directly apply our estimation approach for non-filing tax units. Instead we estimate the model using tax-filers' observations and then impute state weights for non-filers using coefficient estimates for tax filers with AGI of at least $1 but less than $25,000.[16]

Second, we need to adjust the targets from SOI state tables to be consistent with national totals in the tax model database. The tax model database was built to match targets from federal SOI tables which may differ somewhat from national totals in SOI state tables.[17] One of the estimation constraints requires that the weighted totals of targeted variables match their targeted totals within a tolerance level which can only be achieved if a targeted variable's SOI totals across all states equal its weighted federal total in the tax model database. Even though a derived total of any state may deviate from its target, it must be the case that the summation across all states of the derived federal total must equal the federal total in the tax model database. As a result, we adjust each target by the ratio of its federal weighted tax model total and its SOI total across all states.[18] This adjustment yields a set of adjusted targeted state totals whose summations across all states are exactly the weighted federal totals in the tax model. Adjusted targets are generally quite similar to actual values in SOI state tables.[19]

Third, the estimation procedure may fail if the original, national-representative sample is incompatible for producing a representative sample for all 52 states simultaneously. To guarantee success, we allow the national weight of each observation to be modified in such a way that weighted national totals are unchanged but the distribution of national weights across

observations is more conducive to convergence. We do this by implementing the Schirm and Zaslavsky's methodology for each state separately (i.e. $S = 2$, with s = 1 for the targeted state and s = 2 for all other states combined) and then replacing each tax model observation's national weight with the sum of its 52 state weights. Using the derived national weights as a starting point, we reweight the observations again to match SOI federal totals in more detail than the state targets. [20] [21] After this reweighting exercise, we can successfully employ the weight splitting procedure to create a set of consistent national and state weights simultaneously matching all national and state targets for all but two AGI groups.

For two AGI groups (less than $1 and at least $25,000 but less than $50,000), we need to drop at least one key targeted variables in order for the estimation to converge with $S = 52$ due to insufficient data points in the Tax Model database. [22] As an alternative, we use the state weights derived from applying the Schirm and Zaslavsky' methodology separately for each state and use the sum of these weights at the national weight for these AGI groups. This results in their weighted totals matching all of the state targets and most of the federal targets.

Taking into accounts the three issues discussed above, we estimate Schirm and Zaslavsky's constrained model, setting the tolerance level at five percent of the adjusted targets. Then, with the derived coefficient estimates, we impute state weights for every observation in the tax model. State weighted totals for targeted variables in the tax model database must be within five percent of adjusted targets by construction. In fact, Table 2 shows that the state-weighted totals match targets much closer in general. To be specific, out of 22,308 targets overall, only 32 targets (accounting for 0.1% of all targets) have weighted state totals deviating from their adjusted targeted totals by more than two percent.[23] [24] The next section assesses whether our tax model produces reasonable estimate of federal tax liability across states when using the state-weighted tax model database.

TABLE 1

## State Targets for Weight Splitting Procedure

| Targeted Item | Type[1] | AGI Group | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Under $1 | $1 under $25,000 | $25,000 under $50,000 | $50,000 under $75,000 | $75,000 under $100,000 | $100,000 under $200,000 | $200,000 under $500,000 | $500,000 under $1,000,000 | $1,000,000 or more |
| Number of returns | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of joint returns | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of exemptions | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Adjusted gross income (AGI) | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Salaries and wages in AGI | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Taxable interest | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Ordinary dividends | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Qualified dividends | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| State and local income tax refunds | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Business or profession net income (less loss) | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Net capital gain (less loss) in AGI | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Taxable individual retirement arrangements distributions | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Taxable pensions and annuities in AGI | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of farm returns | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Unemployment compensation | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Taxable social security benefits in AGI | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Partnership/S-corp net income (less loss) | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Self-employed health insurance deduction | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Individual retirement arrangement payments | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Student loan interest deduction | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | N/A | N/A | N/A |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | N/A | N/A | N/A |
| Total itemized deductions | Number | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| State and local income taxes | Number | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| State and local general sales taxes | Number | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Real estate taxes | Number | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Home mortgage interest paid | Number | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Charitable contributions | Number | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | N/A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Self-employment tax | Number | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Amount | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Earned income credit | Number | ✓ | ✓ | ✓ | N/A | N/A | N/A | N/A | N/A | N/A |
| | Amount | ✓ | ✓ | ✓ | N/A | N/A | N/A | N/A | N/A | N/A |

**Notes:** Check indicates variable was part of the estimation constraint for given AGI group. N/A indicates that variable is irrelevant due to the state totals equaling $0 for the given AGI group.

[1]Number of returns with item or total dollars for item.

## COMPARING STATE TAX OUTCOMES TO PUBLISHED SOI TABLES

The prior section showed that we successfully created state weights which when applied to the tax model database produce tabulations closely matching published SOI tables for inputs into calculation of income taxes (exemptions, income components, deductions, etc.). This section compares values produced by the tax calculator based on inputs from the tax model database to published SOI tabulations by state. Calculated taxes may differ from SOI values for a state because SOI targets are not available for all items entering tax calculation. Furthermore, while we use a rich set of state targets by AGI group, we do not have targets for cross-tabulations of these items. For instance, while we match the number of returns with capital gains and returns with dividends in every AGI group in every state, we may not match the true number of returns with both capital gains and dividends. And finally, the tax model does not always match SOI tabulations of calculated tax values in 2011 at the national level, making it impossible to match every SOI tabulation by state simultaneously.

Tables 3a-3e show that our simulations of current law federal income taxes by state are close to SOI tabulations. The model's estimates for income taxes net of credits are within 3.8 percent of SOI totals for all states. Taxable income and income tax before credits are very close to SOI totals as well. Our projections of taxable income are within 1.5 percent of SOI tabulations for all states, income tax before credits are within 2.5 percent of SOI tabulations for all states, and number of returns with positive income tax before credits are within 1.0 percent of SOI tabulations for all states except Alaska (-8.9 percent).

Our projections of the alternative minimum tax (AMT) match SOI totals less closely than tax before credits but are generally still reasonably close. Our projections for AMT dollars are within 20 percent of SOI totals for all but 3 states (Montana, New Hampshire, and Wyoming) and our projection for the number of returns with AMT are within 20 percent of SOI totals for all states.

Our projections for the majority of tax credits are generally close to SOI tabulations. Our projections of Child Tax Credit (CTC) dollars are within 15 percent of targets for all but 2 states (District of Columbia and Florida), our projections of Additional Child Tax Credit (ACTC) dollars are within 15 percent of targets for all but 2 states (Utah and West Virginia), and our projections almost exactly match state targets for Earned Income Tax Credit (EITC). We match EITC tabulations very closely because, as discussed in Section IV, we use receipt of EITC and EITC dollars as targets when creating the weights. While we are close to SOI tabulations for CTC, ACTC, and EITC, which together comprise about 70 percent of all tax credits, our projections for other credits often deviate substantially from state SOI totals.

This exercise illustrates that we have greater ability to simulate tax items that are directly based on inputs we target when creating the state weights. We match SOI tabulations of tax before credits very closely because we match the distribution of each component of income very closely by state. Families with children under age 17 and incomes below certain thresholds are eligible for the CTC and ACTC. We match less well for CTC and ACTC than tax before credits, because while we target income and the number of exemptions by state, state targets for number of exemptions by age of dependent are not available. The AMT adjusts the definition of taxable income and generally affects higher income tax filers. Our simulations match SOI figures for the AMT less well than for tax before credits, because, while we target the income distribution and the state tax deduction, which accounts for over two-thirds of AMT adjustments to income, state targets are not available for most other AMT adjustments. Our simulations often do not match well for credits other than CTC, ACTC, and EITC because SOI targets are not available by state for their key determinants such as qualified education expenses, child care expenses, and retirement contributions. Thus estimates by state of credits other than CTC, ACTC, and EITC should be treated with caution as should any estimate of tax provisions dependent on factors we do not target when creating state weights.

TABLE 2

## Count of State Totals with Larger than Two Percent Deviation from Adjusted Targets

| Targeted Item | Type[1] | AGI Group | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Under $1 | $1 under $25,000 | $25,000 under $50,000 | $50,000 under $75,000 | $75,000 under $100,000 | $100,000 under $200,000 | $200,000 under $500,000 | $500,000 under $1,000,000 | $1,000,000 or more | All |
| Number of returns | Number | - | - | - | - | - | - | - | - | - | - |
| Number of joint returns | Number | - | - | - | - | - | - | - | - | - | - |
| Number of exemptions | Number | - | - | - | - | - | - | - | - | - | - |
| Adjusted gross income (AGI) | Amount | - | - | - | - | - | - | - | - | - | - |
| Salaries and wages in AGI | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | - | - | - | - | - | - |
| Taxable interest | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | - | - | 1 | - | - | 1 |
| Ordinary dividends | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | - | - | - | - | - | - |
| Qualified dividends | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | 1 | - | - | - | - | 1 |
| State and local income tax refunds | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | - | - | - | - | - | - |
| Business or profession net income (less loss) | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | 1 | 1 | - | - | - | 2 |
| Net capital gain (less loss) in AGI | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | 1 | - | - | - | - | - | - | - | 1 |
| Taxable individual retirement arrangements distributions | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | 1 | - | - | - | - | 1 |
| Taxable pensions and annuities in AGI | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | - | - | - | - | - | - |
| Number of farm returns | Number | - | - | 1 | - | 1 | - | - | - | - | 2 |
| Unemployment compensation | Number | - | - | - | - | - | - | - | 1 | - | 1 |
| | Amount | - | - | - | - | - | - | - | 1 | - | 1 |
| Taxable social security benefits in AGI | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | - | - | - | - | - | - |
| Partnership/S-corp net income (less loss) | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | 9 | 1 | 1 | - | - | - | - | - | 11 |
| Self-employed health insurance deduction | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | - | - | - | - | - | - |
| Individual retirement arrangement payments | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | - | - | - | - | - | - |
| Student loan interest deduction | Number | - | - | - | - | - | - | | | | - |
| | Amount | - | - | - | - | - | - | | | | - |
| Total itemized deductions | Number | N/A | - | - | - | - | - | - | - | - | - |
| | Amount | N/A | - | - | - | - | - | 1 | - | - | 1 |
| State and local income taxes | Number | N/A | - | - | - | - | - | - | - | - | - |
| | Amount | N/A | - | - | - | - | - | 8 | - | - | 8 |
| State and local general sales taxes | Number | N/A | - | - | - | - | - | - | - | - | - |
| | Amount | N/A | - | - | - | - | - | - | - | - | - |
| Real estate taxes | Number | N/A | - | - | - | - | - | - | - | - | - |
| | Amount | N/A | - | - | - | 1 | - | - | - | - | 1 |
| Home mortgage interest paid | Number | N/A | - | - | - | - | - | - | - | - | - |
| | Amount | N/A | - | - | - | - | - | - | - | - | - |
| Charitable contributions | Number | N/A | - | - | - | - | - | - | - | - | - |
| | Amount | N/A | - | - | - | - | - | - | - | - | - |
| Self-employment tax | Number | - | - | - | - | - | - | - | - | - | - |
| | Amount | - | - | - | - | - | 1 | - | - | - | 1 |
| Earned income credit | Number | - | - | - | | | | | | | - |
| | Amount | - | - | - | | | | | | | - |
| **All Targets** | | | **10** | **2** | **1** | **5** | **2** | **10** | **2** | **-** | **32** |

**Notes:** We used 22,308 state-AGI targets. N/A indicates that the variable is irrelevant due to the state totals equaling $0 for the given AGI group.

[1]Number of returns with item or total dollars for item.

