



RESEARCH REPORT

The Effect of Different Tax Calculators on the Supplemental Poverty Measure

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Introduction

Federal and state income taxes are an important component of the Supplemental Poverty Measure (SPM). Positive tax liability counts as an expense when calculating the SPM and so it moves some workers (primarily those without children) into poverty or near-poverty. In contrast, refundable tax credits, including the earned income tax credit (EITC) and the refundable portion of the child tax credit, increase family resources and are important antipoverty policies for families with children.

Taxes are not directly reported on the Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC), or on any other microdata source that could be used to calculate the SPM such as the Survey of Income and Program Participation (SIPP) or the American Community Survey (ACS), so the Census Bureau calculates payroll taxes and federal and state income taxes using its own internal model. Maintaining and updating a tax model annually is labor intensive, especially when state income taxes are included. The current tax model used by the Census Bureau was developed in-house and requires substantial staff effort to keep up to date. The annual updates for policy changes in a model as complex as an accurate tax imputation model must be require expertise and labor input that may not be available in-house. Maintaining in-house expertise with the tax model can also be challenging as staff members move on to other positions or projects.

In light of these challenges, some experts have recommended that the Census Bureau use the National Bureau of Economic Research (NBER) TAXSIM model to calculate taxes. Another possibility would be to use the tax model developed by Dr. Jon Bakija of Williams College, which is currently being used by the Urban-Brookings Tax Policy Center for state income tax modeling. Both models have been provided to the Census Bureau and could be run in-house.

This paper compares the results of the Census Bureau's tax model with results generated by the TAXSIM and Bakija models and shows how differences in tax estimates affect the SPM. To provide additional context, the results are also compared with results from the Transfer Income Model Version 3 (TRIM3), a comprehensive microsimulation model developed and maintained by the Urban Institute with primary funding from the Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation (ASPE).¹

¹ Information presented here is derived in part from TRIM3 and associated databases. TRIM3 requires users to input assumptions and/or interpretations about economic behavior and the rules governing federal programs. Therefore, the conclusions presented here are attributable only to the authors of this report.

In the sections below, we discuss (1) our analytical approach, (2) the tax models analyzed, (3) results of the tax models compared with federal income tax targets, (4) results of the tax models compared with state income tax targets, (5) the effect of different tax estimates on the SPM, and (6) our conclusions.

Analytical Approach

The analysis is performed using the public-use version of the 2013 ASEC (reflecting income and taxes for calendar year 2012). We prepare tax estimates using the Census Bureau's tax model (a version designed to run on public-use data), TAXSIM, and the Bakija model. TAXSIM estimates are prepared using the Internet version of TAXSIM, and the Bakija model is used with the permission of Dr. Jon Bakija. SPM calculations are performed using the TRIM3 "poverty module," which calculates SPM poverty following the Census Bureau's methodology. Tax inputs (filing units, dependents, income, and itemizable expenses) are obtained from the Census Bureau tax model and the TRIM3 model, and then are used as input to the TAXSIM and the Bakija models. The resulting tax estimates are then uploaded to the TRIM3 poverty module to obtain the effects on the SPM.

TRIM3 is a comprehensive microsimulation model that simulates a number of programs that provide assistance to low-income individuals and families, as well as payroll taxes to fund Social Security and Medicare (the Federal Insurance Contributions Act tax, or FICA), federal income taxes, and state income taxes. Installing TRIM3 at the Census Bureau would require much more effort than installing TAXSIM or the Bakija model.² Nevertheless, TRIM3 serves an important part in this analysis. Both TAXSIM and the Bakija model require input data in which tax units, filing status, numbers of dependents, income sources, and itemizable expenses have already been defined. Neither model is designed to run on the CPS ASEC; rather, each is a generalized model that could run on data from any source, as long as the necessary inputs are provided. TRIM3, like the Census Bureau's tax model, is a CPS-based model that performs the steps of defining filing units, dependents, and income items, and both models perform a statistical match with the Internal Revenue Service (IRS) Statistics of Income Public-Use File (PUF) to obtain itemizable expenses. Including TRIM3 in the analysis provides insight into the sensitivity of the results to different approaches to defining filing units, income, and statistical match procedures and also provides additional context when results differ across models.

² Using TRIM3 for tax calculation at the Census Bureau might present a feasible option if the Census Bureau intended to use other (nontax) aspects of the model.

The primary goal of this analysis is to determine the implications of using different tax estimates for calculation of the SPM—in particular, how different tax estimates affect the SPM poverty rate or the estimated effect of taxes and refundable tax credits on the SPM. We do, however, show some results for middle- and higher-income groups. In particular, we examine the effect of different tax estimates on the extent to which people fall within different ranges of the SPM poverty threshold, and we compare tax results to IRS administrative targets for tax units classified by adjusted gross income (AGI) level. We do not, however, focus on the results produced by the model for high-income units; nor do we include detailed comparisons of results at the household level that might point to additional differences between the models.

Tax Models Included in the Analysis

Below, we provide information about each tax model included in the analysis. We then describe and compare the TAXSIM and Bakija model input and output variables.

Census Bureau CPS Tax Model

The Census Bureau's tax model was developed in the early 1980s. Other than annual updates for changes in marginal tax rates, the underlying methodology was not changed until the development of a new model in 2004. Key changes implemented at that time include enabling certain nonrelatives to be claimed as dependents, imputing capital gains and itemized deductions through a statistical match with the PUF rather than through assignment of mean values by AGI level, incorporating several statutory adjustments, and simulating more refundable and nonrefundable state income tax credits (O'Hara 2004).³

The revised model has been used for CPS-ASEC files from 2004 (representing the 2003 income and tax year) to present. The model is updated each year to incorporate changes in tax parameters and to update the statistical match with the PUF. Other changes since 2004 include modifications to use reported medical and child care expenses (available beginning with the 2010 CPS ASEC) rather than values obtained from the statistical match and to use presence of a mortgage (also available beginning with the 2010 CPS ASEC) when matching tax units with PUF returns claiming the mortgage interest deduction. The model no longer incorporates capital gains and losses because of challenges in imputing

³ In addition, the prior model had constrained state income tax EITC amounts to zero. The revised model allowed refundable state income tax EITC values

these variables to the CPS ASEC.⁴ The Census Bureau has investigated using new CPS ASEC parent pointers when assigning children to tax units within the household but has only partially adopted this approach (Webster 2011).⁵ The Census Bureau also investigated a new method for imputing the variables obtained from the PUF (O'Hara, 2006), but this approach has not been adopted.

The Census Bureau's model consists of 14 SAS programs that calculate federal and state income taxes using input from the CPS ASEC and the PUF. The model creates tax units, formats the CPS and PUF data, and statistically matches the two datasets for processing through the tax calculator. The tax model calculates federal income taxes and various credits, including the child and dependent care tax credit (CDCTC), credit for the elderly or disabled, child tax credit (CTC), additional child tax credit (ACTC), and the EITC. The model first calculates federal income taxes using the state income tax deduction obtained from the statistical match with the PUF, then simulates state income taxes using information obtained from the first federal income tax simulation, and finally recalculates federal income taxes using the simulated state income taxes when calculating itemized deductions. The model calculates taxes for dependents following the rules for dependent filers.

The Census Bureau's model captures state EITCs and other key refundable and nonrefundable state income tax credits. However, the ASEC does not provide sufficient data on property taxes, rent, and homeowner values to model state "circuit breaker" credits that provide property tax rebates and rental relief to certain low- and moderate-income families in a number of states. The model includes code enabling simulation of local income taxes to be added to state income taxes in Indiana and Maryland (which have local income taxes that are largely uniform across counties), and in New York City. However, only Indiana's local income taxes were incorporated into the final state income tax variable and the Census Bureau's 2012 SPM estimates. As with the other models included in this report, income taxes are generated for the District of Columbia, and the District is included as a state for purposes of discussion.

⁴The availability of the PUF typically lags the CPS ASEC by a few years. Capital gains and losses can vary considerably from year to year, complicating efforts to come close to IRS figures for the current year when using variables matched from a prior year's PUF.

⁵ The new parent pointers identify both of a child's parents within a household, regardless of whether the parents are married. Previously, it was possible to identify only one of a child's parents if the parents were unmarried cohabiting partners. The Census Bureau has investigated, but not adopted, use of parent pointers when assigning children to unmarried cohabiting parents. The new parent pointers have been used to improve assignment of children to married parents in cases in which the parent pointer indicates that a family spouse (rather than the head) is the parent of the child.

The Census Bureau's model assigns a variable indicating the tax unit's filing status (joint, head of household, single, or nonfiler). Tax filers include tax units that are required to file taxes or would be likely to file (to obtain a refundable credit or because some tax units file taxes even when not required to do so).⁶ However, the Census Bureau's SPM calculations include simulated taxes for all tax units, regardless of whether they would actually file, and we follow that approach for this analysis.

For this report, we first show results using the version of the Census Bureau's SAS code that was used to create the 2012 CPS ASEC estimates. We then incorporate corrections that were made to later versions of code or were discovered in the course of work on this project, and show the results of these estimates relative to the original results and results from other tax models.

TRIM3

TRIM3 and earlier versions of the model have been developed and maintained by the Urban Institute under primary funding from HHS/ASPE for more than 40 years. TRIM3 captures a wide range of programs benefiting low-income families, models payroll taxes and federal and state income taxes (including credits such as the EITC), and measures the combined effects of these programs on family income and poverty.⁷ The model is a client/server system written in C++ and is accessed through the Internet. TRIM3 is parameterized, allowing tax-related rules, rates, and brackets to be viewed and modified.

The TRIM3 FederalTax module identifies tax filing units, determines filing status, identifies dependents, and determines qualifying children for the EITC, CTC, and CDCTC. Capital gains and losses, deductible IRA and Keogh contributions, and itemizable expenses (including state income taxes) are obtained through a statistical match with the PUF. The model assigns federal income taxes for each tax unit according to federal tax rules and calculates federal income tax credits (the CDCTC, credit for the elderly or disabled, CTC, ACTC, and EITC). Taxes for dependent filers are calculated according to the rules for dependent filers. All tax units are simulated to file a federal income tax return, regardless of whether their income is high enough to meet the filing requirement.

⁶ There are errors in the final filing status variable included in the public-use ASEC for certain multiple-family households. However, the error is introduced at the last stage of processing (when variables are written out for inclusion in the public-use file). Taxes are calculated for all households using an appropriate filing status.

⁷ Documentation is available at <http://trim3.urban.org/T3Technical.php>.

The TRIM3 StateTax model is run following the FederalTax model using tax related variables computed by the FederalTax model where appropriate. StateTax calculates taxes in accordance with state income tax rules, most of which are obtained from the Bakija model's database. Like the Census Bureau model, TRIM3 captures key state income tax credits affecting low- and middle-income taxpayers, but it does not simulate circuit breaker credits because of a lack of sufficient data in the ASEC. However, although federal income taxes are simulated for dependent filers, state income taxes for dependent filers are not captured. As with federal income taxes, all tax units are simulated to file a state income tax return (except in states without a state income tax). Local income taxes are not included in the TRIM3 StateTax simulation.

TRIM3's role in this project is twofold. TRIM3 serves as a comprehensive CPS-based tax model for comparison with the Census Bureau CPS tax model. TRIM3 also serves as a tool for SPM calculation of the tax results from different models.

TAXSIM

TAXSIM, housed at the NBER, calculates FICA taxes and federal and state income taxes for individual tax units. TAXSIM was written by Amy Taylor in 1976 to estimate the impact of federal tax deductibility on charitable contributions. A few years later, the model was expanded to study a proposed integration of the corporate and personal income tax system. The ability to calculate state tax liabilities was added to the model in 1981 (Feenberg and Coutts 1993). Dr. Daniel Feenberg currently heads the development of TAXSIM and has done so for many years.

TAXSIM is written in the FORTRAN programming language. The full version of the model, available in house at NBER, operates on tax return data from the PUF. An online version has also been developed. The online version is a subset of the full model and is designed to calculate taxes based on 22 variables provided by the user.⁸ Users can specify the characteristics of an individual tax filing unit and obtain the resulting taxes, or upload a file of tax units in a specified format. (For more detail on the inputs for the TAXSIM model, see figure 1.) TAXSIM produces output in a delimiter-separated values file, including federal income tax liability, state income tax liability, FICA, federal marginal rate, state marginal rate, and FICA rate.

⁸ TAXSIM can be accessed at: <http://www.nber.org/taxsim/taxsim-calc9>. PC and Linux versions of the model are available for users with confidential data that they would rather not upload.

We use Internet TAXSIM (v9) for this analysis, using filing status, dependents, income sources, and itemizable expenses defined by TRIM3 or the Census Bureau tax model. All subsequent references to TAXSIM in this paper refer to Internet TAXSIM (v9). Version 9 of TAXSIM was updated during the course of this project to include a modification made in response to a limitation identified during the course of our work. Previously, TAXSIM did not request information on the age of the tax unit head and spouse that was necessary to prevent tax units without a head or spouse older than 24 years old from being assigned the childless EITC. In response to our questions, Dr. Feenberg updated TAXSIM version 9, enabling the TAXSIM estimates in our analysis to capture the rule regarding the minimum age for the childless EITC.⁹ To perform the analysis, we prepared files in the specified format using TRIM3 or Census Bureau tax model inputs and uploaded them to TAXSIM through the Internet. The Census Bureau has also obtained a copy of Internet TAXSIM for use in house.¹⁰

The model is updated every year based on the most recent tax code. The tax calculator is updated using information from the tax forms distributed by states to their residents. If needed, summaries published by the Commerce Clearing House, the Advisory Commission on Intergovernmental Relations, and the Tax Foundation are used as well. The model contains tax rules for dependent filers and calculates taxes for all tax units, regardless of whether they would be required to file taxes. The state income tax and federal income tax simulations are performed in an iterative fashion and simulated state income taxes are used when computing itemized deductions for federal income taxes. TAXSIM models the CDCTC, Credit for the Elderly or Disabled, CTC, ACTC, and EITC.¹¹

TAXSIM simulates state income taxes and captures key state income tax credits. The model includes the ability to simulate state circuit breaker tax credits if relevant input variables for rent and real estate taxes are provided. Because we provide property taxes to the model as input for simulating itemized deductions but do not provide rent or property taxes for nonitemizers, the TAXSIM results generated in this report partially capture circuit breaker tax credits.¹² TAXSIM does not include simulation of local income taxes.

⁹ The TAXSIM simulations were run in March 2016 using a beta version of the interface that enabled the new age detail. The additional age detail also enabled simulation of whether a taxpayer is eligible for the full AMT exclusion.

¹⁰ Although outside users can upload data to TAXSIM over the Internet (as we have done for this report), Census Bureau staff are unable to do so because of the Census Bureau's firewall and data security requirements. Therefore, NBER provided the Census Bureau with a version of the model for use in house.

¹¹ TAXSIM does not include an input variable for disability, so the Credit for the Elderly or Disabled is calculated for the elderly only.

¹² Based on the itemized property tax deduction data put into TAXSIM by the Census tax model, TAXSIM generates \$445 million in circuit breaker tax credits in the following states: Arizona, the District of Columbia, Illinois, Kansas,

Bakija Model

The Bakija tax calculator was developed and is maintained by Dr. Jon Bakija at Williams College. Dr. Bakija developed the model while he was a visitor at the Brookings Institution and the Congressional Budget Office (Bakija 2014). In 2014, the Tax Policy Center, a joint venture of the Urban Institute and the Brookings Institution, began working with Dr. Bakija to update and add capabilities to the tax calculator. The Bakija model is updated every summer by research assistants. The tax calculator is updated using the tax forms, instructions, and glossary of terms in the IRS Statistics of Income *Individual Income Tax Returns* publication for the federal income tax. In recent years, the state income tax calculator has been updated using state income tax forms and instructions found on various websites. The results presented here were prepared using version 2015.01 of the Bakija model, which was supplied to the Urban Institute by Dr. Bakija.

The Bakija tax calculator consists of a single SAS program and two space-delimited ASCII text files, which contain the parameters of the federal and state income tax rules. The program requires a SAS dataset for input. The data file must be processed before input into the Bakija calculator to create tax unit-level data and to edit variable names to match what the program expects. The calculator allows 70 variables per unit, though values can be set to zero if they are not available or are unknown. (For more detail on the input variables for the Bakija model, see figure 1.) The Bakija model produces a SAS dataset with the results of the tax calculation, including federal and state tax liabilities, federal and state marginal tax rates, federal and state average tax rates, and more detailed variables. The state and federal income tax simulations are performed iteratively, so that the simulated state income tax can be used in computing federal income tax liability. The Bakija model captures the CDCTC, credit for the elderly or disabled, CTC, ACTC, and EITC.¹³ Taxes are simulated for all tax units, regardless of whether they would be required to pay taxes. The model does not currently include the capability to model rules for dependent filers, so the Bakija model estimates produced in this analysis treat dependent filers as if they were not dependents.

Michigan, Minnesota, Missouri, Montana, New Jersey, New York, Rhode Island, and Wisconsin. Amounts (relative to the total estimated tax liability in the state) are highest in Illinois and Minnesota, where the estimated credits are almost 2 percent of total estimated tax liability. The circuit breaker tax credits captured in this simulation represent only a portion of the amount that would be simulated had we supplied TAXSIM with information about rent and property taxes of nonitemizers.

¹³ Although the Bakija model includes input variables for age and blindness, it does not request information about disability status. Therefore the model does not capture eligibility for the credit for the elderly or disabled based on disability.

The Bakija model captures key state income tax credits, including state circuit breaker credits if requested by the user. At the request of the user, local income taxes can be simulated for those states (Maryland and Indiana) with similar income taxes across the state. For this analysis, we “turned off” simulation of state circuit breaker credits and local income taxes, to enable the greatest consistency with the TRIM3 and Census Bureau model estimates.¹⁴

TAXSIM and Bakija Model Inputs and Outputs

Inputs to the Models

As mentioned previously, the TAXSIM and Bakija tax models require tax-related input variables for their tax computations. Figure 1 compares the inputs of the two tax calculators for the following categories: general, demographics, children and their ages, income (and some adjustments), information for calculating circuit breaker credits, adjustments and deductions, credits, and information for minimum and maximum taxes.

The Bakija model has more detailed input than TAXSIM, allowing for 70 input variables compared to 22 for TAXSIM. Although some of the additional detail in the Bakija model involves nuances of tax rules for high-income units (such as other tax preferences in the base of the alternative minimum tax, or AMT), other variables enable more precise simulation of taxes and credits relevant to low-income families. For example, TAXSIM asks for the number of dependent exemptions and the number of dependents under the age of 17 (which is required for simulation of the child tax credit), whereas the Bakija model also requests information on the number of children eligible for the CDCTC and the number meeting the age and student status criteria for the EITC.¹⁵ As a result, the Bakija model is able to appropriately simulate tax units where a dependent does not qualify for the EITC (for example, a 19-year-old child who is a dependent but does not meet the EITC criteria because he or she is not a full-time student); it also has information on the number of children qualifying for the CDCTC (which affects

¹⁴ This introduces an inconsistency between our TAXSIM and Bakija model estimates, because we were not able to completely turn off the TAXSIM circuit breaker calculations without also removing real estate taxes from itemized deductions. Therefore, we chose to specify real estate taxes as an input variable.

