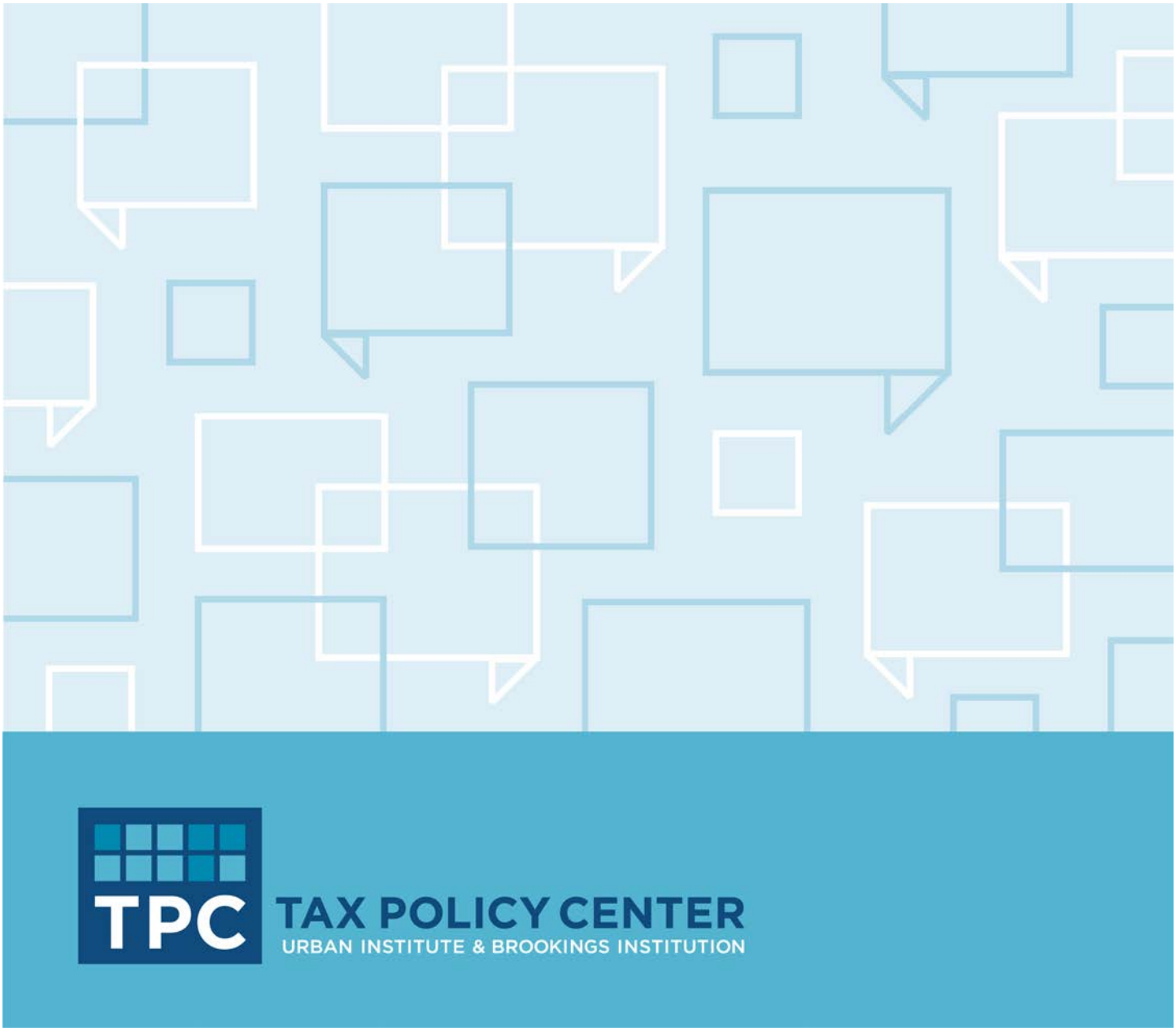

A METHODOLOGY FOR INTEGRATED DISTRIBUTIONAL ANALYSIS OF TAXES AND TRANSFERS

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ABSTRACT

Distributional analyses play a prominent role in policy discussions. Both tax and transfer policy have important distributional consequences, but traditionally they have been examined separately. This report describes a new methodology for integrated distributional analysis that imports results from other Urban Institute microsimulation models into the tax model. The method allows for analyzing the distribution of taxes and transfers by income groups and family structure under current law and policy alternatives. We use the new methodology to analyze the impact of current law taxes and transfers on the income distribution. We discuss possible refinements to the methodology and future applications.

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INTRODUCTION

Distributional analyses play a prominent role in policy discussions. Citizens, policymakers, journalists, and advocates want to know how government policies affect people at different income levels, whether and how much they reduce income disparities, and how they affect people in different family structures. The fate of proposals to change tax and spending programs often hinges on perceptions of who might "win" or "lose." Because the tax and transfer systems are comingled, we need to consider many tax and spending policies together to understand their distributional impact.

Long gone are the days when government mainly supplied public goods such as defense and the postal service and paid for these services by collecting taxes. Today much government spending provides benefits to individuals as cash or in-kind, such as health care. While the tax system's main purpose remains collecting revenues to pay for spending programs, it also encompasses the largest antipoverty program for working-age people—the earned income tax credit—and many subsidies and penalties that encourage health insurance coverage under the Patient Protection and Affordable Care Act (ACA). Further, the line between taxes and spending has blurred; both redistribute income and can substantially affect income disparities.

Despite these links and overlaps between the tax and spending sides of the budget, traditionally the two sides have been examined separately. The Urban Institute, for example, hosts four major models that analyze the distributional impacts of federal policy:

- The Urban-Brookings Tax Policy Center Microsimulation Model (TPC model or tax model) focuses on federal taxes.
- The Dynamic Simulation of Income Model (DYNASIM) focuses on public and private retirement benefits, particularly over the long term.
- The Health Insurance Policy Simulation Model (HIPSM) focuses on health insurance coverage.
- The Transfer Income Model (TRIM) focuses on taxes and transfer programs for low- and moderate-income families.

Each model includes elements from both the tax and the spending sides of the budget, but none of them provide a comprehensive look at federal policies.

To analyze the distributional impacts of complex proposals involving both tax and spending programs, we have developed methodologies for importing micro-level results from each of the other Urban Institute microsimulation models into the tax model database. Once we have imported them, we can tabulate the distribution of taxes and transfers by income group and family structure under current law and policy alternatives.

This report presents an initial attempt to implement this approach. We first describe the four microsimulation models housed at the Urban Institute. We then present and assesses the methodologies we use to combine results from the four models. Next, we use the new methodologies to analyze the impact of current-law taxes and transfers on the distribution of income. Last, we discuss possible refinements to the methodology and future applications.

OVERVIEW OF URBAN INSTITUTE'S MICROSIMULATION MODELS

The Urban Institute has four microsimulation models that provide the foundation for a more complete analysis of federal tax and transfer programs together. They cover taxes, retirement benefits, health insurance coverage, and means-tested transfers. These separate models are built upon different data and specialize in different aspects of the tax and transfer systems.

URBAN-BROOKINGS TAX POLICY CENTER MICROSIMULATION MODEL

The TPC model produces revenue and distributional estimates of the US federal tax system.[1] The model allows researchers to document how federal tax policies affect families with different incomes and family structures and how potential policy changes would affect both taxpayers and federal revenues. It simulates nearly all federal taxes including individual income, payroll, corporate income, estate, and excise taxes.

The model's primary focus is producing revenue and distributional estimates that span the usual congressional budget window, which includes the current year plus the following 10 years. TPC updates the model each year; thus the near-term capability currently covers 2017 to 2027. TPC also recently developed a long-run module that produces revenue and distribution estimates at 10-year intervals from 2030 through 2090.

The model focuses on the population that files taxes, but it also contains information on nonfilers, including those who are institutionalized (such as those in prisons, nursing homes, etc.). The model's primary data source is the 2006 public-use file (PUF) produced by the Statistics of Income Division of the Internal Revenue Service. The PUF contains 145,858 records with detailed information from federal individual income tax returns filed in calendar year 2006. To preserve tax return confidentiality, the PUF does not contain any information that would disclose specific taxpayers' identity. TPC "ages" the file to match published Statistics of Income tabulations for 2011. It adds information on other demographic characteristics and sources of income not reported on tax returns through a constrained statistical match of the aged PUF with data from the March 2012 Current Population Survey (CPS) of the US Census Bureau. That match also generates a sample of individuals who do not file individual income tax returns (nonfilers). TPC then augments the tax model database by imputing wealth, education, consumption, health, and retirement savings variables for each record in the matched file.[2] Last, TPC ages the augmented database to future years using targets from the Congressional Budget Office (CBO), Joint Committee on Taxation (JCT), and Census Bureau.

DYNAMIC SIMULATION OF INCOME MODEL

DYNASIM models the long-run distributional consequences of retirement and aging issues.[3] Starting with a representative sample of individuals and families, the model ages the data year by

year, simulating demographic events (e.g., births, deaths, marriages, and divorces) and economic events (e.g., labor force participation, earnings, hours of work, disability onset, and retirement).[4] The model simulates Social Security coverage and benefits, pension coverage and participation, benefit payments, and pension assets. DYNASIM also includes a detailed federal income tax calculator and payroll tax calculations. It has a model of Medicare spending that takes into account the program's complex cost-sharing provisions and how they are slated to evolve under current law.[5] It further produces estimates of most Medicaid spending on the aged including spending on long-term services and supports (LTSS).[6] Last, DYNASIM simulates home and financial assets, health status, living arrangements, and income from coresident family members, and calculates Supplemental Security Income (SSI) eligibility, participation, and benefits.

DYNASIM can simulate the effects of changing formulas for Old Age, Survivor, And Disability Insurance funding and benefits, both of which could be critical in upcoming budget debates. The model's Medicare capacities can be used to understand the importance of alternative growth and cost-sharing assumptions on program finances, a useful capacity given tremendous uncertainty about how health costs may grow in coming decades. Notably, the model includes information on the institutionalized, who can consume a significant amount of resources, though often short term.

DYNASIM's core data file is the Survey of Income and Program Participation (SIPP), statistically matched to earnings histories from the Panel Study of Income Dynamics, National Longitudinal Survey of Youth, and public-use earnings records from the Social Security Administration.[7] Demographic and economic events are simulated based on regressions estimated using a number of longitudinal household surveys and administrative data files. Outcomes from many key aging processes are aligned to tabulations from the Social Security and Medicare Trustees' Reports and related analyses (Shatto and Clemens 2017), and closely compared to data from household surveys, administrative records, and other sources.

HEALTH INSURANCE POLICY SIMULATION MODEL

HIPSM is a detailed microsimulation model of the health care system.[8] It estimates the cost and coverage effects of proposed health care policy options. It can be adapted to analyze numerous new scenarios—from novel health insurance offerings and strategies for increasing affordability to state-specific proposals—and can describe the effects of a policy option over several years.

To evaluate how policy changes would affect the health care system, HIPSM simulates the decisions of employers to offer and of families and individuals to enroll in health insurance coverage. The model is designed to show the impact of policy on government and private health care spending, uncompensated care costs, health insurance premiums in employer and nongroup health insurance risk pools, rates of employer coverage offers, and health insurance coverage. The large sample size of the survey data on which HIPSM is based enables detailed distributional

analysis of the results. In particular, estimates can be produced for states and for many local areas within states.

To calculate the impact of reform options, HIPSM uses a flexible new simulation approach based on the relative desirability of the health insurance options available to each individual and family under reform. The approach, known as a "utility-based framework," allows new coverage options to be assessed without simply extrapolating from historical data, as in previous models. Within HIPSM, the health insurance decisions of individuals, families, and employers are calibrated to findings in the best empirical economics literature, as well as available Medicaid and marketplace enrollment data.

HIPSM uses the US Census Bureau's American Community Survey data from 2012 and 2013 as its core data files. Combining these datasets results in over 6 million observations. The Medical Expenditure Panel Survey's Household Component and other data sources are used to impute health care expenditures for each individual in the dataset in each possible coverage status, including out-of-pocket spending, spending covered by insurance, Medicaid/Children's Health Insurance Program (CHIP) spending, and uncompensated care for the uninsured. The model is calibrated yearly to reproduce each state's latest available Medicaid and ACA marketplace enrollment numbers.

TRANSFER INCOME MODEL

TRIM is a comprehensive microsimulation model focusing on federal and state taxes and transfers affecting low- and moderate-income families.[9] The model allows users to examine how program rules affect eligibility and spending in means-tested federal transfer programs, in select non–means-tested transfer programs, and in state programs. The model is designed to capture actual program participation as it ultimately appears in administrative data, rather than the lower levels reported in survey data. Unlike, the other models, the current version of TRIM does not generally project into the future, although static aging has been incorporated in some past work. TRIM uses the CPS as its core data file.