TABLE 3A

# Comparing Simulated Income Tax Values from State-Weighted Tax Model to IRS Tabulations

Percent difference from IRS tabulations, tax year 2011

| | US | Min across states | Max across states | AL | AK | AZ | AR | CA | CO | CT | DE | DC | FL | GA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Taxable income ($) | 0.3 | -1.5 | 1.4 | 0.4 | 0.1 | -0.1 | 0.7 | 0.9 | 0.3 | 0.6 | 0.7 | 0.9 | 0.1 | 0.2 |
| Income tax before credits (# ret >0)[1] | 0.3 | -8.9 | 1.0 | 0.5 | -8.9 | 0.9 | 0.2 | 0.6 | 0.4 | 0.2 | 0.0 | -0.1 | 1.0 | 0.2 |
| Income tax before credits ($) | -0.1 | -1.6 | 2.5 | 0.2 | -0.2 | -1.5 | 0.9 | 0.3 | -0.3 | 0.6 | 0.8 | 1.2 | -0.6 | 0.0 |
| AMT (# ret>0) | -0.2 | -10.7 | 15.4 | 6.5 | 0.2 | 15.4 | -0.7 | -4.0 | 6.0 | 0.4 | -1.9 | 3.2 | 2.0 | -10.1 |
| AMT ($) | -1.2 | -31.5 | 40.4 | -14.1 | -6.7 | -5.4 | -2.9 | -8.2 | -8.2 | 3.9 | -9.6 | -7.9 | 0.3 | -3.9 |
| Child Tax Credit (# ret>0) | 9.9 | -6.1 | 33.5 | 11.2 | -6.1 | 6.4 | 4.2 | 10.0 | 8.9 | 7.2 | 8.8 | 33.5 | 18.5 | 14.4 |
| Child Tax Credit ($) | 8.9 | -1.7 | 32.0 | 10.1 | -1.7 | 5.7 | 3.7 | 13.6 | 6.0 | 7.1 | 9.0 | 32.0 | 16.2 | 13.9 |
| EITC (# ret>0) | 1.0 | -0.8 | 3.3 | 0.0 | 0.6 | 2.5 | 0.0 | 3.1 | 1.8 | 0.4 | 1.1 | 1.0 | 0.4 | 1.0 |
| EITC ($) | 0.5 | -1.3 | 4.1 | -0.9 | -0.4 | 3.1 | -0.4 | 3.5 | 2.4 | -0.2 | 1.3 | -0.2 | -1.1 | -0.1 |
| Additional Child Tax Credit (# ret>0) | 2.4 | -3.9 | 13.9 | 7.2 | 1.6 | 0.2 | 3.6 | 1.2 | 0.6 | 1.0 | 2.6 | 4.6 | 3.3 | 1.8 |
| Additional Child Tax Credit ($) | -2.5 | -15.8 | 17.1 | 4.4 | -11.7 | -8.4 | 3.4 | -1.7 | -11.2 | -1.3 | 0.3 | 3.9 | -4.6 | -5.0 |
| Other credits[2] ($) | -18.5 | -31.8 | 56.7 | -24.7 | 40.5 | 7.8 | 41.0 | -19.4 | 5.1 | -15.9 | -19.6 | -30.8 | -24.9 | -28.8 |
| Total credits ($) | -3.8 | -8.8 | 11.1 | -3.2 | 7.4 | 1.6 | 6.4 | -1.8 | 1.2 | -5.5 | -2.6 | -8.0 | -6.5 | -5.3 |
| Income tax net of credits ($) | 0.6 | -2.3 | 3.8 | 1.3 | -1.1 | -2.3 | -0.8 | 0.6 | -0.5 | 1.0 | 1.4 | 2.0 | 0.6 | 1.6 |

**Source:** Urban-Brookings Tax Policy Center Microsimulation Model (version TM15-v1) and IRS, "Table 2. Individual Income and Tax Data, by State and Size of Adjusted Gross Income, Tax Year 2011." http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2.

[1]Number of returns with non-zero value for relevant item.

[2]Foreign Tax Credit, Child and Dependent Care Tax Credit, Nonrefundable Education Credit, Refundable Education Credit, and Retirement Savings Credit. Simulated totals for other credits are much closer to SOI tabulations at the national level in years after 2011. Starting in 2012 receipt of refundable education credits declined by nearly twenty percent. The tax model database was calibrated to match the lower level of education credits.

TABLE 3B

# Comparing Simulated Income Tax Values from State-Weighted Tax Model to IRS Tabulations

Percent difference from IRS tabulations, tax year 2011

| | US | HI | ID | IL | IN | IA | KS | KY | LA | ME | MD | MA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Taxable income ($) | 0.3 | 0.4 | -1.5 | 0.4 | -0.6 | 0.6 | 0.5 | 0.6 | 0.6 | 0.9 | 1.4 | 0.2 |
| Income tax before credits (# ret >0)[1] | 0.3 | -0.4 | -0.9 | 0.7 | 0.4 | -0.1 | 0.1 | -0.2 | 0.2 | -0.1 | 0.1 | 0.0 |
| Income tax before credits ($) | -0.1 | 0.4 | -1.4 | -0.6 | -0.7 | 0.9 | 0.5 | 0.7 | 0.3 | 1.1 | 1.7 | -0.2 |
| AMT (# ret>0) | -0.2 | 1.0 | 11.7 | 1.9 | 5.1 | 1.7 | 3.3 | 4.2 | -0.3 | -3.3 | -5.0 | 5.6 |
| AMT ($) | -1.2 | -14.7 | 5.7 | 7.6 | 12.5 | 0.1 | 0.3 | -4.4 | -7.8 | -11.2 | -4.8 | 1.6 |
| Child Tax Credit (# ret>0) | 9.9 | 11.1 | 8.2 | 13.0 | 9.2 | 6.1 | 4.8 | 5.7 | 9.5 | 9.5 | 11.5 | 10.1 |
| Child Tax Credit ($) | 8.9 | 6.5 | 1.2 | 13.2 | 8.1 | 1.0 | 1.7 | 4.8 | 8.7 | 7.2 | 13.0 | 8.3 |
| EITC (# ret>0) | 1.0 | 0.0 | 0.1 | 1.8 | 1.0 | -0.3 | 0.6 | 0.0 | -0.1 | -0.8 | 0.8 | -0.1 |
| EITC ($) | 0.5 | 0.3 | 0.1 | 1.2 | 1.0 | -0.4 | 0.8 | -0.3 | -1.3 | -0.9 | 0.3 | -0.7 |
| Additional Child Tax Credit (# ret>0) | 2.4 | 13.3 | 6.4 | -1.2 | 4.3 | 3.8 | 0.3 | 4.0 | 8.5 | 11.8 | -0.3 | 4.8 |
| Additional Child Tax Credit ($) | -2.5 | 9.1 | -2.8 | -7.3 | -3.7 | -2.4 | -5.3 | 0.6 | 10.2 | 10.5 | -2.2 | 3.9 |
| Other credits[2] ($) | -18.5 | -12.3 | 5.2 | -19.2 | -3.0 | -1.0 | 20.5 | 4.4 | -4.3 | -9.3 | -21.0 | -5.0 |
| Total credits ($) | -3.8 | 0.1 | 0.6 | -4.0 | 0.9 | -0.5 | 3.8 | 1.6 | 1.6 | 0.4 | -3.9 | 0.2 |
| Income tax net of credits ($) | 0.6 | 0.4 | -2.0 | -0.1 | -1.1 | 1.2 | 0.0 | 0.5 | -0.1 | 1.2 | 2.3 | -0.2 |

**Source:** Urban-Brookings Tax Policy Center Microsimulation Model (version TM15-v1) and IRS, "Table 2. Individual Income and Tax Data, by State and Size of Adjusted Gross Income, Tax Year 2011." http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2.

[1]Number of returns with non-zero value for relevant item.

[2]Foreign Tax Credit, Child and Dependent Care Tax Credit, Nonrefundable Education Credit, Refundable Education Credit, and Retirement Savings Credit. Simulated totals for other credits are much closer to SOI tabulations at the national level in years after 2011. Starting in 2012 receipt of refundable education credits declined by nearly twenty percent. The tax model database was calibrated to match the lower level of education credits.

TABLE 3C

# Comparing Simulated Income Tax Values from State-Weighted Tax Model to IRS Tabulations

Percent difference from IRS tabulations, tax year 2011

| | US | MI | MN | MS | MO | MT | NE | NV | NH | NJ | NM | NY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Taxable income ($) | 0.3 | -0.2 | 0.5 | 1.0 | -0.5 | 0.4 | 0.8 | 0.7 | 0.8 | -0.4 | 0.5 | 1.4 |
| Income tax before credits (# ret >0)[1] | 0.3 | 0.1 | 0.2 | 0.1 | -0.2 | -0.1 | 0.1 | 0.7 | 0.0 | 0.3 | 0.1 | 0.4 |
| Income tax before credits ($) | -0.1 | -0.4 | 0.7 | 1.2 | -0.5 | -0.4 | 1.1 | 0.2 | 2.5 | -0.7 | 0.1 | 1.1 |
| AMT (# ret>0) | -0.2 | 8.8 | 2.8 | -0.6 | 7.2 | -10.7 | 0.7 | 13.7 | 1.0 | 1.9 | 4.6 | -10.1 |
| AMT ($) | -1.2 | 4.2 | 1.4 | -5.8 | 0.6 | -31.5 | -2.9 | 6.5 | 40.4 | 11.1 | -3.6 | -5.6 |
| Child Tax Credit (# ret>0) | 9.9 | 13.4 | 11.3 | 10.9 | 7.0 | 9.1 | 7.0 | 9.2 | 8.6 | 10.1 | 4.3 | 13.9 |
| Child Tax Credit ($) | 8.9 | 9.4 | 5.3 | 9.7 | 3.1 | 2.0 | 1.0 | 9.3 | 7.9 | 13.4 | 2.3 | 14.9 |
| EITC (# ret>0) | 1.0 | 0.3 | 0.4 | -0.2 | -0.3 | -0.6 | 0.2 | 3.3 | 0.2 | 0.9 | 0.7 | 0.4 |
| EITC ($) | 0.5 | -0.7 | 0.3 | -1.3 | -0.7 | -0.9 | 0.1 | 4.1 | -0.8 | 0.1 | 0.8 | -1.0 |
| Additional Child Tax Credit (# ret>0) | 2.4 | 8.8 | 3.2 | 7.1 | 6.6 | 11.0 | 2.4 | -2.8 | 10.4 | -2.7 | 3.7 | 4.7 |
| Additional Child Tax Credit ($) | -2.5 | 2.3 | -7.2 | 7.7 | 3.9 | 4.8 | -3.6 | -11.3 | 5.1 | -7.4 | 4.7 | 1.9 |
| Other credits[2] ($) | -18.5 | -28.7 | -13.4 | -31.8 | 8.2 | 14.9 | 12.3 | -4.1 | 21.8 | -18.3 | 30.5 | -30.5 |
| Total credits ($) | -3.8 | -6.2 | -3.6 | -3.2 | 2.6 | 3.8 | 2.3 | -0.3 | 9.3 | -4.8 | 5.7 | -8.8 |
| Income tax net of credits ($) | 0.6 | 0.8 | 1.2 | 3.8 | -1.1 | -1.2 | 0.9 | 0.2 | 1.9 | -0.3 | -1.5 | 2.2 |

**Source:** Urban-Brookings Tax Policy Center Microsimulation Model (version TM15-v1) and IRS, "Table 2. Individual Income and Tax Data, by State and Size of Adjusted Gross Income, Tax Year 2011." http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2.

[1]Number of returns with non-zero value for relevant item.

[2]Foreign Tax Credit, Child and Dependent Care Tax Credit, Nonrefundable Education Credit, Refundable Education Credit, and Retirement Savings Credit. Simulated totals for other credits are much closer to SOI tabulations at the national level in years after 2011. Starting in 2012 receipt of refundable education credits declined by nearly twenty percent. The tax model database was calibrated to match the lower level of education credits.

TABLE 3D

# Comparing Simulated Income Tax Values from State-Weighted Tax Model to IRS Tabulations

Percent difference from IRS tabulations, tax year 2011

| | US | NC | ND | OH | OK | OR | PA | RI | SC | SD | TN | TX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Taxable income ($) | 0.3 | -0.3 | 0.1 | 0.4 | 0.4 | 1.2 | 0.3 | -1.3 | -0.4 | 0.1 | -0.3 | 0.2 |
| Income tax before credits (# ret >0)[1] | 0.3 | 0.9 | 0.0 | 0.2 | 0.0 | 0.4 | 0.3 | -0.2 | 0.6 | -0.1 | 0.2 | 0.5 |
| Income tax before credits ($) | -0.1 | -0.3 | 0.0 | 0.2 | 0.2 | 1.1 | -0.1 | -1.5 | -0.5 | 0.6 | -0.4 | -0.8 |
| AMT (# ret>0) | -0.2 | 7.6 | 4.2 | -6.7 | 4.6 | -0.4 | 5.5 | 11.7 | 11.4 | 4.2 | 13.3 | -0.3 |
| AMT ($) | -1.2 | 3.3 | 3.4 | -5.0 | -1.1 | -6.9 | 2.2 | 1.9 | 2.0 | 11.6 | 7.0 | 5.5 |
| Child Tax Credit (# ret>0) | 9.9 | 4.6 | 6.9 | 9.5 | 3.1 | 12.4 | 11.2 | 7.5 | 8.4 | 9.4 | 10.4 | 6.7 |
| Child Tax Credit ($) | 8.9 | 5.4 | -1.4 | 5.6 | 0.8 | 9.4 | 9.6 | 5.9 | 7.8 | 1.4 | 9.6 | 6.7 |
| EITC (# ret>0) | 1.0 | 1.5 | -0.5 | 0.5 | 0.2 | 1.4 | 0.0 | 0.1 | 0.6 | -0.1 | 0.6 | 0.9 |
| EITC ($) | 0.5 | 1.4 | -0.2 | 0.0 | 0.0 | 2.0 | -0.4 | -0.8 | 0.3 | -0.2 | -0.1 | -0.2 |
| Additional Child Tax Credit (# ret>0) | 2.4 | -0.2 | 2.6 | 7.7 | 2.4 | 7.3 | 6.5 | 3.7 | 4.4 | 2.4 | 4.9 | -1.6 |
| Additional Child Tax Credit ($) | -2.5 | -4.5 | -4.8 | 4.5 | -0.9 | 0.0 | 3.5 | 2.8 | 1.8 | -6.1 | -1.8 | -5.1 |
| Other credits[2] ($) | -18.5 | -6.8 | 48.5 | -8.0 | 56.7 | -0.6 | -2.8 | -10.9 | -11.5 | 0.9 | 17.2 | -1.1 |
| Total credits ($) | -3.8 | -0.6 | 11.1 | 0.2 | 7.9 | 2.6 | 1.7 | -1.5 | -0.3 | -0.5 | 4.4 | -0.3 |
| Income tax net of credits ($) | 0.6 | -0.2 | -1.1 | 0.2 | -1.4 | 0.9 | -0.3 | -1.5 | -0.5 | 0.8 | -1.5 | -0.9 |

**Source:** Urban-Brookings Tax Policy Center Microsimulation Model (version TM15-v1) and IRS, "Table 2. Individual Income and Tax Data, by State and Size of Adjusted Gross Income, Tax Year 2011." http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2.