¹⁵ The number of dependents and EITC-qualifying children differ for some tax units in both the Census Bureau’s model and in TRIM3. For this analysis, we felt it most important to compare results for the EITC and so set the TAXSIM dependent exemption input variable equal to the number of EITC-qualifying children.

the amount of the credit). The Bakija model provides more detailed input for income sources, adjustments to income, and itemizable expenses. TAXSIM allows these items to be input in a more aggregated form. Both models can be operated with adjustments to income and itemizable expenses set to 0, if these are unavailable in the input data. Although we supply input variables for most adjustments to income and itemizable expenses, we set input variables to zero for certain variables for which data are unavailable. Variables with nonzero values included in the analysis are marked with an asterisk in figure 1. Variables with a double asterisk indicate cases in which the total amount for the head and the spouse was included in the amount entered for the head.

TAXSIM and the Bakija model are continually updated and improved based in part on feedback from users. Based on communications with Dr. Feenberg, we understand that a forthcoming version of TAXSIM will enable separate specification of the number of children eligible for the CDCTC and the number eligible for the EITC. Researchers interested in using TAXSIM or the Bakija model should contact Dr. Feenberg or Dr. Bakija for the most up-to-date information regarding the capabilities of their models.

FIGURE 1

Comparison of Input Data for TAXSIM and Bakija Tax Simulation Models

Category	TAXSIM	Bakija
General	Generic ID*	Generic ID*
	Tax year (between 1960 and 2023 for federal, 1977 and 2013 for state)*	Tax year (between 1913 and 2025 for federal, 1900 and 2014 for state—can specify different years for federal and state)*
	State (SOI code)*	State (SOI or postal code)*
Demographics	Marital status*	Marital status*
	Age of head and spouse (previously the number of taxpayers over 65 years old)*	Number of age exemptions (for taxpayer and spouse)* Age of primary earner* Age of spouse*
	N/A	If primary earner and/or spouse are blind*
	Dependent exemptions (for children of all ages)*	Number of dependent exemptions*
Children and their ages	N/A	Number of dependents eligible for federal child care credit or deduction*
	N/A	Number of dependents eligible for the federal earned income credit *
	Number of dependents under age 17*	Number of dependents eligible for federal child credit (under age 17)*
	Wage, salary, and self-employment income of taxpayer*	Wage and salary income of primary earner*
Income (and some adjustments)	Wage, salary, and self-employment income of spouse*	Wage and salary income of spouse*
	N/A	Sole proprietorship net income of primary earner*
	N/A	Sole proprietorship net income of spouse*
	N/A	Farm net income of primary earner*
	N/A	Farm net income of spouse*
	Dividend income (qualified dividends only)*	Qualified dividend income of primary earner* Qualified dividend income of spouse*

FIGURE 1 (CONTINUED)

Comparison of Input Data for TAXSIM and Bakija Tax Simulation Models

Category	TAXSIM	Bakija
Income (and some adjustments)	Other property income (interest, unearned partnership and S-corp income, rent, alimony, fellowships, non-qualified dividends, state income tax refunds, taxable IRA distributions, capital gains distributions on form 1040, other income or loss) and adjustments and items (alimony paid, IRA contributions, foreign income exclusion, NOLs) *	Interest income of primary earner*
		Interest income of spouse*
		Federally tax-exempt interest income of primary earner
		Federally tax-exempt interest income of spouse
		Net rental income or loss of primary earner*
		Net rental income or loss of spouse*
		Total dividend income of primary earner (both qualified and nonqualified dividends)*
		Total dividend income of spouse (both qualified and nonqualified dividends)*
		Partnership and S-corporation income of primary earner
		Partnership and S-corporation income of spouse
		Other income or loss of primary earner*
		Other income or loss of spouse*
		Other federal adjustments to income for primary earner**
		Other federal adjustments to income for spouse
Taxable pensions*	Federally taxable pension income of primary earner*	
	Federally taxable pension income of spouse*	
Gross Social Security benefits*	Gross social security benefits of primary earner*	
	Gross social security benefits of spouse*	
Other nontaxable transfer income (welfare, workers comp, veterans benefits, child support) that would affect eligibility for state property tax rebates but would not be taxable federally	Income (broad definition, including welfare and other transfer income)	
Unemployment compensation*	Unemployment compensation of primary earner*	
	Unemployment compensation of spouse*	
Short-term capital gains or losses	Other capital gains or losses of primary earner	
	Other capital gains or losses of spouse	
Long-term capital gains or losses*	Long term capital gains of primary earner**	
	Long term capital gains of spouse	
Information for calculating circuit breaker credits	Rent paid (for state property tax rebates)	Annual rent payment (minus any government rent subsidies)
		Value of home

FIGURE 1 (CONTINUED)

Comparison of Input Data for TAXSIM and Bakija Tax Simulation Models

Category	TAXSIM	Bakija
Adjustments and deductions	Other itemized deductions (for AMT) (other state and local taxes, deductible medical expenses, miscellaneous)*	N/A
	Deductions not included before (deductible medical expenses, motor vehicle taxes, home mortgage interest, charitable contributions, casualty or theft losses)*	N/A
	N/A	Interest paid (other than investment interest)*
	N/A	Investment interest paid
	N/A	State income taxes paid (ignored if state is known)
	Real estate taxes paid (for AMT and state property tax rebates)*	State and local property taxes paid*
	N/A	State and local sales taxes paid
	N/A	Total deductible state and local taxes (when detail by tax is unavailable)
	N/A	Medical and dental expenses*
	N/A	Deductible moving expenses
	N/A	Unreimbursed employee business expenses
	N/A	Miscellaneous itemized deductions subject to 2% of the AGI floor*
	N/A	Other miscellaneous itemized deductions
	N/A	Charitable donations*
	N/A	Unrealized capital gains and donations of appreciated property
	N/A	Casualty and theft losses*
Credits	Child care expenses*	Child care expenses*
	N/A	Federal credits other than EITC, child credit, child care credit, and elderly credit
Information for minimum and maximum taxes	N/A	Other tax preferences in base of federal minimum tax or AMT
	N/A	Other AMT adjustments
	N/A	Average lagged taxable income for income averaging computations
	N/A	Personal service income, used to compute the federal maximum tax on personal service income
	N/A	Deductions allowable against personal service income, used to compute the federal maximum tax on personal service income

* This variable is used in our analyses of the differences between the Census Bureau, TAXSIM, Bakija, and TRIM3 tax models.

** The combined value for the head and spouse is entered in the head's variable. Capital gains are not included in the Census Bureau model.

Outputs from the Models

The output variables from the TAXSIM and Bakija tax models vary somewhat. Both tax calculators provide the tax unit's tax liability (for federal income, state income, and FICA) and the marginal tax rates (for federal income, state income, and FICA). Both also have more detailed output variables, including the CTC, ACTC, CDCTC (federal and state), and EITC (federal and state). The Bakija tax model includes the average tax rates (for federal income, state income, and FICA), as well as the federal Credit for the Elderly or Disabled, and provides state EITC variables separated into refundable and nonrefundable components. Both models supply the necessary output variables for inclusion in the Census Bureau's SPM estimate and for determining the poverty-effect of federal taxes and refundable credits (the EITC and ACTC) as included in Census Bureau SPM publications.

Federal Income Taxes

In this section, we examine how the federal income taxes calculated by the Census Bureau's tax model (before and after corrections made by the Census Bureau and as part of this project since the original 2012 estimates) compare to administrative targets and how TRIM3 results compared to target. We then examine federal income tax results across models when the Census Bureau's tax model and TRIM3 are used to prepare inputs for TAXSIM and Bakija model simulations. Finally, we discuss common trends across the tax models regarding the relationship of simulated results to IRS administrative targets.

Census and TRIM3 Federal Income Tax Results

Table 1a shows that there was a total of \$1,097 billion in federal income taxes for tax year 2012. Summing up total federal income taxes in the public-use ASEC data yields a total that is 15 percent below the target amount. The public-use ASEC estimate captures 89 percent of taxable income, exceeds the target number of returns with a positive tax by 9 percent, and captures 66 percent of total refunds for "negative" returns (returns with the refundable portion of the EITC and/or the ACTC).

We achieve similar results when we run the 2012 version of the Census Bureau's tax model to generate tax estimates.¹⁶ Slight differences occur because we run the model on the public-use version of the data rather than on internal Census Bureau files, and there are differences in the order in which records are selected through the statistical match with the PUF.¹⁷

¹⁶ We do not perform tests of significant difference in this paper.

¹⁷ According to information provided by Bruce Webster of the Census Bureau, the statistical match is performed in two runs. First, the match is run on all households using the Census Bureau's internal files. Then, it is rerun on households with top-coded income items using the public-use version of the CPS ASEC. We perform the statistical match on all households using data from the public-use ASEC. Therefore, the PUF record selected through the statistical match for a particular unit may differ, although aggregate results are similar.

TABLE 1A

Federal Income Tax: Number of Returns, Income, and Income Tax: Simulated vs. Target, Tax Year 2012

	Target	Calculated (Public-Use ASEC)	Percent of Target		TRIM3 Tax Variables
			Census Tax Model		
			Before Corrections	With Corrections	
Income (billions of dollars)					
Adjusted gross income ¹	9,100	89%	89%	88%	95%
Taxable income	6,395	89%	88%	85%	91%
Positive income tax (millions of returns)	93.1	109%	108%	109%	105%
Total income taxes (billions of dollars)					
Positive returns	1,187.9	84%	83%	79%	85%
Negative returns ²	-90.6	66%	65%	67%	71%
All returns	1,097.2	85%	85%	80%	87%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, and Transfer Income Model Version 3 (TRIM3). Targets from <http://www.irs.gov/pub/irs-soi/12inalcr.pdf>.

¹ Adjusted Gross Income (AGI) in this table includes both positive and negative AGI amounts.

² The target for the dollar amount of negative returns is obtained by adding the amount of additional child tax credit, refundable EITC, and EITC used to offset "other tax" liability (i.e., self-employment tax, social security and Medicare tax on tip income not reported to employer, tax on qualified plans, and household employment taxes).

Various corrections have been made to the Census Bureau SAS code since the 2012 version of the code and we have identified additional areas that have been corrected as part of this project.¹⁸ In order to best reflect the Census Bureau estimates that would be produced going forward, we provide results in which we correct the identified errors in the 2012 Census Bureau tax model SAS code.¹⁹ Correcting these errors produces a 5 percentage point reduction in aggregate income taxes relative to target, yielding a value equal to 80 percent of target. We use the corrected version for comparison with TRIM3 and the TAXSIM and Bakija models.

The last column in table 1a compares the results of the 2012 TRIM3 federal income tax simulation to target. TRIM3 captures a higher share of AGI (95 percent) and taxable income (91 percent) than is captured in the Census Bureau's model (88 percent and 85 percent, respectively). This stems from the fact that TRIM3 includes capital gains (statistically matched from the PUF), whereas the Census Bureau's model does not.²⁰ When capital gains are subtracted from AGI, TRIM3 also captures 88 percent of the target amount of AGI (not shown). TRIM3 captures a somewhat larger share of both positive and negative taxes relative to the Census Bureau's model (85 percent of the target for positive returns compared to 79 percent in the Census Bureau's model, and 71 percent of the target for negative returns compared to 67 percent in the Census Bureau's model).

Table 1b compares Census Bureau and TRIM3 results to targets for the number of returns with positive tax liability, average tax liability for positive returns, and total tax liability for positive returns. Results are shown by AGI level, as determined by each model.

Tax units with positive taxes and AGI below \$10,000 represent less than 3 percent of tax units with positive tax liability and consist almost entirely of dependent filers—according to IRS data, 95 percent of tax units in this category were claimed as dependents of other tax units in 2012.²¹ The Census

¹⁸ Corrections to the code made since the Census Bureau's 2012 estimates include removing the double-counting of federal and military pension income, correcting errors in the processing of households with more than one married couple, correcting errors in the identification of dependent children, correcting the calculation of itemized deductions, correcting an error in the calculation of the AMT, capturing the child care credit, and correcting errors in the calculation of the EITC. In addition, corrections were made to the state income tax calculation in a number of states.

¹⁹ We also remove the local income taxes simulated for Indiana from the estimates, to enable more consistent comparison with the other tax models. Indiana is the only state for which local taxes were captured in the Census Bureau model for 2012. Eliminating Indiana's local income tax had no effect on the national SPM estimate.

²⁰ The 2012 TRIM3 federal income tax baseline assigns \$623 billion in capital gains, matching the total according to IRS administrative data.

²¹ Authors' calculations based on data from IRS Statistics of Income Tables 1.1 and 1.7 for tax year 2012, available at <https://www.irs.gov/uac/SOI-Tax-Stats---Individual-Statistical-Tables-by-Size-of-Adjusted-Gross-Income>. Tax

Bureau model captures 67 percent of the total number of tax units with positive tax liability in this income range. TRIM3 exceeds the target by 3 percent—however, this is overstated owing to an error in the current version of the model. Once the error is corrected, TRIM3 will capture approximately 71 percent of the tax returns with positive tax liability in this income range, similar to the Census Bureau’s estimate. Total positive tax liability for returns with less than \$10,000 in AGI also falls short of target. The Census Bureau model captures about 67 percent of total positive tax liability in this income range, compared with 55 percent in TRIM3.²²

For both models, the shortfall in positive tax liability for returns with AGI below \$10,000 likely stems from a shortage of tax units assigned to file as dependents. Each model applies decision rules to determine whether a tax unit is claimed as a dependent of another tax unit in the household. Neither model captures cases in which a person is claimed as a dependent of a taxpayer living in another household. The Census Bureau model assigns dependency status to unmarried children living with a parent who are under age 19, under 24 and in school at the time of the survey, or of any age and unable to work due to a disability. Persons without income who are under the age of 19 and living without a parent are assigned as dependents of the household reference person. TRIM3 captures more dependent filers than the Census Bureau model because it enables tax units to claim relatives of any age as dependents, including married couples, so long as relevant gross income and support tests are met.²³ TRIM3 also ensures that if a person with a child is claimed as a dependent, then the person’s child is also claimed as a dependent, if appropriate.

Both models exceed the administrative target for total positive tax liability for tax units with AGI between \$10,000 and \$200,000, but the Census Bureau model’s estimates are generally higher than the TRIM3 estimates in this income range.²⁴ The Census Bureau’s higher estimates in this income range likely stem from the fact that the Census Bureau captures fewer itemized deductions than TRIM3. TRIM3 matches the IRS total for the amount of itemized deductions claimed, whereas the Census Bureau’s model falls 30 percent short of the IRS total (not shown). For some tax units, the identification

units that do not file as dependents are unlikely to have positive tax liability at AGI levels below \$10,000 due to the combination of the standard deduction and personal exemption.

²² The TRIM3 estimate for total tax liability for returns with positive tax liability and AGI below \$10,000 falls slightly to 54 percent after correction.

²³ TRIM3 approximates the support test by assuming that the head and spouse spend equal amounts of their income on each family member and comparing that income to the amount of income of the potential dependent.

²⁴ An exception occurs in the \$10,000 to \$20,000 AGI range, where the TRIM3 estimate of total tax liability exceeds that of the Census Bureau, despite the Census Bureau estimate finding more tax units with positive tax liability in this income range.

of additional dependent exemptions in TRIM3 enables tax units assigned single status in the Census Bureau model to claim head-of-household filing status in TRIM3, thus reducing their tax liability. As discussed below, TRIM3 also captures more EITC than the Census Bureau model— reducing the tax liability of some tax units for whom the EITC offsets positive tax liability.

Tax units with AGI of \$200,000 or more make up less than 6 percent of units with positive tax liability in 2012 but account for 55 percent of federal income taxes. Both models are somewhat short of the IRS figure for total tax liability for tax units with AGI between \$200,000 and \$500,000. TRIM3 captures 94 percent of the IRS target and the Census Bureau model captures 87 percent. There is substantial deviation from IRS figures at AGI levels above \$500,000, with both models falling well below target for the number of tax returns and total taxes for tax units with AGI between \$500,000 and \$1.0 million, exceeding the target for tax units with AGI in the \$1.0 to \$1.5 million range, and capturing a very small share (4% for the Census Bureau model and 26% for TRIM3) of aggregate taxes for returns with AGI above \$1.5 million. The higher tax liability observed in TRIM3 for returns with AGI above \$1.5 million is likely attributable to the capital gains assigned to taxpayers in the TRIM3 data.

Table 1c compares model results for selected tax credits. Corrections to the Census Bureau model resulted in an increase in tax units with the EITC (from 77 percent of the IRS administrative target to 82 percent) and a smaller increase in the share of EITC dollars captured (from 70 percent to 71 percent of the administrative target). Before the correction, children ages 19–23 attending school were not counted as EITC-qualifying children unless they also had a disability.²⁵ In addition, taxpayers age 25 were not counted as eligible for the childless EITC. Correcting these errors increased the number of tax units with the EITC and the amount of EITC claimed. This increase was offset to a certain extent by a separate correction to prevent double-counting of students ages 16–18 when counting the number of EITC-qualifying children.

²⁵ We thank Arloc Sherman of the Center on Budget and Policy Priorities for notifying us of this error.

TABLE 1B

Federal Income Tax: Positive Returns: Average and Total Tax Liability by AGI Level; Tax Year 2012
(Returns with positive tax liability)

AGI Level	Target	Calculated (Public-Use ASEC)	Percent of Target		TRIM3 Tax Variables
			Before Corrections	With Corrections	
Number of returns (thousands)					
< \$10,000	2,294	31%	31%	67%	103%
\$10,000 < \$20,000	10,325	116%	117%	116%	111%
\$20,000 < \$30,000	10,567	122%	122%	121%	114%
\$30,000 < \$50,000	19,449	107%	106%	107%	100%
\$50,000 < \$75,000	17,797	110%	109%	109%	101%
\$75,000 < \$100,000	11,886	106%	106%	106%	103%
\$100,000 < \$200,000	15,553	115%	116%	113%	110%
\$200,000 < \$500,000	4,138	100%	100%	97%	100%
\$500,000 < \$1,000,000	702	53%	53%	53%	70%
\$1,000,000 < \$1,500,000	169	109%	110%	111%	156%
\$1,500,000+	222	8%	8%	8%	50%
Total	93,103	109%	109%	109%	105%
Average tax liability					
< \$10,000	188	108%	108%	100%	53%
\$10,000 < \$20,000	533	90%	90%	97%	106%
\$20,000 < \$30,000	1,416	105%	105%	105%	109%
\$30,000 < \$50,000	2,815	111%	111%	110%	108%
\$50,000 < \$75,000	5,288	105%	104%	102%	103%
\$75,000 < \$100,000	8,244	106%	106%	104%	100%
\$100,000 < \$200,000	17,064	107%	106%	100%	100%
\$200,000 < \$500,000	55,963	95%	95%	90%	95%
\$500,000 < \$1,000,000	162,602	106%	106%	100%	100%
\$1,000,000 < \$1,500,000	297,653	113%	113%	108%	95%
\$1,500,000+	1,163,010	54%	53%	49%	52%
Total	12,758	77%	77%	72%	81%
Total tax liability (millions)					
< \$10,000	431	33%	33%	67%	55%
\$10,000 < \$20,000	5,505	105%	105%	112%	117%
\$20,000 < \$30,000	14,967	128%	128%	127%	124%
\$30,000 < \$50,000	54,739	118%	118%	118%	108%
\$50,000 < \$75,000	94,111	115%	114%	111%	104%
\$75,000 < \$100,000	97,981	113%	113%	110%	103%
\$100,000 < \$200,000	265,391	124%	122%	113%	110%
\$200,000 < \$500,000	231,596	95%	95%	87%	94%
\$500,000 < \$1,000,000	114,172	56%	56%	53%	69%
\$1,000,000 < \$1,500,000	50,205	123%	124%	119%	148%
\$1,500,000+	258,756	4%	4%	4%	26%
Total	1,187,853	84%	83%	79%	85%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, and Transfer Income Model Version 3 (TRIM3).
 Targets from <http://www.irs.gov/pub/irs-soi/12inalcr.pdf>.

