Economic Policy Institute

The Economic Policy Institute's Family Budget Calculator

Technical Documentation

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This paper presents the methodology and data sources used in the 2022 update of the Economic Policy Institute's Family Budget Calculator. EPI's Family Budget Calculator measures the monthly income a family needs in order to attain a modest yet adequate standard of living. The budgets estimate community-specific costs for 10 family types (one or two adults with zero to four children). Compared with the federal poverty line and the Supplemental Poverty Measure, EPI's family budgets provide a more accurate and complete measure of economic security in America.

The budget calculator draws upon the most recent reliable data, which in many instances is data for 2020. If 2020 data were unavailable, we used data from the latest available year inflated to 2020 dollars with the budget-item-appropriate inflator. The calculator now includes data for all 3,142 U.S. counties and county equivalents and for all 613 metropolitan areas. Previous versions of the calculator did not include county-level data; they included data for the metropolitan areas along with data for rural (nonmetropolitan) areas by state. Other specific changes to the methodology of individual components of the family budget calculator are noted within the description of each component.

View the EPI Family Budget Calculator

SECTIONS

Definitions of families

The size of a family dramatically affects the budget needed to maintain a modest yet adequate standard of living. We have constructed budgets for 10 different types of families in each area. These families include a single person with no children; a married couple with no children; single-parent families with one, two, three, or four children; and a married couple with one, two, three, or four children.

We make assumptions about each of the 10 family prototypes in order to generate specific cost estimates for each family type's tax liability, child care expenses, food costs, etc.

Our definition of a single person with no children assumes that he or she is employed and is the head of household

for federal income tax purposes. Our definition of a married couple with no children assumes both are employed, live together, and jointly file federal income taxes. Our definition of single-parent families assumes that the head of household is employed, lives with his or her children, and files as the head of household for federal income tax purposes. Our definition of two-parent families assumes that both partners are employed, live together with their children, and jointly file federal income taxes.

Families with one child are assumed to have a 4-year-old. Families with two children are assumed to have a 4-year-old and an 8-year-old. Families with three children are assumed to have a 4-year-old, an 8-year-old, and a 12-year-old. Families with four children are assumed to have a 4-year-old, an 8-year-old, a 12-year-old, and a 16-year-old.

Definition of areas

The EPI Family Budget Calculator presents data for all 3,142 U.S. counties and county equivalents as of 2020 (some locations are not inside any county but are defined as county-equivalents by the federal government for administrative and statistical reasons). We have also constructed cost estimates for all 613 metropolitan areas ("metro areas") using both metro-level data and aggregations of county data.

Where possible, the family budget metropolitan areas correspond with the metropolitan statistical areas (MSAs) delineated by the Office of Management and Budget (OMB) for application to U.S. Census Bureau data. OMB defines MSAs as having at least one urbanized area of 50,000 or more people, plus adjacent territory that has a high degree of social and economic integration with the core, as measured by commuting ties (OMB 2009).

Our number of metro areas (613) exceeds the nearly 400 official MSAs because our housing costs are calculated using fair market rent (FMR) areas. FMR areas are defined by the U.S. Department of Housing and Urban Development (U.S. Dept. HUD 2017). These FMR areas are used to help determine the value of rent subsidies offered to families in the nation's low-income rental assistance programs. FMR areas are divided into metropolitan FMR areas and nonmetropolitan FMR areas. When we refer to "metropolitan areas" or "metro areas," we are referring collectively to the MSAs and HUD metropolitan FMR areas in our data.

Counties located in metropolitan areas will have cost estimates available at both the county and metropolitan area levels, while nonmetro counties will have cost estimates available only at the county level.

Child care costs and out-of-pocket medical costs depend on whether an area is designated as a metro area or a nonmetro (rural) area.

Components of the EPI family budgets

The EPI family budgets consist of seven individual components: housing, food, transportation, child care, health care, taxes, and "other necessities." The following sections describe the methodology used to construct a monthly cost for each of these seven components across the 3,142 U.S. counties and 613 metro areas.

Housing

Data for rental costs come from the U.S. Department of Housing and Urban Development's fiscal year 2021 fair market rents (FMRs) (U.S. Dept. HUD 2021). HUD releases estimated fair market rents (FMRs) for every fiscal year to establish cost information for certain federal housing assistance programs. For example, FMRs are used to determine landlord reimbursements for accepting rental housing vouchers in over 600 FMR areas, and thus help ensure a sufficient supply of housing for these programs. HUD calculates FMRs for each FMR area using five-year data from the American Community Survey (ACS) and relies on the Office of Management and Budget for definitions of metropolitan areas. All counties that are not in FMR areas are classified as nonmetro counties. Because FMRs within metro areas are calculated at the metropolitan level, counties within the same metro area all have the same FMRs, and nonmetro counties each have their own FMRs.