[1]Number of returns with non-zero value for relevant item.

[2]Foreign Tax Credit, Child and Dependent Care Tax Credit, Nonrefundable Education Credit, Refundable Education Credit, and Retirement Savings Credit. Simulated totals for other credits are much closer to SOI tabulations at the national level in years after 2011. Starting in 2012 receipt of refundable education credits declined by nearly twenty percent. The tax model database was calibrated to match the lower level of education credits.

TABLE 3E

# Comparing Simulated Income Tax Values from State-Weighted Tax Model to IRS Tabulations

Percent difference from IRS tabulations, tax year 2011

| | US | UT | VT | VA | WA | WV | WI | WY |
|---|---|---|---|---|---|---|---|---|
| Taxable income ($) | 0.3 | 0.7 | 0.6 | -1.3 | 0.4 | 0.3 | 0.1 | 0.1 |
| Income tax before credits (# ret >0)[1] | 0.3 | 0.6 | 0.2 | -0.2 | 0.2 | -0.3 | 0.1 | 0.1 |
| Income tax before credits ($) | -0.1 | 0.5 | 0.2 | -1.6 | -0.2 | -0.1 | 0.4 | -0.5 |
| AMT (# ret>0) | -0.2 | 6.1 | -6.2 | 6.0 | 1.6 | 2.5 | 6.5 | 2.1 |
| AMT ($) | -1.2 | 0.5 | -15.4 | 7.4 | 0.8 | -4.6 | 5.9 | -20.1 |
| Child Tax Credit (# ret>0) | 9.9 | 9.8 | 8.0 | 7.2 | 9.3 | 7.8 | 8.7 | 8.5 |
| Child Tax Credit ($) | 8.9 | 1.3 | 5.5 | 4.4 | 6.4 | 5.3 | 4.9 | 0.6 |
| EITC (# ret>0) | 1.0 | 2.1 | -0.6 | 0.4 | 2.0 | -0.5 | 1.0 | 0.8 |
| EITC ($) | 0.5 | 3.0 | -0.8 | 0.3 | 3.0 | -0.1 | 1.2 | 0.9 |
| Additional Child Tax Credit (# ret>0) | 2.4 | -3.9 | 12.3 | 4.1 | 2.5 | 13.9 | 3.1 | 1.1 |
| Additional Child Tax Credit ($) | -2.5 | -15.8 | 8.3 | 1.3 | -5.1 | 17.1 | -8.0 | -11.6 |
| Other credits[2] ($) | -18.5 | -2.9 | -4.5 | -8.7 | 27.6 | 45.1 | 3.3 | 40.0 |
| Total credits ($) | -3.8 | -3.3 | 0.9 | -1.0 | 8.8 | 10.1 | 1.0 | 9.5 |
| Income tax net of credits ($) | 0.6 | 1.6 | 0.1 | -1.6 | -1.3 | -2.2 | 0.3 | -1.7 |

**Source:** Urban-Brookings Tax Policy Center Microsimulation Model (version TM15-v1) and IRS, "Table 2. Individual Income and Tax Data, by State and Size of Adjusted Gross Income, Tax Year 2011." http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2.

[1]Number of returns with non-zero value for relevant item.

[2]Foreign Tax Credit, Child and Dependent Care Tax Credit, Nonrefundable Education Credit, Refundable Education Credit, and Retirement Savings Credit. Simulated totals for other credits are much closer to SOI tabulations at the national level in years after 2011. Starting in 2012 receipt of refundable education credits declined by nearly twenty percent. The tax model database was calibrated to match the lower level of education

## SIMULATING FEDERAL TAXES AT STATE LEVEL

An important use of the TPC Tax model is analyzing the distribution of federal taxes across different groups. The tax model can be used to examine the distribution of comprehensive federal tax burdens including federal income taxes, payroll taxes, estate taxes, corporate income taxes, and excise taxes.[25] Examining the current tax burden provides valuable information about the distribution of taxes across different segments of the population and the overall progressivity of the federal tax system, providing a baseline against which to evaluate various tax policy options. With the new state weights the TPC tax model can extend that analysis by simulating federal tax burdens by state.

Table 4 shows average pre-tax income, federal tax burden, after-tax income, and average federal tax rate by state. We use a broad measure of pre-tax income, which we call "expanded cash income" or ECI, to analyze the distribution of federal taxes.[26] Mean pre-tax income is $73,398 for the nation as a whole in 2011, varying from $55,980 in Mississippi to $104,985 in Connecticut. Average federal tax burden ranges from $7,471 in Mississippi to $20,386 in Connecticut and is $12,131 overall. Nationally, the average federal tax rate is 16.5 percent with rates by state varying from 13.3 percent in Mississippi to 20.1 percent in the District of Columbia.

Another important use of the TPC tax model is analyzing changes in federal tax policy. The state weights allow us to show federal tax changes by state as well as the distribution of federal tax changes by income groups within specific states. We demonstrate this capability by analyzing three federal tax policy options: (1) eliminating the AMT, (2) increasing the top marginal rate, and (3) reducing the CTC. We focus on departures from current law in 2011.

### *Eliminating the AMT*

The AMT operates parallel to the regular tax and sets a floor on total tax liability. Taxpayers whose income exceeds the AMT exemption must calculate both regular tax and AMT liabilities and pay the larger amount. The AMT applies a different income definition and rate structure than the regular income tax and allows different deductions and exemptions. Because the AMT exemption is high relative to income and the AMT disallows the deduction for state and local taxes paid, we expect that repealing the AMT will affect more households in higher-income states, and particularly those with higher state taxes.

Table 5 shows the impact on federal tax burden of repealing the AMT in 2011 by state. Nationally, 3.1 percent of tax units receive a tax cut and the average federal tax cut (for all tax units) is $222. The percent of tax units with tax cuts ranges from 6.9 percent in New Jersey to only 1.3 percent in Mississippi and the average tax cut ranges from $538 in New Jersey to $52 in

Alaska. The rightmost columns show each state's rank in terms of average AGI and average state tax deduction and indicate which states have no state income tax. As expected the states gaining the most by repealing the AMT are higher income states with higher state tax deductions.

The tax model can also produce distributional estimates for individual states. For example, table 6 shows tax changes under the proposal by income group in California. Almost no tax units with income below $75,000 benefit from eliminating the AMT, with the percentage of taxpayers that benefit increasing to over 44.9 percent in the $200,000 to $500,000 income range, 87.2 percent in the $500,000 to $1,000,000 range, but falling to 41.3 percent of those with incomes over $1,000,000.[27]

Table 7 shows the distribution of tax change under the same policy in Louisiana, which is one of the states least affected by repealing the AMT. As in California, high-income tax units benefit more than low-income tax units, though tax cuts are lower for all income groups in Louisiana. Comparing tables 6 and 7 suggests that California benefits more from repealing the AMT both because a greater share of its residents are high income and because it has higher state taxes. In California, 7.6 percent of tax units have incomes above $200,000 compared to 5.0 percent in Louisiana. Additionally, due to higher state taxes, tax-units with high income in California benefit more than tax-units with the same income in Louisiana. For instance, the average tax change for tax units with incomes between $200,000 and $500,000 in California is $2,370 but only $1,105 for the same income group in Louisiana.

***Raising the Top Tax Rate***

Table 8 shows the impact of raising the top marginal rate in 2011 from 35 percent to 39.6 percent by state.[28] Nationally, 0.4 percent of tax units would see their taxes increase and the average tax change is $147. Across states the share of tax units affected ranges from 0.2 percent in 14 states to 0.9 percent in Connecticut. The average tax increase ranges from $43 in West Virginia to $444 in Connecticut. The ranking of tax changes closely follows the state ranking based on SOI tabulations of share of tax filers with taxable income above $500,000, as shown in the last column of Table 8.

***Reducing Amount and Refundability of Child Tax Credit to 2000 Law***

Taxpayers can claim the Child Tax Credit (CTC) for each child under age 17. The credit is $1,000 per eligible child, with the credit starting to phase out when AGI exceeds $110,000 for joint filers and $75,000 for single filers. If the total credit claimed exceeds taxes owed, taxpayers can receive some or all of the balance as a refund, known as the Additional Child Tax Credit (ACTC). Currently, the ACTC is limited to 15 percent of earnings above $3,000.[29]

Table 9 shows the impact by state of changing the CTC rules in 2011 to what they were in 2000. The amount of CTC would be reduced to $500 and the refundable portion would be

limited only to families with three or more children.[30] Nationally, 23 percent of tax units pay higher taxes with the average tax increase equal to $237. By state, the percent of tax units with a tax increase ranges from 16.9 percent in the District of Columbia to 32.1 percent in Mississippi. The average tax increase ranges from $159 in Massachusetts to $356 in Mississippi. As expected, the ranking by average tax increase closely follows SOI ranking by number of dependent exemptions shown in the last column.

TABLE 4

# Baseline Distribution of Income and Federal Taxes

By state, ranked by federal tax rate, 2011

| | Federal Tax Rate Rank | Number of Tax Units[1] (thousands) | Avg Pre-Tax Income ($)[2] | Avg Federal Tax ($)[3] | Avg After-Tax Income ($) | Federal Tax Rate[4] |
|---|---|---|---|---|---|---|
| United States | | 163,330 | 73,398 | 12,131 | 61,267 | 16.5 |
| District of Columbia | 1 | 362 | 93,446 | 18,746 | 74,700 | 20.1 |
| Connecticut | 2 | 1,903 | 104,985 | 20,386 | 84,599 | 19.4 |
| Massachusetts | 3 | 3,486 | 95,272 | 17,848 | 77,423 | 18.7 |
| New York | 4 | 10,624 | 84,943 | 15,607 | 69,336 | 18.4 |
| New Jersey | 5 | 4,811 | 91,885 | 16,697 | 75,187 | 18.2 |
| Maryland | 6 | 3,057 | 87,936 | 15,513 | 72,422 | 17.6 |
| New Hampshire | 7 | 704 | 84,736 | 14,852 | 69,884 | 17.5 |
| North Dakota | 8 | 348 | 82,173 | 14,289 | 67,885 | 17.4 |
| Virginia | 9 | 4,058 | 86,300 | 14,921 | 71,379 | 17.3 |
| Wyoming | 10 | 330 | 77,319 | 13,336 | 63,983 | 17.2 |
| Colorado | 11 | 2,628 | 80,695 | 13,806 | 66,889 | 17.1 |
| California | 12 | 19,418 | 78,057 | 13,295 | 64,762 | 17.0 |
| Alaska | 13 | 451 | 68,145 | 11,590 | 56,555 | 17.0 |
| Washington | 14 | 3,580 | 79,665 | 13,532 | 66,133 | 17.0 |
| Texas | 15 | 12,531 | 74,612 | 12,664 | 61,948 | 17.0 |
| Illinois | 16 | 6,853 | 77,098 | 13,077 | 64,021 | 17.0 |
| Minnesota | 17 | 2,773 | 80,573 | 13,578 | 66,995 | 16.9 |
| Pennsylvania | 18 | 6,988 | 71,922 | 11,790 | 60,132 | 16.4 |
| Rhode Island | 19 | 564 | 73,643 | 12,010 | 61,633 | 16.3 |
| Delaware | 20 | 472 | 73,875 | 11,944 | 61,930 | 16.2 |
| Florida | 21 | 11,148 | 63,989 | 10,251 | 53,738 | 16.0 |
| Nevada | 22 | 1,505 | 65,500 | 10,467 | 55,033 | 16.0 |
| South Dakota | 23 | 435 | 70,008 | 11,180 | 58,829 | 16.0 |
| Vermont | 24 | 342 | 70,096 | 11,164 | 58,933 | 15.9 |
| Kansas | 25 | 1,485 | 71,575 | 11,363 | 60,211 | 15.9 |
| Nebraska | 26 | 914 | 73,130 | 11,590 | 61,541 | 15.8 |
| Iowa | 27 | 1,485 | 73,163 | 11,459 | 61,704 | 15.7 |
| Wisconsin | 28 | 3,045 | 70,817 | 11,091 | 59,725 | 15.7 |
| Ohio | 29 | 5,991 | 66,522 | 10,399 | 56,123 | 15.6 |
| Oklahoma | 30 | 1,783 | 67,976 | 10,551 | 57,425 | 15.5 |
| Louisiana | 31 | 2,151 | 65,294 | 10,116 | 55,178 | 15.5 |
| Missouri | 32 | 3,004 | 67,220 | 10,323 | 56,897 | 15.4 |
| Hawaii | 33 | 743 | 67,243 | 10,306 | 56,937 | 15.3 |
| Maine | 34 | 667 | 66,675 | 10,209 | 56,466 | 15.3 |
| Michigan | 35 | 5,361 | 64,491 | 9,828 | 54,663 | 15.2 |
| Tennessee | 36 | 3,231 | 63,466 | 9,653 | 53,813 | 15.2 |
| Oregon | 37 | 1,993 | 67,580 | 10,275 | 57,305 | 15.2 |
| Arizona | 38 | 3,143 | 66,197 | 10,045 | 56,152 | 15.2 |
| Georgia | 39 | 5,325 | 61,584 | 9,332 | 52,252 | 15.2 |
| North Carolina | 40 | 4,786 | 65,727 | 9,818 | 55,909 | 14.9 |
| Indiana | 41 | 3,476 | 62,857 | 9,361 | 53,497 | 14.9 |
| Montana | 42 | 519 | 64,058 | 9,466 | 54,592 | 14.8 |
| Utah | 43 | 1,271 | 70,023 | 10,301 | 59,722 | 14.7 |
| Alabama | 44 | 2,291 | 63,355 | 9,313 | 54,042 | 14.7 |
| Kentucky | 45 | 2,077 | 62,299 | 9,122 | 53,177 | 14.6 |
| West Virginia | 46 | 904 | 61,002 | 8,904 | 52,098 | 14.6 |
| Arkansas | 47 | 1,349 | 62,546 | 9,065 | 53,481 | 14.5 |
| New Mexico | 48 | 1,066 | 58,027 | 8,329 | 49,698 | 14.4 |
| South Carolina | 49 | 2,315 | 61,364 | 8,748 | 52,616 | 14.3 |
| Idaho | 50 | 739 | 63,225 | 8,818 | 54,407 | 13.9 |
| Mississippi | 51 | 1,387 | 55,980 | 7,471 | 48,509 | 13.3 |