TABLE 1C

Federal Income Tax: Comparison of Tax Credits: Simulated vs. Targets, Tax Year 2012

Returns are in millions; amounts are in billions of dollars

	Target	Calculated (Public-Use ASEC)	Percent of Target		TRIM3 tax variables
			Census Tax Model		
			Before corrections	With corrections	
Tax credits					
<i>Earned income tax credit</i>					
Number of returns	27.8	78%	77%	82%	83%
Amount	64.1	71%	70%	71%	73%
<i>Child tax credit</i>					
Number of returns	22.9	99%	98%	97%	93%
Amount	27.7	110%	109%	107%	101%
<i>Additional child tax credit</i>					
Number of returns	20.5	59%	58%	61%	67%
Amount	27.7	57%	56%	60%	67%
<i>Child tax credit + additional child tax credit</i>					
Amount	55.4	84%	83%	84%	84%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, and Transfer Income Model Version 3 (TRIM3). Targets from <http://www.irs.gov/pub/irs-soi/12inalcr.pdf>.

TRIM3 captures a slightly higher proportion of the number of returns with the EITC and the total amount of EITC than does the Census Bureau, but is still well below target. Given the size of the EITC, the dollar shortfall is substantial—\$18.8 billion in the Census Bureau estimates and \$17.4 billion in TRIM3 (not shown). The somewhat higher share of EITC captured in TRIM3 is explained in part by the fact that TRIM3 identifies more EITC qualifying children. Both models capture the rules allowing the EITC for children under the age of 19 or age 19-23 and in school.²⁶ Unlike the Census Bureau’s model, TRIM3 also assigns EITC-qualifying child status to adult disabled children, married children, and other relatives (who meet the requirements for the EITC and cannot be claimed as the qualifying child of a parent in the household). In addition, if a household reference person claims a child for the EITC, and that child has a child of his or her own, then TRIM3 allows the household reference person to claim both the child and grandchild for the EITC. TRIM3 also allows foster children to be claimed for the EITC. In contrast, the only cases in which the Census Bureau’s model allows a tax unit to claim a person other than a child of the head or spouse is when the tax unit is the household reference person and the child is under the age of 19 with no income and no parent present.

Both models are within 7 percent of target for the number of returns and aggregate amount of the CTC, but fall well below target for the number of returns and amount of the ACTC (the refundable portion of the child tax credit). The Census Bureau’s model captures 60 percent of the total ACTC and TRIM3 captures 67 percent, resulting in shortfalls of \$11.1 and \$9.1 billion, respectively (not shown). The Census Bureau model and TRIM3 each capture 84 percent of the combined amount of the CTC and ACTC according to IRS administrative data.

TAXSIM and Bakija Model Federal Tax Results

Table 2a shows the federal income tax results, relative to administrative targets, of TAXSIM and the Bakija model when tax-related inputs are generated by TRIM3 and by the Census Bureau model (after corrections). The TAXSIM and Bakija model results are quite close to TRIM3 results when TRIM3 is used to define the inputs to these models and are very close to Census Bureau model estimates when the Census Bureau model’s inputs are used. For example, TRIM3 captures 85 percent of positive tax

²⁶ Under IRS rules, a student is considered to be in school if he or she was a full-time student at the end of the tax year. The Census Bureau model approximates this requirement by classifying all persons who attended school in the week before the survey as “in school.” TRIM3 approximates this rule by classifying students as persons who attended school full-time in the week before the survey, reported that they did not work at all in the prior calendar year because they were attending school, or worked fewer than 30 weeks in the prior calendar year and reported that the reason that they did not work the full year was that they were in school.

liability according to IRS data. When TRIM3 inputs are submitted to TAXSIM and the Bakija model, the models capture 86 percent and 85 percent of positive tax liability, respectively. Similarly, the share of positive tax liability captured when Census Bureau inputs are submitted to the TAXSIM and Bakija models matches the share captured in the Census Bureau's model.

Table 2b compares estimates across models for returns with positive tax liability by AGI level. In general, the results are fairly consistent across models using the same tax input data. An exception is the lowest AGI category, where the Bakija model captures only a fraction of the simulated tax liability. This stems from the fact that the Bakija model treats all filers as if they are not dependents, and nondependent tax filers are unlikely to have positive tax liability if their AGI is below \$10,000. Some differences persist in the \$10,000 to \$30,000 range, but results are quite similar (given the same inputs) at income levels between \$30,000 and \$200,000. The Census Bureau model's estimates for average and total tax liability for tax units with AGI of \$200,000 to \$500,000 are somewhat lower than those calculated in the TAXSIM and Bakija models, whereas TRIM3, TAXSIM, and Bakija estimates are fairly consistent in this income range. Although we have not investigated this discrepancy, differences in the calculation of the AMT could affect results in this income range.

The tax models produce similar results for the EITC, CTC, and ACTC when using inputs from the same tax model (table 2c). The TRIM3 model (and TAXSIM and Bakija using TRIM3 inputs) capture 73 percent of the total EITC according to IRS administrative data, compared to 71 percent in the Census Bureau model (and TAXSIM and Bakija using Census Bureau inputs). All of the models exceed the IRS target for the value of the CTC, fall short of the IRS target for the ACTC, and capture 84 percent of the combined value of the CTC and ACTC.

The models also simulate the CDCTC, although the output variables from the Bakija and Census Bureau models provide results before the point at which the credit is capped at positive tax liability. Estimates are fairly consistent, with TRIM3, the Bakija model, and the Census Bureau model identifying between 7.4 and 7.7 million returns as potentially eligible for the credit, with a total of \$4.9 to \$5.0 billion in potential credit (before capping at positive tax liability) (table 2d). TRIM3 and TAXSIM results are similar when the credit is capped at positive tax liability. Capping the credit at positive tax liability lowers the available credit amount to \$4.0 billion in TRIM3. TAXSIM estimates a credit value of \$4.2 (using TRIM3 inputs) and \$4.4 billion (using Census Bureau inputs) when the credit is capped at positive tax liability. As noted, TAXSIM does not currently provide an input variable for the number of children qualifying for the CDCTC and so the credit is calculated based on the total number of children,

potentially overstating the amount of the credit in families that contain one qualifying child under the age of 13 and one or more children ages 13 and above.²⁷ TRIM3 goes an additional step beyond the other models in simulation of the CDCTC—reducing the number of tax units claiming the credit so as to come close to IRS administrative targets to yield a total of 6.0 million returns claiming \$3.5 billion in CDCTC.

Relatively few tax units receive the credit for the elderly or disabled (67,000 in 2012) and many who are eligible do not claim the credit. Although all of the models compute the credit, it is not included as a TAXSIM output variable, so TAXSIM results are not shown here. The credit is capped at positive tax liability and estimates differ across models. Before capping, the TRIM3 model estimates that 164,000 tax units are eligible for the credit. The Census Bureau model estimates that 500,000 are eligible, and the Bakija model estimates that 1.9 million are eligible (when TRIM3 inputs are used) and 2.6 million are eligible (when Bakija model inputs are used).²⁸ After capping at positive tax liability and selecting claimants from among those eligible, TRIM3 assigns the credit to 65,000 returns. The Bakija and Census Bureau models assign the credit to all eligible filers and cap the credit at positive tax liability.

Common Trends across Models

The results presented above show broad consistency in federal income tax results across tax models. Although differences arise for certain income ranges and credits, the overall picture remains the same. Positive tax liability exceeds IRS administrative figures for taxpayers with AGI in the lower-middle to upper-middle income ranges, the EITC and ACTC fall well below the amounts claimed according to the IRS, and the models capture only a fraction of the federal income taxes of the very rich. The TRIM3-based estimates come slightly closer to IRS figures than do the estimates based on the Census Bureau's model, but do not change these overall findings.

²⁷ The higher number of units eligible for the CDCTC in TAXSIM may be attributable to the fact that TRIM3, like the Census Bureau model, denies the CDCTC to households without children under the age of 13, even when the household reports child and dependent care expenses. Although the CDCTC can be claimed for expenses related to the care of persons with disabilities, this aspect of the CDCTC is not currently captured in the TRIM3 or Census Bureau models.

²⁸ We have not investigated the reasons for this discrepancy.

TABLE 2A

Federal Income Tax: Number of Returns, Income, and Income Tax: Simulated vs. Target, Tax Year 2012

	Target	Percent of Target					
		TRIM3 tax variables	TAXSIM using TRIM3 tax variables	Bakija using TRIM3 tax variables	Census Tax model with corrections	TAXSIM using Census tax variables	Bakija using Census tax variables
Income (billions of dollars)							
Adjusted gross income ¹	9,100	95%	95%	94%	88%	88%	87%
Taxable income	6,395	91%	92%	91%	85%	85%	85%
Positive income tax (millions of returns)	93.1	105%	105%	102%	109%	108%	105%
Total income taxes (billions of dollars)							
Positive returns	1,187.9	85%	86%	85%	79%	79%	79%
Alternative minimum tax	32.8	76%	68%	71%	N/A	40%	41%
Negative returns ²	-90.6	71%	70%	70%	67%	67%	67%
All returns	1,097.2	87%	88%	86%	80%	80%	80%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model. Targets from <http://www.irs.gov/pub/irs-soi/12inalcr.pdf>.

¹ Adjusted gross income (AGI) in this table includes both positive and negative AGI amounts.

² The target for the dollar amount of negative returns is obtained by adding the amount of additional child tax credit, refundable EITC, and EITC used to offset "other tax" liability (i.e., self-employment tax, social security and Medicare tax on tip income not reported to employer, tax on qualified plans, and household employment taxes).

TABLE 2B

Federal Income Tax: Positive Returns: Average and Total Tax Liability by AGI Level; Tax Year 2012

(Returns with positive tax liability)

AGI level	Target	Percent of Target					
		TRIM3 tax variables	TAXSIM using TRIM3 tax variables	Bakija using TRIM3 tax variables	Census tax model with corrections	TAXSIM using Census tax variables	Bakija using Census tax variables
Number of returns (thousands)							
< \$10,000	2,294	103%	52%	2%	67%	63%	2%
\$10,000 < \$20,000	10,325	111%	106%	97%	116%	116%	101%
\$20,000 < \$30,000	10,567	114%	114%	112%	121%	120%	116%
\$30,000 < \$50,000	19,449	100%	103%	103%	107%	107%	106%
\$50,000 < \$75,000	17,797	101%	105%	105%	109%	108%	108%
\$75,000 < \$100,000	11,886	103%	104%	103%	106%	106%	106%
\$100,000 < \$200,000	15,553	110%	113%	113%	113%	113%	113%
\$200,000 < \$500,000	4,138	100%	100%	100%	97%	97%	97%
\$500,000 < \$1,000,000	702	70%	70%	69%	53%	53%	52%
\$1,000,000 < \$1,500,000	169	156%	156%	154%	111%	111%	111%
\$1,500,000+	222	50%	50%	45%	8%	8%	8%
Total	93,103	105%	105%	102%	109%	108%	105%
Average tax liability							
< \$10,000	188	53%	80%	5%	100%	101%	5%
\$10,000 < \$20,000	533	106%	92%	89%	97%	97%	90%
\$20,000 < \$30,000	1,416	109%	100%	99%	105%	106%	104%
\$30,000 < \$50,000	2,815	108%	105%	104%	110%	110%	110%
\$50,000 < \$75,000	5,288	103%	103%	102%	102%	102%	102%
\$75,000 < \$100,000	8,244	100%	101%	100%	104%	104%	104%
\$100,000 < \$200,000	17,064	100%	100%	100%	100%	99%	100%
\$200,000 < \$500,000	55,963	95%	94%	94%	90%	95%	95%
\$500,000 < \$1,000,000	162,602	100%	99%	99%	100%	103%	103%
\$1,000,000 < \$1,500,000	297,653	95%	94%	94%	108%	107%	108%
\$1,500,000+	1,163,010	52%	52%	54%	49%	48%	49%
Total	12,758	81%	82%	83%	72%	73%	76%
Total tax liability (millions)							
< \$10,000	431	55%	42%	0%	67%	64%	0%
\$10,000 < \$20,000	5,505	117%	97%	86%	112%	112%	91%
\$20,000 < \$30,000	14,967	124%	114%	111%	127%	127%	121%
\$30,000 < \$50,000	54,739	108%	108%	106%	118%	118%	116%
\$50,000 < \$75,000	94,111	104%	108%	107%	111%	111%	110%
\$75,000 < \$100,000	97,981	103%	104%	103%	110%	110%	110%
\$100,000 < \$200,000	265,391	110%	113%	113%	113%	112%	112%
\$200,000 < \$500,000	231,596	94%	94%	94%	87%	91%	91%
\$500,000 < \$1,000,000	114,172	69%	69%	69%	53%	55%	54%
\$1,000,000 < \$1,500,000	50,205	148%	147%	145%	119%	119%	119%
\$1,500,000+	258,756	26%	26%	24%	4%	4%	4%
Total	1,187,853	85%	86%	85%	79%	79%	79%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model. Targets from <http://www.irs.gov/pub/irs-soi/12inalcr.pdf>.

TABLE 2C

Federal Income Tax: Comparison of Tax Credits: Simulated vs. Targets, Tax Year 2012

Returns are in millions; amounts are in billions of dollars

	Target	Percent of Target					
		TRIM3 Tax Variables	TAXSIM Using TRIM3 Tax Variables	Bakija Using TRIM3 Tax Variables	Census Tax Model with Corrections	TAXSIM Using Census Tax Variables	Bakija Using Census Tax Variables
Tax Credits							
<i>Earned income tax credit</i>							
Number of returns	27.8	83%	83%	83%	82%	82%	82%
Total amount	64.1	73%	73%	73%	71%	71%	71%
<i>Child tax credit</i>							
Number of returns	22.9	93%	95%	94%	97%	97%	97%
Amount	27.7	101%	102%	102%	107%	107%	107%
<i>Additional child tax credit</i>							
Number of returns	20.5	67%	65%	66%	61%	61%	61%
Amount	27.7	67%	66%	66%	60%	60%	60%
<i>Child tax credit + additional child tax credit</i>							
Amount	55.4	84%	84%	84%	84%	84%	84%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model. Targets from <http://www.irs.gov/pub/irs-soi/12inalcr.pdf>.

TABLE 2D

Federal Income Tax: Child Care and Credit for Elderly or Disabled, Tax Year 2012

Returns are in millions; amounts are in billions of dollars

	TRIM3 tax variables	TAXSIM using TRIM3 variables	Bakija using TRIM3 variables	Census tax model (with corrections)	TAXSIM using Census tax variables	Bakija using Census tax variables
Tax Credits						
<i>Child and dependent care credit</i>						
<i>Before capping at positive tax liability</i>						
Number of returns	7.7	N/A	7.6	7.4	N/A	7.4
Amount	5.0	N/A	4.9	5.0	N/A	5.0
<i>After capping, before selecting participants</i>						
Number of returns	6.3	6.5	N/A	N/A	6.6	N/A
Amount	4.0	4.2	N/A	N/A	4.4	N/A
<i>After capping and selecting participants</i>						
Number of returns	6.0	N/A	N/A	N/A	N/A	N/A
Amount	3.5	N/A	N/A	N/A	N/A	N/A
<i>Credit for elderly or disabled</i>						
Number of returns	0.164	N/A	1.948	0.5	N/A	2.551
Amount	0.046	N/A	1.125	0.2	N/A	1.534
<i>After capping and selecting participants</i>						
Number of returns	0.065	N/A	N/A	N/A	N/A	N/A
Amount	0.010	N/A	N/A	N/A	N/A	N/A

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model. Targets from <http://www.irs.gov/pub/irs-soi/12inalcr.pdf>.

While a full investigation of the discrepancy between ASEC-based tax model estimates and IRS totals is beyond the scope of this paper, the degree of consistency observed across models suggests that the findings are driven by the underlying income and demographic information found in the ASEC, rather than by the characteristics or design of a particular tax model. One limitation of the ASEC is that data are collected for individuals present in the household at the time of the survey, but reflect their income in the prior year. Fluctuation in household composition is not captured—for example, a taxpayer may appear ineligible for the EITC in the survey data because the child is not living with the taxpayer at the time of the survey. However, if the child resided with the taxpayer for the majority of the tax year, the taxpayer is entitled to claim the child for the EITC. ASEC respondents may also refuse to answer questions about income and/or may misreport their incomes in the survey data. The Census Bureau imputes income to nonrespondents using hot-deck procedures that borrow values from households with similar characteristics. Approximately 30 percent of earnings responses are imputed, and research linking CPS-ASEC data with Social Security administrative data suggests that the imputation process results in too few low earners and too few very high earners (Bollinger et al. 2015).

The tax models discussed here assume full compliance with tax rules. EITC noncompliance likely explains a substantial share of the discrepancy between tax model estimates and IRS totals. The Inspector General of the Department of the Treasury (TIGTA) estimates that between 21 and 25 percent of total EITC paid was paid in error in 2012 (TIGTA 2014a), which could explain much of the 27 percent and 29 percent short-fall in simulated EITC in the TRIM3 and Census Bureau models, respectively. In a subsequent report, TIGTA indicates that improper ACTC payments accounted for between 25.2 and 30.5 percent of the ACTC in 2013 and finds that the root causes of improper ACTC payments are similar to those of the EITC (TIGTA 2014b). According to the TIGTA report, the IRS estimates that 70 percent of EITC errors in FY 2013 are attributable to errors associated with the IRS's inability to authenticate qualifying child requirements, filing status, and claims involving complex or nontraditional living situations. The remaining 30 percent result from errors regarding improper reporting of income, enabling erroneous claims of the EITC.

The shortfall in tax units with positive tax liability and AGI below \$10,000 likely reflects under-identification of dependent filers in the Census Bureau model and TRIM3.²⁹ This is not surprising, as neither model attempts to capture all of the potential dependency relationships within a household. For

²⁹ As noted previously, although table 2b shows TRIM3 exceeding the number of returns with positive tax liability and AGI below \$10,000, this is the result of an error that will be corrected in subsequent versions. The corrected estimate will capture 71 percent of the IRS figure.

example, neither model assigns a taxpayer to claim his or her cohabiting partner as a dependent or assigns a person to be a dependent of a taxpayer in another household.

The excess in simulated returns with positive tax liability at AGI levels of \$10,000 to \$50,000 is explained in part by the short-fall in simulated EITC and ACTC relative to target. Many taxpayers in this income range who inaccurately claim the EITC may receive a refund rather than having positive tax liability. Others will have lower positive tax liability as a result of the inaccurate claim.

The excess in positive tax liability in the lower- through upper-middle income ranges may also occur in part because the tax models treat all reported earnings as taxable in the current year. However, ASEC respondents may report earnings that are not currently taxable—such as tax-deferred contributions to 401k plans, pre-tax payment of the worker share of employer-sponsored health insurance premiums, and tax exempt contributions to medical and dependent care flexible spending accounts.