Fair market rent estimates are provided at the 40th percentile of rental costs—the dollar amount below which 40 percent of standard-quality rental units are rented.

For each county that crosses into multiple FMR/metro areas, weighted FMR averages are calculated based on the share of the population living in each metro area located in the county's borders.

Finally, since FMRs within metro areas are provided at the metropolitan level only, counties within the same metro area all have the same FMR value. We adjust these numbers to create county-level variation using county-level ACS median gross rent data. We create a metro-level population-weighted average rent, and then apply the ratio of ACS metro rent to ACS county-within-metro rent to each county FMR that is calculated at the metro level.

HUD makes rental rates available for studio apartments and one-bedroom through four-bedroom apartments. The EPI family budgets assume that a one-adult household occupies a studio and a two-adult household occupies a one-bedroom apartment. Families with one or two children occupy a two-bedroom unit. Families with three or four children occupy a three-bedroom unit. Rental costs include shelter plus all tenant-paid utilities, excluding telephone service, cable or satellite service, and Internet service. Telephone service costs are included in "other necessities" within the family budgets.

Food

Data for food costs are taken from *Official USDA Food Plans: Cost of Food at Home at*

Four Levels, a report published by the Department of Agriculture's Center for Nutrition Policy and Promotion (USDA 2021). Presented there are the official USDA costs for four types of food plans that serve as national standards for nutritious diets: the "Thrifty Plan," "Low-Cost Plan," "Moderate-Cost Plan," and "Liberal Food Plan." We use the USDA Low-Cost Plan, which assumes that almost all food is bought at a grocery store and then prepared at home. We use June 2020 data, which represents the 2020 average weekly cost (Carlson, Lino, and Fungwe 2007). New in this edition of the Family Budget Calculator is that we now provide county-level food costs by adjusting the national cost estimates from the USDA for county-level food cost variance using a multiplier generated from 2019 data from Feeding America's Map the Meal Gap project (Feeding America 2021).

Family food costs are constructed from data for the categories child age 4–5 and child age 6–8 and from averages of male and female data at age 12–13, age 14–18, and age 19–50.

- For single-adult households, we use an average of the male age 19–50 data and the female age 19–50 data to represent the adult in the household. For married-couple households, we assume one male age 19–50 and one female age 19–50 are the two adults in the household. All costs in the USDA food plans table are for individuals in four-person families; for individuals in families of other sizes, USDA suggests making the following adjustments to account for differences in returns to scale:
  - One-person family: add 20 percent
  - Two-person family: add 10 percent
  - Three-person family: add 5 percent
  - Five-person family: subtract 5 percent
  - Six-person family: subtract 5 percent
- To calculate overall household food costs, we first adjust food costs for each person in the household and then sum the adjusted food costs.
- Example: For a one-parent, two-child household (a three-person family):

  Food cost = [(average [female age 19–50, male age 19–50]) × 1.05] + [child age 4–5 × 1.05] + [child age 6–8 × 1.05]

Note that for Alaska and Hawaii, separate food cost data are available in half-year increments. We use the average of the first and second half of 2017 to compute household food costs for Alaska and Hawaii because this average is most similar to the annual national data used for the other states. Note that only the USDA Thrifty Plan costs are provided for Alaska and Hawaii; cost data are not provided for Low-Cost, Moderate-Cost, or Liberal Food Plans. We therefore use the Thrifty Plan costs for these two states. In addition, Alaska and Hawaii only have data available for children ages 6–8 and 9–11, so we imputed values for 4-year-old children, 12-year-old children, and 16-year-old children by applying the ratio of costs for relative age groups using the national data for the age groups available for Alaska and Hawaii.

As the USDA notes, the USDA food plans represent a nutritious diet at four different cost

levels. The nutritional foundation of the plans is based on the 1997–2005 Dietary Reference Intakes, 2005 Dietary Guidelines for Americans, and 2005 MyPyramid food intake recommendations. In addition to cost, plans vary in terms of the specific foods and quantities of certain foods that make up the "market baskets" (week's worth of groceries, based on age and gender) in each plan (USDA 2007a, 2007b). According to the USDA, all four food plans are "based on 2001–2002 data and updated to current dollars by using the Consumer Price Index for specific food items" (USDA 2021).

For all U.S. counties and county equivalents, Feeding America's *Map the Meal Gap 2021* report provides average cost estimates for a meal consumed by a 19-to-50-year-old male under the USDA's Thrifty Food Plan. These county-level meal cost estimates are derived from data provided by Nielsen PLC that measures the costs of Universal Product Code (UPC) barcoded food items in over 65,000 stores across the country. We generate county-level multipliers to gauge the relative cost of food per county by dividing county-level meal costs by average meal costs. These multipliers are then applied to the USDA estimates of average meal costs to generate food costs that are more reflective of local food price variation.