**Source:** Urban-Brookings Tax Policy Center Microsimulation Model (version 0515-2).

[1]Includes both filing and non-filing units but excludes those that are dependents of other tax units.

[2]Expanded cash income equals AGI plus employer provided fringe benefit, tax-exempt interest, non-taxable pension and retirement income, above-the-line adjustments, cash and cash-like transfer payments, employer share of payroll taxes, and imputed corporate income tax liability.

[3]Federal tax includes individual income, corporate income, Social Security, Medicare, estate, and excise taxes.

[4]Average federal tax as a percentage of average expanded cash income.

TABLE 5

# Average Federal Tax Change from Repealing AMT

By state, ranked by average dollar tax change, 2011

| | Tax Change Rank | % with Tax Cut | Avg Tax Change ($)[1] | Avg Tax Change (%)[1] | IRS AGI Rank[2] | IRS State Tax Ded Rank[2] | No Income Tax State |
|---|---|---|---|---|---|---|---|
| United States | | 3.1 | -222 | -1.8 | | | |
| New Jersey | 1 | 6.9 | -538 | -3.2 | 4 | 2 | |
| Connecticut | 2 | 6.3 | -537 | -2.6 | 1 | 1 | |
| New York | 3 | 5.0 | -533 | -3.4 | 5 | 3 | |
| District of Columbia | 4 | 6.0 | -407 | -2.2 | 2 | 5 | |
| Massachusetts | 5 | 5.6 | -388 | -2.2 | 3 | 6 | |
| California | 6 | 4.4 | -378 | -2.8 | 9 | 7 | |
| Maryland | 7 | 5.2 | -321 | -2.1 | 6 | 4 | |
| Virginia | 8 | 4.5 | -255 | -1.7 | 7 | 13 | |
| Minnesota | 9 | 3.6 | -250 | -1.8 | 14 | 9 | |
| Illinois | 10 | 3.7 | -232 | -1.8 | 13 | 10 | |
| Rhode Island | 11 | 3.4 | -214 | -1.8 | 18 | 11 | |
| New Hampshire | 12 | 3.0 | -207 | -1.4 | 8 | 17 | limited[3] |
| Oregon | 13 | 2.8 | -204 | -2.0 | 27 | 8 | |
| Vermont | 14 | 2.5 | -183 | -1.6 | 31 | 15 | |
| Wisconsin | 15 | 2.6 | -179 | -1.6 | 23 | 12 | |
| Colorado | 16 | 3.0 | -177 | -1.3 | 10 | 23 | |
| Kansas | 17 | 2.5 | -174 | -1.5 | 21 | 20 | |
| Pennsylvania | 18 | 2.9 | -172 | -1.5 | 20 | 14 | |
| North Carolina | 19 | 2.7 | -171 | -1.7 | 35 | 18 | |
| Nebraska | 20 | 2.5 | -163 | -1.4 | 22 | 21 | |
| Maine | 21 | 2.3 | -159 | -1.6 | 40 | 16 | |
| Ohio | 22 | 2.5 | -159 | -1.5 | 34 | 19 | |
| Delaware | 23 | 2.6 | -146 | -1.2 | 19 | 22 | |
| Iowa | 24 | 2.3 | -137 | -1.2 | 24 | 24 | |
| Missouri | 25 | 2.2 | -134 | -1.3 | 32 | 30 | |
| Utah | 26 | 2.2 | -133 | -1.3 | 25 | 25 | |
| Georgia | 27 | 2.3 | -132 | -1.4 | 43 | 26 | |
| Idaho | 28 | 1.9 | -128 | -1.4 | 49 | 31 | |
| Arkansas | 29 | 1.7 | -125 | -1.4 | 47 | 38 | |
| North Dakota | 30 | 2.5 | -124 | -0.9 | 15 | 43 | |
| Michigan | 31 | 2.2 | -121 | -1.2 | 36 | 28 | |
| Texas | 32 | 2.4 | -119 | -0.9 | 17 | 39 | yes |
| Wyoming | 33 | 1.6 | -119 | -0.9 | 12 | 50 | yes |
| Florida | 34 | 1.7 | -118 | -1.2 | 37 | 44 | yes |
| Hawaii | 35 | 2.1 | -118 | -1.1 | 28 | 27 | |
| Kentucky | 36 | 1.9 | -117 | -1.3 | 45 | 29 | |
| Oklahoma | 37 | 2.0 | -117 | -1.1 | 26 | 37 | |
| South Carolina | 38 | 2.0 | -116 | -1.3 | 48 | 34 | |
| Montana | 39 | 1.8 | -115 | -1.2 | 46 | 32 | |
| Washington | 40 | 2.3 | -113 | -0.8 | 11 | 33 | yes |
| Indiana | 41 | 1.7 | -103 | -1.1 | 39 | 36 | |
| Arizona | 42 | 2.0 | -102 | -1.0 | 33 | 35 | |
| Nevada | 43 | 1.5 | -98 | -0.9 | 30 | 45 | yes |
| Louisiana | 44 | 1.9 | -91 | -0.9 | 38 | 46 | |
| West Virginia | 45 | 1.5 | -88 | -1.0 | 44 | 41 | |
| New Mexico | 46 | 1.5 | -75 | -0.9 | 50 | 40 | |
| South Dakota | 47 | 1.5 | -74 | -0.7 | 29 | 51 | yes |
| Alabama | 48 | 1.5 | -70 | -0.8 | 42 | 42 | |
| Mississippi | 49 | 1.3 | -65 | -0.9 | 51 | 47 | |
| Tennessee | 50 | 1.5 | -65 | -0.7 | 41 | 48 | limited[3] |
| Alaska | 51 | 1.4 | -52 | -0.4 | 16 | 49 | |

**Source:** Urban-Brookings Tax Policy Center Microsimulation Model (version 0515-2).

[1]Including units with no change.

[2]Ranking based on SOI, "Table 2. Individual Income and Tax Data, by State and Size of Adjusted Gross Income, Tax Year 2011." http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2.

[3]New Hampshire and Tennessee only tax interest and dividends.

**Table 6**
**Effect of Repealing Federal AMT on California Residents, 2011**
**Baseline: Current Law**
**Distribution of Federal Tax Change by Expanded Cash Income Level, 2011 [1]**
**Detail Table**

| Expanded Cash Income Level (thousands of 2015 dollars) [2] | Percent of Tax Units [3] | | Percent Change in After-Tax Income [4] | Share of Total Federal Tax Change | Average Federal Tax Change | | Share of Federal Taxes | | Average Federal Tax Rate [5] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | With Tax Cut | With Tax Increase | | | Dollars | Percent | Change (% Points) | Under the Proposal | Change (% Points) | Under the Proposal |
| Less than 20 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0.5 | 0.0 | 2.2 |
| 20-50 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0.1 | 4.5 | 0.0 | 6.5 |
| 50-75 | 0.1 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0.2 | 6.8 | 0.0 | 11.4 |
| 75-100 | 0.6 | 0.0 | 0.0 | 0.1 | -5 | 0.0 | 0.2 | 7.6 | 0.0 | 14.1 |
| 100-200 | 3.6 | 0.0 | 0.1 | 2.5 | -62 | -0.3 | 0.7 | 25.5 | -0.1 | 16.8 |
| 200-500 | 44.9 | 0.0 | 1.1 | 40.5 | -2,370 | -4.3 | -0.4 | 26.4 | -0.9 | 19.8 |
| 500-1,000 | 87.2 | 0.0 | 2.6 | 27.0 | -12,156 | -7.8 | -0.5 | 9.3 | -1.9 | 22.8 |
| More than 1,000 | 41.3 | 0.0 | 1.6 | 29.8 | -33,519 | -4.4 | -0.3 | 19.1 | -1.2 | 25.7 |
| All | 4.4 | 0.0 | 0.6 | 100.0 | -378 | -2.8 | 0.0 | 100.0 | -0.5 | 16.6 |

**Baseline Distribution of Income and Federal Taxes in California**
**by Expanded Cash Income Level, 2011 [1]**

| Expanded Cash Income Level (thousands of 2015 dollars) [2] | Tax Units | | Pre-Tax Income | | Federal Tax Burden | | After-Tax Income [4] | | Average Federal Tax Rate [5] |
|---|---|---|---|---|---|---|---|---|---|
| | Number (thousands) | Percent of Total | Average (dollars) | Percent of Total | Average (dollars) | Percent of Total | Average (dollars) | Percent of Total | |
| Less than 20 | 4,903 | 25.2 | 10,796 | 3.5 | 233 | 0.4 | 10,563 | 4.1 | 2.2 |
| 20-50 | 5,643 | 29.1 | 31,100 | 11.6 | 2,016 | 4.4 | 29,083 | 13.1 | 6.5 |
| 50-75 | 2,596 | 13.4 | 57,790 | 9.9 | 6,580 | 6.6 | 51,209 | 10.6 | 11.4 |
| 75-100 | 1,660 | 8.6 | 81,398 | 8.9 | 11,454 | 7.4 | 69,944 | 9.2 | 14.1 |
| 100-200 | 2,919 | 15.0 | 130,513 | 25.1 | 21,948 | 24.8 | 108,565 | 25.2 | 16.8 |
| 200-500 | 1,252 | 6.5 | 267,948 | 22.1 | 55,294 | 26.8 | 212,653 | 21.2 | 20.6 |
| 500-1,000 | 163 | 0.8 | 628,955 | 6.8 | 155,569 | 9.8 | 473,386 | 6.1 | 24.7 |
| More than 1,000 | 65 | 0.3 | 2,860,299 | 12.3 | 769,290 | 19.4 | 2,091,009 | 10.9 | 26.9 |
| All | 19,418 | 100.0 | 78,057 | 100.0 | 13,295 | 100.0 | 64,762 | 100.0 | 17.0 |

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0515-2).
Number of AMT Taxpayers (millions). Baseline: 0.8 Proposal: 0
* Less than 0.05
(1) Calendar year. Baseline is current law. For a description of TPC's current law baseline see
http://www.taxpolicycenter.org/taxtopics/Baseline-Definitions.cfm
(2) Includes both filing and non-filing units but excludes those that are dependents of other tax units. Tax units with negative adjusted gross income are excluded from their respective income class but are included in the totals. For a description of expanded cash income, see
http://www.taxpolicycenter.org/TaxModel/income.cfm
(3) Includes tax units with a change in federal tax burden of $10 or more in absolute value.
(4) After-tax income is expanded cash income less: individual income tax net of refundable credits; corporate income tax; payroll taxes (Social Security and Medicare); estate tax; and excise taxes.
(5) Average federal tax (includes individual and corporate income tax, payroll taxes for Social Security and Medicare, the estate tax, and excise taxes) as a percentage of average expanded cash income.