Tax model results by AGI level suggest that the ASEC substantially understates the incomes of the very rich. Taxes for these taxpayers fall well below target, producing an overall shortfall in aggregate tax liability, despite the excess in simulated positive income tax liability throughout much of the income distribution.

State Income Tax Results

To validate state income tax results across models, we compare simulation results to values obtained from the Census Bureau's Annual Survey of State Government Tax Collections (for all states with state income taxes) and also from individual state revenue offices in five large states—California, New Jersey, New York, Ohio, and Virginia.³⁰ In all cases, the state-obtained tax collections are below the Census of Governments' report of tax collections. The aggregate state tax figures obtained from the states range from 73 percent of the Census of Governments' figure in California to 99 percent in New York. Although the District of Columbia has an income tax, the District of Columbia is not included in the Survey of State Government Tax Collections, and so comparisons to target are not shown.

The Census of Governments reports tax collections during each fiscal year. In order to make the totals more comparable to the calendar year data used for the simulations, we combine data from both fiscal years under the assumption that taxes are paid equally throughout the months of the year. For example, in most states, fiscal year 2012 runs from July 2011 to June 2012. For these states, we consider half of FY 2012 and half of FY 2013 to account for all of tax year 2012 collections.

A potential source of inconsistency between the simulated state income taxes and the collections according to the Census of Governments is that the collections reported in any given year may represent taxes owed across several years. For example, if a person has individual income taxes for tax year (and calendar year) 2012 withheld throughout the year in 2012, as is customary, most of their 2012 taxes will be collected in 2012. If they have too much tax withheld, it will show up as a collection in 2012 and then the amount that is over-withheld will likely be refunded in 2013 when the individuals file their state income tax forms. To the extent that this is consistent across years, it does not present a significant problem. However, in cases where income and/or state income tax rules are experiencing substantial changes, the timing issue can introduce inconsistency into the comparison of the simulated and administrative figures.

An additional source of possible inconsistency arises when taxpayers live in one state and pay taxes in one or more additional states—for example, because they were a part-year resident of another state or because they commuted to work in another state in which they were required to pay state income taxes. TRIM3 and the Census Bureau tax model calculate taxes based on state of residence. If the state

³⁰ We use values obtained as part of the validation of the 2012 TRIM3 State Income Tax baseline simulation. As noted in the table footnotes, in some cases the data for the alternative targets reflect tax year 2011 or 2013.

income taxes received by a particular state from residents of other states substantially differ from the total state income taxes paid by residents of the state to other states, then this can contribute to differences between simulated results and tax payments according to administrative data.

We compare EITC results to targets obtained from state administrative data for 10 states and to estimates based on federal EITC payments in an additional 9 states and the District of Columbia. For the remaining four states with an EITC in 2012, targets were not readily available for inclusion in the analysis.

Census and TRIM3 State Income Tax Results

Table 3a compares Census Bureau model and TRIM3 state income tax estimates to administrative targets. Corrections to the Census Bureau tax model had little effect on aggregate state income taxes relative to target, but did cause small changes in most states. States with the largest percentage change include California, which increased from 81 percent to 91 percent of the target according to California administrative data, North Carolina, which decreased from 147 percent to 94 percent of target, and Oregon, which increased from 81 percent to 89 percent of target. Indiana fell from 122 percent to 89 percent of target in part because we excluded local income taxes from the corrected model for consistency with the other tax models.

TRIM3 captures 91 percent of total state income taxes compared to the target from the Census Bureau's Annual Survey, and 98 percent of the target when state sources are used instead of the targets from the Annual Survey (for the five states where these are available). The Census Bureau model captures a substantially smaller share of the target amount of state income taxes – 80 percent using the Annual Survey and 85 percent using the alternate target. The TRIM3 estimate is higher, relative to target, than the Census Bureau model's estimate in all states but Delaware and Kansas.

Table 3b shows state EITC estimates compared to target. The Maryland and Rhode Island estimates are complicated by the fact that the EITC is not fully refundable in these states. Excluding these two states, TRIM3 captures 85 percent of the EITC (in states with an available target) compared with 82 percent in the Census Bureau's model. Prior to corrections, the Census Bureau's tax model captured 70 percent of aggregate state EITC. The increase in the share of the state EITC captured in the Census Bureau's tax model stems primarily from a correction to New York's EITC and the inclusion of New Mexico's EITC in the Census Bureau model's estimates. The dollar amount of EITC for the different estimates is provided in table 3c, including for those states without an available target.

TABLE 3A

State Income Tax: Individual Income Tax Collections, 2012¹*(in thousands of dollars)*

	Target	Calculated (Public-Use ASEC)	Percent of Target		TRIM3 tax variable
			Before corrections	With corrections	
Alabama	3,063,708	108%	104%	108%	115%
Alaska	n/a	n/a	n/a	n/a	n/a
Arizona	3,245,806	76%	75%	80%	118%
Arkansas	2,525,740	58%	57%	59%	82%
California	60,916,718	60%	60%	67%	78%
California state data ²	44,761,368	82%	81%	91%	107%
Colorado	5,202,056	93%	93%	90%	100%
Connecticut	7,591,569	69%	69%	68%	72%
Delaware	1,128,258	70%	71%	71%	68%
DC*	n/a	n/a	n/a	n/a	n/a
Florida	n/a	n/a	n/a	n/a	n/a
Georgia	8,457,299	102%	103%	109%	120%
Hawaii	1,638,232	101%	99%	101%	105%
Idaho	1,252,949	101%	101%	102%	107%
Illinois	16,025,486	105%	105%	105%	119%
Indiana	4,870,971	123%	122%	89%	94%
Iowa	3,233,234	94%	93%	96%	106%
Kansas	2,924,166	90%	89%	91%	89%
Kentucky	3,617,520	96%	95%	97%	102%
Louisiana	2,607,295	70%	70%	69%	84%
Maine	1,486,715	97%	97%	98%	103%
Maryland	7,404,965	91%	92%	92%	94%
Massachusetts	12,415,515	67%	67%	68%	80%
Michigan	7,250,546	116%	116%	115%	129%
Minnesota	8,469,420	69%	68%	68%	85%
Mississippi	1,628,346	93%	90%	94%	121%
Missouri	5,256,169	104%	103%	109%	126%
Montana	972,840	80%	80%	82%	95%
Nebraska	1,970,019	85%	84%	85%	87%
Nevada	n/a	n/a	n/a	n/a	n/a
New Hampshire	90,292	59%	59%	59%	59%
New Jersey	11,618,517	77%	77%	78%	88%
New Jersey state data ³ (2011)	10,174,000	88%	88%	89%	100%
New Mexico	1,195,707	136%	137%	128%	145%
New York	39,865,776	65%	55%	55%	57%
New York state data ⁴	39,497,271	66%	55%	55%	58%
North Carolina	10,725,981	148%	147%	94%	118%
North Dakota	537,147	58%	58%	57%	60%
Ohio	9,449,447	78%	78%	77%	85%
Ohio state data ⁵	9,039,300	82%	82%	81%	89%
Oklahoma	2,845,496	49%	49%	51%	90%
Oregon	6,042,979	84%	81%	89%	92%
Pennsylvania	10,439,724	87%	87%	87%	97%
Rhode Island	1,078,729	90%	89%	90%	99%
South Carolina	3,227,176	104%	105%	99%	141%
South Dakota	n/a	n/a	n/a	n/a	n/a

TABLE 3A (CONTINUED)

State Income Tax: Individual Income Tax Collections, 2012¹*(in thousands of dollars)*

	Target	Calculated (Public-Use ASEC)	Percent of Target		TRIM3 tax variable
			Before corrections	With corrections	
Tennessee	222,547	99%	99%	99%	103%
Texas	n/a	n/a	n/a	n/a	n/a
Utah	2,659,292	96%	97%	99%	101%
Vermont	630,739	82%	82%	78%	121%
Virginia	10,558,504	92%	90%	90%	103%
Virginia state data ⁶ (2011)	9,846,787	99%	97%	96%	111%
Washington	n/a	n/a	n/a	n/a	n/a
West Virginia	1,775,847	88%	88%	85%	107%
Wisconsin	6,995,045	85%	84%	86%	121%
Wyoming	n/a	n/a	n/a	n/a	n/a
Total, Target from:					
State source, if available ⁷	276,024,240	88%	86%	85%	98%
Census Survey of State Government ⁸	295,114,475	82%	80%	80%	91%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, and Transfer Income Model Version 3 (TRIM3).

Sources for Estimates: Targets from US Census Bureau, American FactFinder, Annual Survey of State Government Tax Collections Detailed Table, Individual Income Taxes and noted sources for selected states.

¹ In cases where 2012 information was not available, we used the most recent data available, as noted in the table.

² "Personal Income Tax Statistics By Zip Code" State of California Franchise Tax Board.

<https://www.ftb.ca.gov/aboutFTB/reports/2012pitstats.pdf>

³ "Statistics of Income: 2011 Income Tax Returns," New Jersey Division of Taxation, Summer 2013.

http://www.state.nj.us/treasury/taxation/pdf/pubs/soi_tables2011.pdf.

⁴ "Annual Statistical Report of New York State Tax Collections Statistical Summaries and Historical Tables: Fiscal Year 2013-14," New York Department of Taxation and Finance, August 2014.

⁵ "Individual Income Tax: 2012 Income Tax Returns by Income Class," Ohio Department of Taxation.

http://www.tax.ohio.gov/tax_analysis/tax_data_series/individual_income/publications_tds_individual/Y1TY12.aspx (Column: Income Tax Liability).

⁶ "Annual Report: Fiscal Year 2013," Virginia Department of Taxation. <http://www.tax.virginia.gov/site.cfm?alias=AnnualReports>

⁷ Excludes DC. Data from Census Annual Survey of State Government Tax Collections Detailed Table, except where data from state revenue offices is available. In those cases, state revenue office data is substituted.

⁸ Excludes DC. Data from Census Annual Survey of State Government Tax Collections Detailed Table. Does not include data from state revenue offices.

TABLE 3B

State EITC Compared to Targets, 2012¹*(in thousands of dollars)*

	Target	Percent of Target			
		Calculated (Public-Use ASEC) ²	Census Tax Model		TRIM3 tax variables
			Before corrections	With corrections	
Connecticut	112,154	87%	85%	89%	87%
Delaware	n/a	n/a	n/a	n/a	n/a
DC*	49,167	53%	53%	53%	61%
Illinois*	183,869	80%	79%	80%	82%
Indiana	n/a	n/a	n/a	n/a	n/a
Iowa	31,030	86%	85%	85%	87%
Kansas (2011)	89,042	96%	95%	95%	96%
Louisiana*	49,786	54%	55%	55%	56%
Maine	n/a	n/a	n/a	n/a	n/a
Maryland	86,139	145%	144%	149%	213%
Massachusetts*	121,496	83%	82%	81%	87%
Michigan*	116,556	62%	62%	63%	65%
Minnesota	196,000	86%	85%	84%	85%
Nebraska*	30,322	83%	81%	84%	88%
New Jersey (2011)	239,696	78%	77%	80%	86%
New Mexico*	51,148	0%	0%	66%	72%
New York (2010)	943,749	60%	59%	88%	91%
North Carolina*	112,462	65%	64%	62%	66%
Oklahoma*	41,102	75%	74%	75%	79%
Oregon*	35,186	94%	92%	95%	97%
Rhode Island (2011)	9,895	80%	80%	80%	88%
Vermont	26,697	86%	85%	86%	94%
Virginia	n/a	n/a	n/a	n/a	n/a
Wisconsin (2011)	100,854	107%	107%	95%	93%
Total (in states with targets)	2,626,350	74%	72%	84%	89%
Total (in states with targets, excluding MD and RI)	2,530,315	72%	70%	82%	85%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, and Transfer Income Model Version 3 (TRIM3).

* Fully refundable state EITCs calculated as a percentage of the federal EITC.

¹ In cases where 2012 information was not available, we used the most recent data available, as noted in the table.

² The Census Bureau's state EITC estimates are not available in the public use CPS data. The tabulation was provided by Bruce Webster at the Census Bureau.

<http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2>

State-specific information sources:

Connecticut (TY 2012): "Department of Revenue Services 2012-2013 Annual Report," Connecticut Department of Revenue.

http://www.ct.gov/drs/lib/drs/research/annualreport/drs_fy12_annual_report.pdf.

Iowa (TY 2012): "2012 Iowa Individual Income Tax Annual Statistical Report," Iowa Department of Revenue.

<http://www.iowa.gov/tax/educate/11inprep.pdf>, Table 13-A, page 43

Kansas (TY 2011): "Department of Revenue Annual Statistical Report," Kansas Department of Revenue, 2014.

<http://www.ksrevenue.org/pdf/ar10b.pdf>, Tax Year 2011 Kansas Department of Revenue Tax Credits, page 31

Maryland (TY 2012): "Income Tax Summary Report: Tax Year 2012," Comptroller of Maryland.

http://finances.marylandtaxes.com/static_files/revenue/incometaxsummary/summary12.pdf, Selected Tax Credits (by county), page 19.

Minnesota (TY 2012): "Minnesota Revenue: Individual Income Tax," Minnesota Department of Revenue.
http://www.revenue.state.mn.us/legislativeupdate/Documents/Income_Tax.pdf, Working Family Credit, on last page.

New Jersey (TY 2011): "Statistics of Income: 2011 Income Tax Returns," New Jersey Department of the Treasury.
http://www.state.nj.us/treasury/taxation/pdf/pubs/soi_tables2011.pdf, Table E: Full Year Resident Gross Income Tax Summary 2004-2011.

New York (TY 2010): "Earned Income Tax Credit: Analysis of Credit Claims for 2010," New York State Department of Taxation and Finance, November 2011.
http://www.tax.ny.gov/pdf/stats/stat_pit/eitc/ny_state_and_ny_city_earned_income_tax_credits_analysis_of_credit_claims_for_2009.pdf, Figure 2: Total New York State Earned Income Tax Credit Claimed - 1994-2010, page 11.

Rhode Island (TY 2011): "2014 Tax Expenditures Report," Rhode Island Department of Revenue,
http://www.revenue.state.mn.us/legislativeupdate/Documents/Income_Tax.pdf, 10. Earned Income (Federal), page 80.

Vermont (TY 2012): Vermont Department of Taxes, 2012 Vermont Personal Income Tax Returns – Dollars.

Wisconsin (TY 2011): "Wisconsin Earned Income Tax Credit: Summary for 2011," Wisconsin Department of Revenue, Oct. 2013, Table 1: Federal And State Earned Income Tax Credits In Wisconsin, Tax Years 1989-2011.

TABLE 3C

State EITC, 2012

(in thousands of dollars)

	Calculated (Public-Use ASEC) ¹	Census Tax Model		TRIM3 tax variables
		Before corrections	With corrections	
Connecticut	98,025	95,193	99,669	98,094
Delaware	28,021	27,091	27,652	2,880
DC*	25,862	25,857	26,159	29,897
Illinois*	147,101	144,791	147,308	150,671
Indiana	89,311	89,198	88,560	68,838
Iowa	26,640	26,445	26,299	27,103
Kansas	85,431	84,969	84,177	85,552
Louisiana*	27,026	27,261	27,138	28,045
Maine	7,897	7,741	7,885	2,181
Maryland	124,724	123,611	128,659	183,256
Massachusetts*	100,362	100,225	98,410	105,190
Michigan*	72,773	72,117	73,488	75,392
Minnesota	167,810	166,471	165,343	167,556
Nebraska*	25,085	24,682	25,531	26,803
New Jersey	187,215	184,630	192,146	206,365
New Mexico* ²	0	0	33,623	36,836
New York	570,633	553,685	829,950	855,385
North Carolina*	73,152	72,499	70,262	73,871
Oklahoma*	30,918	30,512	30,648	32,401
Oregon*	33,231	32,409	33,388	34,302
Rhode Island	7,906	7,894	7,877	8,720
Vermont	22,844	22,741	23,022	25,187
Virginia ³	0	0	187,962	71,523
Wisconsin	108,121	107,586	95,646	93,799

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, and Transfer Income Model Version 3 (TRIM3).

* Fully refundable state EITCs calculated as a percentage of the federal EITC.

¹ The Census Bureau's state EITC estimates are not available in the public-use CPS data. The tabulation was provided by Bruce Webster at the Census Bureau.

² The Census Bureau's estimate before corrections is zero as a result of an issue with the programming code.

³ The Census Bureau's estimate before corrections is zero because the credit is under the name Low Income Individuals Credit, and it has not been output into the state EITC variable.

TAXSIM and Bakija Model State Income Tax Results

Aggregate state income taxes are fairly consistent when TRIM3 is used to provide input to TAXSIM and the Bakija model (table 4a). TRIM3 captures 91 percent of total state income taxes according to the Annual Survey of State Government Tax Collections. TAXSIM produces 92 percent of the target when TRIM3 is used to provide input, and the Bakija model captures 93 percent of the target. The Census Bureau model captures 80 percent of state income taxes, compared with 82 percent in both TAXSIM and the Bakija model (when the Census Bureau model provides the inputs).

Although aggregate results are similar, there is a fair amount of variation in results across models for individual states, which is indicative of the complexity of state income tax modeling. Of the various model combinations, the closest correspondence occurs between the TAXSIM and Bakija models when Census Bureau tax variables are used as input (table 4b). Of the 44 states (including the District of Columbia) with a state income tax, aggregate TAXSIM and Bakija model state income tax estimates are within 2 percent of each other in 26 states and within 5 percent of each other in 35 states. In contrast, the Census Bureau and TAXSIM estimates are within 5 percent of each other in 27 states and the Census Bureau and Bakija model estimates are within 5 percent of each other in 23 states. TRIM3 estimates are somewhat more closely aligned with the Bakija model and TAXSIM estimates than is the case for the Census Bureau estimates. The TRIM3 and TAXSIM estimates are within 5 percent of each other in 30 states and the TRIM3 and Bakija model estimates are within 5 percent of each other in 26 states.

State EITC results are similar in most states when the same inputs (Census Bureau or TRIM3) are used, although there are differences for some models and states (table 4c). As noted, interpretation of EITC results for Maryland and Rhode Island is complicated by the fact that the EITC is not fully refundable in these states. Excluding these two states, the Census Bureau model captures 82 percent of aggregate state EITC amounts, compared with 88 percent in TAXSIM and 77 percent in the Bakija model. TRIM3 and TAXSIM (using TRIM3 inputs) capture 85 percent of aggregate state EITC amounts, compared with 77 percent in the Bakija model. The differences in aggregate amounts are largely attributable to differences in the EITC estimates for New York, for which the Bakija model produces a lower estimate than the other models. In addition, the Census Bureau model's estimates are somewhat lower than the other models for the District of Columbia, New Jersey, and Vermont. There is also substantial variation in the EITC estimates for the four states for which we do not provide targets (table 4d).