The most important federal programs in the model are the Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF), Medicaid including CHIP, child care subsidies, public housing subsidies, unemployment compensation, Supplemental Security Income (SSI), the Low Income Home Energy Assistance Program (LIHEAP), and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). TRIM also models federal and state income taxes and federal payroll taxes, but not with the same detail as the TPC model. In particular, the TPC model has more information about high-income households who have a large influence on tax revenues but are not particularly important when modeling income-based transfer programs.

A hallmark of TRIM is the ability to model all the tax and transfer programs in an integrated manner, capturing the real-world interactions across programs. For example, changing SSI benefits affects SNAP benefits, expanding Medicaid enrollment increases WIC eligibility, and a change in a family's copayment in the child care subsidy program affects their child care expenses for purposes of child care exclusions or credits.

METHODS

OVERVIEW

We developed the capability to simulate the distribution of federal taxes and transfers in 2017 and 2026 under current law and policy alternatives. We accomplished this by developing methodologies for importing micro-level results from each of the Urban Institute's other microsimulation models into the tax model database. Once data are imported we can analyze the distribution of federal taxes and transfers by income group and family structure. When analyzing alternatives we can show the distribution of average changes in net transfers as well as the distribution of "winners" and "losers."

To simulate the combined distribution of federal taxes and transfers, we start by simulating federal taxes in the tax model database. We then use a statistical matching algorithm to import Social Security, SSI[10], and Medicare benefits for all participants, as well as Medicaid benefits for those age 65 and over, from DYNASIM into the tax model. We use a similar algorithm to import Medicaid benefits and private health insurance coverage for the under-65 population from HIPSM into the tax model. We calculate SNAP for tax units in the tax model after adding imputations for several necessary input variables to the tax model database. We then calibrate the SNAP simulations to detailed tabulations from TRIM of beneficiaries by type, income, and benefit level. We use the tax model's education module to simulate Pell grants. We use its existing transfer module for current-law values of other cash transfers, such as TANF, veterans' benefits, workers' compensation, and LIHEAP. These benefits are derived from a statistical match to the CPS, and some are calibrated to tabulations from TRIM. We use existing values from tax records for current-law unemployment benefits.

IMPORTING RETIREMENT BENEFITS FROM DYNASIM INTO THE TAX MODEL

Summary

We import government retirement benefits into the tax model database by linking observations in DYNASIM to similar observations in the tax model using a statistical matching algorithm. Benefits imported from DYNASIM include Social Security, SSI, and Medicare as well as Medicaid for individuals age 65 and up. Medicaid benefits include acute care and LTSS. We develop a separate match between HIPSM and the tax model for Medicaid benefits for the under-65 population (see below). Once we establish the match, we can use it to import retirement benefits under current law and policy alternatives into the tax model database. We develop separate

matches for 2017 and 2026. Last, we calibrate all retirement benefits to be consistent with baseline CBO projections.

Statistical Matching Algorithm

Statistical matching is a method for importing information from a donor dataset to a host dataset while preserving the joint distributions of the imported variables.[11] The method links similar observations by using information available in both databases. In this case, individuals are matched within cells defined by marital status, gender, age category, and tax unit income category.[12] We identify similar observations using a measure of "distance" that is a function of tax unit income, age, earnings, share of couple earnings, presence of dependents in the tax unit, pension income, financial assets, and home equity. Like Smith, Scheuren, and Berk (2002), our distance function equals the weighted sum of squared differences, with differences normalized by dividing by the standard deviation of relevant matching variables:

$$D_d = \sum_{j=1}^{n} w_j * [\frac{X_{dj} - X_{rj}}{\sigma_j}]^2$$

where *j* is the number of matching variables, *w* is a weight factor, *X* is a matching variable, σ_j is the standard deviation of the *j*th *X* variable, *d* is the characteristics of the donor, and *r* is the characteristics of the recipient.

For a given cell, we match each tax model individual to the DYNASIM individual with minimum distance subject to the constraint that DYNASIM individuals are matched roughly an equal number of times within cells.[13] The constraints increase the likelihood of the match preserving the distribution of imported variables but reduces the closeness of the match between individuals.

For statistical matching to preserve the distribution of imported variables, the host and donor datasets must have similar characteristics. Demographics and income are generally similar across the 2017 DYNASIM and tax model databases (tables 1 and 2), but there are some differences. The percentage of individuals that are married is 7 points higher in DYNASIM than in the tax model (42 percent versus 35 percent). And while the income distributions are similar, for individuals under age 65 the tax model has fewer individuals with incomes between zero and $10,000 and more individuals in the $10,000–30,000 range.

There are 134,763 individuals in DYNASIM and 626,946 individuals in the tax model, divided among 63 matching cells (table 3). Nearly all matching cells have more than 1,000 observations from each dataset. Most cells are further divided into 11 income groups. After stratifying by income there are 600 cells, most of which have more than 100 observations and all of which have at least 20.

Assessing the Match

Tax model individuals are matched to DYNASIM individuals with similar presence of earnings, split of earnings between spouses, tax unit income, presence of dependents, age, and pension income nearly 90 percent of the time in 2017 (table 4). The share matching closely on income is higher, 96 percent, which is important because our ultimate goal is to show the distribution of taxes and transfers changes by income group. Individuals are matched less closely in the top income group because we combine all individuals with incomes over $200,000 into one category.[14] Because of matching within cells, individuals are always matched to individuals with the same marital/dependency status, gender, age category, and income category.

The distributions of individuals with Social Security and Medicare in the matched tax model file closely follow the distributions in DYNASIM (table 5). The number of individuals with matched Social Security benefits in the tax model is only 3 percent greater than the number with benefits in DYNASIM, and the share in each income group is similar. The number of individuals with Medicare benefits in the tax model is only 5 percent higher than the number with benefits in DYNASIM, again with similar shares across income groups.

The algorithm performs somewhat worse for SSI and aged Medicaid, resulting in about 20 percent more individuals with SSI and 33 percent more individuals with Medicaid in the tax model than in DYNASIM. The match produces too many SSI and Medicaid beneficiaries, primarily due to a difference between the models in the size of a key population subgroup. The tax model has more unmarried adults over age 65 with low incomes than DYNASIM, and this group has relatively high incidence of SSI and Medicaid. While the algorithm correctly imports the characteristics of this group into the tax model, the larger size of the group in the tax model results in more individuals with these benefits. Still, the relative distributions of SSI and aged Medicaid recipients by income are about the same in both models. We later calibrate all aggregate benefit totals to match CBO projections (see below).

Valuing Health Benefits

For individuals in the tax model with Medicare and Medicaid, we assign benefit amounts based on the insurance value of coverage. We first use the statistical match to import Medicare and Medicaid spending from DYNASIM to individuals in the tax model. We then assign benefit values based on average spending for the relevant age, gender, and marital-status group. This is roughly what the individual would have to pay an insurance company to provide the same coverage. Insurance value is certainly not the only way of valuing health benefits. Individuals may value them at more or less than their cost, and medical providers may capture some of the benefit through higher incomes. This is discussed further in the section describing the current-law distribution of taxes and transfers.

Calibration

We calibrate all benefits to be consistent with CBO's forecast for current law (results of that calibration appear in table 6).[15] Benefits are tabulated at the tax unit as opposed to individual level as that is the level of analysis we ultimately use to analyze taxes and transfers. Many tax units across the income scale have Social Security and Medicare benefits, though the lowest-income units receive a disproportionate share of benefits. Tax units with incomes less than $10,000 are nearly 25 percent of units but receive over a third of Social Security benefits and over 40 percent of Medicare benefits. The concentration at the lowest income is partly due to the income classifier used in this table, which excludes transfer benefits such as Social Security and Medicare. Consequently, the lowest income group contains a relatively large number of retirees with limited earnings. As we will see in the section describing the current-law distribution of taxes and transfers, classifying by an income measure that includes transfers would result in smaller Social Security and Medicare benefits at the lowest incomes. Medicaid and SSI benefits are highly concentrated at lower incomes, reflecting their means-tested eligibility. Families with incomes below $20,000 constitute 38 percent of tax units but receive over 90 percent of Medicaid and SSI benefits.

IMPORTING MEDICAID BENEFITS AND HEALTH INSURANCE COVERAGE FROM HIPSM INTO THE TAX MODEL

Summary

Similar to the method used for linking DYNASIM to the tax model, we also use a statistical matching algorithm to import health insurance coverage for the under-65 population from the HIPSM into the tax model database. We assign coverage status for Medicaid/CHIP, employer-sponsored health insurance (ESI), nongroup coverage, and other public coverage. If not covered under any of these, the observation is classified as uninsured. We also import Medicaid spending on acute care and ESI and nongroup premiums. Medicaid spending for acute care and LTSS for the over-65 population is imported from DYNASIM (see above). Like the DYNASIM–tax model linkage, the match can be used to import Medicaid spending and health insurance coverage under current law and policy alternatives. We develop separate matches for 2017 and 2026, value Medicaid benefits at their insurance value, and calibrate imported Medicaid benefits to be consistent with aggregate totals from HIPSM.

Statistical Matching Algorithm

We match HIPSM tax units with tax model units as follows. We begin by altering the upper tail of adjusted gross income (AGI) in HIPSM so that it better matches the tax model database. We then partition tax units in both the HIPSM and the tax model to preserve critical characteristics such as family composition, availability of ESI, and categorical eligibility for health coverage programs

under the ACA. We then rank each observation in a partition by AGI divided by tax unit size, and match each tax model unit with the closest HIPSM unit.

Imputing Upper Trail of Income Distribution

The AGI distributions in HIPSM and the tax model are generally comparable except for the upper tail and the prevalence of units with negative income. Due to top coding and underreporting of very large incomes in the American Community Survey, HIPSM's underlying data source, HIPSM has less aggregate income in the uppermost portion of the income distribution than the tax model. To make the datasets more consistent, we replace the upper tail of AGI in HIPSM with imputations based on tax model data. Specifically, we take HIPSM and tax model units with AGI above $200,000 and partition them by filing status, the presence of wage income, the number of elderly adults, and the number of dependents. For more about these partitions, see the next section.

Within each partition, we rank units in both datasets by AGI divided by number of persons in the unit. The AGI of each HIPSM unit is changed to the per capita AGI of the tax model unit, with the closest rank multiplied by the HIPSM unit size.

Partitioning Datasets

To preserve crucial characteristics, we define several partitions for the match. The HIPSM dataset is far larger than the tax model database, so we can define a large number of partitions and still have an adequate number of donor file records in each partition. Partitions are defined by a combination of seven characteristics:

1. Presence of wage income
2. Tax filing status
    a. Single
    b. Joint
    c. Head of household
3. Presence of elderly tax unit members
    a. No elderly members
    b. Head or spouse is elderly, no elderly dependents
    c. Head and spouse are elderly, no elderly dependents
    d. Elderly dependents
4. Number of dependents, capped based on filing status and number of elderly unit members.
5. Presence of ESI
6. Firm size of ESI policy holder
    a. ≤50 workers
    b. 50–1000 workers
    c. 1,000+ workers

7. Modified adjusted gross income (MAGI)[16] as percentage of Federal Poverty Line (FPL) category
    a. <138 percent of FPL
    b. 138–400 percent of FPL
    c. >400 percent of FPL

To ensure a large pool of donor records in each partition, some partitions are collapsed by firm size, employer coverage, or number of dependents. For example, firm size is collapsed for partitions with employer coverage, MAGI below 138 percent of FPL, wage income, filing jointly, and one elderly member. Wage income, filing status, number of elderly unit members, and MAGI are never collapsed. We categorize 6.2 million HIPSM tax units into 282 partitions.

Ranking AGI and Selecting Donor Units

Within partitions we match tax model units to HIPSM units with similar incomes. Since units within partitions can contain different numbers of people due to the cap on the number of dependents, we rank tax model and HIPSM units within partitions by MAGI per capita. We then match each tax model unit with the HIPSM unit with closest per capita MAGI rank.

Assessing Match

The distributions by income in HIPSM and the tax model are generally similar, except the tax model has relatively fewer units in the $0–10,000 range and relatively more units in the $10,000–40,000 range (table 7). We find a similar difference when comparing income in DYNASIM and the tax model (see above).

The distribution of health insurance coverage by income imported into the tax model is generally similar to the distribution in HIPSM (table 8). One notable difference is that the tax model has relatively fewer people with Medicaid or uninsured in the $0–10,000 range and relatively more units in the $10,000–30,000 range. This stems from differences in the income distributions of the two models noted above.