**Table 7**
**Effect of Repealing Federal AMT on Louisiana Residents, 2011**
**Baseline: Current Law**
**Distribution of Federal Tax Change by Expanded Cash Income Level, 2011 [1]**
**Detail Table**

| Expanded Cash Income Level (thousands of 2015 dollars) [2] | Percent of Tax Units [3] | | Percent Change in After-Tax Income [4] | Share of Total Federal Tax Change | Average Federal Tax Change | | Share of Federal Taxes | | Average Federal Tax Rate [5] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | With Tax Cut | With Tax Increase | | | Dollars | Percent | Change (% Points) | Under the Proposal | Change (% Points) | Under the Proposal |
| Less than 20 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 |
| 20-50 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 5.4 | 0.0 | 5.4 |
| 50-75 | * | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 10.1 | 0.0 | 11.9 |
| 75-100 | 0.4 | 0.0 | 0.0 | 0.5 | -5.0 | 0.0 | 0.1 | 10.2 | 0.0 | 14.5 |
| 100-200 | 1.5 | 0.0 | 0.0 | 3.6 | -23.0 | -0.1 | 0.3 | 32.3 | 0.0 | 17.3 |
| 200-500 | 28.5 | 0.0 | 0.5 | 52.4 | -1,105.0 | -2.0 | -0.3 | 23.4 | -0.4 | 20.7 |
| 500-1,000 | 69.9 | 0.0 | 1.2 | 29.2 | -5,427.0 | -3.4 | -0.2 | 7.6 | -0.9 | 24.6 |
| More than 1,000 | 27.7 | 0.0 | 0.4 | 14.1 | -6,838.0 | -1.2 | 0.0 | 11.0 | -0.3 | 27.0 |
| All | 1.9 | 0.0 | 0.2 | 100.0 | -91.0 | -0.9 | 0.0 | 100.0 | -0.1 | 15.4 |

**Baseline Distribution of Income and Federal Taxes in Louisiana**
**by Expanded Cash Income Level, 2011 [1]**

| Expanded Cash Income Level (thousands of 2015 dollars) [2] | Tax Units | | Pre-Tax Income | | Federal Tax Burden | | After-Tax Income [4] | | Average Federal Tax Rate [5] |
|---|---|---|---|---|---|---|---|---|---|
| | Number (thousands) | Percent of Total | Average (dollars) | Percent of Total | Average (dollars) | Percent of Total | Average (dollars) | Percent of Total | |
| Less than 20 | 531 | 24.7 | 11,057 | 4.2 | -19 | 0.0 | 11,077 | 5.0 | -0.2 |
| 20-50 | 682 | 31.7 | 31,206 | 15.2 | 1,698 | 5.3 | 29,507 | 17.0 | 5.4 |
| 50-75 | 317 | 14.8 | 57,574 | 13.0 | 6,825 | 10.0 | 50,749 | 13.6 | 11.9 |
| 75-100 | 186 | 8.6 | 81,420 | 10.8 | 11,836 | 10.1 | 69,584 | 10.9 | 14.5 |
| 100-200 | 311 | 14.5 | 129,348 | 28.7 | 22,385 | 32.0 | 106,964 | 28.0 | 17.3 |
| 200-500 | 93 | 4.3 | 262,114 | 17.4 | 55,323 | 23.6 | 206,791 | 16.2 | 21.1 |
| 500-1,000 | 11 | 0.5 | 631,868 | 4.8 | 160,898 | 7.8 | 470,971 | 4.2 | 25.5 |
| More than 1,000 | 4 | 0.2 | 2,167,609 | 6.2 | 592,813 | 11.0 | 1,574,797 | 5.4 | 27.4 |
| All | 2,151 | 100.0 | 65,294 | 100.0 | 10,116 | 100.0 | 55,178 | 100.0 | 15.5 |

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0515-2).
Number of AMT Taxpayers (millions). Baseline: 0.04 Proposal: 0
* Less than 0.05
(1) Calendar year. Baseline is current law. For a description of TPC's current law baseline see
http://www.taxpolicycenter.org/taxtopics/Baseline-Definitions.cfm
(2) Includes both filing and non-filing units but excludes those that are dependents of other tax units. Tax units with negative adjusted gross income are excluded from their respective income class but are included in the totals. For a description of expanded cash income, see
http://www.taxpolicycenter.org/TaxModel/income.cfm
(3) Includes tax units with a change in federal tax burden of $10 or more in absolute value.
(4) After-tax income is expanded cash income less: individual income tax net of refundable credits; corporate income tax; payroll taxes (Social Security and Medicare); estate tax; and excise taxes.
(5) Average federal tax (includes individual and corporate income tax, payroll taxes for Social Security and Medicare, the estate tax, and excise taxes) as a percentage of average expanded cash income.

TABLE 8

# Average Tax Change from Increasing Top Marginal Rate to 39.6 Percent

by state, ranked by average dollar tax change, 2011[1]

| | Tax Change Rank | Percent with Tax Increase | Avg Tax Change ($)[2] | Avg Tax Change (%)[2] | IRS Share of Returns with AGI above 500K Rank[3] |
|---|---|---|---|---|---|
| United States | | 0.4 | 147 | 1.2 | |
| Connecticut | 1 | 0.9 | 444 | 2.2 | 1 |
| New York | 2 | 0.6 | 300 | 1.9 | 5 |
| District of Columbia | 3 | 0.8 | 280 | 1.5 | 2 |
| Massachusetts | 4 | 0.6 | 260 | 1.5 | 4 |
| New Jersey | 5 | 0.6 | 221 | 1.3 | 3 |
| Texas | 6 | 0.6 | 198 | 1.6 | 8 |
| North Dakota | 7 | 0.6 | 175 | 1.2 | 10 |
| California | 8 | 0.4 | 173 | 1.3 | 6 |
| Wyoming | 9 | 0.4 | 165 | 1.2 | 16 |
| Illinois | 10 | 0.5 | 162 | 1.2 | 7 |
| Florida | 11 | 0.4 | 162 | 1.6 | 14 |
| New Hampshire | 12 | 0.4 | 145 | 1.0 | 19 |
| Maryland | 13 | 0.4 | 142 | 0.9 | 9 |
| Washington | 14 | 0.4 | 140 | 1.0 | 15 |
| South Dakota | 15 | 0.4 | 138 | 1.2 | 20 |
| Nevada | 16 | 0.4 | 136 | 1.3 | 22 |
| Colorado | 17 | 0.4 | 132 | 1.0 | 12 |
| Virginia | 18 | 0.4 | 130 | 0.9 | 11 |
| Minnesota | 19 | 0.4 | 125 | 0.9 | 13 |
| Oklahoma | 20 | 0.4 | 125 | 1.2 | 18 |
| Pennsylvania | 21 | 0.4 | 112 | 0.9 | 17 |
| Tennessee | 22 | 0.4 | 106 | 1.1 | 30 |
| Alaska | 23 | 0.4 | 100 | 0.9 | 23 |
| Alabama | 24 | 0.3 | 98 | 1.1 | 42 |
| Kansas | 25 | 0.3 | 97 | 0.9 | 21 |
| Nebraska | 26 | 0.3 | 96 | 0.8 | 27 |
| Rhode Island | 27 | 0.3 | 96 | 0.8 | 24 |
| Wisconsin | 28 | 0.2 | 96 | 0.9 | 32 |
| Louisiana | 29 | 0.4 | 95 | 0.9 | 29 |
| Missouri | 30 | 0.3 | 92 | 0.9 | 31 |
| Georgia | 31 | 0.3 | 90 | 1.0 | 26 |
| Arizona | 32 | 0.3 | 86 | 0.9 | 33 |
| Michigan | 33 | 0.3 | 85 | 0.9 | 37 |
| Utah | 34 | 0.3 | 81 | 0.8 | 28 |
| Delaware | 35 | 0.3 | 80 | 0.7 | 25 |
| Ohio | 36 | 0.2 | 77 | 0.7 | 35 |
| Iowa | 37 | 0.3 | 75 | 0.7 | 38 |
| North Carolina | 38 | 0.2 | 72 | 0.7 | 34 |
| Montana | 39 | 0.2 | 71 | 0.8 | 39 |
| Idaho | 40 | 0.2 | 66 | 0.8 | 45 |
| Indiana | 41 | 0.2 | 66 | 0.7 | 41 |
| Vermont | 42 | 0.2 | 59 | 0.5 | 40 |
| Kentucky | 43 | 0.2 | 56 | 0.6 | 47 |
| Oregon | 44 | 0.2 | 56 | 0.5 | 36 |
| Arkansas | 45 | 0.2 | 55 | 0.6 | 44 |
| South Carolina | 46 | 0.2 | 55 | 0.6 | 43 |
| Hawaii | 47 | 0.2 | 50 | 0.5 | 46 |
| Maine | 48 | 0.2 | 49 | 0.5 | 48 |
| New Mexico | 49 | 0.2 | 49 | 0.6 | 50 |
| Mississippi | 50 | 0.2 | 47 | 0.6 | 51 |
| West Virginia | 51 | 0.2 | 43 | 0.5 | 49 |

**Source:** Urban-Brookings Tax Policy Center Microsimulation Model (version 0515-2).

[1]The top rate was 35 percent in 2011. The American Taxpayer Relief Act raised the top rate to 39.6 percent in 2013.

[2]Including units with no change.

[3]Ranking based on SOI, "Table 2. Individual Income and Tax Data, by State and Size of Adjusted Gross Income, Tax Year 2011." http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2.

TABLE 9

## Average Tax Change from Child Tax Credit Reverting to 2000 Law

by state, ranked by average dollar tax change, 2011[1]

| | Tax Change Rank | Percent with Tax Increase | Avg Tax Change ($) | Avg Tax Change (%) | IRS Number of Dep Exemption Rank[2] |
|---|---|---|---|---|---|
| United States | | 23.0 | 237 | 2.0 | |
| Mississippi | 1 | 32.1 | 356 | 4.8 | 2 |
| Utah | 2 | 30.8 | 348 | 3.4 | 1 |
| Louisiana | 3 | 29.3 | 312 | 3.1 | 10 |
| Alabama | 4 | 28.3 | 307 | 3.3 | 8 |
| Texas | 5 | 28.0 | 305 | 2.4 | 3 |
| Arkansas | 6 | 27.5 | 295 | 3.3 | 12 |
| Idaho | 7 | 27.1 | 292 | 3.3 | 7 |
| Arizona | 8 | 26.3 | 289 | 2.9 | 5 |
| Georgia | 9 | 25.9 | 281 | 3.0 | 6 |
| South Carolina | 10 | 26.2 | 279 | 3.2 | 13 |
| Oklahoma | 11 | 26.0 | 276 | 2.6 | 16 |
| North Carolina | 12 | 25.6 | 273 | 2.8 | 9 |
| Tennessee | 13 | 25.4 | 267 | 2.8 | 18 |
| California | 14 | 24.4 | 263 | 2.0 | 4 |
| New Mexico | 15 | 24.7 | 263 | 3.2 | 15 |
| Kentucky | 16 | 25.1 | 258 | 2.8 | 19 |
| Nevada | 17 | 23.9 | 250 | 2.4 | 11 |
| Nebraska | 18 | 24.1 | 242 | 2.1 | 23 |
| Indiana | 19 | 23.4 | 241 | 2.6 | 17 |
| Missouri | 20 | 23.1 | 234 | 2.3 | 28 |
| Kansas | 21 | 22.8 | 234 | 2.1 | 20 |
| Illinois | 22 | 22.7 | 232 | 1.8 | 14 |
| Iowa | 23 | 23.0 | 225 | 2.0 | 31 |
| Colorado | 24 | 22.5 | 225 | 1.6 | 21 |
| Ohio | 25 | 22.3 | 223 | 2.1 | 33 |
| Delaware | 26 | 22.3 | 221 | 1.9 | 27 |
| West Virginia | 27 | 22.1 | 220 | 2.5 | 37 |
| Hawaii | 28 | 21.6 | 217 | 2.1 | 36 |
| Virginia | 29 | 21.9 | 217 | 1.5 | 26 |
| South Dakota | 30 | 22.0 | 217 | 1.9 | 39 |
| Washington | 31 | 21.2 | 209 | 1.5 | 25 |
| Oregon | 32 | 21.0 | 209 | 2.0 | 30 |
| Michigan | 33 | 20.9 | 209 | 2.1 | 29 |
| Florida | 34 | 20.5 | 208 | 2.0 | 43 |
| Maryland | 35 | 21.2 | 208 | 1.3 | 24 |
| Montana | 36 | 21.0 | 206 | 2.2 | 47 |
| Wisconsin | 37 | 21.1 | 204 | 1.8 | 35 |
| Minnesota | 38 | 21.3 | 203 | 1.5 | 32 |
| New York | 39 | 20.0 | 197 | 1.3 | 34 |
| North Dakota | 40 | 20.8 | 195 | 1.4 | 46 |
| Maine | 41 | 20.3 | 191 | 1.9 | 49 |
| Wyoming | 42 | 19.9 | 187 | 1.4 | 42 |
| Pennsylvania | 43 | 19.1 | 183 | 1.6 | 41 |
| New Jersey | 44 | 19.0 | 182 | 1.1 | 22 |
| Rhode Island | 45 | 19.3 | 182 | 1.5 | 45 |
| New Hampshire | 46 | 18.7 | 171 | 1.1 | 48 |
| Vermont | 47 | 18.4 | 168 | 1.5 | 50 |
| Alaska | 48 | 18.1 | 166 | 1.4 | 40 |
| Connecticut | 49 | 17.7 | 163 | 0.8 | 38 |
| District of Columbia | 50 | 16.9 | 162 | 0.9 | 51 |
| Massachusetts | 51 | 17.4 | 159 | 0.9 | 44 |

**Source:** Urban-Brookings Tax Policy Center Microsimulation Model (version 0515-2).

[1]Simulation reduces CTC from $1,000 to $500 and eliminates refundability for most families. Under 2000 law only families with three or more children can receive refundable CTC with the amount limited to their payroll taxes minus EITC.