TABLE 4A

State Income Tax: Individual Income Tax Collections, 2012¹*(in thousands of dollars)*

	Target	Percent of Target					
		TRIM3 tax variables	TAXSIM using TRIM3 tax variables	Bakija using TRIM3 tax variables	Census tax model with corrections	TAXSIM using Census tax variables	Bakija using Census tax variables
Alabama	3,063,708	115%	115%	105%	108%	109%	99%
Alaska	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Arizona	3,245,806	118%	116%	118%	80%	108%	109%
Arkansas	2,525,740	82%	94%	95%	59%	88%	89%
California	60,916,718	78%	86%	87%	67%	67%	67%
California state data ²	44,761,368	107%	118%	118%	91%	91%	91%
Colorado	5,202,056	100%	103%	101%	90%	93%	92%
Connecticut	7,591,569	72%	73%	74%	68%	68%	67%
Delaware	1,128,258	68%	66%	65%	71%	65%	64%
DC*	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Florida	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Georgia	8,457,299	120%	115%	110%	109%	107%	103%
Hawaii	1,638,232	105%	104%	99%	101%	102%	96%
Idaho	1,252,949	107%	111%	121%	102%	104%	113%
Illinois	16,025,486	119%	113%	113%	105%	98%	98%
Indiana	4,870,971	94%	92%	92%	89%	80%	79%
Iowa	3,233,234	106%	103%	95%	96%	92%	83%
Kansas	2,924,166	89%	95%	95%	91%	92%	91%
Kentucky	3,617,520	102%	98%	97%	97%	94%	94%
Louisiana	2,607,295	84%	85%	84%	69%	84%	83%
Maine	1,486,715	103%	103%	102%	98%	98%	98%
Maryland	7,404,965	94%	96%	91%	92%	93%	87%
Massachusetts	12,415,515	80%	79%	80%	68%	71%	71%
Michigan	7,250,546	129%	120%	125%	115%	114%	114%
Minnesota	8,469,420	85%	88%	101%	68%	81%	92%
Mississippi	1,628,346	121%	124%	123%	94%	93%	91%
Missouri	5,256,169	126%	117%	119%	109%	104%	105%
Montana	972,840	95%	87%	88%	82%	84%	85%
Nebraska	1,970,019	87%	90%	89%	85%	86%	85%
Nevada	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New Hampshire	90,292	59%	25%	60%	59%	28%	59%
New Jersey	11,618,517	88%	80%	82%	78%	75%	77%
New Jersey state data ³ (2011)	10,174,000	100%	92%	94%	89%	86%	88%
New Mexico	1,195,707	145%	139%	138%	128%	142%	141%
New York	39,865,776	57%	61%	64%	55%	57%	59%
New York state data ⁴	39,497,271	58%	61%	64%	55%	57%	59%
North Carolina	10,725,981	118%	118%	117%	94%	94%	94%
North Dakota	537,147	60%	61%	61%	57%	59%	58%

TABLE 4A (CONTINUED)

State Income Tax: Individual Income Tax Collections, 2012¹*(in thousands of dollars)*

	Target	Percent of Target					
		TRIM3 tax variables	TAXSIM using TRIM3 tax variables	Bakija using TRIM3 tax variables	Census tax model with corrections	TAXSIM using Census tax variables	Bakija using Census tax variables
Ohio	9,449,447	85%	85%	82%	77%	78%	74%
Ohio state data ⁵	9,039,300	89%	89%	85%	81%	81%	78%
Oklahoma	2,845,496	90%	94%	103%	51%	95%	95%
Oregon	6,042,979	92%	95%	95%	89%	87%	88%
Pennsylvania	10,439,724	97%	94%	93%	87%	88%	87%
Rhode Island	1,078,729	99%	103%	97%	90%	98%	91%
South Carolina	3,227,176	141%	124%	123%	99%	107%	107%
South Dakota	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tennessee	222,547	103%	44%	90%	99%	47%	89%
Texas	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Utah	2,659,292	101%	103%	100%	99%	97%	92%
Vermont	630,739	121%	101%	125%	78%	78%	82%
Virginia	10,558,504	103%	101%	104%	90%	99%	101%
Virginia state data ⁶ (2011)	9,846,787	111%	109%	111%	96%	106%	109%
Washington	n/a	n/a	n/a	n/a	n/a	n/a	n/a
West Virginia	1,775,847	107%	102%	107%	85%	97%	99%
Wisconsin	6,995,045	121%	103%	106%	86%	94%	95%
Wyoming	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total, Target From: State source, if available ⁷	276,024,240	98%	98%	99%	85%	87%	87%
Census Survey of State Government ⁸	295,114,475	91%	92%	93%	80%	82%	82%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model.

Sources for Estimates: Targets from US Census Bureau, American FactFinder, Annual Survey of State Government Tax Collections Detailed Table, Individual Income Taxes and noted sources for selected states.

¹ In cases where 2012 information was not available, we used the most recent data available, as noted in the table.

² "Personal Income Tax Statistics By Zip Code" State of California Franchise Tax Board.

<https://www.ftb.ca.gov/aboutFTB/reports/2012pitstats.pdf>.

³ "Statistics of Income: 2011 Income Tax Returns," New Jersey Division of Taxation, Summer 2013.

http://www.state.nj.us/treasury/taxation/pdf/pubs/soi_tables2011.pdf.

⁴ "Annual Statistical Report of New York State Tax Collections Statistical Summaries and Historical Tables: Fiscal Year 2013-14," New York Department of Taxation and Finance, August 2014.

http://www.tax.ny.gov/research/collections/fy_collections_stat_report/2013_14_annual_statistical_report_of_ny_state_tax_collections.htm.

⁵ "Individual Income Tax: 2012 Income Tax Returns by Income Class," Ohio Department of Taxation. http://www.tax.ohio.gov/tax_analysis/tax_data_series/individual_income/publications_tds_individual/Y1TY12.aspx (Column: Income Tax Liability)

⁶ "Annual Report: Fiscal Year 2013," Virginia Department of Taxation. <http://www.tax.virginia.gov/site.cfm?alias=AnnualReports>

⁷ Excludes DC. Data from Census Annual Survey of State Government Tax Collections Detailed Table, except where data from state revenue offices is available. In those cases, state revenue office data is substituted.

⁸ Excludes DC. Data from Census Annual Survey of State Government Tax Collections Detailed Table. Does not include data from state revenue offices.

TABLE 4B

Number of States by Percent Difference¹ in Total State Income Tax Estimate across Tax Models, 2012

Tax model comparison	Number of States with Difference				
	0 - <2%	2 - <5%	5 - <10%	10 - <20%	20% +
TRIM3 and Census tax variables	2	3	12	15	12
Models using TRIM3 tax variables					
TRIM3 and TAXSIM	11	19	7	5	2
TRIM3 and Bakija	14	12	8	10	0
TAXSIM and Bakija	23	10	6	2	3
Models using Census tax variables					
Census and TAXSIM	17	10	6	5	6
Census and Bakija	13	10	9	8	4
TAXSIM and Bakija	26	9	5	2	2

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model.

¹ Percent difference (plus or minus) in total state income tax liability of first listed model relative to second listed model.

TABLE 4C

State EITC Compared to Targets, 2012¹*(in thousands of dollars)*

	Target	Percent of Target					
		TRIM3 tax variables	TAXSIM using TRIM3 tax variables	Bakija using TRIM3 tax variables	Census tax model with corrections	TAXSIM using Census tax variables	Bakija using Census tax variables
Connecticut	112,154	87%	88%	88%	89%	89%	89%
Delaware	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DC*	49,167	61%	61%	61%	53%	58%	58%
Illinois*	183,869	82%	82%	82%	80%	80%	80%
Indiana	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Iowa	31,030	87%	85%	88%	85%	82%	85%
Kansas (2011)	89,042	96%	96%	96%	95%	94%	95%
Louisiana*	49,786	56%	57%	57%	55%	55%	55%
Maine	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Maryland	86,139	213%	534%	539%	149%	511%	513%
Massachusetts*	121,496	87%	86%	87%	81%	81%	81%
Michigan*	116,556	65%	65%	64%	63%	63%	63%
Minnesota	196,000	85%	87%	87%	84%	83%	83%
Nebraska*	30,322	88%	88%	88%	84%	84%	84%
New Jersey (2011)	239,696	86%	85%	87%	80%	84%	84%
New Mexico*	51,148	72%	73%	72%	66%	67%	66%
New York (2010)	943,749	91%	90%	67%	88%	87%	65%
North Carolina*	112,462	66%	65%	66%	62%	62%	62%
Oklahoma*	41,102	79%	79%	79%	75%	75%	75%
Oregon*	35,186	97%	97%	98%	95%	94%	95%
Rhode Island (2011)	9,895	88%	87%	416%	80%	80%	397%
Vermont	26,697	94%	94%	94%	86%	91%	91%
Virginia	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wisconsin (2011)	100,854	93%	92%	92%	95%	94%	95%

TABLE 4C (CONTINUED)

State EITC Compared to Targets, 2012¹

(in thousands of dollars)

	Target	Percent of Target					
		TRIM3 tax variables	TAXSIM using TRIM3 tax variables	Bakija using TRIM3 tax variables	Census tax model with corrections	TAXSIM using Census tax variables	Bakija using Census tax variables
Total (in states with targets)	2,626,350	89%	99%	93%	84%	102%	92%
Total (in states with targets, excluding MD and RI)	2,530,315	85%	85%	77%	82%	88%	77%

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model.

* Fully refundable state EITCs calculated as a percentage of the federal EITC.

¹ In cases where 2012 information was not available, we used the most recent data available, as noted in the table.

<http://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2>

State-specific information sources:

Connecticut (TY 2012): "Department of Revenue Services 2012-2013 Annual Report," Connecticut Department of Revenue.

http://www.ct.gov/drs/lib/drs/research/annualreport/drs_fy12_annual_report.pdf.

Iowa (TY 2012): "2012 Iowa Individual Income Tax Annual Statistical Report," Iowa Department of Revenue.

<http://www.iowa.gov/tax/educate/11inprep.pdf>. Table 13-A, page 43.

Kansas (TY 2011): "Department of Revenue Annual Statistical Report," Kansas Department of Revenue, 2014. <http://www.ksrevenue.org/pdf/ar10b.pdf>, Tax Year 2011 Kansas Department of Revenue Tax Credits, page 31.

Maryland (TY 2012): "Income Tax Summary Report: Tax Year 2012," Comptroller of Maryland.

http://finances.marylandtaxes.com/static_files/revenue/incometaxsummary/summary12.pdf, Selected Tax Credits (by county), page 19.

Minnesota (TY 2012): "Minnesota Revenue: Individual Income Tax," Minnesota Department of Revenue.

http://www.revenue.state.mn.us/legislativeupdate/Documents/Income_Tax.pdf, Working Family Credit, on last page.

New Jersey (TY 2011): "Statistics of Income: 2011 Income Tax Returns," New Jersey Department of the Treasury.

http://www.state.nj.us/treasury/taxation/pdf/pubs/soi_tables2011.pdf, Table E: Full Year Resident Gross Income Tax Summary 2004-2011.

New York (TY 2010): "Earned Income Tax Credit: Analysis of Credit Claims for 2010," New York State Department of Taxation and Finance, November 2011.

http://www.tax.ny.gov/pdf/stats/stat_pit/eitc/ny_state_and_ny_city_earned_income_tax_credits_analysis_of_credit_claims_for_2009.pdf, Figure 2: Total New York State Earned Income Tax Credit Claimed - 1994-2010, page 11.

Rhode Island (TY 2011): "2014 Tax Expenditures Report," Rhode Island Department of Revenue. http://www.revenue.state.mn.us/legislativeupdate/Documents/Income_Tax.pdf, 10. Earned Income (Federal), page 80.

Vermont (TY 2012): Vermont Department of Taxes. http://www.state.vt.us/tax/pdf.word/excel/statistics/2011/income_stats_2011_town.pdf, 2012 Vermont Personal Income Tax Returns - Dollars.

Wisconsin (TY 2011): "Wisconsin Earned Income Tax Credit: Summary for 2011," Wisconsin Department of Revenue, October 2013.
<http://www.revenue.wi.gov/ra/11EITCsum.pdf>, Table 1: Federal and State Earned Income Tax Credits In Wisconsin, Tax Years 1989-2011.

TABLE 4D

State EITC, 2012

(in thousands of dollars)

	TRIM3 tax	TAXSIM using TRIM3 variables	Bakija using TRIM3 variables	Census SAS variables (with corrections)	TAXSIM using Census variables	Bakija using Census variables
Connecticut	98,094	98,494	98,474	99,669	99,932	99,675
Delaware	2,880	28,439	7,111	27,652	27,436	8,014
DC*	29,897	30,020	30,172	26,159	28,399	28,477
Illinois*	150,671	150,589	150,560	147,308	147,345	147,312
Indiana	68,838	78,420	90,285	88,560	76,714	87,753
Iowa	27,103	26,304	27,184	26,299	25,462	26,301
Kansas	85,552	85,384	85,603	84,177	83,990	84,179
Louisiana*	28,045	28,163	28,213	27,138	27,170	27,138
Maine	2,181	8,051	2,541	7,885	7,935	2,838
Maryland	183,256	459,587	464,413	128,659	440,499	442,089
Massachusetts*	105,190	104,876	105,212	98,410	98,400	98,650
Michigan*	75,392	75,443	75,154	73,488	73,633	73,525
Minnesota	167,556	169,807	170,117	165,343	162,403	162,072
Nebraska*	26,803	26,691	26,815	25,531	25,440	25,532
New Jersey	206,365	204,758	207,529	192,146	200,251	201,146
New Mexico*	36,836	37,417	36,875	33,623	34,074	33,624
New York	855,385	846,022	636,007	829,950	820,824	616,886
North Carolina*	73,871	73,520	73,990	70,262	69,887	70,266
Oklahoma*	32,401	32,307	32,442	30,648	30,675	30,649
Oregon*	34,302	33,983	34,324	33,388	33,136	33,389
Rhode Island	8,720	8,626	41,187	7,877	7,894	39,307
Vermont	25,187	25,158	25,209	23,022	24,355	24,292
Virginia	71,523	180,945	94,553	187,962	172,671	89,411
Wisconsin	93,799	92,572	93,179	95,646	95,172	95,686

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model.

* Fully refundable state EITCs calculated as a percentage of the federal EITC.

Effects on the SPM

In this section, we show the effects on the SPM of using tax variables calculated by the Census Bureau and TRIM3 models. We then show the effects of substituting in tax variables generated by the Bakija and TAXSIM models, when inputs are defined by the Census Bureau model and TRIM3. Finally, we show the effects of possible tax modeling simplifications on the SPM.

SPM Using Census Bureau and TRIM3 Tax Estimates

Table 5a shows the number of persons in poverty and the poverty rate according to the Census Bureau's published results for 2012 (Short 2013). We first demonstrate our ability to come close to the published estimates by calculating the SPM following Census Bureau methodology. The minimal differences from published estimates arise from the fact that our calculated results are generated using public-use data rather than internal Census Bureau files and certain minor household heads living with parents are classified as "children" when calculating the SPM threshold in our calculated results, but not in the published results. The results differ from the published figures by "type of unit" because of definitional differences (see footnote in table) and by metropolitan/nonmetropolitan status because of nondisclosure of metropolitan area status for some ASEC households.

We next show the effects on the SPM of incorporating the federal and state income taxes produced when we run the Census Bureau's tax model on the public-use ASEC, both before and after the corrections to the tax model. The results before correction are similar to the calculated and published results, with no change in the overall SPM poverty rate. After corrections, the SPM poverty rate is 0.1 percentage point lower than in the published estimate. People ages 18–64 experience a 0.2 percentage point reduction in the SPM poverty rate, whereas the rate remains unchanged for children and the elderly. The reduction in the estimated SPM poverty rate appears to be driven by the corrections to the EITC calculation to count students ages 19–23 as qualifying children and to enable 25-year-old adults to qualify for the childless EITC.³¹

³¹ The correction to count students ages 19–23 as EITC-qualifying children was implemented after all other corrections had been made. Before this correction, there was no change from published estimates in the overall SPM poverty rate.

The final column of table 5a compares SPM estimates generated using TRIM3 federal and state income taxes to published SPM estimates. Substituting in TRIM3 taxes reduces the number of poor persons by approximately 958,000 relative to the published estimate and decreases the SPM poverty rate by 0.3 percentage points relative to the published estimate and by 0.2 percentage points relative to the corrected estimate from the Census Bureau's tax model.

Table 5b shows the percentage distribution of the population by the ratio of SPM resources to the SPM poverty threshold. (Table 5c provides additional detail by age and race/ethnic group.) For example, the published estimates show that 34.6 percent of the population has resources between 200 and 400 percent of the SPM threshold. The corrections to the 2012 Census Bureau tax model decrease the share of the population between 200 and 400 percent of poverty by 0.3 percentage points relative to the published estimate and by 0.2 percentage points relative to the tax model before corrections. The share of the population above 400 percent of the poverty threshold increases by 0.6 percentage points relative to the published estimate and by 0.5 percentage points relative to the tax model before corrections.

The distribution of the population by poverty level changes slightly when TRIM3 tax variables are used, with reductions in the share of the population below 200 percent of poverty and a 0.5 percentage point increase in the share of the population above 400 percent of the poverty threshold, relative to the Census Bureau tax model estimate after corrections. Some of the higher income in TRIM3 is attributable to the fact that TRIM3 includes capital gains in resources. This is necessary for consistency with the tax simulation—if capital gains are taken into consideration when calculating taxes, they must also be included in family resources.

Estimates of the effect on poverty of federal income taxes, refundable credits, and state income taxes are provided in table 5d. Antipoverty effects of additional selected programs are also included. The top panel of table 5d shows the SPM poverty rate in the absence of a given benefit or expense. The Census Bureau's published estimates are shown, followed by the difference from the published estimates when the Census Bureau tax model's estimates (after corrections to the 2012 model) and TRIM3 tax variables are substituted into the SPM. Calculating the SPM using Census tax model estimates produces results similar to the published estimates. Results differ from the published estimates by no more than 0.1 to 0.2 percentage points. TRIM3 estimates of the SPM poverty rate in the absence of a given benefit or expense are between 0.2 and 0.4 percentage points lower than the published Census Bureau estimates for persons under the age of 65, reflecting the overall lower TRIM3 SPM poverty rate in this age range when TRIM3 tax variables are used.

The bottom panel of table 5d shows the Census Bureau’s published estimate for the change in the SPM poverty rate in the absence of a given benefit or expense. For example, the Census Bureau estimates that in the absence of refundable tax credits, the SPM poverty rate would be 3.0 percentage points higher. The following columns show the change relative to this estimate when the SPM is calculated using the Census Bureau tax model estimates and when using TRIM3 tax variables. The results of the Census Bureau tax model differ from the published estimates by no more than 0.1 percentage points. Results using TRIM3 tax variables are also close to the published estimates, differing from the published estimates by no more than 0.2 percentage points.