Valuing Medicaid Benefits and Calibration

We assign the insurance value of benefits to each tax unit with Medicaid coverage in a similar manner as we do for health benefits imported from DYNASIM. After importing federal Medicaid spending from HIPSM units to tax model units, we assign insurance values based on average spending for relevant demographic groups. We then calibrate benefits to be consistent with HIPSM's forecast for total benefits for the under-65 population.[17] Not surprisingly, Medicaid benefits are highly concentrated among low-income households (table 9). Families with incomes below $20,000 are 30 percent of tax units but receive over 55 percent of the Medicaid benefits.

Incorporating HIPSM Health Insurance Coverage into Tax Model's Health Module

In addition to providing Medicaid benefits for analysis of transfers, the HIPSM–tax model match lets us import health insurance coverage into the tax model's health module. This module simulates health-related taxes and subsidies such as the tax exclusion for employer-provided health benefits (EPHB) and various ACA taxes and credits, including the Premium Tax Credit, the excise tax on high-cost health plans ("Cadillac tax"), and individual and employer mandate penalties for inadequate health insurance coverage. By importing this coverage from HIPSM, the health module can incorporate the impact of coverage changes into estimates of changing health-related taxes and credits.

To simulate the tax treatment of EPHB, we need to augment ESI premiums imported from HIPSM with imputations for other health benefits, such as contributions to health savings accounts and medical flexible-spending accounts and premiums for dental and vision coverage. We impute other health benefits onto tax units with ESI coverage imported from HIPSM based on regression coefficients estimated in the Kaiser Family Foundation and Health Research & Education Trust Employer Health Benefits Survey.[18] We calibrate EPHB to be consistent with CBO/JCT estimates for the value of the health exclusion and Cadillac tax and with Treasury estimates for use of health savings accounts. Table 10 shows the resulting distribution of EPHB in the tax model database. While tax units across the income scale have substantial EPHB, units with incomes above $50,000 receive a disproportionate share.

We use the tax model's calculators to simulate the health insurance–related credits and penalties using tax units' health insurance status imported from HIPSM. The distributions of the Premium Tax Credit in HIPSM and the tax model are very similar (table 11). The credit is concentrated among low- and moderate-income families, with over 70 percent of the credit dollars going to families with incomes between $10,000 and $40,000.

SIMULATING SMAP IN THE TAX MODEL DATABASE

Summary

To incorporate SNAP benefits (formerly known as food stamps) into distributional analysis of taxes and transfers, we develop a calculator that simulates benefits for tax units in the tax model database. To simulate benefits, we augment the tax model database with a number of additional imputations. Not all people qualifying for transfers, including SNAP benefits, decide to use them. Consequently, we calibrate benefit take-up so characteristics of those with simulated SNAP benefits in the tax model for any month over the course of 2011 appear similar to beneficiaries in TRIM. We further calibrate take-up in 2017 and 2026 to match CBO projections of total SNAP benefits in those years.

Augmented Tax Model Database

Under current program rules SNAP benefits are a function of several variables, including the following:

- Unit size
- Monthly income
- Monthly earnings
- Age
- Disability status
- Monthly child support expenses
- Monthly child care expenses
- Monthly medical expenses
- Monthly housing expenses
- Number of postsecondary students
- Assets
- State of residence

While many of the variables necessary for simulating SNAP are already in the tax model database (e.g., income and family size), we impute values for additional needed variables.[19] We use an existing statistical match between the CPS and the tax model to import dependent's income into the tax model database.[20] We use the same match to import housing expenses, medical expenses, and disability status from TRIM, which uses the CPS as its core data file.

We impute child care expenses based on receipt of the Child and Dependent Care Tax Credit (CDCTC) in the tax model and from regression coefficients estimated in a data extract from TRIM. To maintain consistency between the imputations and receipt of the CDCTC, we first assign presence of child care expenses to tax units with the CDCTC in the tax model database. We impute presence of expenses to additional units based on coefficients from probit models estimated in a TRIM extract. For units with the CDCTC, we start with expenses eligible for the credit as our measure of childcare expenses. If credit expenses equal the maximum amounts the Internal Revenue Service allows, we impute expenses beyond the thresholds, again using coefficients from models estimated in TRIM.[21] Similarly, for the additional units we assign presence of expenses, we impute childcare expense amounts based on coefficients from models estimated in TRIM.

SNAP eligibility and benefits are determined monthly, while income variables in the tax model database are on an annual basis. Simply dividing annual income by 12 or "annualizing" the SNAP formula would not allow us to fully capture families with fluctuating monthly incomes who only qualify for benefits for part of the year. To better approximate monthly income for modeling eligibility and benefit receipt, we impute monthly earnings from annual earnings using a method similar to the one used in TRIM. We impute number of weeks of the year worked to each

observation in the tax model database using the statistical match to the CPS. We then divide earnings evenly over the number of weeks worked. All other monthly income variables equal annual values divided by 12.

SNAP Calculator

We develop a SNAP calculator that produces potential monthly benefits given the necessary data fields and program rule settings. Program rules simulated include

- gross income test,
- net income test,
- asset test,
- categorical eligibility,
- broad-based categorical eligibility,
- treatment of elderly and disabled,
- treatment of postsecondary students and able-bodied adults without dependents,
- benefit formula, and
- minimum benefits.

Calibrating Take-Up of SNAP Benefits in 2011 to Closely Match Benefits Distribution in TRIM

For each unit in the tax model database, we use the calculator to simulate SNAP benefits for each month of the year, then sum these amounts to get potential annual benefits. We then apply take-up rates based on regression coefficients estimated from TRIM data. Whether a tax unit will take up the benefits for which they appear eligible is a function of beneficiary type (age 60 or older, disabled, with children, other), income, potential benefit amount, presence of earnings, and receipt of TANF or SSI. We calibrate take-up to match TRIM tabulations of total SNAP dollars and number of units with benefits anytime over the course of the year by benefit amount category, income group, and presence of earnings. While potential benefits are simulated monthly, a unit either participates in SNAP for all months it is eligible or no months.

By design, the simulations of the number of units with benefits, average benefits, and number of recipients per unit are similar to TRIM overall and by beneficiary type (table 12). The number of units with benefits by presence of earnings compares reasonably well across the models, though the tax model simulates a larger difference in benefit amounts between earners and nonearners than TRIM. Tables 13 and 14 show the distribution of SNAP benefits by income and benefit size categories in both models. Again, by design, tax model simulations of the number of units with benefits and average benefit amounts are similar to TRIM.

Simulating SNAP Benefits in 2017 and 2026

To simulate benefits in 2017 and 2026, we age monthly income variables and other inputs for calculating SNAP by existing growth factors in the tax model. For instance, the new monthly earnings variable is grown by the same factor as for annual wages. We then run the aged database through the SNAP calculator to get potential benefits and weight by tax model weight for the relevant year. We start with the same take-up probabilities we used for 2011 and further adjust them to match CBO projections of total benefits in 2017 and 2026. SNAP benefits are highly concentrated among low-income units, with 75 percent going to units with annual incomes of less than $20,000 in 2017 (table 15), but there are beneficiaries at all income levels, many of whom are units that only worked for a portion of the year. By construction, total benefits are similar to the CBO forecast (see addendum to table 15).

OTHER TRANSFERS

We use existing capabilities in the tax model database to capture other transfers. The tax model's education module uses imputations based on the National Postsecondary Student Aid Study to simulate Pell grants.[22] Current law unemployment benefits in the tax model come straight from the PUF for tax filers and from the CPS–tax model match for nonfilers. Current law TANF, veterans' benefits, workers' compensation, and LIHEAP also come from the CPS–tax model match. The distribution of TANF benefits by income group is calibrated to tabulations from TRIM. Total TANF, workers' compensation, LIHEAP, and veterans' benefits are calibrated to CBO's baseline forecast. With the exception of Pell grants, we do not simulate program rules for these other transfers, but rather impute current law values. For that reason, we have limited ability to simulate detailed policy changes for these programs.

The goal of our new methodology is to examine how federal policies affect the distribution of income under current law and policy alternatives. In this section, we examine how current-law federal transfers and taxes are distributed across tax units ranked by income. We consider the distribution across all tax units, and separately for units with children and units with at least one member age 65 or older.

We do not attempt to distribute the benefits from all federal spending, but rather limit our analysis to direct transfer payments to identifiable people. In principle, we would like to know how all government spending is distributed, but it is difficult to assign spending on goods and services that are equally available to all people living in the US, such as national defense, environmental protection, or public health programs. The direct transfer payments that we assign include cash payments from major entitlement programs such as Social Security, near-cash transfers such as those from SNAP, and in-kind transfers such as health insurance coverage through Medicare and Medicaid. We distribute almost all federal taxes, including individual and corporate income taxes, payroll taxes, estate taxes, and excise taxes.

MEASURING INCOME

We use three measures of income for this analysis: pre-transfer, pre-tax income, which excludes transfers and taxes; post-transfer, pre-tax income, which adds in transfers payments, and post-transfer, post-tax income, which subtracts taxes (table 16). The difference between the first and last is a measure of the net effect of federal policies.

Market Income

A person's pre-tax, pre-transfer income is roughly the same as their market income (MI), the income they earn from working, investing, and other market activities. MI includes labor income, business income, capital income, and all other sources of nontransfer income.

Following TPC's standard method for measuring pre-tax income (see Rosenberg 2013), our measure of MI begins with a taxpayer's adjusted gross income (AGI), as reported on federal income tax forms. MI excludes taxable transfer payments such as Social Security and unemployment insurance from AGI, and adds in four other categories of income:

- First, it includes other forms of compensation not in AGI, including employee and employer contributions to retirement plans, defined-benefit pension accruals,[23] and employer contributions for health insurance and other fringe benefits.[24]
- Second, it adds in investment income not included in AGI such as tax-exempt interest and the annual return on assets held in defined-contribution retirement accounts.

- Third, it adds to taxable retirement income any nontaxable distributions from defined-benefit pensions and defined-contribution retirement accounts.
- Last, it includes an estimate of the taxes that are paid by others but that ultimately come out of the taxpayer's MI. These include the employer share of payroll taxes and the imputed share of corporate income tax liability.

Expanded Cash Income Plus Health Care Transfers

Adding cash transfer payments to MI yields expanded cash income (ECI), a measure of post-transfer, pre-tax income. ECI is the income measure TPC uses to analyze the distribution of federal tax payments. However, because this analysis includes the impact of health care transfers on income, we add government health benefits to our measure of post-transfer, pre-tax income. The following are the transfer payments included in expanded cash income plus health care transfers (ECI+HC)[25]:

- Social Security
- Unemployment insurance
- SSI
- TANF
- SNAP
- Workers compensation
- LIHEAP
- Veterans' benefits
- Pell grants
- Medicare
- Medicaid[26]
- CHIP
- ACA cost-sharing subsidies

Valuing Transfers

We value cash transfers such that every dollar received counts as a dollar of benefit. Similarly, we value near-cash transfers by counting a dollar of benefits as a dollar of income, though some recipients of these benefits may value them less.

Valuing in-kind benefits presents greater difficulty than cash and near-cash transfers. Some Medicaid beneficiaries likely value the health insurance they receive at less than the cost of providing it—particularly when the cost to provide it is a large share of their disposable income. Beneficiaries could value government health insurance at more than the cost of providing it because they could not individually purchase the same health care services at the price the government pays.

There is also the question of whether to distribute the insurance value, as is common practice, rather than the value of services received. We do not attempt to answer theoretical questions associated with valuing in-kind transfers, but instead value in-kind transfers such as Medicare and Medicaid at their dollar cost, which may overstate or understate the value some recipients believe they are receiving from the government. It does reflect the cost of providing the program, however, and thus recipients' effective income, just as the value of employee health insurance is counted as part of total compensation. This follows the methodology that previous analyses have adopted for valuing Medicare and Medicaid benefits (see, e.g., CBO 2013; Prante and Hodge 2013). We assign Medicare and Medicaid benefits based on average spending for different demographic groups, where beneficiaries are classified by age, gender, and marital status.

The Challenge of Incidence

Post-transfer and post-tax income measures are conceptually straightforward if the burden of taxes always falls on the people who pay them and the benefit of transfers always goes to those who receive them. The situation is more complex, because the people who pay taxes or receive payments are not always the ones who bear the economic burden of a tax or get the benefit from transfers. For example, refiners might pay an excise tax on their gasoline sales, but then pass it through to consumers as higher prices. Seniors might be legally entitled to a Medicare subsidy for health care, but providers and private payers may capture some of the benefit in the form of fees or higher incomes.