[2]Ranking based on SOI, "Table 2. Individual Income and Tax Data, by State and Size of Adjusted Gross Income, Tax Year 2011." http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2.

## SIMULATING STATE INCOME TAXES

The Tax Policy Center has recently developed a microsimulation model of state-level income tax systems. The TPC state income tax model (STM) incorporates all major features of each state's personal income taxes and can be used for revenue and distributional analysis in the same manner as the TPC federal tax model.[31] The STM uses the state-weights that have been added to the tax model database to simulate the current law distribution of state income taxes in each state and the District of Columbia as well as examine changes in state policies. In addition to analyzing changes in state income tax rules, TPC can use its federal and state models in tandem to examine the interaction between federal and state income taxes. For example, raising the top federal rate will directly affect state income taxes in the 7 states that allow a full or partial deduction for federal income taxes. Likewise, expanding or changing the federal EITC will change the amount of state EITC claimed in the 27 states that base their credit on the federal credit.

The ability to analyze specific state income tax proposals or laws will enable comparisons across states and research on best practices. Using the STM, we can examine different tax structures (flat tax, progressive tax, large credits, etc. at the state or federal level) and compare the results for selected states or all states with an income tax against their current baseline taxes. For example, if all states adopted the same flat tax with a large standard deduction, tax progressivity will increase in some states and decline in others and revenue impact will differ significantly.

The ability to examine state income taxes in greater detail will allow us to contribute to the ongoing debate in a number of states to eliminate or drastically reduce the personal income tax. Typically, enacted measures encompass a broad package of changes that obscure the effect of each component. An example is Kansas which recently reduced tax rates from 6.45 percent to 4.9 percent but simultaneously reduced the value of certain itemized deductions and changed the standard deduction. Each of these changes affects taxpayers differently and being able to model the separate components is important for policy analysis. Tables 10 and 11 show preliminary results of this type of analysis using the STM. The changes to the standard deduction and itemized deductions increased tax liability in Kansas while the rate changes reduced it. The STM can also evaluate how changes in federal tax policy affect state income taxes, particularly for those states that derive significant features of their tax code from the federal code. For example, the state standard deduction in nine states is the same as the federal standard deduction. When the federal government increased the standard deduction for married couples to twice the amount for single tax filers in 2003 to reduce marriage penalties, these states had the choice of continuing to conform to the federal amount or "de-couple" and establish their own standard deduction (all the states chose to conform to the federal changes).

Colorado is one of the states that conform to the federal government standard deduction. If Colorado had de-coupled that feature of its tax system in 2003 and kept the same ratio of

standard deductions for married and single filers as in 2002 affected taxpayers would have paid an average of $18 more in state taxes and total Colorado income tax revenue would have increased by about $48 million (Table 12).

***Issues in Using the State-Weighted National Sample for Analysis of State Income Taxes***

The TPC database for analysis of state income taxes is based on a nationally representative sample of federal income tax returns weighted to hit state level targets. The targets themselves come from tabulations by the IRS of all federal returns filed and processed in a particular calendar year, in this case 2011. IRS classifies those returns by state based on the home address reported on each tax return.[32]

Estimates based on a state-weighted sample of federal tax returns may differ from those based on a sample of state tax returns filed in a specific state for a number of reasons. First, there is the potential misalignment of taxes and income based on the state of residence reported on federal tax returns. Non-resident and part-year taxpayers who file a return in a particular state, for instance, are not counted in the targets for that state if they report a home address in a different state on their federal tax return. For example, if someone is a resident of Florida but lives in New York for three months out of the year and pays state income taxes to New York, those taxes and the associated income would not be classified by the IRS as New York State income and taxes but would be classified instead as paid by a Florida resident. Thus there will be differences caused by a mismatch between the state that collects the tax and the state for which the taxpayer reports an address on his or her federal tax return.

Second, the target for the number of tax filers in a particular state may over- or under-estimate the number of returns actually filed. The state specific targets will include taxpayers who file a federal tax return but do not file a state tax return in their reported state of residence. This might occur if the federal filing requirements differ from those in their home state such that they are not required to file a state return. Some states do not have refundable tax credits so a low income taxpayer in such a state may file a federal return to claim federal credits but has no incentive to file a state tax return. Conversely, the state specific targets will not include taxpayers who do not file a federal return but do file a state tax return in their home state, likely due to different filing requirements or in order to claim special state-specific rebates or credits.

Finally, even if a federal tax filer files a state return in the state identified on his or her federal return, certain income or deductions may be treated differently for federal and state income tax purposes. For example, a municipal bond investor in a state which exempts interest on bonds issued by in-state entities may have purchased a bond issued by another state: the interest would be exempt from federal tax but would be taxable at the state level. Because the federal tax return data do not identify the source of tax-exempt interest, it is not currently possible to adjust the amount of tax-exempt interest by adding the out of state bond interest to taxable income in the state tax model.

These data limitations are known and can possibly be addressed through various adjustments to the data. Prior to making those adjustments, we explore whether the state model captures the essential elements of current state income tax systems and whether estimates from the model can accurately depict the revenue and distributional effects of tax policy on state tax filers.

***Comparison of State Tax Model and Other States' Tax Models***

As a validation check, we compared estimates from the STM to estimates from models used by individual states. We do not expect exact matches because of significant differences in the underlying data but the reasons for the differences should be transparent.

We have selected 11 states to compare based on data availability for baseline distribution of taxes and income. The STM overestimates the number of filers in all states but one (Iowa), by percentages ranging from 8 to 35 percent. In contrast, the estimates for state taxable income are much closer. The STM model estimates are within 5 percent of state agency totals in all but two states (Ohio and Oregon). This suggests that the additional filers estimated by the STM model are concentrated among low-income households, thus reducing the impact on taxable income. The estimates for tax liability are not as close as the estimates for taxable income. The STM model over-estimates tax liability in all but two states but is within 5 percent of the state agency totals in five of the eleven states (tables 13 and 14).

We also compare STM estimates for a proposed tax rate reduction in the District of Columbia with estimates from the DC Office of Revenue Analysis (ORA). Because this comparison examines changes rather than current levels, some of the differences caused by non-resident filers should be netted out. In the analysis, we estimate the effect of reducing the top tax rate by 0.20 percentage points. The top rate applies to taxable income over $350,000. The STM estimates lost revenue of $8.0 million from this policy while ORA estimated a revenue loss of $8.4 million. The models also compare favorably by income category. (Table 15)

TABLE 10 - PRELIMINARY

## Kansas Tax Cuts

Average tax change, dollars in thousands.

| Kansas AGI | Reduce Standard Deduction | Limit Itemized Deductions | Lower Top Rate | All Changes |
|---|---|---|---|---|
| Zero or less | - | - | - | - |
| 0 to 10k | 0 | 0 | (3) | (3) |
| 10k to 20k | 15 | 1 | (31) | (8) |
| 20k to 30k | 35 | 6 | (89) | (34) |
| 30k to 50k | 40 | 18 | (214) | (130) |
| 50k to 75k | 44 | 41 | (422) | (291) |
| 75k to 100k | 36 | 73 | (757) | (600) |
| 100k to 200k | 23 | 110 | (1,387) | (1,214) |
| 200k to 500k | 8 | 171 | (3,557) | (3,350) |
| 500k to 1m | 7 | 534 | (9,198) | (8,572) |
| 1m and more | 10 | 2120 | (45,285) | (42,710) |
| Total | 23 | 32 | (445) | (369) |

TABLE 11- PRELIMINARY

## Kansas Tax Cuts

Tax change as share of income, dollars in thousands.

| Kansas AGI | Reduce Standard Deduction | Limit Itemized Deductions | Lower Top Rate | All Changes |
|---|---|---|---|---|
| Zero or less | 0.00% | 0.00% | 0.00% | 0.00% |
| 0 to 10k | 0.00% | 0.00% | 0.00% | 0.00% |
| 10k to 20k | 0.00% | 0.00% | 0.00% | 0.00% |
| 20k to 30k | 0.00% | 0.00% | 0.00% | 0.00% |
| 30k to 50k | 0.00% | 0.01% | -0.01% | 0.00% |
| 50k to 75k | 0.00% | 0.01% | -0.04% | -0.03% |
| 75k to 100k | 0.00% | 0.01% | -0.08% | -0.06% |
| 100k to 200k | 0.00% | 0.02% | -0.21% | -0.18% |
| 200k to 500k | 0.00% | 0.01% | -0.10% | -0.09% |
| 500k to 1m | 0.00% | 0.02% | -0.37% | -0.35% |
| 1m and more | 0.00% | 0.02% | -0.44% | -0.42% |
| All Filer | 0.00% | 0.01% | -0.13% | -0.12% |

TABLE 12 - PRELIMINARY

# Colorado De-Couple

| Colorado AGI (thousands of dollars) | All Taxpayers | |
|---|---|---|
| | Number of returns | Average tax change ($) |
| Zero or less | 231,967 | - |
| 0 to 10k | 382,800 | 0.0 |
| 10k to 20k | 352,949 | 4.1 |
| 20k to 30k | 299,447 | 13.4 |
| 30k to 50k | 432,386 | 27.6 |
| 50k to 75k | 334,425 | 36.1 |
| 75k to 100k | 215,524 | 38.9 |
| 100k to 200k | 289,860 | 29.5 |
| 200k to 500k | 73,232 | 14.0 |
| 500k to 1m | 10,357 | 9.8 |
| 1m and more | 4,924 | 8.4 |
| | | |
| **Total** | **2,627,871** | **18.1** |

**Notes:** Colorado tax liability if standard deduction set to 2002 ratio, inflated to 2011 levels. Standard deduction for married filers reduced from $11,900 to $9,950.

TABLE 13

# STM Output: Comparison with State Department Tables

| | Number of Returns (thousands) | | | State Taxable Income ($m) | | | Mean State Taxable Income | | |
|---|---|---|---|---|---|---|---|---|---|
| | STM | State Agency | STM/State Agency | STM | State Agency | STM/State Agency | STM | State Agency | STM/State Agency |
| California | 19,754 | 15,042 | 1.31 | 879,950 | 838,347 | 1.05 | 44,546 | 55,732 | 0.8 |
| District of Columbia | 364 | 326 | 1.12 | 20,877 | 20,908 | 1.00 | 57,406 | 64,205 | 0.89 |
| Iowa | 1,552 | 1,793 | 0.87 | 55,608 | 52,855 | 1.05 | 35,840 | 29,475 | 1.22 |
| Illinois | 6,995 | 5,542 | 1.26 | 305,771 | 293,995 | 1.04 | 43,712 | 53,052 | 0.82 |
| Louisiana | 2,211 | 1,894 | 1.17 | 80,602 | 76,807 | 1.05 | 36,449 | 40,563 | 0.9 |
| Minnesota | 2,886 | 2,474 | 1.17 | 113,931 | 108,077 | 1.05 | 39,477 | 43,680 | 0.9 |
| New Jersey | 4,928 | 3,655 | 1.35 | 287,256 | 276,945 | 1.04 | 58,294 | 75,776 | 0.77 |
| Ohio | 6,175 | 5,066 | 1.22 | 257,238 | 324,018 | 0.79 | 41,661 | 63,963 | 0.65 |
| Oregon | 2,032 | 1,600 | 1.27 | 71,817 | 63,697 | 1.13 | 35,336 | 39,812 | 0.89 |
| Virginia | 3,945 | 3,657 | 1.08 | 194,209 | 186,231 | 1.04 | 46,198 | 50,929 | 0.91 |
| Vermont | 358 | 310 | 1.16 | 11,258 | 11,340 | 0.99 | 31,406 | 36,549 | 0.86 |