TABLE 5A

Number and Percentage of People in SPM Poverty Using Different Tax Simulations, 2012

Full population (in thousands)

	Change Relative to Published SPM									
	Published		Calculated (Public-Use ASEC) ¹		Census Tax Model				TRIM3 Tax Variables ²	
	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate
All people	49,730	16.0	50	0.0	158	0.0	-357	-0.1	-958	-0.3
<i>Sex</i>										
Male	23,278	15.3	11	0.0	79	0.0	-162	-0.1	-465	-0.3
Female	26,452	16.7	39	0.0	79	0.0	-194	-0.2	-494	-0.4
<i>Age</i>										
Less than 18	13,358	18.0	72	0.1	101	0.1	-39	0.0	-187	-0.2
18 to 64	29,953	15.5	-21	0.0	47	0.0	-291	-0.2	-762	-0.4
65 and older	6,419	14.8	-1	0.0	9	0.1	-26	0.0	-10	0.0
<i>Type of Unit</i> ³										
Married couple	18,703	10.0	318	0.1	439	0.2	104	0.0	-180	-0.2
Female householder	18,137	28.9	276	0.3	253	0.3	99	0.0	-141	-0.4
Male householder	7,766	23.1	-255	-0.4	-261	-0.4	-249	-0.3	-382	-0.7
New SPM	5,124	18.4	-290	-0.4	-274	-0.4	-311	-0.5	-256	-0.3
<i>Race and Hispanic origin</i>										
White	34,002	14.0	27	0.0	131	0.1	-194	-0.1	-497	-0.2
White, not Hispanic	20,946	10.7	6	0.0	57	0.1	-132	0.0	-254	-0.1
Black	10,363	25.8	39	0.1	-1	0.0	-88	-0.2	-282	-0.7
Asian	2,737	16.7	-4	-0.1	35	0.2	-41	-0.3	-66	-0.4
Hispanic (any race)	14,819	27.8	11	0.1	63	0.2	-103	-0.2	-305	-0.5
<i>Nativity</i> ⁴										
Native born	39,538	14.6	26	0.0	74	0.0	-276	-0.1	-764	-0.3
Foreign born	10,192	25.4	24	0.1	84	0.2	-80	-0.2	-195	-0.5
Naturalized citizen	3,361	18.5	0	0.0	10	0.0	-61	-0.4	-93	-0.5
Not a citizen	6,831	31.2	25	0.1	73	0.3	-20	-0.1	-102	-0.5

TABLE 5A (CONTINUED)

Number and Percentage of People in SPM Poverty Using Different Tax Simulations, 2012

Full population (in thousands)

	Published		Change Relative to Published SPM							
			Calculated (Public-Use ASEC) ¹		Census Tax Model				TRIM3 Tax Variables ²	
	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	Number	poverty Rate
<i>Tenure</i> ⁵										
Owner	20,512	9.9	-25	0.0	70	0.0	-247	-0.1	-597	-0.3
Owner/mortgage	11,676	8.5	-48	-0.1	8	0.0	-192	-0.2	-502	-0.4
Owner/no mortgage/rent free	9,694	13.4	23	0.0	69	0.1	-50	-0.1	-108	-0.2
Renter	28,360	28.1	75	0.1	82	0.1	-114	-0.1	-348	-0.3
<i>Residence</i> ⁶										
Inside metropolitan statistical areas	43,064	16.4	-130	0.0	-24	0.0	-488	-0.2	-1,037	-0.4
Inside principal cities	21,401	21.1	-2,519	1.2	-2,464	1.3	-2,686	1.0	-2,935	0.7
Outside principal cities	21,664	13.4	-3,523	0.1	-3,479	0.1	-3,702	-0.1	-3,940	-0.2
Not disclosed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Outside metropolitan statistical areas	6,666	13.9	-171	0.1	-160	0.1	-211	0.0	-264	-0.1
<i>Region</i>										
Northeast	8,570	15.5	5	0.1	19	0.1	-103	-0.1	-205	-0.3
Midwest	8,268	12.4	-12	0.0	-10	0.0	-69	-0.1	-177	-0.2
South	18,939	16.3	54	0.1	88	0.1	-90	-0.1	-266	-0.2
West	13,953	19.0	4	0.0	61	0.1	-95	-0.1	-311	-0.4
<i>Health insurance coverage</i>										
With private insurance	15,273	7.7	-24	0.0	21	0.0	-174	-0.1	-491	-0.3
With public, no private insurance	19,655	30.5	65	0.1	83	0.2	-57	0.0	-161	-0.2
Not insured	14,802	30.9	9	0.0	54	0.1	-126	-0.3	-307	-0.7

TABLE 5A (CONTINUED)

Number and Percentage of People in SPM Poverty Using Different Tax Simulations, 2012

Full population (in thousands)

	Change Relative to Published SPM									
	Published		Calculated (Public-Use ASEC) ¹		Census Tax Model				TRIM3 Tax Variables ²	
					Before Corrections		With Corrections			
Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	
<i>Work experience</i>										
Total, 18 to 64 years	29,953	15.5	-21	0.0	47	0.0	-291	-0.2	-762	-0.4
All workers (18 to 64 years)	14,066	9.6	-20	0.0	23	0.1	-217	-0.1	-464	-0.3
Worked full-time, year-round	5,252	5.3	-2	0.0	34	0.1	-90	-0.1	-240	-0.2
Less than full-time, year-round	8,814	18.7	-19	0.0	-11	0.0	-127	-0.3	-224	-0.5
Did not work at least 1 week	15,887	33.2	-1	0.0	24	0.1	-75	-0.1	-298	-0.6
<i>Disability status ⁷</i>										
Total, 18 to 64 years	29,953	15.5	-21	0.0	47	0.0	-291	-0.2	-762	-0.4
With a disability	3,979	26.5	6	0.1	13	0.1	-3	0.0	-47	-0.3
With no disability	25,921	14.6	-26	0.0	36	0.0	-288	-0.2	-714	-0.4

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), and Short, Kathleen. 2013. "The Research Supplemental Poverty Measure: 2012." <https://www.census.gov/prod/2013pubs/p60-247.pdf>.

¹ The differences in published and calculated public-use ASEC estimates arise from the fact that the calculated results are generated using public-use data rather than internal Census Bureau files and certain minor household heads living with parents are classified as "children" when calculating the SPM threshold in the calculated results, but not in the published results.

² The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

³ The type of unit estimates differ slightly because of differences in how "New SPM" units are identified. The calculated SPM estimates classify a unit as a "New SPM" unit if the unit contains both related and nonrelated members (according to relationship codes in HHDFMX). The Census Bureau relies in part on mother and father identifiers when assigning "New SPM" unit status. Units with discrepancies appear to be those with unusual/unexpected reported relationships—such as codes indicating a step-child has co-parented a child with his/her step-parent.

⁴ Nativity represents native and foreign born status as reported on the CPS and does not incorporate adjustments made by TRIM3.

⁵ People in households that report living with no cash rent are excluded from renter status and are included in the owner/no mortgage/rent free group. Owner status includes only those households that report that they own or are buying their home, and excludes those who say they are living with no cash rent.

⁶The Census Bureau and calculated public-use ASEC estimates are not fully consistent owing to nondisclosure of area of residence for certain households in the public use data.

⁷Person reports presence of a disability or limitation. Armed forces members are excluded from the universe for this question.

TABLE 5B

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using Different Tax Simulations, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Percentage distribution (published)	5.2	10.8	17.0	14.2	34.6	18.2
<i>Change relative to published SPM</i>						
Calculated (Public-Use ASEC) ¹	0.0	0.0	0.0	0.0	0.0	0.0
Census Tax Model before corrections	0.0	0.1	0.0	0.0	-0.1	0.1
Census Tax Model with corrections	-0.1	0.0	-0.1	0.0	-0.3	0.6
TRIM3 tax variables ²	-0.2	-0.2	-0.4	-0.4	0.0	1.1

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), and Short, Kathleen. 2013. "The Research Supplemental Poverty Measure: 2012." <https://www.census.gov/prod/2013pubs/p60-247.pdf>.

¹ The differences in published and calculated public-use ASEC estimates arise from the fact that the calculated results are generated using public-use data rather than internal Census Bureau files and certain minor household heads living with parents are classified as "children" when calculating the SPM threshold in the calculated results, but not in the published results.

² The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

TABLE 5C

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using Different Tax Simulations, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Percentage distribution (published)						
<i>All people</i>	5.2	10.8	17.0	14.2	34.6	18.2
<i>Age</i>						
Less than 18	4.7	13.3	21.4	16.3	32.7	11.7
18 to 64	5.4	10.1	15.1	13.4	35.7	20.3
65 and older	4.7	10.1	18.0	14.3	33.1	19.7
<i>Race and Hispanic origin</i>						
White	4.6	9.4	15.9	13.9	36.0	20.2
White, not Hispanic	4.0	6.7	13.0	13.4	39.2	23.7
Black	7.7	18.0	23.0	16.4	27.0	7.9
Asian	6.0	10.6	15.5	13.6	35.7	18.6
Hispanic (any race)	7.2	20.6	27.8	15.7	22.8	5.8
Change relative to published SPM (Census tax model with corrections)						
<i>All people</i>	-0.1	0.0	-0.1	0.0	-0.3	0.6
<i>Age</i>						
Less than 18	0.0	0.0	-0.3	0.0	-0.4	0.7
18 to 64	0.0	-0.1	0.0	0.0	-0.4	0.5
65 and older	0.0	0.0	-0.1	-0.2	-0.2	0.6
<i>Race and Hispanic origin</i>						
White	0.0	0.0	-0.1	-0.1	-0.4	0.7
White, not Hispanic	0.0	0.0	-0.1	0.0	-0.5	0.7
Black	-0.2	0.0	0.0	-0.2	0.1	0.1
Asian	0.0	-0.2	0.2	-0.3	-0.5	0.8
Hispanic (any race)	-0.1	-0.1	0.0	0.1	0.0	0.2
Change relative to published SPM (TRIM3 tax variable)¹						
<i>All people</i>	-0.2	-0.2	-0.4	-0.4	0.0	1.1
<i>Age</i>						
Less than 18	-0.1	-0.2	-0.6	-0.4	0.1	1.0
18 to 64	-0.1	-0.3	-0.2	-0.3	-0.1	1.0
65 and older	-0.1	0.1	-0.6	-0.6	-0.4	1.7
<i>Race and Hispanic origin</i>						
White	-0.1	-0.1	-0.4	-0.4	-0.3	1.3
White, not Hispanic	-0.1	0.0	-0.5	-0.4	-0.4	1.4
Black	-0.3	-0.3	0.1	-0.6	0.7	0.4
Asian	-0.2	-0.1	-0.3	-1.0	0.7	1.0
Hispanic (any race)	-0.1	-0.4	-0.1	-0.1	0.5	0.4

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), and Short, Kathleen. 2013. "The Research Supplemental Poverty Measure: 2012." <https://www.census.gov/prod/2013pubs/p60-247.pdf>.

¹The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

TABLE 5D

Effect of Excluding Individual Elements on SPM Poverty Rates Using Different Tax Simulations, 2012

	Change Relative to Published SPM											
	Published SPM				Census Tax Model with Corrections				TRIM3 Tax Variables ¹			
	All persons	<18 years	18-64 years	65+ years	All persons	<18 years	18-64 years	65+ years	All persons	<18 years	18-64 years	65+ years
SPM poverty rate	16.0	18.0	15.5	14.8	-0.1	-0.1	-0.2	0.0	-0.3	-0.3	-0.4	0.0
SPM in absence of benefit or expense												
SNAP	17.6	21.0	16.7	15.6	-0.1	-0.1	-0.1	-0.1	-0.3	-0.4	-0.4	0.0
School lunch	16.4	18.9	15.7	14.9	-0.2	-0.1	-0.1	-0.1	-0.4	-0.3	-0.4	-0.1
WIC	16.1	18.3	15.6	14.8	-0.1	-0.1	-0.2	0.0	-0.3	-0.3	-0.4	0.0
Refundable tax credits ²	19.0	24.7	17.7	15.0	-0.1	-0.1	-0.1	0.0	-0.2	-0.2	-0.3	0.0
Federal income tax	15.6	17.7	14.9	14.6	-0.1	0.0	-0.1	0.0	-0.2	-0.2	-0.2	0.1
State income tax, including refundable credits	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FICA	14.8	16.4	14.3	14.6	-0.1	0.1	-0.2	0.0	-0.3	-0.2	-0.4	0.0
Change in SPM in absence of benefit or expense												
SNAP	1.6	3.0	1.2	0.8	0.0	-0.1	0.1	0.0	0.0	-0.1	0.1	0.0
School lunch	0.4	0.9	0.2	0.1	0.0	0.0	0.1	-0.1	-0.1	-0.1	0.0	-0.1
WIC	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Refundable tax credits ²	3.0	6.7	2.2	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.2	0.0
Federal income tax	-0.4	-0.3	-0.6	-0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1
State income tax, including refundable credits	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FICA	-1.2	-1.6	-1.2	-0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Transfer Income Model Version 3 (TRIM3), and Short, Kathleen. 2013. "The Research Supplemental Poverty Measure: 2012." <https://www.census.gov/prod/2013pubs/p60-247.pdf>.

¹ The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

² Refundable tax credits include the federal EITC and refundable portion of the federal child tax credit. State refundable credits are not included in this row.

SPM Using TAXSIM and Bakija Model Estimates

Tables 6a through 6d show that, when the Bakija and TAXSIM models are run using TRIM3 inputs, the resulting SPM estimates are virtually identical to the SPM using TRIM3 federal and state income taxes. The same holds true when the Bakija and TAXSIM models are run using Census Bureau inputs and are compared to the estimates using the Census tax model after correction (tables 7a through 7d).

Sensitivity of the SPM to Modeling Simplifications

We use the TRIM3 model to test the sensitivity of the SPM to various simplifications in the modeling of federal and state income taxes. The simplifications include eliminating the simulation of federal income taxes for dependent filers, excluding capital gains from resources and taxes, and excluding capital gains as well as itemized deductions and other variables obtained from the match with the PUF.

TRIM3 simulates federal income taxes, but not state income taxes, for dependent filers.³² The Bakija model does not currently include rules for simulation of dependent filers. Excluding the federal income taxes of dependent filers from the SPM has no discernable effect on the SPM estimates (tables 8a through 8d).

TRIM3 statistically matches realized capital gains and losses from the PUF to the ASEC. Although the Census Bureau model obtains capital gains from the statistical match with the PUF, they have been zeroed out in recent years. Obtaining a reasonable estimate of capital gains using a statistical match with the PUF is complicated by the fact that the most recent PUF dataset may lag the ASEC by several years. The amount of realized capital gains can change substantially within a year or two in response to changes in the economy or the tax treatment of capital gains. When capital gains from an earlier PUF are statistically matched to the current ASEC year, results can easily be too high or too low for the current year. Typically, adjustments must be made to the resulting match in order to bring values within acceptable range of target. Alternatively, the PUF can be “aged” to the appropriate year before the match. However, either task adds to the staff resources and time required for preparation of the tax estimates.

³² TRIM3 draws most of the rules for the StateTax model from the Bakija model, which does not include tax rules for dependent filers.

TABLE 6A

Number and Percentage of People in SPM Poverty Using Different Tax Simulations, 2012

Full population (in thousands)

	Change Relative to TRIM3 Tax SPM					
	TRIM3 Tax Variables ¹		TAXSIM Using TRIM3 Tax Variables		Bakija Using TRIM3 Tax Variables	
	Number	Poverty rate	Number	poverty rate	Number	Poverty rate
All people	48,772	15.7	89	0.0	-15	0.0
<i>Sex</i>						
Male	22,813	15.0	56	0.0	-14	0.0
Female	25,958	16.3	33	0.0	-2	0.0
<i>Age</i>						
Less than 18	13,171	17.8	16	0.0	4	0.0
18 to 64	29,191	15.1	75	0.0	-8	0.0
65 and older	6,409	14.8	-2	0.0	-11	0.0
<i>Type of Unit</i>						
Married couple	18,523	9.8	8	0.0	-28	0.0
Female householder	17,996	28.5	45	0.1	20	0.0
Male householder	7,384	22.4	23	0.1	1	0.0
New SPM	4,868	18.1	12	0.0	-7	0.0
<i>Race and Hispanic origin</i>						
White	33,505	13.8	32	0.0	2	0.0
White, not Hispanic	20,692	10.6	11	0.0	-2	0.0
Black	10,081	25.1	69	0.2	5	0.0
Asian	2,671	16.3	-1	0.0	-13	-0.1
Hispanic (any race)	14,514	27.3	18	0.0	-8	0.0
<i>Nativity</i> ¹						
Native born	38,775	14.3	71	0.0	-21	0.0
Foreign born	9,997	24.9	18	0.0	6	0.0
Naturalized citizen	3,268	18.0	21	0.1	2	0.0
Not a citizen	6,729	30.7	-3	0.0	4	0.0
<i>Tenure</i> ²						
Owner	19,915	9.6	34	0.0	-20	0.0
Owner/mortgage	11,174	8.1	-8	0.0	-11	0.0
Owner/no mortgage/rent free	9,586	13.2	44	0.1	-7	0.0
Renter	28,012	27.8	53	0.1	3	0.0

TABLE 6A (CONTINUED)

Number and Percentage of People in SPM Poverty Using Different Tax Simulations, 2012

Full population (in thousands)

	TRIM3 Tax Variables ¹		Change Relative to TRIM3 Tax SPM			
	Number	Poverty rate	TAXSIM Using TRIM3 Tax Variables		Bakija Using TRIM3 Tax Variables	
			Number	Poverty rate	Number	Poverty rate
<i>Residence</i>						
Inside metropolitan statistical areas	42,027	16.0	103	0.0	-12	0.0
Inside principal cities	18,466	21.8	54	0.1	14	0.0
Outside principal cities	17,724	13.2	57	0.0	-14	0.0
Not disclosed	5,837	13.5	-8	0.0	-11	0.0
Outside metropolitan statistical areas	6,402	13.8	-8	0.0	-4	0.0
<i>Region</i>						
Northeast	8,365	15.2	36	0.1	3	0.0
Midwest	8,091	12.2	-21	0.0	12	0.0
South	18,673	16.1	33	0.0	-24	0.0
West	13,642	18.6	41	0.1	-6	0.0
<i>Health Insurance Coverage</i>						
With private insurance	14,782	7.4	61	0.0	-11	0.0
With public, no private insurance	19,494	30.3	-4	0.0	-7	0.0
Not insured	14,495	30.2	33	0.1	3	0.0
<i>Work Experience</i>						
Total, 18 to 64 years	29,191	15.1	75	0.0	-8	0.0
All workers (18 to 64 years)	13,602	9.3	40	0.0	-9	0.0
Worked full-time, year-round	5,012	5.1	22	0.0	-2	0.0
Less than full-time, year-round	8,590	18.2	18	0.0	-8	0.0
Did not work at least 1 week	15,589	32.6	35	0.1	2	0.0
<i>Disability Status</i> ⁴						
Total, 18 to 64 years	29,191	15.1	75	0.0	-8	0.0
With a disability	3,932	26.2	8	0.1	-4	0.0
With no disability	25,207	14.2	67	0.0	-4	0.0

Sources: 2013 CPS ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model.

¹ The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

² Nativity represents native and foreign born status as reported on the CPS and does not incorporate adjustments made by TRIM3.

³ People in households that report living with no cash rent are excluded from renter status and are included in the owner/no mortgage/rent free group. Owner status includes only those households that report that they own or are buying their home, and excludes those who say they are living with no cash rent.

⁴ Person reports presence of a disability or limitation. Armed forces members are excluded from the universe for this question.

TABLE 6B

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using Different Tax Simulations, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Percentage distribution (TRIM3 tax variables) ¹	5.0	10.6	16.6	13.8	34.6	19.3
<i>Change relative to TRIM3 tax SPM</i>						
TAXSIM using TRIM3 tax variables	0.0	0.0	0.0	0.0	0.0	0.0
Bakija using TRIM3 tax variables	0.0	0.0	0.0	0.0	0.0	0.0

Sources: 2013 CPS ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model.