Tax economists have grappled with this issue for decades. As a result, tax modelers have established techniques for measuring the burden of a tax. Analysts typically conclude that income taxes are borne by the individuals who pay them, and that payroll taxes are borne by workers even though employers are liable for about half of the tax. Thus, a worker's MI and tax burden are both higher than they may think; in calculating them, we need to include the employer share of payroll taxes as part of employee compensation. The incidence of corporate income taxes raises similar concerns. While less settled, there is general agreement that they are borne by a mix of corporate shareholders, owners of capital more broadly, and workers.

Less research exists on the distribution of transfers. As with personal income taxes, most analysts believe that cash transfers, such as unemployment insurance, and near-cash transfers, such as SNAP, accrue to the people who receive them. The situation is more complex with in-kind benefits such as Medicare and Medicaid, where some benefits ultimately might accrue to providers or private payers rather than the individuals receiving these subsidies for health insurance and health care (Duggan, Stark, and Vabson 2016). In this analysis, we assume that Medicare and Medicaid benefits go to people covered by those programs. We plan to explore alternative incidence assumptions in the future.

Disposable Income

To calculate post-transfer, post-tax income, we subtract federal taxes from ECI+HC, yielding a measure of disposable income (DI). The taxes we subtract include both those taxpayers pay directly (e.g., personal income taxes) and those they bear indirectly (e.g., the employer share of payroll taxes and corporate income taxes).

Individual Income Tax: The tax model uses a detailed tax calculator that captures most features of the federal individual income tax system, including the alternative minimum tax. We assume that the burden of the individual income tax falls on the individual taxpayer.

Payroll Tax: The tax model also calculates federal payroll taxes for Social Security and Medicare. We assume workers bear the burden of both the employer and employee portions of payroll taxes.

Corporate Income Tax: Although firms pay the corporate income tax, the economic incidence of the tax falls on various individuals. TPC's tax model therefore distributes the burden of the tax to individuals. Which individuals bear the burden of the corporate tax, however, is an unsettled issue. The tax could be borne by the owners of corporate stock, or passed on in part to labor as lower real wages, to consumers as higher prices, or to the owners of some or all capital as lower real rates of return. TPC estimates that 60 percent of the corporate tax is borne by shareholders, 20 percent by all capital owners, and 20 percent by labor (largely consistent with the approaches taken by CBO, JCT, and the Treasury). See Nunns (2012) for a thorough discussion of TPC's assumptions regarding the incidence of the corporate income tax.

Estate Tax: The tax model calculates the estate tax using wealth data from the Survey of Consumer Finances, adjusting those data to align more closely with the assets and liabilities reported on estate tax returns. TPC assigns the estate tax to decedents.

Excise Taxes: We include all federal excise taxes, the largest of which are those assessed on motor fuels, alcohol, tobacco, air transportation, certain health insurance providers, and prescription drug manufacturers. We also include the excise taxes on individuals without essential health insurance coverage ("individual mandate") and employers that fail to meet minimum essential coverage ("employer mandate") associated with the ACA. Following the methodology in Toder, Nunns, and Rosenberg (2011), TPC assumes excise taxes lower real incomes in proportion to each tax unit's share of labor income plus the portion of capital income that exceeds the normal rate of return. In addition, TPC assumes that excise taxes paid or passed through to the retail level raise the cost of taxed goods and services relative to those untaxed, and assign a portion of the excise tax burden to tax units based on their purchases of taxed goods and services, based on expenditure imputations from the Consumer Expenditure Survey.

DISTRIBUTION OF INCOME

Tables 17 and 18 show estimates of the distribution of MI, ECI+HC, and DI in 2017. Tax units are ranked by quintile of ECI+HC adjusted for family size. As is well known, income disparities across quintiles are substantial. Average MI is over $275,000 for the top quintile compared to $45,000 for the middle quintile and less than $12,000 for the bottom quintile (table 17). In aggregate, the top quintile receives 60 percent of all MI, compared to 11 percent for the middle quintile and 3 percent for the bottom quintile (table 18).

Transfers modestly reduce income inequality. Transfers increase income by nearly 70 percent for the bottom quintile but only by 36 percent for the middle quintile and 5 percent for the top quintile (see table 17, Transfers as percentage of MI column), reducing the share of income going to the top quintile from 60 percent to 54 percent. Subtracting taxes from income further reduces inequality. Federal taxes reduce average income by 25 percent for the top quintile, but only by 11 percent for the middle quintile and 1 percent for the bottom quintile (see taxes as percentage of ECI+HC). Progressive taxation further reduces the top quintile's share of income from 54 percent to 50 percent.

DISTRIBUTION OF TRANSFERS, TAXES, AND NET TRANSFERS

The amount of transfers, taxes, and net transfers differs across income quintiles (table 19). While table 17 showed that transfers have the largest relative impact on income for the bottom quintile, table 19 shows that average transfer benefits are highest for the middle quintile: over $16,000 for tax units in the middle quintile, compared to $8,100 for the bottom quintile and $12,900 for the top quintile.

Cash social insurance, which consists mostly of Social Security benefits, and Medicare are the largest transfers and are similarly distributed. Table 19 shows that average cash social insurance benefits are $5,600 and average Medicare benefits are $4,000. For the bottom quintile, however, cash social insurance benefits are only $900 and Medicare benefits only $700—in seeming contrast to what we described in the section on importing retirement benefits into the tax model database. In table 6 we showed that the distribution of Social Security and Medicare benefits are disproportionately concentrated at the lowest income levels using a measure of income similar to MI. However, when classifying tax units by an income measure that includes the value of transfers, most units with Social Security and Medicare benefits have incomes high enough to be in the top four quintiles.[27] Including transfers in the income classifier shifts the composition of the bottom quintile from units with very little MI, including many retirees, to units with more MI and fewer transfers, particularly fewer retirement benefits.

Means-tested cash benefits are the smallest transfer category. This category includes SSI, SNAP, Pell grants, veterans' benefits, TANF, and LIHEAP. Average means-tested cash benefits

are nearly $1,400 for all tax units (table 19). Average means-tested cash benefits are $2,600 for the bottom quintile, about $1,000 for the middle quintile, and under $800 for the top quintile. The bottom quintile receives nearly 40 percent of total means-tested cash benefits.

Means-tested health benefits (mostly Medicaid) are distributed in a similar manner to means-tested cash benefits. While benefits average $2,000, average means-tested health benefits are nearly $4,000 for the bottom quintile, less than half that much for the middle quintile, and just over $300 for the top quintile (table 19). Similarly, the bottom quintile receives about 42 percent of means-tested health benefits, as opposed to less than 19 percent for the middle quintile and less than 3 percent for the top quintile (table 20).

As noted, the distribution of federal taxes is progressive. Average federal taxes are $17,800 and increase substantially with income, from less than $300 for the bottom quintile to $6,900 for the middle quintile and nearly $72,000 for the top quintile. The top quintile pays over 70 percent of federal taxes (table 19).

The distribution of net transfers, transfer minus taxes, is progressive. Taxes exceed transfers as average net transfers are −$4,700, which is not surprising as we include most federal revenue but only the portion of federal spending made through transfer programs (table 19). About half of all tax units have positive net transfers, but the share of units with positive net transfers ranges from 75 percent for the lowest income quintile to 19 percent for the highest. Net transfers are negative for the top quintile, which pays an average of nearly $60,000 more in taxes than it receives in transfer benefits. The bottom three quintiles receive positive net transfers and the fourth quintile pays $2,100 more in taxes than in receives in benefits. While average net transfers are larger for the middle quintile ($9,100) than for the bottom quintile ($7,900), net transfers as percent of income are largest for the bottom quintile—40 percent of income (ECI+HC) for the bottom quintile versus 15 percent for the middle quintile. Net transfers for the top quintile are negative and equal about 20 percent of income.

DISTRIBUTION OF TRANSFERS, TAXES, AND NET TRANSFERS FOR DIFFERENT DEMOGRAPHIC GROUPS

Average transfer benefits are much lower for tax units with children (table 21) than for tax units with at least one member age 65 or older (table 23). Average transfers for units with children are about $10,700, ranging from $9,200 for units in the lowest income quintile to $7,700 for units in the highest.[28] Average transfers for older tax units exceed $25,000, ranging from $10,000 for older households in the lowest income quintile to $31,200 for units in the highest quintile. Because most transfer benefits for older units are not means-tested, while a significant portion of transfer for units with children are, there is a large difference between average transfers in the highest quintile for those two groups, even though income quintiles are defined for the entire population in both cases, and not separately for each demographic group.

For tax units with children, means-tested cash transfers average about $1,500 and means-tested health transfers average about $2,600. Together they account for 38 percent of total average transfers for those households (table 22). For older tax units, means-tested cash transfers average about $1,400 and means-tested health transfers average $1,600—together only 12 percent of transfers for those households (table 24). For units in the lowest income quintile, means-tested transfers are 85 percent of average transfer benefits for units with children and 66 percent of transfers for older units. In-kind health benefits account for a large portion of transfers for both low-income groups: 58 percent of average transfers for units with children and 55 percent for older units.

The disparity in taxes between units with children and older units is not nearly as large as the disparity in transfers. Average taxes are $21,300 for units with children, or 19 percent of ECI+HC, compared with $18,500 for older units, or 18 percent of ECI+HC (tables 21 and 23). Some notable differences exist within income groups. For units in the lowest income quintile, average taxes are 2.1 percent of ECI+HC for older units but −2.3 percent of ECI+HC for units with children. The negative percentage for units with children reflects refundable credits such as the earned income tax credit and the additional-child tax credit that on average exceed tax liabilities. Those credits are included on the tax side of the ledger in the tables. At the other end of the income scale, taxes as a percentage of ECI+HC are higher for units with children than for older units in the top two income groups. This partly reflects the favorable tax treatment of transfer benefits, which make up a larger portion of the total income of older units in those income groups.

Net transfers (transfers minus taxes) are negative for units with children and positive for older units. Taxes exceed transfer by $10,600 for units with children, and transfers exceed taxes by $6,700 for older units. Forty-eight percent of tax units with children have positive net transfers compared with 70 percent of older units. Net transfers are progressive for both groups. Average transfers exceed average taxes for units with children up through the middle income quintile. Transfers exceed taxes for older units in all income groups except the top quintile.

CONCLUSION AND FUTURE WORK

We need to consider taxes and transfers together to understand the distributional impact of many government policies. The federal government's efforts to reduce poverty, increase health insurance coverage, and encourage college attendance all include both major tax and spending components. Examining just the tax or spending side of efforts like these often misses important distributional implications.

To analyze the distributional impacts of policies involving both tax and spending components, we have developed the capability to simulate the distribution of nearly all federal taxes and transfers. To analyze taxes and spending together we import micro-level results from three of the other Urban Institute's microsimulation models into the tax model database. We use statistical matching algorithms to import retirement benefits from DYNASIM and Medicaid benefits from HIPSM into the tax model. We develop a benefit calculator to simulate SNAP in the tax model database and calibrate results to detailed tabulations from TRIM. We also calibrate TANF imputations to TRIM tabulations. Once transfers are imported into the tax model database, we can tabulate the distribution of taxes and transfers by income groups and family structure under current law and policy alternatives.

Using these methods, we simulate the distribution of federal transfers and taxes across income groups for 2017. We show that the distribution of federal transfers and taxes are both progressive and that, together, they modestly reduce income inequality. Net transfers (transfers minus taxes) are negative on average (but positive for about half of all tax units), although it is important to note that our estimates include almost all federal revenue but only the portion of federal spending made through transfer programs. Our estimates also show the degree to which net transfers are targeted to low-income households (74 percent of tax units in the lowest income quintile have positive net transfers) and to older households (70 percent of all tax units with at least one member at least age 65 have positive net transfers).

In future work we will refine the methodologies described here. Our algorithms for importing transfers into the tax model database would work better if the distribution of income and demographics in the underlying models were more consistent. Going forward, we will explore ways to harmonize the data files. This will be challenging as each model uses the data best suited for its intended purpose and these data sources often paint somewhat different pictures. We will also explore other ways of valuing and distributing in-kind transfers such as health care and education benefits. While we value health benefits at their insurance value, families may in fact value benefits at less or more than this. Ultimately, some of the benefit of Medicare and Medicaid may go to medical providers instead of families. Likewise, some of the benefit of Pell grants may go to educational institutions instead of students. Last, we will continue to explore which income classifier is best for distributional analysis of taxes and transfers together. Including health benefits in the income classifier, as we've done here, is

consistent with examining changes in income net of all taxes and transfers, but results in a different population at the bottom of the income distribution than many might expect.