TABLE 14

# State Tax Model Output: Comparison with State Department Tables

| | State Tax Liability ($m) | | | Mean State Tax Liability | | |
|---|---|---|---|---|---|---|
| | STM | State Agency | STM/State Agency | STM | State Agency | STM/State Agency |
| California | 45,269 | 43,921 | 1.03 | 2,292 | 2,920 | 0.78 |
| District of Columbia | 1,440 | 1,252 | 1.15 | 3,958 | 3,846 | 1.03 |
| Iowa | 3,226 | 2,621 | 1.23 | 2,079 | 1,462 | 1.42 |
| Illinois | 14,595 | 14,037 | 1.04 | 2,086 | 2,533 | 0.82 |
| Louisiana | 2,533 | 2,184 | 1.16 | 1,146 | 1,153 | 0.99 |
| Minnesota | 7,187 | 7,262 | 0.99 | 2,490 | 2,935 | 0.85 |
| New Jersey | 11,822 | 8,820 | 1.34 | 2,399 | 2,413 | 0.99 |
| Ohio | 7,812 | 8,239 | 0.95 | 1,265 | 1,626 | 0.78 |
| Oregon | 5,454 | 4,749 | 1.15 | 2,684 | 2,968 | 0.9 |
| Virginia | 10,208 | 9,847 | 1.04 | 2,428 | 2,693 | 0.9 |
| Vermont | 545 | 510 | 1.07 | 1,521 | 1,642 | 0.93 |

TABLE 15

## Comparing STM Output with DC Office of Revenue Analysis

| Federal AGI (thousands of dollars) | DC Tax Office | | | | | | |
|---|---|---|---|---|---|---|---|
| | Baseline | | | Proposal | | Tax Year 2015 Impact | |
| | AGI | Tax | Tax as share of AGI | Tax | Tax as share of AGI | $ change | Eff.Rate change |
| LT 10k | 711,206,266 | (10,736,204) | -1.5% | (10,740,860) | -1.5% | (4,656) | 0.0% |
| 10k to 50k | 4,798,244,894 | 61,184,977 | 1.3% | 61,184,977 | 1.3% | - | 0.0% |
| 50k to 75k | 2,934,679,390 | 145,446,910 | 5.0% | 145,446,910 | 5.0% | - | 0.0% |
| 75k to 100k | 2,364,341,309 | 136,381,083 | 5.8% | 136,381,083 | 5.8% | - | 0.0% |
| 100k to 200k | 5,390,771,264 | 363,030,934 | 6.7% | 363,030,672 | 6.7% | (262) | 0.0% |
| 200k to 500k | 4,520,936,452 | 359,703,436 | 8.0% | 359,586,044 | 8.0% | (117,392) | 0.0% |
| 500k to 1m | 1,734,529,370 | 148,709,255 | 8.6% | 147,472,925 | 8.5% | (1,236,330) | -0.1% |
| more than 1m | 3,811,985,406 | 308,046,340 | 8.1% | 300,975,982 | 7.9% | (7,070,358) | -0.2% |
| **All Taxpayers** | **26,266,694,351** | **1,511,766,731** | **5.8%** | **1,503,337,732** | **5.7%** | **(8,428,999)** | **0.0%** |

| Federal AGI (thousands of dollars) | STM | | | | | | |
|---|---|---|---|---|---|---|---|
| | Baseline | | | Proposal | | Tax Year 2015 Impact | |
| | AGI | Tax | Tax as share of AGI | Tax | Tax as share of AGI | $ change | Eff.Rate change |
| LT 10k | (130,161,758) | (10,929,539) | 8.4% | (10,902,064) | 8.4% | 27,475 | 0.0% |
| 10k to 50k | 4,831,178,774 | 101,069,773 | 2.1% | 101,833,537 | 2.1% | 763,764 | 0.0% |
| 50k to 75k | 3,464,757,971 | 164,332,729 | 4.7% | 164,552,674 | 4.7% | 219,945 | 0.0% |
| 75k to 100k | 2,807,823,502 | 152,647,470 | 5.4% | 152,772,324 | 5.4% | 124,854 | 0.0% |
| 100k to 200k | 6,133,317,684 | 369,768,954 | 6.0% | 369,839,097 | 6.0% | 70,144 | 0.0% |
| 200k to 500k | 5,216,993,451 | 361,688,072 | 6.9% | 361,472,251 | 6.9% | (215,821) | 0.0% |
| 500k to 1m | 2,026,990,039 | 160,780,971 | 7.9% | 159,290,633 | 7.9% | (1,490,338) | -0.1% |
| more than 1m | 4,706,873,608 | 390,560,273 | 8.3% | 383,093,094 | 8.1% | (7,467,179) | -0.2% |
| **All Taxpayers** | **29,057,773,271** | **1,689,918,704** | **5.8%** | **1,681,951,546** | **5.8%** | **(7,967,158)** | **0.0%** |

**Note:** Reduce Top Rate from 8.95 to 8.75

## CONCLUSION

We have added the capability to analyze federal taxes at the state level to the TPC tax model. To do so, we add to every observation in the tax model database a set of state weights that sum to the observation's federal weight. Using the appropriate state weights the tax model database can now be representative of any state. By construction, the state-weighted tax model database matches published IRS tabulations by state for most determinants of federal individual income tax liability such as exemptions, components of income, and deductions. As a result, simulations of current law income taxes using the state-weighted tax model closely match IRS tabulations by state as well.

The state weights allow us to distribute national estimates of federal tax burden to states. Not only can we evaluate the impacts of a wide array of federal policy proposals across states but we can examine the distribution of changes within states. Future work will use these new capabilities to analyze recently discussed potential federal policy changes that are of particular interest to states, such as eliminating or reducing the state income tax deduction.

Additionally, the state-weighted tax model database can be used in conjunction with state income tax calculators to perform revenue and distributional analysis for state income taxes. Future work will examine the current law distribution of state income taxes within each state as well as analyze policy changes that states are considering as they continue to emerge from the Great Recession of 2008.

Our new state capabilities can also be used to examine interactions between federal and state tax policy. For instance, recent deficit commissions have proposed broadening the federal individual income tax base which would change the definition of taxable income for states that currently "piggy back" on the federal provisions. We can utilize these capacities to show the impact on state income tax revenues and distributional effects across state populations for states that choose to continue to use federal income definitions or modify their tax codes in response to changes.

The need for tax analysis at the state level is particularly acute in the current economic and fiscal environment. States may face increasing fiscal pressures due to a still lackluster economic recovery, greater public pension and Medicaid long-term care costs due to an aging population, and any costs the federal government ultimately passes on to states when addressing its own long-term fiscal imbalance. Revenue and distributional analysis of current and proposed tax policies at the federal and state level will provide federal and state policymakers invaluable information as they decide how to meet these ongoing challenges.

TABLE A1

## Percent Difference between Adjusted State Targets and State SOI Tabulations

| Targeted Item | Type[1] | AGI Group | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | All | Under $12 | $1 under $25,000 | $25,000 under $50,000 | $50,000 under $75,000 | $75,000 under $100,000 | $100,000 under $200,000 | $200,000 under $500,000 | $500,000 under $1,000,000 | $1,000,000 or more |
| Number of returns | Number | -0.74 | -19.62 | -0.6 | -0.02 | -0.64 | 0.25 | -0.18 | -0.04 | -0.83 | -1.06 |
| Number of joint returns | Number | -0.18 | -12.47 | 0.75 | -0.4 | -1.11 | 0.7 | 0.27 | 0.14 | -0.53 | -0.35 |
| Number of exemptions | Number | -0.55 | -16.94 | -0.72 | -0.15 | -0.77 | 0.55 | 0.29 | -0.49 | -1.74 | -0.61 |
| Adjusted gross income (AGI) | Amount | -0.05 | -3.34 | -0.46 | -0.13 | -0.6 | 0.29 | -0.06 | 0.08 | -0.72 | 0.1 |
| Salaries and wages in AGI | Number | -0.4 | 1 | -0.73 | 0.27 | -1.06 | 0.08 | -0.56 | 0.35 | -0.41 | -0.09 |
| | Amount | -0.29 | 0.53 | -0.8 | -0.02 | -1.17 | -0.06 | -0.2 | 0.15 | -0.03 | 0.01 |
| Taxable interest | Number | -0.21 | -1.17 | 0.01 | -0.39 | -1.41 | 0.9 | -0.08 | 0.56 | -0.84 | -0.97 |
| | Amount | -2.36 | -0.22 | -16.01 | -12.8 | -4.74 | 0.99 | -0.34 | 5.81 | 6.87 | -0.99 |
| Ordinary dividends | Number | 0.21 | -5.1 | 0.74 | -1.74 | 2.43 | -0.28 | 0.41 | 0.75 | -1.09 | -0.54 |
| | Amount | 1.42 | 0.73 | 5.08 | -4.89 | 4.69 | 0.64 | 2.58 | 1.74 | 0.21 | 1.19 |
| Qualified dividends | Number | 0.38 | -5.09 | 1.32 | -1.09 | 2.09 | -0.34 | 0.55 | 0.6 | -1.1 | -0.26 |
| | Amount | 1.83 | 0.38 | 6.61 | -5.72 | 4.9 | 3.17 | 2.57 | 1.91 | 2.39 | 1.37 |
| State and local income tax refunds | Number | -0.77 | -9.7 | -2.39 | -2.54 | -0.37 | -0.82 | 0.47 | -1.58 | 0.09 | -2.01 |
| | Amount | -0.51 | -1.08 | -3.55 | -1.09 | -1.57 | 2.73 | 1.75 | -3.91 | -2.64 | -2.83 |
| Business or profession net income (less loss) | Number | -1.17 | -1.95 | -1.15 | 0.51 | -0.85 | -1.93 | -1.66 | -4.23 | -9.31 | -6.84 |
| | Amount | -1.75 | -20.96 | -0.77 | -2.01 | -1.06 | 2.82 | -4.75 | -2.29 | -5.81 | -7.34 |
| Net capital gain (less loss) in AGI | Number | -8.71 | -10.59 | -10.91 | -11.08 | -8.44 | -8.65 | -7.81 | -4.67 | -4.83 | -1.84 |
| | Amount | 1.62 | -0.59 | 22.37 | 1.79 | -12.46 | -0.34 | -1.65 | -0.42 | -2.94 | 3.17 |
| Taxable individual retirement arrangements distributions | Number | 0.33 | -4.22 | 0.09 | -1.28 | 4.03 | 1.16 | -1.88 | 2.09 | 0.05 | 1.57 |
| | Amount | 1.07 | -3.41 | -1.44 | -1.5 | 5.44 | 4.22 | -0.35 | -1.57 | 9.75 | 0.66 |
| Taxable pensions and annuities in AGI | Number | 1.22 | 4.52 | 1.6 | 1.65 | 0.46 | 1.13 | 0.66 | 1.02 | 2.77 | 1.21 |
| | Amount | 1.66 | 8.07 | 2.6 | 2.34 | 1.15 | 0.83 | 2.42 | -1.08 | -0.69 | 3.14 |
| Number of farm returns | Number | -3.64 | -9.18 | -0.02 | -4.48 | -10.33 | 1.85 | -2.21 | -1.11 | -4.75 | -6.1 |
| Unemployment compensation | Number | -0.78 | -18.23 | -0.47 | -1.46 | -2.47 | 0.45 | 2.28 | 2.34 | -2.45 | 6.32 |
| | Amount | 0.12 | -17.92 | -0.75 | 0.12 | 0.46 | -1.6 | 5.65 | 7.09 | -6.95 | 6.9 |
| Taxable social security benefits in AGI | Number | 0.77 | -15.76 | 1.2 | 0.4 | 2.05 | 1.77 | -1.47 | 0.41 | 2.57 | -1.9 |
| | Amount | 0.34 | 32.4 | -0.39 | -0.92 | 1.66 | 3.29 | -2.33 | -0.32 | 2.92 | -7.15 |
| Partnership/S-corp net income (less loss) | Number | -2.87 | -15.18 | -8.31 | -7.13 | -3.76 | 2.52 | 0.89 | 0.93 | -2.2 | -0.38 |
| | Amount | -0.11 | -1.19 | 41.59 | -19.03 | -12.53 | 2.28 | 3.06 | 1.75 | -1.98 | -0.38 |
| Self-employed health insurance deduction | Number | -1.35 | -9.66 | -1.68 | -2.32 | -3.78 | 5.34 | 2.13 | -4.35 | -4.06 | -0.68 |
| | Amount | -1.97 | -4.08 | -0.32 | -5.04 | -11.64 | 5.66 | 2.56 | -2.88 | -3.76 | -2.12 |
| Individual retirement arrangement payments | Number | 1.29 | 9.98 | -4.21 | 5.36 | -0.84 | -2.45 | 3.03 | 8.3 | -1.85 | -4.4 |
| | Amount | -0.77 | 3.11 | -7.83 | 7.5 | -6.68 | -4.94 | 0.29 | 5.35 | -0.83 | -2.81 |
| Student loan interest deduction | Number | -0.37 | -1.88 | -1.23 | -0.33 | -1.27 | 3.06 | -0.88 | N/A | N/A | N/A |
| | Amount | -1.38 | 9.17 | -5.69 | -1.57 | -0.75 | 6.17 | -5.11 | N/A | N/A | N/A |
| Total itemized deductions[3] | Number | -3.32 | N/A | -26.63 | -2.81 | -0.91 | -0.05 | -0.33 | -0.15 | -0.97 | -1.07 |
| | Amount | -3.99 | N/A | -25.56 | -3.69 | -3.28 | -2.35 | -3.91 | -2.62 | 0.07 | -0.42 |
| State and local income taxes[3] | Number | -1.77 | N/A | -19.72 | -2.74 | -0.92 | -0.23 | -0.46 | -0.31 | -1.13 | -1.81 |
| | Amount | -0.7 | N/A | -32.42 | -5.22 | -0.14 | 0.98 | -0.96 | 0.07 | 1 | -0.74 |
| State and local general sales taxes[3] | Number | -6.47 | N/A | -28.54 | -3.33 | -0.59 | 0.74 | 1.14 | 0.15 | 0.2 | 3.91 |
| | Amount | -9.94 | N/A | -49.42 | -11.59 | -4.58 | 0.6 | -3.27 | -3.06 | -4.83 | 8.96 |
| Real estate taxes[3] | Number | -2.04 | N/A | -22.53 | -1.43 | -0.57 | -0.22 | 0.21 | 0.02 | -0.55 | -0.58 |
| | Amount | -1.06 | N/A | -26.03 | 0.04 | 1.62 | -0.75 | 0.17 | 0.64 | 1.16 | 0.1 |
| Home mortgage interest paid[3] | Number | -0.81 | N/A | -21.62 | -0.55 | -0.22 | 1.26 | 1.32 | 1.37 | 1.53 | 1.66 |
| | Amount | 1.78 | N/A | -21.19 | 3 | 2.58 | 4.51 | 2.22 | 3.46 | 2.45 | 3.17 |
| Charitable contributions[3] | Number | -2.06 | N/A | -19.08 | -3.33 | -0.34 | 0.45 | -0.4 | -0.23 | -0.94 | -1.07 |
| | Amount | -0.62 | N/A | -14.04 | -3.86 | -0.26 | 2.25 | -0.97 | 1 | -1.41 | 0.22 |
| Self-employment tax | Number | -0.67 | -31.39 | -0.48 | 2.11 | -0.02 | -2.35 | 1 | -0.43 | -1.43 | 1.79 |
| | Amount | 0.65 | -25.82 | -0.55 | 1.18 | 1.81 | 1.92 | 1.61 | 2.72 | 0.49 | 0.07 |
| Earned income credit | Number | -0.16 | 0.06 | 0.12 | -0.98 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Amount | -0.08 | -4.82 | 0.32 | -1.55 | N/A | N/A | N/A | N/A | N/A | N/A |