¹ The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

TABLE 6C

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using Different Tax Simulations, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Percentage distribution (TRIM3 tax variables)¹						
<i>All people</i>	5.0	10.6	16.6	13.8	34.6	19.3
<i>Age</i>						
Less than 18	4.6	13.1	20.8	15.9	32.8	12.7
18 to 64	5.3	9.8	14.9	13.1	35.6	21.3
65 and older	4.6	10.2	17.4	13.7	32.7	21.4
<i>Race and Hispanic origin</i>						
White	4.5	9.3	15.5	13.5	35.7	21.5
White, not Hispanic	3.9	6.7	12.5	13.0	38.8	25.1
Black	7.4	17.7	23.1	15.8	27.7	8.3
Asian	5.8	10.5	15.2	12.6	36.4	19.6
Hispanic (any race)	7.1	20.2	27.7	15.6	23.3	6.2
Change relative to TRIM3 tax SPM (TAXSIM using TRIM3 Tax variables)						
<i>All people</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Age</i>						
Less than 18	0.0	0.0	0.0	0.0	0.0	0.0
18 to 64	0.0	0.0	0.0	0.0	0.0	0.0
65 and older	0.0	0.0	0.0	0.0	0.0	0.0
<i>Race and Hispanic origin</i>						
White	0.0	0.0	0.0	0.0	0.0	0.0
White, not Hispanic	0.0	0.0	0.0	0.0	0.0	0.0
Black	0.0	0.1	0.0	0.0	-0.1	0.0
Asian	0.1	-0.1	0.2	0.0	-0.2	0.0
Hispanic (any race)	0.0	0.1	0.0	0.0	0.0	0.0

TABLE 6C (CONTINUED)

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using Different Tax Simulations, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Change relative to TRIM3 tax SPM (Bakija using TRIM3 tax variables)						
<i>All people</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Age</i>						
Less than 18	0.0	0.0	0.0	0.0	0.0	0.0
18 to 64	0.0	0.0	0.0	0.0	0.0	0.0
65 and older	0.0	0.0	0.0	0.0	-0.1	0.1
<i>Race and Hispanic origin</i>						
White	0.0	0.0	0.0	0.0	0.0	0.0
White, not Hispanic	0.0	0.0	0.0	0.0	0.0	0.0
Black	0.0	0.0	0.0	0.0	0.1	0.0
Asian	0.0	-0.1	0.2	0.0	-0.1	0.0
Hispanic (any race)	0.0	0.0	0.0	0.0	0.0	0.0

Sources: 2013 CPS ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model.

¹ The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

TABLE 6D

Effect of Excluding Individual Elements on SPM Poverty Rates Using Different Tax Simulations, 2012

	TRIM3 Tax Variables ¹				Change Relative to TRIM3 Tax SPM							
					TAXSIM Using TRIM3 Tax Variables				Bakija Using TRIM3 Tax Variables			
	All persons	<18 years	18-64 years	65+ years	All persons	<18 years	18-64 years	65+ years	All persons	<18 years	18-64 years	65+ years
SPM poverty rate	15.7	17.8	15.1	14.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPM in absence of benefit or expense												
SNAP	17.3	20.7	16.3	15.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
School lunch	16.0	18.6	15.3	14.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WIC	15.8	18.0	15.2	14.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Refundable tax credits ²	18.8	24.5	17.5	15.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Federal income tax	15.4	17.5	14.7	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
State income tax, including refundable credits	15.5	17.7	14.9	14.7	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
FICA	14.5	16.2	13.9	14.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Change in SPM in absence of benefit or expense												
SNAP	1.6	2.9	1.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
School lunch	0.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WIC	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Refundable tax credits ²	3.1	6.7	2.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Federal income tax	-0.3	-0.2	-0.4	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
State income tax, including refundable credits	-0.1	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FICA	-1.1	-1.5	-1.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sources: 2013 CPS ASEC, Transfer Income Model Version 3 (TRIM3), Bakija Tax Model, and TAXSIM Tax Model.

¹ The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

² Refundable tax credits include the federal EITC and refundable portion of the federal child tax credit. State refundable credits are not included in this row.

TABLE 7A

Number and Percentage of People in SPM Poverty Using Different Tax Simulations, 2012

Full population (in thousands)

	Census Tax Model with Corrections		Change Relative to Census Tax Model SPM			
			TAXSIM Using Census Tax Variables		Bakija Using Census Tax Variables	
	Number	Poverty rate	Number	poverty rate	Number	Poverty rate
All people	49,374	15.9	-107	0.0	-114	0.0
<i>Sex</i>						
Male	23,116	15.2	-43	0.0	-53	0.0
Female	26,258	16.5	-64	0.0	-62	0.0
<i>Age</i>						
Less than 18	13,319	18.0	-42	-0.1	-39	-0.1
18 to 64	29,662	15.3	-49	0.0	-59	0.0
65 and older	6,393	14.8	-16	0.0	-16	0.0
<i>Type of Unit</i>						
Married couple	18,807	10.0	-72	0.0	-69	0.0
Female householder	18,236	28.9	-36	-0.1	-36	-0.1
Male householder	7,517	22.8	11	0.0	1	0.0
New SPM	4,813	17.9	-11	0.0	-10	0.0
<i>Race and Hispanic origin</i>						
White	33,808	13.9	-82	0.0	-75	0.0
White, not Hispanic	20,814	10.7	-49	0.0	-58	0.0
Black	10,275	25.6	-32	-0.1	-33	-0.1
Asian	2,696	16.4	-5	0.0	0	0.0
Hispanic (any race)	14,716	27.6	-32	-0.1	-35	-0.1
<i>Nativity</i> ¹						
Native born	39,262	14.5	-88	0.0	-105	0.0
Foreign born	10,112	25.2	-19	0.0	-10	0.0
Naturalized citizen	3,300	18.1	1	0.0	-4	0.0
Not a citizen	6,811	31.1	-20	-0.1	-6	0.0
<i>Tenure</i> ²						
Owner	20,265	9.8	-36	0.0	-34	0.0
Owner/mortgage	11,484	8.3	-27	0.0	-24	0.0
Owner/no mortgage/rent free	9,644	13.3	-9	0.0	-10	0.0
Renter	28,246	28.0	-71	-0.1	-80	-0.1

TABLE 7A (CONTINUED)

Number and Percentage of People in SPM Poverty Using Different Tax Simulations, 2012

Full population (in thousands)

	Census Tax Model with Corrections		Change Relative to Census Tax Model SPM			
			TAXSIM Using Census Tax Variables		Bakija Using Census Tax Variables	
	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate
<i>Residence</i>						
Inside metropolitan statistical areas	42,576	16.2	-77	0.0	-76	0.0
Inside principal cities	18,715	22.1	-23	0.0	-23	0.0
Outside principal cities	17,962	13.3	-53	0.0	-36	0.0
Not disclosed	5,899	13.7	-1	0.0	-16	0.0
Outside metropolitan statistical areas	6,455	13.9	-26	-0.1	-39	-0.1
<i>Region</i>						
Northeast	8,467	15.4	-68	-0.1	-54	-0.1
Midwest	8,199	12.3	-33	0.0	-9	0.0
South	18,849	16.2	-3	0.0	-35	0.0
West	13,858	18.9	-4	0.0	-16	0.0
<i>Health insurance coverage</i>						
With private insurance	15,100	7.6	-81	0.0	-60	0.0
With public, no private insurance	19,598	30.5	-18	0.0	-36	-0.1
Not insured	14,677	30.6	-8	0.0	-18	0.0
<i>Work experience</i>						
Total, 18 to 64 years	29,662	15.3	-49	0.0	-59	0.0
All workers (18 to 64 years)	13,849	9.5	-33	0.0	-36	0.0
Worked full-time, year-round	5,162	5.2	-17	0.0	-13	0.0
Less than full-time, year-round	8,687	18.4	-16	0.0	-23	0.0
Did not work at least 1 week	15,812	33.1	-16	0.0	-23	0.0
<i>Disability status</i> ³						
Total, 18 to 64 years	29,662	15.3	-49	0.0	-59	0.0
With a disability	3,976	26.5	-1	0.0	-11	-0.1
With no disability	25,633	14.4	-48	0.0	-49	0.0

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Bakija Tax Model, and TAXSIM Tax Model.

¹ Nativity represents native and foreign born status as reported on the CPS and does not incorporate adjustments made by TRIM3.

² People in households that report living with no cash rent are excluded from renter status and are included in the owner/no mortgage/rent free group. Owner status includes only those households that report that they own or are buying their home, and excludes those who say they are living with no cash rent.

³ Person reports presence of a disability or limitation. Armed forces members are excluded from the universe for this question.

TABLE 7B

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using Different Tax Simulations, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Percentage distribution (Census tax model with corrections)	5.1	10.8	16.9	14.2	34.3	18.8
Change relative to Census tax model SPM						
TAXSIM using Census tax variables	0.0	0.0	0.0	0.0	0.0	0.0
Bakija using Census tax variables	0.0	0.0	0.0	0.0	0.0	0.0

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Bakija Tax Model, and TAXSIM Tax Model.

TABLE 7C

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using Different Tax Simulations, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Percentage distribution (Census tax model with corrections)						
<i>All people</i>	5.1	10.8	16.9	14.2	34.3	18.8
<i>Age</i>						
Less than 18	4.7	13.3	21.1	16.3	32.3	12.4
18 to 64	5.4	10.0	15.1	13.4	35.3	20.8
65 and older	4.7	10.1	17.9	14.1	32.9	20.3
<i>Race and Hispanic origin</i>						
White	4.6	9.4	15.8	13.8	35.6	20.9
White, not Hispanic	4.0	6.7	12.9	13.4	38.7	24.4
Black	7.5	18.0	23.0	16.2	27.1	8.0
Asian	6.0	10.4	15.7	13.3	35.2	19.4
Hispanic (any race)	7.1	20.5	27.8	15.8	22.8	6.0
Change relative to Census tax model SPM (TAXSIM using Census tax variables)						
<i>All people</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Age</i>						
Less than 18	-0.1	0.0	0.0	0.1	0.0	0.0
18 to 64	0.0	0.0	0.0	0.0	0.0	0.0
65 and older	0.0	0.0	0.0	0.0	0.0	0.0
<i>Race and Hispanic origin</i>						
White	0.0	0.0	0.0	0.0	0.0	0.0
White, not Hispanic	0.0	0.0	0.0	0.0	0.0	0.0
Black	-0.1	0.0	0.1	0.0	0.0	0.0
Asian	-0.1	0.1	0.1	0.0	0.0	0.0
Hispanic (any race)	-0.1	0.0	0.0	0.1	0.0	0.0

TABLE 7C (CONTINUED)

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using Different Tax Simulations, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Change relative to Census tax model SPM (Bakija using Census tax variables)						
<i>All people</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Age</i>						
Less than 18	0.0	0.0	0.0	0.0	0.0	0.0
18 to 64	0.0	0.0	0.0	0.0	0.0	0.0
65 and older	0.0	0.0	0.0	0.0	0.0	0.0
<i>Race and Hispanic origin</i>						
White	0.0	0.0	0.0	0.0	0.0	0.0
White, not Hispanic	0.0	0.0	0.0	0.0	0.0	0.0
Black	-0.1	0.0	0.0	0.1	0.0	0.0
Asian	-0.1	0.1	0.1	-0.1	0.0	0.0
Hispanic (any race)	0.0	0.0	0.0	0.0	0.0	0.0

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Bakija Tax Model, and TAXSIM Tax Model

TABLE 7D

Effect of Excluding Individual Elements on SPM Poverty Rates Using Different Tax Simulations, 2012

	Change Relative to Census Tax Model SPM											
	Census Tax Model with Corrections				TAXSIM Using Census Tax Variables				Bakija Using Census Tax Variables			
	All persons	<18 years	18-64 years	65+ years	All persons	<18 years	18-64 years	65+ years	All persons	<18 years	18-64 years	65+ years
SPM poverty rate	15.9	18.0	15.3	14.8	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0	0.0
SPM in absence of benefit or expense												
SNAP	17.5	20.9	16.6	15.5	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
School lunch	16.2	18.8	15.6	14.8	0.0	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0
WIC	16.0	18.3	15.4	14.8	0.0	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0
Refundable tax credits ¹	18.9	24.7	17.6	15.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
Federal income tax	15.5	17.7	14.8	14.6	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0	0.0
State income tax, including refundable credits	15.7	17.9	15.1	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FICA	14.7	16.5	14.1	14.6	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.0
Change in SPM in absence of benefit or expense												
SNAP	1.6	2.9	1.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
School lunch	0.4	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WIC	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Refundable tax credits ¹	3.1	6.7	2.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Federal income tax	-0.4	-0.3	-0.5	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
State income tax, including refundable credits	-0.1	-0.1	-0.2	-0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
FICA	-1.1	-1.5	-1.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sources: 2013 CPS ASEC, Census Tax Model run on the public-use ASEC, Bakija Tax Model, and TAXSIM Tax Model.

¹ Refundable tax credits include the federal EITC and refundable portion of the federal child tax credit. State refundable credits are not included in this row.

TABLE 8A

Number and Percentage of People in SPM Poverty Using TRIM3 Tax Variables and TRIM3 Tax Variables with Simplifications, 2012

Full population (in thousands)

	Change Relative to TRIM3 Tax SPM							
	TRIM Tax Variables							
	TRIM3 Tax Variables ¹		Without Dependents		Without Capital Gains		Without Itemized Deductions or Capital Gains	
	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate
All people	48,772	15.7	0	0.0	-22	0.0	231	0.1
<i>Sex</i>								
Male	22,813	15.0	0	0.0	4	0.0	149	0.1
Female	25,958	16.3	0	0.0	-26	0.0	82	0.1
<i>Age</i>								
Less than 18	13,171	17.8	0	0.0	14	0.0	68	0.1
18 to 64	29,191	15.1	0	0.0	6	0.0	197	0.1
65 and older	6,409	14.8	0	0.0	-41	-0.1	-35	-0.1
<i>Type of unit</i>								
Married couple	18,523	9.8	0	0.0	9	0.0	181	0.1
Female householder	17,996	28.5	0	0.0	-38	-0.1	9	0.0
Male householder	7,384	22.4	0	0.0	21	0.1	47	0.1
New SPM	4,868	18.1	0	0.0	-15	-0.1	-5	0.0
<i>Race and Hispanic origin</i>								
White	33,505	13.8	0	0.0	-48	0.0	124	0.1
White, not Hispanic	20,692	10.6	0	0.0	-32	0.0	99	0.1
Black	10,081	25.1	0	0.0	12	0.0	66	0.2
Asian	2,671	16.3	0	0.0	-9	-0.1	4	0.0
Hispanic (any race)	14,514	27.3	0	0.0	-7	0.0	35	0.1

TABLE 8A (CONTINUED)

Number and Percentage of People in SPM Poverty Using TRIM3 Tax Variables and TRIM3 Tax Variables with Simplifications, 2012

Full population (in thousands)

	Change Relative to TRIM3 Tax SPM							
	TRIM3 Tax Variables ¹		TRIM Tax Variables				Without Itemized Deductions or Capital Gains	
	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate
<i>Nativity</i> ²								
Native born	38,775	14.3	0	0.0	-11	0.0	197	0.1
Foreign born	9,997	24.9	0	0.0	-11	0.0	33	0.1
Naturalized citizen	3,268	18.0	0	0.0	8	0.0	32	0.2
Not a citizen	6,729	30.7	0	0.0	-18	-0.1	1	0.0
<i>Tenure</i> ³								
Owner	19,915	9.6	0	0.0	35	0.0	269	0.1
Owner/mortgage	11,174	8.1	0	0.0	51	0.0	280	0.2
Owner/no mortgage/rent free	9,586	13.2	0	0.0	-13	0.0	-8	0.0
Renter	28,012	27.8	0	0.0	-60	-0.1	-41	0.0
<i>Residence</i>								
Inside metropolitan statistical areas	42,027	16.0	0	0.0	1	0.0	243	0.1
Inside principal cities	18,466	21.8	0	0.0	2	0.0	64	0.1
Outside principal cities	17,724	13.2	0	0.0	5	0.0	159	0.1
Not disclosed	5,837	13.5	0	0.0	-5	0.0	20	0.0
Outside metropolitan statistical areas	6,402	13.8	0	0.0	-21	0.0	-10	0.0

TABLE 8A (CONTINUED)

Number and Percentage of People in SPM Poverty Using TRIM3 Tax Variables and TRIM3 Tax Variables with Simplifications, 2012

Full population (in thousands)

	Change Relative to TRIM3 Tax SPM							
	TRIM3 Tax Variables ¹		TRIM Tax Variables					
	Number	Poverty rate	Without Dependents		Without Capital Gains		Without Itemized Deductions or Capital Gains	
	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate	Number	Poverty rate
<i>Region</i>								
Northeast	8,365	15.2	0	0.0	-42	-0.1	-1	0.0
Midwest	8,091	12.2	0	0.0	13	0.0	54	0.1
South	18,673	16.1	0	0.0	-10	0.0	101	0.1
West	13,642	18.6	0	0.0	18	0.0	77	0.1
<i>Health insurance coverage</i>								
With private insurance	14,782	7.4	0	0.0	10	0.0	244	0.1
With public, no private insurance	19,494	30.3	0	0.0	-12	0.0	-10	0.0
Not insured	14,495	30.2	0	0.0	-19	0.0	-3	0.0
<i>Work experience</i>								
Total, 18 to 64 years	29,191	15.1	0	0.0	6	0.0	197	0.1
All workers (18 to 64 years)	13,602	9.3	0	0.0	-14	0.0	110	0.1
Worked full-time, year-round	5,012	5.1	0	0.0	-9	0.0	68	0.1
Less than full-time, year-round	8,590	18.2	0	0.0	-6	0.0	42	0.1
Did not work at least 1 week	15,589	32.6	0	0.0	20	0.0	87	0.2
<i>Disability status⁴</i>								
Total, 18 to 64 years	29,191	15.1	0	0.0	6	0.0	197	0.1
With a disability	3,932	26.2	0	0.0	5	0.0	16	0.1
With no disability	25,207	14.2	0	0.0	0	0.0	182	0.1

Sources: 2013 CPS ASEC and Transfer Income Model Version 3 (TRIM3).

¹ The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

² Nativity represents native and foreign born status as reported on the CPS and does not incorporate adjustments made by TRIM3.

³ People in households that report living with no cash rent are excluded from renter status and are included in the owner/no mortgage/rent free group. Owner status includes only those households that report that they own or are buying their home, and excludes those who say they are living with no cash rent.

⁴ Person reports presence of a disability or limitation. Armed forces members are excluded from the universe for this question.

TABLE 8B

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using TRIM3 Tax Variables and TRIM3 Tax Variables with Simplifications, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Percentage distribution (TRIM3 tax variables)¹	5.0	10.6	16.6	13.8	34.6	19.3
Change relative to TRIM3 tax SPM						
TRIM3 tax variables without dependents	0.0	0.0	0.0	0.0	0.0	0.0
TRIM3 tax variables without capital gains	0.0	0.0	0.1	0.2	0.3	-0.6
TRIM3 tax variables without itemized deductions or capital gains	0.0	0.1	0.4	0.5	0.9	-1.9

Sources: 2013 CPS ASEC and Transfer Income Model Version 3 (TRIM3).