The current economic and fiscal climate calls for combined analysis of taxes and transfers. Proposals to help workers left behind by the changing economy will likely include both tax and spending components. For example, fully understanding the distributional implications of a recent proposal to implement a universal wage subsidy funded by a value-added tax requires analyzing taxes and all means-tested transfers.[29] And the nation's long-term budget imbalance likely will require future changes to taxes and transfer programs. Designing polices that address the imbalance fairly, while protecting the most vulnerable populations, will require integrated distributional analysis of taxes and transfers.

TABLE 1

Demographic Characteristics of Individuals in DYNASIM and Tax Model, 2017

	DYNASIM	Tax Model
	Percentage	
Male	49.2	47.8
Married	42.1	35.3
Has Earnings	53.8	50.8
Age Category		
< 18	23.4	24.7
18 - 29	16.6	16.2
30 - 49	25.9	24.9
50 - 64	18.6	17.3
65 - 80	11.7	12.4
80+	3.9	4.6
65+	15.6	16.9

Source: DYNASIM3 (version 919) and Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).

TABLE 2

Distribution of Individuals by Tax Unit Income in DYNASIM3 and Tax Model, 2017

Income Category[1] (thousands of dollars)	Under Age 65			
	DYNASIM		Tax Model	
	Count	Percentage	Count	Percentage
<0	1,621,193	0.6	1,375,003	0.5
0-10	44,514,850	15.6	30,979,058	11.0
10-20	25,871,126	9.1	34,059,046	12.1
20-30	25,755,326	9.0	33,921,431	12.1
30-40	23,645,761	8.3	25,515,086	9.1
40-50	21,138,449	7.4	20,873,953	7.4
50-75	42,898,691	15.0	38,866,114	13.9
75-100	32,237,582	11.3	29,108,463	10.4
100-150	34,289,248	12.0	32,146,841	11.5
150-200	14,505,150	5.1	15,337,466	5.5
200+	19,149,718	6.7	18,358,011	6.5
All	285,627,094	100.0	280,540,471	100.0

Income Category[1] (thousands of dollars)	Age 65+			
	DYNASIM		Tax Model	
	Count	Percentage	Count	Percentage
<0	714,085	1.4	533,723	1.0
0-10	19,103,108	36.8	22,222,311	39.6
10-20	5,736,563	11.1	5,919,339	10.5
20-30	4,602,632	8.9	5,237,371	9.3
30-40	3,511,681	6.8	4,071,478	7.3
40-50	3,021,888	5.8	3,122,351	5.6
50-75	5,257,650	10.1	5,323,064	9.5
75-100	3,378,914	6.5	3,155,270	5.6
100-150	3,180,727	6.1	3,103,581	5.5
150-200	1,380,917	2.7	1,457,489	2.6
200+	1,999,184	3.9	1,965,554	3.5
All	51,887,349	100.0	56,111,530	100.0

Source: DYNASIM3 (version 919) and Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).

1. Individuals are categorized by tax unit level income. Income defined as adjusted gross income - taxable Social Security benefits.

TABLE 3

Cell Sizes for DYNASIM-Tax Model Match[1], 2017

Cell Definition			DYNASIM	Tax Model	DYNASIM	Tax Model
Gender (M/F)	Marital Status (Married=M, Single=S, Dependent=D)	Age Range	N		Weighted Count	
M	M	<25	755	2,011	1,900,623	1,021,746
M	M	25-29	1,834	5,072	4,616,877	3,250,550
M	M	30-34	2,322	9,192	5,845,359	4,917,446
M	M	35-39	2,544	12,763	6,404,218	5,369,167
M	M	40-44	2,442	16,487	6,147,445	5,931,562
M	M	45-49	2,830	19,403	7,124,189	6,127,315
M	M	50-54	3,018	19,631	7,597,456	5,922,963
M	M	55-59	3,197	17,866	8,048,067	6,778,368
M	M	60-64	2,861	14,605	7,202,227	5,802,022
M	M	65-69	2,407	9,894	5,952,499	5,405,797
M	M	70-74	1,821	6,764	4,503,324	3,827,107
M	M	75-79	1,150	4,653	2,812,695	2,309,900
M	M	80+	1,208	4,971	2,779,280	2,443,754
M	S	<25	3,720	5,764	9,364,658	6,403,037
M	S	25-29	2,711	6,296	6,824,620	7,639,548
M	S	30-34	2,182	4,531	5,492,926	4,822,349
M	S	35-39	1,794	4,150	4,516,182	3,412,360
M	S	40-44	1,512	4,528	3,806,280	3,629,147
M	S	45-49	1,435	4,952	3,612,442	3,829,617
M	S	50-54	1,406	4,847	3,539,438	3,989,872
M	S	55-59	1,255	4,612	3,159,313	4,534,465
M	S	60-64	1,016	3,595	2,557,659	3,555,512
M	S	65-69	874	1,834	2,161,398	2,388,031
M	S	70-79	1,100	2,610	2,706,491	3,102,749
M	S	80+	958	2,141	2,153,274	2,412,632
M	D	<5	4,212	22,360	10,603,209	11,528,819
M	D	5-9	4,294	23,083	10,809,635	11,100,356
M	D	10-14	4,377	26,380	11,018,577	11,781,078
M	D	15-24	4,512	38,331	11,358,424	14,501,991
M	D	25-64	513	2,532	1,291,417	1,664,483
M	D	65+	92	2,739	220,309	1,374,267
F	M	<25	1,291	3,360	3,249,939	1,735,297
F	M	25-29	2,268	6,732	5,709,420	4,104,433
F	M	30-34	2,629	11,073	6,618,195	5,489,876
F	M	35-39	2,801	14,905	7,051,184	5,766,566
F	M	40-44	2,711	17,902	6,824,620	6,000,839
F	M	45-49	2,874	19,997	7,234,953	6,124,474
F	M	50-54	2,956	19,407	7,441,379	6,074,218
F	M	55-59	3,044	16,686	7,662,908	6,548,826
F	M	60-64	2,644	14,136	6,655,956	6,195,839
F	M	65-69	2,157	8,917	5,324,002	5,138,574
F	M	70-74	1,453	5,302	3,586,358	2,767,484
F	M	75-79	856	3,542	2,109,820	1,745,183
F	M	80+	713	3,199	1,692,614	1,494,443
F	S	<25	3,780	6,427	9,515,701	7,253,942
F	S	25-29	2,275	6,579	5,727,042	7,950,509
F	S	30-34	1,746	5,935	4,395,347	5,905,750
F	S	35-39	1,484	5,158	3,735,794	4,562,983
F	S	40-44	1,332	5,452	3,353,152	4,506,094
F	S	45-49	1,285	5,732	3,234,835	4,640,868
F	S	50-54	1,451	4,810	3,652,720	3,840,518
F	S	55-59	1,557	4,356	3,919,562	4,156,062
F	S	60-64	1,434	3,335	3,609,925	3,436,021
F	S	65-69	1,456	3,480	3,593,763	4,664,329
F	S	70-74	1,254	2,742	3,095,178	4,089,234
F	S	75-79	1,109	2,676	2,733,400	3,537,426
F	S	80+	2,497	5,017	5,984,190	7,577,104
F	D	<5	4,219	21,490	10,620,831	11,298,322
F	D	5-9	4,181	21,998	10,525,170	10,735,575
F	D	10-14	4,265	24,544	10,736,630	10,575,262
F	D	15-24	3,884	37,177	9,777,508	14,251,005
F	D	25-64	609	2,888	1,533,085	1,873,419
F	D	65+	196	3,395	478,757	1,833,513
	All		134,763	626,946	337,514,448	336,651,999

Source: DYNASIM3 (version 919) and Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).
1. Cells are further divided into following income groups (<0, 0-10K, 10-20K, 20-30K, 30-40K, 40-50K, 50-75K, 75-100K, 100-150K, 150-200K, 200K+).

TABLE 4

Percentage of Tax Model Individuals Matched to DYNASIM Individuals with Similar Characteristics, 2017

Income Category[1] (thousands of dollars)	Match Presence of Earnings	Earnings Within 25 Percent or Both <10K in Absolute Value	Couple Earnings Split Within 25 Percentage Points	Income Within 25 Percent or Both <10K in Absolute Value	Match Presence of Dependents	Age Within 2 Years	Match Presence of Pension Income in Tax Unit
<0	81	70	91	18	90	93	82
0-10	85	97	98	100	94	89	98
10-20	91	85	96	95	91	94	95
20-30	91	87	96	99	91	94	93
30-40	92	85	95	100	91	94	91
40-50	91	82	93	100	91	94	88
50-75	91	80	94	99	92	96	86
75-100	91	75	93	100	93	96	82
100-150	90	74	94	100	93	96	79
150-200	88	68	92	98	92	94	81
200+	86	56	92	54	91	95	80
All	89	81	95	96	92	94	89

Source: DYNASIM3 (version 919) and Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).
1. Individuals are categorized by tax unit level income. Income defined as adjusted gross income - taxable Social Security benefits.

TABLE 5

Distribution of Individuals with Social Security, SSI, Medicare, and Aged Medicaid in DYNASIM and Imported into Tax Model, 2017

Income Category[1] (thousands of dollars)	Social Security				Supplemental Security Income				Medicare			
	DYNASIM		Tax Model		DYNASIM		Tax Model		DYNASIM		Tax Model	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
<0	1,097,944	1.8	760,201	1.2	122,438	1.6	69,295	0.7	941,419	1.6	665,957	1.1
0-10	23,300,000	37.7	25,000,000	39.2	5,726,405	75.9	6,992,147	75.5	21,600,000	37.3	23,700,000	39.0
10-20	6,681,511	10.8	6,812,237	10.7	1,048,279	13.9	1,464,534	15.8	6,213,430	10.7	6,348,694	10.4
20-30	5,454,164	8.8	5,889,098	9.2	331,920	4.4	427,160	4.6	5,062,728	8.7	5,606,734	9.2
30-40	4,210,721	6.8	4,637,368	7.3	148,333	2.0	134,924	1.5	3,940,659	6.8	4,439,237	7.3
40-50	3,645,846	5.9	3,643,497	5.7	40,278	0.5	40,428	0.4	3,412,706	5.9	3,443,101	5.7
50-75	6,252,526	10.1	6,285,759	9.9	57,855	0.8	69,603	0.8	5,842,897	10.1	5,890,168	9.7
75-100	3,905,461	6.3	3,604,347	5.6	30,209	0.4	29,066	0.3	3,761,689	6.5	3,534,359	5.8
100-150	3,672,496	5.9	3,500,045	5.5	27,691	0.4	25,088	0.3	3,548,545	6.1	3,446,602	5.7
150-200	1,496,823	2.4	1,586,419	2.5	7,552	0.1	6,875	0.1	1,494,248	2.6	1,581,165	2.6
200+	2,027,622	3.3	2,082,798	3.3	5,035	0.1	5,943	0.1	2,145,192	3.7	2,105,678	3.5
All	61,745,114	100.0	63,801,769	100.0	7,545,995	100.0	9,265,063	100.0	57,963,513	100.0	60,761,695	100.0

Income Category[1] (thousands of dollars)	Aged Medicaid Acute Care Benefits				Aged Medicaid LTSS Benefits[2]			
	DYNASIM		Tax Model		DYNASIM		Tax Model	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
<0	82,253	1.2	72,383	0.8	19,444	0.7	23,096	0.7
0-10	5,748,804	85.9	8,047,647	89.3	2,137,763	81.2	3,017,392	85.6
10-20	410,172	6.1	449,179	5.0	189,878	7.2	210,697	6.0
20-30	198,929	3.0	209,210	2.3	118,077	4.5	127,140	3.6
30-40	74,834	1.1	70,561	0.8	40,614	1.5	32,657	0.9
40-50	38,969	0.6	30,803	0.3	26,626	1.0	23,528	0.7
50-75	75,990	1.1	66,270	0.7	56,251	2.1	58,183	1.7
75-100	52,881	0.8	43,598	0.5	35,584	1.4	22,356	0.6
100-150	9,490	0.1	11,012	0.1	7,022	0.3	10,605	0.3
150-200	2,468	0.0	2,599	0.0	-	-	-	-
200+	-	-	12,727	0.1	-	-	227	0.0
All	6,694,791	100.0	9,015,991	100.0	2,631,259	100.0	3,525,882	100.0

Source: DYNASIM3 (version 919) and Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).
1. Individuals are categorized by tax unit level income. Income defined as adjusted gross income - taxable Social Security benefits.
2. Long-term services and supports (LTSS) are sometimes called long-term care.