**Notes:** N/A indicates that variable is irrelevant due to the state totals equaling $0 for the given AGI. Adjusted target for each state-AGI group equals state SOI tabulation * (National Sum in Tax Model / Sum of State SOI Tabulations).

[1]Number of returns with item or total dollars for item.

[2]The tax model matches federal SOI tables which have 20% fewer returns with zero and negative AGI than state SOI tables.

[3]The tax model has fewer returns with itemized deductions in the $1 to $25,000 AGI group than federal and state SOI tables because it does not allow tax filers to itemized if the standard deduction results in lower tax liability.

## NOTES

[1] See CBO (2001), JCT (2005), and Cilke (1994) for descriptions of their models.
[2] A tax unit is an individual, or a married couple who would file a tax return jointly, along with all dependents of that individual or married couple. The tax model database includes all tax units, whether or not they file tax returns. See Section II for more detail.
[3] For simplicity of exposition, we subsequently refer to the 52 jurisdictions collectively as states, even though they include the District of Columbia and other areas.
[4] See ITEP (2014) for its model description.
[5] See Pew Charitable Trusts (2016).
[6] For further description of the TPC tax model see http://www.taxpolicycenter.org/taxtopics/Brief-Description-of-the-Model-2013.cfm.
[7] The complete dataset has 280,667 records based on 148,858 tax-filing records from the LAPUF and 12,875 non-filing records from the CPS. The matching process often requires splitting PUF records. That is, a record from LAPUF may be matched to more than one CPS record; each of the PUF-CPS matched record is treated as a unique tax unit.
[8] We use the Survey of Consumer Finances to impute wealth and retirement accounts contributions; the Consumer Expenditure Survey, Medical Expenditure Panel Survey, and American Housing Survey to impute household expenditures; the National Postsecondary Student Aid Study to impute information on post-secondary students; and the Kaiser/HRET to impute employer-provided health benefits.
[9] Without the parametric assumption, there would be an infinite number of solutions for state weights that satisfy constraints (2) and (3). The parametric assumption reduces the number of unknowns to only ($\underline{\beta}$ and $\delta$). With more observations than the number of parameters ($\underline{\beta}$ and $\delta$) plus the number of constraints, the solution of ($\underline{\beta}$ and $\delta$) will be unique in general.

The following trivial example shows how the identifying assumption brings about a unique set of state weights. Suppose that we had two observations, *A* and *B*, with identical characteristics. Their federal weights are $W^A$ and $W^B$, respectively. Suppose also that there were only two states 1 and 2 and the targeted state weights were $W_1$ and $W_2$, respectively. By construction, $W_1 + W_2 = W^A + W^B$. Without the identifying assumption, there would be an infinite number of solutions for $(w_1^A, w_1^B, w_2^A, w_2^B)$. In contrast, with the identifying assumption, the state 1 and 2 shares of all the federal weights must be identical for both observations given their identical characteristics. As a result, we obtain the unique state weights $w_s^h = \left(\frac{W_s}{W_1+W_2}\right) W^h$ for $s$ = 1 and 2 and $h$ = *A* and *B*.

[10] As a starting point, $\underline{\beta}_{s(0)}$ is set to zero, resulting in the federal weights being equally split across all *S* states.
[11] These nine AGI groups are: (1) Less than $1, (2) $1 to under $25,000, (3) $25,000 to under $50,000, (4) $50,000 to under $75,000, (5) $75,000 to under $100,000, (6) $100,000 to under $200,000, (7) $200,000 to under $500,000, (8) $500,000 to under $1,000,000, and (9) $1,000,000 or more.
[12] See "Table 2. Individual Income and Tax Data, by State and Size of Adjusted Gross Income, Tax Year 2011" which can be found at http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2.
[13] The number of state targets for each AGI group varies because some targets such as Earned Income Tax Credit, student loan interest deduction, and itemized deductions are only relevant to some but not all AGI groups.
[14] We did not target the number of dependent exemptions due to collinearity between number of exemptions and marital status.
[15] For 2011, SOI Table 2 did not provide separate counts of returns for all filing statuses.
[16] Average AGI among non-filers in the 2011 tax model database is $1,982. We use coefficients from the $1 to $25,000 group as opposed to the less than $1 group because latter includes tax units with negative AGI which are often more similar to high income tax units than low income tax units.
[17] Federal SOI tables are based on a sample of tax returns while state SOI tables are based on all returns. SOI cleans the federal sample to adjust for inconsistencies in the data. The SOI federal tables are: Table 1.2 All Returns: Adjusted Gross Income, Exemptions, Deductions, and Tax Items, by Size of Adjusted Gross Income and by Marital Status, Tax Year 2011, Table 1.4 All Returns: Sources of Income, Adjustments, and Tax Items, by Size of Adjusted Gross Income, Tax Year 2011, Table 2.1 Returns with Itemized Deductions: Sources of Income, Adjustments,

Itemized Deductions by Type, Exemptions, and Tax Items, by Size of Adjusted Gross Income, Tax Year 2011, Table 2.3 All Returns: Exemptions by Type and Number of Exemptions, by Size of Adjusted Gross Income, Tax Year 2011, Table 2.5 Returns with Earned Income Credit, by Size of Adjusted Gross Income, Tax Year 2011, and Table 3.3 All Returns: Tax Liability, Tax Credits, and Tax Payments, by Size of Adjusted Gross Income, Tax Year 2011.

[18] In addition to these scaled adjustments, we also adjust values of several targeted totals that cannot be supported by data points available in the tax model database. In general, these adjustments are necessary when SOI state totals are too extreme (e.g. unemployment compensation in New York for tax units with more than $1,000,000 in AGI).

[19] See Appendix Table A for more detail. Adjustments to targets are generally less than 5 percent. One exception is targets for the less than $1 AGI group where the number of returns with zero or negative AGI in federal SOI tables is 20 percent lower than in state SOI tables. Another exception is targets for itemized deductions in the $1 to $25,000 AGI group. The tax model cannot match the relatively small number of returns itemizing deductions at the lowest AGI levels because it does not allow returns to itemized deductions if the standard deduction results in lower tax liability.

[20] The state targets are a strict subset of the federal targets. In addition, the Tax Model database was calibrated to match federal targets for 13 AGI groups as opposed to the 9 AGI groups for the state targets, with tax units with AGI at least $1 but less than $25,000 further divided into two groups by the $10,000 AGI break and tax units with AGI at least $1,000,000 further divided into four groups by the AGI breaks of $2,000,000, $5,000,000 and $10,000,000, respectively.

[21] We do this using a variation of the Shirm and Zaslavsky methodology to adjust the national weights to match national targets. We scale up the national weights by a constant factor and then employ the procedure to divide the weights between the nation and residual (i.e. S=2, with s=1 for nation and s=2 for residual with residual targets equaling the difference between scaled-up weighted totals and national totals).

[22] Because equation (3) cannot be satisfied exactly in general, we proceed by setting a tolerance level to five percent. That is, based on the derived coefficient estimates for any AGI group, every weighted state total of any targeted variable ($\sum_h w_s^h x_k^h$) must be within five percent of the targeted state total ($X_{ks}$). We chose five percent to guarantee that the reweighted tax model database is closely representative for all states, and at the same time flexible enough to admit a large set of targeted variables.

At the five percent tolerance level, the following targeted variables would need to be excluded from the estimations in order for the estimations to converge: (a) for tax units with AGI less than $1, amount of state income tax refund and numbers of returns and amounts of self-employment health insurance deduction, Individual Retirement Arrangement payment deduction, student loan interest deduction, self-employment tax, and Earned Income credit, (b) for tax units with AGI at least $25,000 but less than $50,000, amounts of state income tax refund and state and local income tax deduction, and (c) number of tax units with itemized deductions for tax units with AGI at least $1,000,000.

[23] In addition, out of 22,204 targets overall, only 266 targets (accounting for 1.2% of all targets) have weighted state totals deviating from their adjusted targeted totals by more than one percent.

[24] This is a byproduct of the employed estimation technique. Recall that the estimation repeatedly searched for the best way to satisfy all constraints via a change in the coefficient estimates. In essence, it evaluated the differences between weighted and targeted totals, and changed coefficient estimates to reduce such differences accordingly. For this to work, most differences must be sufficiently close to zero so that a slight change in the coefficient estimates, which would cause all differences to change somewhat, should still result in these differences being relatively close to zero. Loosely speaking, it is as if this were a process of eliminating the largest difference observed in the previous iteration, and the process repeated until the last large difference was eliminated. That is, the iterations stopped when every weighted state totals are within ten percent of its targeted total, and so the ten-percent tolerance should be binding for only one target.

[25] Tax burdens can differ from actual taxes paid. For example, when distributing tax burden, the model accounts for the present value of tax savings associated with contributions to retirement accounts. The burden measure incorporates not only the tax treatment of contributions (which affects current taxes paid) but also tax-free accrual in subsequent years as well as any taxes ultimately paid on withdrawal.

[26] ECI equals AGI plus employer provided fringe benefits, tax-exempt interest, non-taxable pension and retirement income, above-the-line adjustments, cash and cash-like transfer payments, the employer share of payroll taxes, and imputed corporate income tax liability. See Rosenberg (2013).

[27] The maximum statutory tax rate under the AMT, 28 percent, was lower than the maximum statutory regular tax rate of 35 percent in 2011, so very high income tax units tended not to have any AMT, resulting in a smaller share of tax units affected in the over $1,000,000 group than in the $500,000 to $1,000,000 group.
[28] In 2011 the 35 percent tax bracket started at $379,150 of taxable income for joint and single filers. The American Taxpayer Relief Act raised the top rate to 39.6 percent above $450,000 for joint filers and $400,000 for single filers in 2013.
[29] The earnings threshold for the ACTC is scheduled to increase to $10,000 (indexed for inflation after 2001) in 2018.
[30] Under 2000 law families with three or more eligible children could receive a refundable CTC limited to an amount equal to their payroll taxes minus any refundable EITC received.
[31] The current version of the TPC state income tax model incorporates state income tax calculators developed by Jon Bakija of Williams College. Bakija (2009) documents the model and methodology in detail.
[32] The IRS notes that "…..some taxpayers may have used the address of a tax lawyer, or accountant, or the address of a place of business; moreover, such addresses could each have been located in a State other than the State in which the taxpayer resided."

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