¹ The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

TABLE 8C

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using TRIM3 Tax Variables and TRIM3 Tax Variables with Simplifications, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Percentage distribution (TRIM3 tax variables)¹						
<i>All people</i>	5.0	10.6	16.6	13.8	34.6	19.3
<i>Age</i>						
Less than 18	4.6	13.1	20.8	15.9	32.8	12.7
18 to 64	5.3	9.8	14.9	13.1	35.6	21.3
65 and older	4.6	10.2	17.4	13.7	32.7	21.4
<i>Race and Hispanic origin</i>						
White	4.5	9.3	15.5	13.5	35.7	21.5
White, not Hispanic	3.9	6.7	12.5	13.0	38.8	25.1
Black	7.4	17.7	23.1	15.8	27.7	8.3
Asian	5.8	10.5	15.2	12.6	36.4	19.6
Hispanic (any race)	7.1	20.2	27.7	15.6	23.3	6.2
Change relative to TRIM3 tax SPM (TRIM3 tax variables without dependents)						
<i>All people</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Age</i>						
Less than 18	0.0	0.0	0.0	0.0	0.0	0.0
18 to 64	0.0	0.0	0.0	0.0	0.0	0.0
65 and older	0.0	0.0	0.0	0.0	0.0	0.0
<i>Race and Hispanic origin</i>						
White	0.0	0.0	0.0	0.0	0.0	0.0
White, not Hispanic	0.0	0.0	0.0	0.0	0.0	0.0
Black	0.0	0.0	0.0	0.0	0.0	0.0
Asian	0.0	0.0	0.0	0.0	0.0	0.0
Hispanic (any race)	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 8C (CONTINUED)

Percentage of People by Ratio of SPM Resources to Poverty Threshold Using TRIM3 Tax Variables and TRIM3 Tax Variables with Simplifications, 2012

Full population

	Less than 0.5 estimate	0.5 to 0.99 estimate	1.0 to 1.49 estimate	1.5 to 1.99 estimate	2.0 to 3.99 estimate	4.0 or more estimate
Change relative to TRIM3 tax SPM (TRIM3 tax variables without capital gains)						
<i>All people</i>	0.0	0.0	0.1	0.2	0.3	-0.6
<i>Age</i>						
Less than 18	0.0	0.0	0.1	0.2	0.2	-0.5
18 to 64	0.0	0.0	0.1	0.2	0.3	-0.5
65 and older	0.0	-0.1	0.4	0.3	0.3	-0.9
<i>Race and Hispanic origin</i>						
White	0.0	0.0	0.1	0.2	0.3	-0.6
White, not Hispanic	0.0	0.0	0.1	0.2	0.4	-0.7
Black	0.0	0.1	0.0	0.2	0.0	-0.2
Asian	0.0	-0.1	0.2	0.2	0.5	-0.8
Hispanic (any race)	0.0	0.0	0.1	0.2	0.0	-0.3
Change relative to TRIM3 TAX SPM (TRIM3 tax variables without itemized deductions or capital gains)						
<i>All people</i>	0.0	0.1	0.4	0.5	0.9	-1.9
<i>Age</i>						
Less than 18	0.0	0.1	0.5	0.6	0.8	-2.0
18 to 64	0.0	0.1	0.3	0.5	0.9	-1.9
65 and older	0.0	-0.1	0.5	0.5	0.7	-1.5
<i>Race and Hispanic origin</i>						
White	0.0	0.0	0.4	0.5	1.0	-2.0
White, not Hispanic	0.0	0.0	0.4	0.6	1.3	-2.3
Black	0.0	0.2	0.2	0.5	0.1	-0.9
Asian	0.0	0.0	0.5	0.8	0.6	-2.0
Hispanic (any race)	0.0	0.1	0.4	0.4	-0.2	-0.7

Sources: 2013 CPS ASEC and Transfer Income Model Version 3 (TRIM3).

¹The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

TABLE 8D

Effect of Excluding Individual Elements on SPM Poverty Rates Using TRIM3 Tax Variables and TRIM3 Tax Variables with Simplifications, 2012

	TRIM3 Tax Variables ¹				Change Relative to TRIM3 Tax Variables			
					TRIM Tax Variables			
	All persons	<18 years	18-64 years	65+ years	Without Dependents			
	All persons	<18 years	18-64 years	65+ years	All persons	<18 years	18-64 years	65+ years
TRIM3 tax SPM in absence of benefit or expense								
SNAP	17.3	20.7	16.3	15.6	0.0	0.0	0.0	0.0
School lunch	16.0	18.6	15.3	14.8	0.0	0.0	0.0	0.0
WIC	15.8	18.0	15.2	14.8	0.0	0.0	0.0	0.0
Refundable tax credits ²	18.8	24.5	17.5	15.0	0.0	0.0	0.0	0.0
Federal income tax	15.4	17.5	14.7	14.7	0.0	0.0	0.0	0.0
State income tax, including refundable credits	15.5	17.7	14.9	14.7	0.0	0.0	0.0	0.0
FICA	14.5	16.2	13.9	14.6	0.0	0.0	0.0	0.0
Change in TRIM3 tax SPM in absence of benefit or expense								
SNAP	1.6	2.9	1.3	0.8	0.0	0.0	0.0	0.0
School lunch	0.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0
WIC	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0
Refundable tax credits ²	3.1	6.7	2.4	0.2	0.0	0.0	0.0	0.0
Federal income tax	-0.3	-0.2	-0.4	-0.2	0.0	0.0	0.0	0.0
State income tax, including refundable credits	-0.1	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.0
FICA	-1.1	-1.5	-1.2	-0.2	0.0	0.0	0.0	0.0

TABLE 8D (CONTINUED)

Effect of Excluding Individual Elements on SPM Poverty Rates Using TRIM3 Tax Variables and TRIM3 Tax Variables with Simplifications, 2012

	Change Relative to TRIM3 Tax Variables							
	TRIM Tax Variables							
	Without Capital Gains				Without Itemized Deductions or Capital Gains			
	All persons	<18 years	18-64 years	65+ years	All persons	<18 years	18-64 years	65+ years
TRIM3 tax SPM in absence of benefit or expense								
SNAP	0.0	0.0	0.0	-0.1	0.1	0.1	0.1	-0.1
School lunch	0.0	0.0	0.0	-0.1	0.1	0.1	0.1	-0.1
WIC	0.0	0.0	0.0	-0.1	0.1	0.1	0.1	-0.1
Refundable tax credits ²	0.0	0.0	0.0	-0.1	0.1	0.1	0.1	-0.1
Federal income tax	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	-0.1
State income tax, including refundable credits	-0.2	-0.4	-0.2	-0.1	-0.1	-0.3	-0.1	-0.1
FICA	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	-0.1
Change in TRIM3 tax SPM in absence of benefit or expense								
SNAP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
School lunch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Refundable tax credits ²	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Federal income tax	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
State income tax, including refundable credits	-0.2	-0.4	-0.2	0.0	-0.2	-0.4	-0.2	0.0
FICA	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0

Sources: 2013 CPS ASEC and Transfer Income Model Version 3 (TRIM3).

¹ The TRIM3 estimates presented here are calculated following the Census Bureau methodology, except that federal and state income taxes are replaced with values simulated by TRIM3.

² Refundable tax credits include the federal EITC and refundable portion of the federal child tax credit. State refundable credits are not included in this row.

Excluding capital gains and associated federal and state income taxes from the SPM has little effect on the SPM poverty rate in 2012 (table 8a). The overall rate is the same as in the TRIM3 estimate that includes capital gains and there are small (0.1 percentage point) differences for certain subgroups. Removing capital gains reduces the share of the population above 400 percent of SPM poverty threshold by 0.6 percentage points and increases the share of the population within 100 to 400 percent of the SPM poverty threshold (tables 8b and 8c). Removing capital gains results in a 0.2 percentage point greater effect of state income taxes on the SPM poverty rate but does not affect the overall estimated poverty effect of federal income taxes or the benefit programs examined (table 8d). Depending on the level of capital gains in a given year, the effects could be smaller or larger.

Tax modeling is further simplified if the statistical match with the PUF is eliminated entirely. Eliminating capital gains, itemizable expenses, and deductible IRA and Keogh contributions has minimal effect on the SPM poverty rate. The overall SPM poverty rate increases by 0.1 percentage points, with changes by subgroup of as much as 0.2 percentage points (table 8a). The share of the population above 400 percent of the SPM poverty threshold drops by 1.9 percentage points, relative to the estimate using TRIM3 tax variables, and by 1.3 percentage points, relative to the TRIM3 estimate excluding capital gains (table 8b). The change in the poverty effect of state income taxes is identical to when only capital gains are eliminated (table 8d).

Conclusion

The findings presented here are intended to inform consideration of the choice of tax model for use in future Census Bureau tax and SPM poverty estimates using the ASEC. Either the TAXSIM or Bakija model could be used in place of the Census Bureau model's tax estimates, without a discernable effect on the SPM poverty rate. Below, we discuss issues the Census Bureau may wish to consider when deciding whether to use TAXSIM or the Bakija model. We next describe additional issues that are relevant regardless of the Census Bureau's choice of model. We conclude with thoughts on the broader implications of the study for those interested in tax modeling on the ASEC.

Choice of Tax Model

Using TAXSIM or the Bakija model would reduce the time required by Census Bureau staff to develop and maintain tax models, potentially freeing up resources for other uses.³³ Using estimates provided by TAXSIM or the Bakija model would also likely improve the quality of the tax estimates, an important consideration because the data are provided in the public-use ASEC and can be used for other purposes. Corrections to the Census Bureau's tax model made by Census Bureau staff and by work under this project resulted in a 4 percentage point decrease in simulated positive federal income tax liability and a 1 percentage point increase in simulated EITC relative to IRS targets. The corrections produced a 0.1 percentage point decrease in the estimated SPM poverty rate and a 0.5 percentage point increase in the share of families above 400 percent of the SPM poverty threshold.

Because TAXSIM and the Bakija model are stand-alone models that can operate on any dataset, they could be used to calculate taxes on additional Census Bureau datasets, including the American Community Survey (ACS) and Survey of Income and Program Participation (SIPP). Although work would be required to prepare each dataset for input to the model, once that step is performed the data could be run through a single model. This would substantially reduce the time and resources needed for Census Bureau staff or contractors to develop and maintain federal and state tax calculators specific to each Census Bureau dataset.

³³ Our understanding is that the costs associated with use of TAXSIM and the Bakija model would be lower than the cost of staff time currently devoted to maintaining the Census Bureau's tax model. However, this would need to be confirmed by the Census Bureau through discussion with Dr. Feenberg and Dr. Bakija, and consideration of current staffing requirements.

Either TAXSIM or the Bakija model could potentially serve the Census Bureau’s purposes. Although TAXSIM is currently more widely known, tax analysts are becoming increasingly aware of the Bakija model. In choosing between models, we recommend that the Census Bureau take the following factors into consideration and follow up with the model developers for the most up-to-date information regarding their models.

- The Bakija model’s more detailed input is an attractive feature as it enables the model to capture some aspects of refundable credits that are not captured in TAXSIM (such as the number of children for the child care credit, and the ability to have more dependents in a tax unit than meet the qualifying child criteria for the EITC). However, based on preliminary conversations with Dr. Feenberg, we understand that TAXSIM may soon incorporate the additional detail regarding qualifying children for different credits. Other aspects of the Bakija model’s more detailed input likely improve the quality of the tax estimates for some households, although the effects are not readily apparent in the aggregate comparisons produced here.
- TAXSIM calculates taxes for dependent filers, whereas the Bakija model does not currently have that capability. However, tests using the TRIM3 tax model show no detectible difference on SPM estimates from excluding federal income taxes for dependent filers.³⁴ Additionally, incorporating rules for dependent filers could be an area of potential development of the Bakija model, should the Census Bureau wish to support this effort.³⁵ It might also be possible to process dependents in a separate pass of the Bakija model, setting the Bakija model parameters to appropriate values for dependents.
- TAXSIM is written in FORTRAN, whereas the Bakija model is written in SAS. The Bakija SAS model may be easier to set up in-house and easier to operate, given the greater likelihood of SAS expertise among Census Bureau staff. However, Dr. Feenberg indicates that he is able to provide a 10-line SAS interface to TAXSIM, simplifying the operation for those unfamiliar with FORTRAN.³⁶

³⁴ The TRIM3 tax model does not compute state income taxes for dependent filers.

³⁵ According to personal communication with Dr. Bakija, enhancements to the code such as this are possible. However, since he has developed the model primarily for historical trend analysis, he must weigh the costs of incorporating a new rule for all years covered by the model against the benefits of having the new capability going forward.

³⁶ Personal communication, March 24, 2016.

- The anticipated costs of obtaining annual updates to the selected model should be taken into consideration, along with the potential savings to the Census Bureau of not having to maintain and update a full tax model.

One concern with moving to an external model is whether the model will continue to be supported and available. Both models have been sustained over the years primarily due to the efforts of a single individual—Dr. Feenberg (for TAXSIM) and Dr. Bakija. As such, there is the possibility that the models might no longer be supported, if these researchers were to move on to other things. However, the widespread use of TAXSIM and the adoption of the Bakija model by the Urban-Brookings Tax Policy Center may provide an avenue for continued support for these models. In the event that the Bakija model was no longer supported, Census Bureau staff could potentially make the necessary updates and would likely find such updates more straight-forward than updates to the Census Bureau’s current model or TAXSIM.³⁷

Another question involves whether updates to the selected tax model will be available at the time needed to process a given year’s ASEC. For example, in order for the Census Bureau to have used TAXSIM or the Bakija model for the 2015 ASEC, rules for 2014 would have needed to be available by the spring of 2015. As of September 2015, the federal tax rules were available through 2023 in TAXSIM, but the most recent state tax rules were for 2013.³⁸ For the Bakija model, the federal tax rules were available through 2025, and the state tax rules were available through 2014. However, the update to the Bakija model’s state income tax rules typically occurs during the summer and so would likely not be available in time for the Census Bureau’s estimates.³⁹

Given the likely lag in state income tax rules, one option would be to simulate a particular year’s state income taxes using the most recent year’s rules.⁴⁰ State taxes and refundable credits have only a 0.1 or 0.2 percentage point effect on the SPM poverty rate, so it is unlikely that using a prior year’s rules would have a noticeable effect on the results.

³⁷ For example, the Bakija model is parameterized, with tax parameters stored in two files. The parameter files could be updated to capture most rule changes. If there were changes in tax rules that could not be accommodated by existing parameters, modification to the Bakija model’s SAS code would be required.

³⁸ State tax rules for 2014 were available in TAXSIM as of March 2016 and 2015 rules were under development.

³⁹ Information on timing of the Bakija model update was obtained through personal communication with Dr. Bakija.

⁴⁰ If state income tax rules are not available for a given data year, TAXSIM deflates income amounts to the most recent available year in which state income tax rules are available, calculates state income taxes based on the rules in effect in that year, and then inflates the results back to the data year. The Bakija model allows users to specify the year of the state income tax rules used in the simulation.

Additional Considerations

A key finding of the results presented here is that the choice of tax-related inputs to the tax models (TRIM3 versus the Census Bureau) has a greater effect on simulated taxes and the SPM than the choice of tax model. There is little difference in federal income tax results and virtually no difference in the SPM poverty rate across the tax models when the same inputs (TRIM3 or Census Bureau) are used to provide data to TAXSIM and the Bakija models. However, the TRIM3-based estimates capture between 86 and 88 percent of federal income taxes according to IRS data, compared to 80 percent in the Census Bureau-based estimates. The TRIM3-based estimates also capture a larger share of total refundable credits for returns with a refundable credit—70 to 71 percent of the IRS figure, compared with 67 percent for the Census Bureau-based estimates. TRIM3-based tax estimates result in SPM poverty rates that are 0.2 percentage points lower than when the tax variables are defined using Census Bureau inputs.

The differences between the TRIM3 and Census-based estimates appear to stem primarily from three things: the inclusion of capital gains and losses in TRIM3 estimates; the fact that TRIM3 matches the total amount of itemized deductions according to IRS data, whereas the Census Bureau model captures just 70 percent of total itemized deductions; and the fact that TRIM3 identifies more head-of-household filing units, dependents, and EITC-qualifying children than does the Census Bureau's model. The Census Bureau's model could move in the direction of the TRIM3-based estimates by incorporating capital gains and losses, ensuring that itemized deductions align with IRS totals, and expanding the identification of head-of-household filing status, dependents, and EITC-qualifying children.⁴¹

The statistical match with the PUF is one of the more complicated parts of the Census Bureau's tax model, and aligning the results to hit targets for capital gains and itemized deductions would increase the complexity further. Given the limited effect of capital gains and itemized deductions on the SPM, the Census Bureau may wish to give such improvements lower priority than other potential enhancements—such as expanding the identification of head-of-household filing status, dependents, and EITC-qualifying children. The match with the PUF could even be dropped, with little effect on the SPM poverty rate. However, our tests find that capital gains and itemized deductions cause shifts in the shares of people in various ranges above poverty. Given the Census Bureau's interest in showing SPM

⁴¹ If capital gains and losses are incorporated into the data for the purposes of tax calculation, they should also be included in family resources when computing the SPM. Otherwise, families with capital gains would appear to have fewer resources than is actually the case because the tax on their capital gains would be included as an expense, but the capital gains would not be included as a resource.

results for low-income and middle-income people, and the possible use of the data for purposes other than the SPM, we recommend continuing to statistically match or impute these items to the ASEC for use in tax modeling, assuming the necessary resources are available to support the work.

Another question is to what extent to focus on the simulation of dependent filers. TRIM3 captures more dependent filers than does the Census Bureau model. If the Census Bureau's methods are modified to expand identification of dependents, then the number of dependent filers in the Census Bureau model will also increase. TAXSIM and the Census Bureau model both simulate federal and state income taxes for dependent filers, whereas the rules for dependent filers are not currently captured by the Bakija model (although as noted previously, these could conceivably be added). Although including income taxes for dependent filers is ideal, our tests show that excluding the federal income taxes of dependent filers from estimates using the TRIM3 model has no discernable effect on the SPM poverty rate, or on the percentage of SPM units falling within different ranges of the SPM poverty threshold. This likely stems from the relatively small amount of federal income taxes paid by dependent filers and the fact that they are ineligible for the EITC and ACTC. Therefore, while improved identification of dependents helps to improve tax estimation for the units claiming them, improvements to the estimation of taxes paid by the dependent filers is likely of lesser importance to the SPM.

Both TRIM3 and the Census Bureau's tax model calculate taxes for all tax units regardless of whether they would be required to file a tax return. This approach seems reasonable, given that tax units with incomes below the filing threshold do not typically owe positive taxes and, even when the EITC and ACTC are assigned to all tax units determined eligible in the simulation, the receipt and amount of refundable credits fall substantially below IRS administrative totals. Given the size of the shortfall in refundable credits—\$30 billion in the Census Bureau tax estimates and \$27 billion for TRIM3, a potentially useful area for further research would be to investigate the characteristics of recipient units not identified as eligible through tax modeling approaches, with particular attention to the implications for the SPM. For example, a possible approach would be to use IRS tax return data linked with ASEC data to investigate the SPM poverty status of such units, both with and without the refundable credits that are actually claimed.

Broader Implications

In addition to providing evidence to inform the Census Bureau's decisions about tax modeling, the findings presented here may be of broader interest because they show that four different tax models,

when applied to ASEC data, produce similar results with respect to IRS totals—a substantial shortfall in refundable tax credits, an overestimation of positive tax liability in the lower- to upper-middle income ranges, and a substantial under-representation of tax liability for the wealthiest taxpayers. These common findings across the four tax models suggest that the results are driven by the underlying ASEC income and demographic data, rather than by the characteristics of any one model. Noncompliant receipt of the EITC and ACTC may also explain a substantial share of the shortfall in the total estimated amount of these credits relative to IRS totals.

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