TABLE 6

Final Distribution of Social Security, SSI, Medicare, and Aged Medicaid Benefits Imported from DYNASIM into Tax Model Database, 2017

Income Category[1] (thousands of	All Tax Units		Social Security Benefits		SSI Benefits		Medicare Benefits	
	Count	Percentage	Amount (thousands of dollars)	Percentage	Amount (thousands of dollars)	Percentage	Amount (thousands of dollars)	Percentage
<0	1,106,778	0.6	11,272,600	1.2	315,038	0.6	7,542,618	1.1
0-10	43,035,578	24.6	326,562,000	34.4	43,950,500	81.4	303,575,000	43.0
10-20	23,081,924	13.2	101,569,000	10.7	5,835,135	10.8	75,000,500	10.6
20-30	20,586,011	11.8	91,913,900	9.7	2,021,949	3.7	64,358,100	9.1
30-40	15,443,367	8.8	72,471,300	7.6	693,975	1.3	48,610,000	6.9
40-50	11,967,312	6.8	59,973,500	6.3	251,101	0.5	37,217,100	5.3
50-75	20,555,843	11.7	99,774,500	10.5	400,492	0.7	62,494,300	8.9
75-100	13,243,551	7.6	58,917,400	6.2	220,933	0.4	36,641,200	5.2
100-150	13,065,639	7.5	60,186,900	6.3	215,744	0.4	34,644,600	4.9
150-200	5,895,828	3.4	27,709,100	2.9	59,741	0.1	15,530,400	2.2
200+	7,005,203	4.0	38,650,600	4.1	35,411	0.1	20,385,900	2.9
			-					
All	174,987,034	100.0	949,000,800	100.0	54,000,020	100.0	705,999,718	100.0

Income Category[1] (thousands of dollars)	All Tax Units		Aged Medicaid Acute Care Benefits		Aged Medicaid LTSS Benefits[2]	
	Number of Units	Percentage	Amount (thousands of dollars)	Percentage	Amount (thousands of dollars)	Percentage
<0	1,106,778	0.6	87,525	0.6	198,953	0.6
0-10	43,035,578	24.6	13,698,200	91.3	28,903,800	85.0
10-20	23,081,924	13.2	654,625	4.4	2,076,537	6.1
20-30	20,586,011	11.8	259,321	1.7	1,296,566	3.8
30-40	15,443,367	8.8	99,262	0.7	315,806	0.9
40-50	11,967,312	6.8	38,821	0.3	228,269	0.7
50-75	20,555,843	11.7	83,502	0.6	609,463	1.8
75-100	13,243,551	7.6	45,353	0.3	230,102	0.7
100-150	13,065,639	7.5	15,536	0.1	138,661	0.4
150-200	5,895,828	3.4	3,901	0.0	-	-
200+	7,005,203	4.0	13,951	0.1	1,818	0.0
				-		
All	174,987,034	100.0	14,999,997	100.0	33,999,975	100.0

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).
1. Income defined as adjusted gross income - taxable Social Security benefits.
2. Long-term services and supports (LTSS) are sometimes called long-term care.

TABLE 7

Distribution of Tax Units by Income in HIPSM and Tax Model, 2017

Income Category[1] (thousands of dollars)	HIPSM		Tax Model	
	Number of Units	Percentage	Number of Units	Percentage
<0	53,941	0.0	920,875	0.5
0-10	42,167,209	26.0	21,530,589	12.3
10-20	21,572,740	13.3	29,686,567	17.0
20-30	18,008,909	11.1	25,021,905	14.3
30-40	14,372,290	8.9	17,508,123	10.0
40-50	11,288,550	7.0	13,279,614	7.6
50-75	20,463,928	12.6	23,240,231	13.3
75-100	12,280,756	7.6	15,150,159	8.7
100-200	16,679,207	10.3	21,207,773	12.1
200+	5,205,389	3.2	7,441,198	4.3
All	162,092,918	100.0	174,987,034	100.0

Source: HIPSM-ACS and Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).
1. Tax units are classified by adjusted gross income.

TABLE 8

Distribution of Health Insurance Coverage in HIPSM and Imported into Tax Model, 2017

Individuals Under Age 65

Income Category[1] (thousands of	Medicaid				Employer-Sponsored Health Insurance				Non-group Coverage			
	HIPSM		Tax Model		HIPSM		Tax Model		HIPSM		Tax Model	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
<0	34,022	0.1	838,851	1.3	10,920	0.0	238,829	0.1	7,872	0.0	61,967	0.3
0-10	28,015,733	41.2	15,472,339	24.3	7,639,527	5.1	6,144,217	3.8	1,921,076	10.4	1,553,770	7.5
10-20	13,478,509	19.8	15,521,752	24.3	6,772,062	4.5	8,608,829	5.3	2,802,284	15.2	2,679,269	13.0
20-30	9,156,400	13.5	11,697,019	18.3	10,369,669	6.9	12,850,875	8.0	2,677,454	14.5	3,384,865	16.4
30-40	6,047,754	8.9	6,484,264	10.2	12,005,900	8.0	13,142,956	8.1	1,830,891	9.9	1,868,312	9.0
40-50	3,825,484	5.6	4,191,368	6.6	12,008,506	8.0	11,965,502	7.4	1,486,842	8.1	1,556,141	7.5
50-75	4,670,839	6.9	5,337,086	8.4	29,175,621	19.5	26,710,026	16.5	2,805,726	15.2	3,050,313	14.8
75-100	1,403,903	2.1	2,062,963	3.2	23,169,701	15.5	24,071,441	14.9	1,633,523	8.9	1,981,397	9.6
100-200	1,060,692	1.6	1,713,887	2.7	37,119,212	24.8	41,809,351	25.9	2,084,938	11.3	3,005,073	14.5
200+	256,949	0.4	478,198	0.7	11,239,447	7.5	15,882,750	9.8	1,167,596	6.3	1,526,972	7.4
All	67,950,286	100.0	63,797,727	100.0	149,510,565	100.0	161,424,775	100.0	18,418,203	100.0	20,668,077	100.0

Income Category[1] (thousands of dollars)	Other Public Coverage				Uninsured			
	HIPSM		Tax Model		HIPSM		Tax Model	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
<0	2,672	0.0	64,162	0.6	25,179	0.1	169,385	0.7
0-10	2,375,002	28.1	2,493,212	23.7	10,022,686	35.4	5,276,527	21.9
10-20	1,008,234	11.9	1,187,365	11.3	5,476,819	19.3	5,901,133	24.5
20-30	785,164	9.3	912,563	8.7	4,602,163	16.2	4,410,331	18.3
30-40	694,799	8.2	701,616	6.7	2,977,683	10.5	2,744,768	11.4
40-50	610,542	7.2	597,078	5.7	1,815,294	6.4	1,808,993	7.5
50-75	1,157,881	13.7	1,701,432	16.2	2,102,345	7.4	1,948,092	8.1
75-100	717,980	8.5	944,147	9.0	651,742	2.3	910,360	3.8
100-200	924,637	10.9	1,447,710	13.7	536,131	1.9	750,183	3.1
200+	181,626	2.1	485,359	4.6	132,354	0.5	195,475	0.8
All	8,458,537	100.0	10,534,644	100.0	28,342,396	100.0	24,115,246	100.0

Source: HIPSM-ACS and Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).

1. Individuals are categorized by tax unit's adjusted gross income.

TABLE 9

Final Distribution of Tax Units with Medicaid Benefits for Individuals Under Age 65 Imported from HIPSM into Tax Model, 2017

Income Category[1] (thousands of dollars)	All Tax Units		Tax Units with Under-Age 65 Medicaid			
	Count	Percentage	Count	Percentage	Amount[2] (thousands of dollars)	Percentage
<0	920,875	0.5	413,665	1.3	4,199,726	1.4
0-10	21,530,589	12.3	8,948,976	27.5	85,841,600	28.7
10-20	29,686,567	17.0	8,647,474	26.5	80,713,400	27.0
20-30	25,021,906	14.3	5,463,826	16.8	48,859,400	16.4
30-40	17,508,122	10.0	2,882,261	8.8	25,076,700	8.4
40-50	13,279,614	7.6	1,798,485	5.5	15,485,000	5.2
50-75	23,240,231	13.3	2,398,045	7.4	20,933,900	7.0
75-100	15,150,159	8.7	943,961	2.9	8,119,044	2.7
100-200	21,207,773	12.1	832,639	2.6	7,145,258	2.4
200+	7,441,198	4.3	255,099	0.8	2,259,147	0.8
All	174,987,034	100.0	32,584,431	100.0	298,633,176	100.0

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).
1. Tax units are classified by adjusted gross income.
2. Only includes federal-financed portion of benefits.

TABLE 10

Distribution of Tax Units with Employer Provided Health Benefits in Tax Model, 2017

Income Category[2] (thousands of dollars)	All Tax Units		Tax Units with Employer-Provided Health Benefits[1]			
	Count	Percentage	Count	Percentage	Amount (thousands of dollars)	Percentage
<0	920,875	0.5	206,020	0.2	1,529,600	0.2
0-10	21,530,589	12.3	4,570,349	5.1	30,769,600	3.2
10-20	29,686,567	17.0	6,953,177	7.8	46,912,400	4.9
20-30	25,021,906	14.3	9,594,882	10.7	73,855,100	7.7
30-40	17,508,122	10.0	9,369,955	10.5	77,756,500	8.1
40-50	13,279,614	7.6	8,051,536	9.0	74,112,500	7.7
50-75	23,240,231	13.3	16,038,438	18.0	164,067,000	17.1
75-100	15,150,159	8.7	11,611,680	13.0	147,918,000	15.4
100-200	21,207,773	12.1	16,996,579	19.0	250,159,000	26.0
200+	7,441,198	4.3	5,888,535	6.6	93,923,500	9.8
All	174,987,034	100.0	89,281,151	100.0	961,003,200	100.0

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).

1. Benefits include employer contributions and employee contributions through cafeteria plans for health insurance premiums, health savings accounts, health reimbursement arrangements, medical flexible spending accounts, dental insurance premiums, and vision insurance premiums.
2. Tax units are classified by adjusted gross income.

TABLE 11

Distribution of Tax Units with Premium Tax Credit in HIPSM and in Tax Model Using Imported Coverage[1], 2017

Income Category[2] (thousands of dollars)	HIPSM				Tax Model			
	Count	Percentage	Amount (thousands of dollars)	Percentage	Count	Percentage	Amount (thousands of dollars)	Percentage
<10	106,768	1.7	482,157	1.7	55,533	0.8	216,831	0.7
10-20	1,961,815	30.9	7,798,014	26.8	1,734,325	26.5	7,447,551	25.3
20-30	1,870,607	29.5	8,234,093	28.3	2,212,487	33.8	9,537,003	32.5
30-40	984,054	15.5	4,921,696	16.9	1,077,069	16.5	4,904,936	16.7
40-50	612,446	9.7	3,248,632	11.2	696,450	10.6	3,576,746	12.2
50-75	630,224	9.9	3,582,931	12.3	626,382	9.6	3,081,698	10.5
75-100	144,910	2.3	717,634	2.5	129,027	2.0	571,490	1.9
100-200	28,080	0.4	125,754	0.4	14,672	0.2	43,922	0.1
200+	-	-	-	-	-	-	-	-
All	6,338,906	100.0	29,110,912	100.0	6,545,944	100.0	29,380,178	100.0

Source: HIPSM-ACA and Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).
1. PTC simulated in tax model for tax units with imported marketplace coverage from HIPSM.
2. Tax units are classified by modified adjusted gross income which equals adjusted gross income plus tax exempt interest and non-taxable Social Security benefits.

TABLE 12

Distribution of Tax Units with SNAP in Any Month of 2011 by Beneficiary Type

	Tax Model			
	Count	Total Annual SNAP Benefits (thousands of dollars)	Average Annual Benefits for Units with SNAP	Average Number of Recipients in Units with SNAP
All	28,100,000	66,500,000	2,367	2.0
With Member Age 60+	4,928,062	9,870,000	2,003	1.6
With Disabled Member	7,389,943	15,400,000	2,084	1.7
With Children	11,400,000	41,600,000	3,649	3.2
Other	9,117,153	31,500,000	3,455	3.1
Without Earnings	12,300,000	22,000,000	1,789	1.5
With Earnings	15,900,000	44,500,000	2,799	2.4

	TRIM			
	Count	Total Annual SNAP Benefits (thousands of dollars)	Average Annual Benefits for Units with SNAP	Average Number of Recipients in Units with SNAP
All	27,700,000	67,000,000	2,419	2.0
With Member Age 60+	4,636,427	8,210,000	1,771	1.6
With Disabled Member	7,831,972	17,100,000	2,183	1.9
With Children	11,700,000	45,100,000	3,855	3.2
Other	8,913,827	34,000,000	3,814	3.2
Without Earnings	13,300,000	31,100,000	2,338	1.7
With Earnings	14,400,000	35,900,000	2,493	2.4

Source: TRIM3 and simulations in augmented extract from Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).

TABLE 13

Distribution of Tax Units with SNAP in Any Month in 2011 by Income

Income Category[1] (thousands of dollars)	Count	Total Annual SNAP Benefits (thousands of dollars)	Average Annual Benefits for Units with SNAP	Average Number of Recipients in Units with SNAP
		Tax Model		
All	28,100,000	66,500,000	2,367	2.0
<0	310,012	1,200,000	3,871	2.0
0-10	16,000,000	34,300,000	2,144	1.4
10-20	7,028,137	20,300,000	2,888	2.5
20-30	2,932,113	6,690,000	2,282	2.9
30-40	1,010,725	2,200,000	2,177	3.4
40-50	443,949	1,060,000	2,388	3.6
50-75	271,112	508,000	1,874	2.9
75-100	78,054	164,000	2,101	2.7
100-200	28,455	65,100	2,288	2.2
200+	1,259	6,850	5,441	3.5
		TRIM		
All	27,700,000	67,000,000	2,419	2.0
<0	72,488	239,000	3,297	1.8
0-10	16,700,000	42,200,000	2,527	1.7
10-20	5,460,293	14,100,000	2,582	2.2
20-30	3,153,344	6,680,000	2,118	2.6
30-40	1,324,645	2,360,000	1,782	3.1
40-50	501,022	771,000	1,539	3.3
50-75	358,979	573,000	1,596	3.4
75-100	43,391	78,300	1,805	3.6
100-200	13,677	34,800	2,545	2.9
200+	1,466	3,518	2,400	1.0

Source: TRIM3 and simulations in augmented extract from Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).
1. Tax units are classified by adjusted gross income.

TABLE 14

Distribution of Tax Units with SNAP in Any Month in 2011 by Average Annual Benefits

Tax Model				
Annual Benefit Category	Count	Total Annual SNAP Benefits (thousands of dollars)	Average Annual Benefits for Units with SNAP	Average Number of Recipients in Units with SNAP
All	28,100,000	66,500,000	2,367	2.0
<600	5,941,363	1,440,000	242	1.3
600-1,200	3,861,730	3,580,000	927	1.5
1,200-1,800	3,622,567	5,470,000	1,510	1.5
1,800-2,400	5,734,166	13,100,000	2,285	1.3
2,400-3,600	2,337,817	7,010,000	2,999	2.8
3,600+	6,649,879	35,900,000	5,399	3.4

TRIM				
Annual Benefit Category	Count	Total Annual SNAP Benefits (thousands of dollars)	Average Annual Benefits for Units with SNAP	Average Number of Recipients in Units with SNAP
All	27,700,000	67,000,000	2,419	2.0
<600	5,736,602	1,630,000	284	1.4
600-1,200	3,847,658	3,340,000	868	1.5
1,200-1,800	3,551,965	5,140,000	1,447	1.5
1,800-2,400	5,558,208	12,200,000	2,195	1.3
2,400-3,600	2,345,802	6,890,000	2,937	2.7
3,600+	6,616,240	37,800,000	5,713	3.6

Source: TRIM3 and simulations in augmented extract from Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).

TABLE 15

Distribution of SNAP Benefits in Tax Model by Income, 2017

Income Category[1] (thousands of dollars)	Tax Units with SNAP in Any Month of the Year		Total Annual SNAP Benefits (thousands of dollars)	
	Count	Percentage	Count	Percentage
All	30,681,666	100.0	63,487,000	100.0
<0	247,632	0.8	923,000	1.5
0-10	15,800,000	51.5	29,400,000	46.3
10-20	7,869,113	25.6	18,800,000	29.6
20-30	4,007,801	13.1	8,870,000	14.0
30-40	1,314,648	4.3	2,680,000	4.2
40-50	671,623	2.2	1,220,000	1.9
50-75	559,646	1.8	1,140,000	1.8
75-100	126,001	0.4	248,000	0.4
100-200	80,493	0.3	194,000	0.3
200+	4,709	0.0	12,000	0.0
Addendum				
CBO Baseline Projection for SNAP Benefits in CY 2017			63,520,750,000	

Source: Simulations in augmented extract from Urban-Brookings Tax Policy Center Microsimulation Model (version 0217-1T).

1. Tax units are classified by adjusted gross income.

TABLE 16

Components of Alternative Income Measures

	Market Income (MI)	Expanded Cash Income + Health Care Transfers (ECI + HC)	Disposable Income (DI)
Compensation			
· Wages and salaries	X	X	X
· Employee contributions to retirement plans	X	X	X
· Employer contributions to retirement plans	X	X	X
· DB pension accruals	X	X	X
· Employer-paid fringe benefits	X	X	X
· Employer's share of payroll taxes	X	X	X
Self-Employment and Flow-Through Income			
· Business/Farm income or loss (Schedules C & F)	X	X	X
· Rents, royalties, and income from trusts	X	X	X
· Partnership income or loss	X	X	X
· S corporation income or loss	X	X	X
Investment Income			
· Taxable interest	X	X	X
· Tax-exempt interest	X	X	X
· Dividends	X	X	X
· Net capital gains	X	X	X
· Inside buildup within DC retirement plans	X	X	X
Retirement Income			
· Taxable IRA distributions	X	X	X
· Taxable pension distributions	X	X	X
· Nontaxable pension distributions	X	X	X
Other Taxable Income	X	X	X
Corporate Income Tax Liability	X	X	X
Transfer Payments			
· Social Security benefits		X	X
· Unemployment compensation		X	X
· Worker's compensation		X	X
· Supplemental Social Security (SSI)		X	X
· Temporary Assistance for Needy Families (TANF)		X	X
· SNAP benefits (formerly food stamps)		X	X
· Other transfer payments		X	X
· Education assistance (Pell grants)		X	X
· Medicare		X	X
· Medicaid		X	X
· Children's Health Insurance Program (CHIP)		X	X
· ACA cost sharing subsidies		X	X
Taxes Subtracted			
· Individual Income Tax			X
· Payroll taxes			X
· Corporate Income Tax			X
· Estate Tax			X
· Excise Taxes			X

TABLE 17

Distribution of Income, Transfers, and Taxes by Income Quintile, 2017

Expanded Cash Income + Health Care Transfers Percentile [1, 2, 3]	Number of Tax Units (millions)	Market Income (MI)	Transfers	Expanded Cash Income + Health Care Transfers (ECI+HC)	Taxes	Disposable Income	Transfers as Percentage of MI	Taxes as Percentage of ECI+HC
				Average ($)				
All	175.0	81,900	13,100	94,900	17,800	77,100	16.0	18.8
Lowest Quintile	37.3	11,800	8,100	19,900	300	19,600	69.2	1.3
Second Quintile	37.6	23,400	14,500	37,900	2,600	35,300	61.9	6.8
Middle Quintile	35.8	45,000	16,000	61,100	6,900	54,200	35.5	11.3
Fourth Quintile	32.8	87,600	14,000	101,700	16,100	85,500	16.0	15.9
Highest Quintile	31.1	275,800	12,900	288,700	71,800	216,900	4.7	24.9

Source: Tax and transfer database constructed from extracts from Urban-Brookings Tax Policy Center Microsimulation Model, DYNASIM, and HIPSM with imputations targeted to tabulations from TRIM.
1. Expanded cash income plus health care transfers (ECI+HC) equals market income plus cash transfers plus health care transfers.
2. The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The incomes used for classification are adjusted for family size by dividing by the square root of the number of people in the tax unit. The percentile breaks are (in 2017 dollars): 20% $22,890; 40% $36,970; 60% $57,940; 80% $94,000.
3. Tax units with negative income are excluded from their respective income class but are included in the total.

TABLE 18

Share of Income, Transfers, and Taxes by Income Quintile, 2017

Expanded Cash Income + Health Care Transfers Percentile [1, 2, 3]	Market Income	Transfers	Expanded Cash Income + Health Care Transfers (ECI+HC)	Taxes	Disposable Income
			Percentage		
All	100.0	100.0	100.0	100.0	100.0
Lowest Quintile	3.1	13.3	4.5	0.3	5.4
Second Quintile	6.2	23.9	8.6	3.1	9.9
Middle Quintile	11.2	25.0	13.1	7.9	14.4
Fourth Quintile	20.0	20.1	20.1	16.9	20.8
Highest Quintile	59.9	17.5	54.1	71.7	50.0

Source: Tax and transfer database constructed from extracts from Urban-Brookings Tax Policy Center Microsimulation Model, DYNASIM, and HIPSM with imputations targeted to tabulations from TRIM.

1. Expanded cash income plus health care transfers (ECI+HC) equals market income plus cash transfers plus health care transfers.
2. The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The incomes used for classification are adjusted for family size by dividing by the square root of the number of people in the tax unit. The percentile breaks are (in 2017 dollars): 20% $22,890; 40% $36,970; 60% $57,940; 80% $94,000.
3. Tax units with negative income are excluded from their respective income class but are included in the total.

TABLE 19

Distribution of Transfers, Taxes, and Net Transfer Benefits by Income Quintile, 2017

Expanded Cash Income + Health Care Transfers Percentile [1, 2, 3]	Transfers	Cash Social Insurance [4]	Medicare	Means Tested Cash [5]	Means Tested Health [6]	Taxes	Net Transfers (Transfers - Taxes)	Percentage with Positive Net Transfer	Net Transfers as Percentage of ECI+HC
				Average ($)					
All	13,100	5,600	4,000	1,400	2,000	17,800	(4,700)	49.4	(5.0)
Lowest Quintile	8,100	900	700	2,600	4,000	300	7,900	74.6	39.6
Second Quintile	14,500	5,400	5,000	1,300	2,800	2,600	11,900	66.2	31.5
Middle Quintile	16,000	7,400	5,700	1,000	1,900	6,900	9,100	46.6	14.9
Fourth Quintile	14,000	7,600	4,800	1,000	700	16,100	(2,100)	33.4	(2.1)
Highest Quintile	12,900	7,600	4,200	800	300	71,800	(58,900)	18.7	(20.4)

Source: Tax and transfer database constructed from extracts from Urban-Brookings Tax Policy Center Microsimulation Model, DYNASIM, and HIPSM with imputations targeted to tabulations from TRIM.
1. Expanded cash income plus health care transfers (ECI+HC) equals market income plus cash transfers plus health care transfers.
2. The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The incomes used for classification are adjusted for family size by dividing by the square root of the number of people in the tax unit. The percentile breaks are (in 2017 dollars): 20% $22,890; 40% $36,970; 60% $57,940; 80% $94,000.
3. Tax units with negative income are excluded from their respective income class but are included in the total.
4. Cash social insurance benefits equal the sum of Social Security, unemployment insurance, and workers' compensation benefits.
5. Means tested cash benefits equal the sum of SNAP, SSI, TANF, LIHEAP, Pell grant, and veterans' benefits.
6. Means tested health benefits equal Medicaid/CHIP benefits and ACA cost-sharing subsidies.

TABLE 20

Share of Transfers by Income Quintile, 2017

Expanded Cash Income + Health Care Transfers Percentile [1, 2, 3]	Transfers	Cash Social Insurance [4]	Medicare	Means Tested Cash [5]	Means Tested Health [6]
			Percentage		
All	100.0	100.0	100.0	100.0	100.0
Lowest Quintile	13.3	3.4	3.8	39.7	41.9
Second Quintile	23.9	20.4	26.6	21.0	30.0
Middle Quintile	25.0	27.0	28.8	15.3	18.8
Fourth Quintile	20.1	25.2	22.2	13.6	6.1
Highest Quintile	17.5	23.8	18.6	10.1	2.7

Source: Tax and transfer database constructed from extracts from Urban-Brookings Tax Policy Center Microsimulation Model, DYNASIM, and HIPSM with imputations targeted to tabulations from TRIM.

1. Expanded cash income plus health care transfers (ECI+HC) equals market income plus cash transfers plus health care transfers.
2. The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The incomes used for classification are adjusted for family size by dividing by the square root of the number of people in the tax unit. The percentile breaks are (in 2017 dollars): 20% $ 22,890; 40% $36,970; 60% $57,940; 80% $94,000.
3. Tax units with negative income are excluded from their respective income class but are included in the total.
4. Cash social insurance benefits equal the sum of Social Security, unemployment insurance, and workers' compensation benefits.
5. Means tested cash benefits equal the sum of SNAP, SSI, TANF, LIHEAP, Pell grant, and veterans' benefits.
6. Means tested health benefits equal Medicaid/CHIP benefits and ACA cost-sharing subsidies.

TABLE 21

Distribution of Income, Transfers, and Taxes by Income Quintile, 2017

For Tax Units with Children

Expanded Cash Income + Health Care Transfers Percentile [1, 2, 3]	Number of Tax Units (millions)	Market Income (MI)	Transfers	Expanded Cash Income + Health Care Transfers (ECI+HC)	Taxes	Disposable Income	Transfers as Percentage of MI	Taxes as Percentage of ECI+HC
				Average ($)				
All	58.6	99,400	10,700	110,200	21,300	88,900	10.8	19.3
Lowest Quintile	14.0	14,700	9,200	23,900	(500)	24,400	62.5	(2.3)
Second Quintile	13.0	31,000	13,100	44,100	2,600	41,600	42.4	5.8
Middle Quintile	11.5	58,500	12,900	71,400	8,500	63,000	22.1	11.8
Fourth Quintile	10.1	108,100	10,300	118,400	19,600	98,700	9.5	16.6
Highest Quintile	10.0	349,100	7,700	356,800	92,800	264,100	2.2	26.0

Source: Tax and transfer database constructed from extracts from Urban-Brookings Tax Policy Center Microsimulation Model, DYNASIM, and HIPSM with imputations targeted to tabulations from TRIM.

1. Expanded cash income plus health care transfers (ECI+HC) equals market income plus cash transfers plus health care transfers.
2. The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The incomes used for classification are adjusted for family size by dividing by the square root of the number of people in the tax unit. The percentile breaks are (in 2017 dollars): 20% $ 22,890; 40% $36,970; 60% $57,940; 80% $94,000.
3. Tax units with negative income are excluded from their respective income class but are included in the total.

TABLE 22

Distribution of Transfers, Taxes, and Net Transfer Benefits by Income Quintile, 2017

For Tax Units with Children

Expanded Cash Income + Health Care Transfers Percentile [1, 2, 3]	Transfers	Cash Social Insurance [4]	Medicare	Means Tested Cash [5]	Means Tested Health [6]	Taxes	Net Transfers (Transfers - Taxes)	Percentage with Positive Net Transfer	Net Transfers as Percentage of ECI+HC
				Average ($)					
All	10,700	3,800	2,700	1,500	2,600	21,300	(10,600)	48.2	(9.6)
Lowest Quintile	9,200	800	500	3,000	4,800	(500)	9,700	83.9	40.7
Second Quintile	13,100	4,200	3,800	1,500	3,700	2,600	10,600	68.2	23.9
Middle Quintile	12,900	5,500	4,200	1,100	2,200	8,500	4,500	37.9	6.2
Fourth Quintile	10,300	5,100	3,200	1,000	900	19,600	(9,300)	22.3	(7.9)
Highest Quintile	7,700	4,200	2,400	600	500	92,800	(85,000)	9.5	(23.8)

Source: Tax and transfer database constructed from extracts from Urban-Brookings Tax Policy Center Microsimulation Model, DYNASIM, and HIPSM with imputations targeted to tabulations from TRIM.

1. Expanded cash income plus health care transfers (ECI+HC) equals market income plus cash transfers plus health care transfers.
2. The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The incomes used for classification are adjusted for family size by dividing by the square root of the number of people in the tax unit. The percentile breaks are (in 2017 dollars): 20% $22,890; 40% $36,970; 60% $57,940; 80% $94,000.
3. Tax units with negative income are excluded from their respective income class but are included in the total.
4. Cash social insurance benefits equal the sum of Social Security, unemployment insurance, and workers' compensation benefits.
5. Means tested cash benefits equal the sum of SNAP, SSI, TANF, LIHEAP, Pell grant, and veterans' benefits.
6. Means tested health benefits equal Medicaid/CHIP benefits and ACA cost-sharing subsidies.

TABLE 23

Distribution of Income, Transfers, and Taxes by Income Quintile, 2017

For Tax Units with Head or Spouse Age 65+

Expanded Cash Income + Health Care Transfers Percentile [1, 2, 3]	Number of Tax Units (millions)	Market Income (MI)	Transfers	Expanded Cash Income + Health Care Transfers (ECI+HC)	Taxes	Disposable Income (DI)	Transfers as Percentage of (MI)	Taxes as Percentage of (ECI+HC)
				Average ($)				
All	34.5	79,400	25,200	104,600	18,500	86,100	31.7	17.7
Lowest Quintile	4.5	8,100	10,000	18,100	400	17,700	122.8	2.1
Second Quintile	6.6	14,300	21,500	35,800	1,600	34,300	150.3	4.4
Middle Quintile	8.0	29,800	27,300	57,100	4,100	53,000	91.8	7.2
Fourth Quintile	7.7	66,300	28,700	95,100	11,500	83,600	43.3	12.1
Highest Quintile	7.7	245,900	31,200	277,100	65,600	211,600	12.7	23.7

Source: Tax and transfer database constructed from extracts from Urban-Brookings Tax Policy Center Microsimulation Model, DYNASIM, and HIPSM with imputations targeted to tabulations from TRIM.

1. Expanded cash income plus health care transfers (ECI+HC) equals market income plus cash transfers plus health care transfers.
2. The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The incomes used for classification are adjusted for family size by dividing by the square root of the number of people in the tax unit. The percentile breaks are (in 2017 dollars): 20% $ 22,890; 40% $36,970; 60% $57,940; 80% $94,000.
3. Tax units with negative income are excluded from their respective income class but are included in the total.

TABLE 24

Distribution of Transfers, Taxes, and Net Transfer Benefits by Income Quintile, 2017

For Tax Units with Head or Spouse Age 65+

Expanded Cash Income + Health Care Transfers Percentile [1, 2, 3]	Transfers	Cash Social Insurance [4]	Medicare	Means Tested Cash [5]	Means Tested Health [6]	Taxes	Net Transfers (Transfers - Taxes)	Percentage with Positive Net Transfer	Net Transfers as Percentage of ECI+HC
				Average ($)					
All	25,200	13,000	9,100	1,400	1,600	18,500	6,700	70.3	6.4
Lowest Quintile	10,000	1,700	1,700	2,800	3,800	400	9,600	80.6	53.0
Second Quintile	21,500	9,100	9,000	1,200	2,200	1,600	19,900	82.4	55.6
Middle Quintile	27,300	13,600	10,600	1,200	2,000	4,100	23,200	76.3	40.6
Fourth Quintile	28,700	16,300	10,500	1,300	700	11,500	17,200	71.1	18.1
Highest Quintile	31,200	19,200	10,600	1,200	300	65,600	(34,300)	46.6	(12.4)

Source: Tax and transfer database constructed from extracts from Urban-Brookings Tax Policy Center Microsimulation Model, DYNASIM, and HIPSM with imputations targeted to tabulations from TRIM.

1. Expanded cash income plus health care transfers (ECI+HC) equals market income plus cash transfers plus health care transfers.
2. The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The incomes used for classification are adjusted for family size by dividing by the square root of the number of people in the tax unit. The percentile breaks are (in 2017 dollars): 20% $22,890; 40% $36,970; 60% $57,940; 80% $94,000.
3. Tax units with negative income are excluded from their respective income class but are included in the total.
4. Cash social insurance benefits equal the sum of Social Security, unemployment insurance, and workers' compensation benefits.
5. Means tested cash benefits equal the sum of SNAP, SSI, TANF, LIHEAP, Pell grant, and veterans' benefits.
6. Means tested health benefits equal Medicaid/CHIP benefits and ACA cost-sharing subsidies.

NOTES

[1] For a further description of the TPC model, see http://www.taxpolicycenter.org/resources/brief-description-tax-model.
[2] TPC uses the Survey of Consumer Finances to impute wealth and retirement account contributions; the Consumer Expenditure Survey, Medical Expenditure Panel Survey, and American Housing Survey to impute household expenditures; the National Postsecondary Student Aid Study to impute information on postsecondary students; and the Kaiser Family Foundation/Health Research & Education Trust Employer Health Benefits Survey to impute employer-provided health benefits (EPHB).
[3] For a further description of DYNASIM, see Favreault, Smith, and Johnson (2015).
[4] The aging algorithms rely on a broad range of data sources, including the Health and Retirement Study, Medicare Current Beneficiary Study, and Panel Study of Income Dynamics. They also replicate program rules.
[5] For further description of DYNASIM's Medicare model, see the online appendix to Hatfield et al. (2016).
[6] Sometimes called "long-term care." For further description on DYNASIM's LTSS capacities, see the online appendix to Favreault, Gleckman, and Johnson (2015).
[7] The Urban Institute currently maintains two versions of DYNASIM. DYNASIM3 is based on pooled data from the 1990 through 1993 panels of SIPP. DYNASIM4 is based on pooled data from the 2004 and 2008 SIPP panels. Because portions of DYNASIM4 are just coming online, we used DYNASIM3 (version 919) for this analysis.
[8] For a further description of HIPSM, see Buettgens (2011) and Buettgens et al. (2013).
[9] For a further description of TRIM, see Zedlewski and Giannarelli (2015).
[10] While TRIM simulates SSI in detail, we import these benefits from DYNASIM to ensure consistency between SSI, Social Security, and Medicaid for the 65 and over population and because the current version of TRIM generally does not project into the future.
[11] See Ingram et al. (2000), Kum and Masterson (2008), Rohaly, Carasso, and Saleem (2005), and Smith et al. (2002) for further descriptions of statistical matching.
[12] The tax model database is constructed at the tax unit level, while DYNASIM is constructed at the individual level. For the match, we construct an individual-level version of the tax model database by applying tax unit weights to each member of the unit.
[13] Within cells, we limit the number of times a DYNASIM observation can be matched to a tax model observation to (*N* tax model / *N* DYNASIM), rounded down, plus 1. For example, if there are 200 DYNASIM observations and 420 tax model observations within a cell, 180 DYNASIM observations are used twice and 20 DYNASIM observations are used three times. Since the tax model database is larger, generally all DYNASIM observations are used in the match.
[14] The DYNASIM sample is not large enough to divide the over-$200,000 group into subgroups.
[15] We save the calibration factors for applying to benefits under policy alternatives.
[16] MAGI equals AGI plus tax-exempt interest and nontaxable Social Security benefits.
[17] We calibrate to HIPSM totals instead of totals from CBO because HIPSM's baseline projections differ from CBO's forecast. HIPSM's projected Medicaid enrollment is based on current state Medicaid expansion decisions, while CBO assumes some states that have not done so already will choose to expand their Medicaid programs in the future.
[18] See Kaiser Family Foundation and Health Research & Educational Trust (2016) for more information on the survey. We use the tax model's existing health module for EPHB for individuals age 65 and over.
[19] An important determinant of SNAP eligibility that we do not capture is immigration status.
[20] When constructing the tax model, we match public-use tax records to the CPS. Additionally, nonfilers in the tax model come from the CPS.
[21] Taxpayers can claim up to $3,000 in expenses for one child or $6,000 in expenses for multiple children. We impute expenses beyond the thresholds in the tax model by basing them on coefficients from models for units with expenses above the thresholds in TRIM.
[22] For more information on the tax model's education imputations, see Urban-Brookings Tax Policy Center, "Brief Description of the Tax Model," accessed August 25, 2017, http://www.taxpolicycenter.org/resources/brief-description-tax-model.

[23] Pension accrual is the annual increase in the present discounted value of future benefits associated with an additional year of service.
[24] Includes employee contributions to health insurance through cafeteria plans. Like employer contributions, these are excluded from AGI.
[25] We also add Pell Grants, which are excluded from ECI in the tax model.
[26] We include only the federally financed portion of Medicaid benefits.
[27] Adjusting the income classifier for unit size also pushes retirees, who are more likely to be in smaller units, up the income distribution.
[28] Income quintiles are defined for the entire population. Thus, units with children in the lowest quintile are those whose family-size adjusted income falls below $22,900, the cutoff for the bottom 20 percent for the entire population.
[29] See Leonard E. Burman, "A Tax Credit to Give Middle-Class Workers a Raise," *TaxVox* (blog), Urban-Brookings Tax Policy Center, August 2, 2017, http://www.taxpolicycenter.org/taxvox/tax-credit-give-middle-class-workers-raise. The proposed wage subsidy would be taxable and counted as income for determining eligibility for transfer benefits such as SNAP and Medicaid.

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