Because USDA provides food cost estimates for Alaska and Hawaii at the state level, Alaska and Hawaii's county-level multipliers are calculated by dividing Feeding America's county meal costs by Feeding America's state average meal costs for Alaska and Hawaii, respectively. For all other counties in the remaining 48 states, multipliers are calculated by dividing Feeding America's county-level meal costs by Feeding America's average meal cost across all states excluding Alaska and Hawaii. After these multipliers are applied to the USDA weekly meal costs, they are scaled up to monthly and annual costs.

Metro-level food costs are derived by calculating population-weighted averages of the meal costs for the counties that constitute each metro area.

Child care

We use the Child Care Aware of America (CCAoA) 2020 publication *Picking Up the Pieces: Building a Better Child Care System Post COVID-19*, which relies on state-level data from Child Care Aware's 2020 State Child Care Resource and Referral Network survey. For the purposes of this study, we use data provided in Appendix Table 1, "2019 Average Annual Cost of Full-Time Center Based Care by State," and Appendix Table 2, "2019 Average Annual Cost of Full-Time Family Based Care by State" of CCAoA's publication. Several states in the survey rely on data from prior years, so costs for these states are adjusted for inflation in the CCAoA report. Since the COVID-19 pandemic materially changed the child care landscape and since the Family Budget Calculator strives to be less subject to idiosyncratic volatility, we use the 2019 and not the 2020 costs.

The family budgets also provide substate variation in child care costs. CCAoA provides data at the county level for a subset of states, but many counties within the states did not report data. To adjust child care costs to the county level, we create a ratio of the county-level costs of rent for two-, three-, and four-bedroom apartments to the population-

weighted state average of the same costs. We then adjust 50 percent of the child care costs using this ratio to estimate the variation in child care costs by county. We find this method to be theoretically sound because rental costs are a significant portion of the cost of running a child care operation (whether center-based or home-based), and variations in rents are also a reasonable proxy for variations in costs of living in general and therefore of wage differences within the state. Furthermore, on an empirical level, we find a similar range of estimated costs as well as a high correlation between our county-level estimates and those provided in the CCAoA report. If a metro area is in multiple states, we use a metro area population-weighted average of the counties within the metro area to come up with a single number for the metro area. All costs are inflated to 2020 dollars using the consumer price index (CPI) for child care and nursery school for all urban consumers (BLS 2021b).

We calculate our child care costs for our family types based on the following assumptions:

- One child = cost of 4-year-old care
- Two children = cost of 4-year-old care + cost of care for one school-age child
- Three children = cost of 4-year-old care + cost of care for one school-age child + cost of full-day summer care for one school-age child
- Four children = cost of 4-year-old care + cost of care for one school-age child + cost of full-day summer care for one school-age child

The following subsections explain these assumptions and cost estimates in greater detail.

Center-based care

We use cost estimates for center-based child care for counties that are within metro areas. We use center-based care estimates because center-based care is more regulated than family care and because the costs of center-based care do not fluctuate as much as the costs of family child care.

Family child care

Family child care (also sometimes called “home-based care”) is defined by CCAoA as “child care offered in a caregiver’s own home”; family child care providers “may be licensed or exempt from licensing,” “depending on the state’s licensing regulations” (CCAoA 2020).

We use cost estimates for family child care for the nonmetro counties, operating under the assumption that family child care is more accessible than center-based care for those located in rural areas.

Infant care

The family budget child care costs do not include costs for infant or toddler care because we do not include an infant or toddler as part of any of our family types. It should be noted,

however, that center-based infant and toddler care is significantly more expensive than center-based care for 4-year-olds, so the child care component of some families' budgets may be underestimated.

Four-year-old care

Four-year-old care is full-time, year-round care. To approximate the costs of care in metro areas and nonmetro areas, we use center-based and family child care estimates, respectively, for all 4-year-olds, taken from Appendix Tables 1 and 2 in CCAoA 2020.

School-age child care

In our calculations, we assume that school-age child care for an 8-year-old includes nine months of before- and after-school care and two months of full-time summer care. We assume that school-age child care for a 12-year-old includes only the two months of full-time summer care. For the 16-year-old, we assume child care is not necessary.

The State Child Care Resource and Referral Network survey for school-age care specifically represents the cost of nine months of before- and after-school care; it does not represent full-time care, nor does it include weekend care or full-day summer care. Both the full-time and part-time summer care data in Appendix Tables 1 and 2 (in CCAoA 2020) contain many missing values. In order to include summer care costs in the "school-age child care costs" that we use for the 8-year-old child, we impute our own summer care costs by assuming that the cost of full-time summer care for a month is twice the cost of before- and after-school care for one month, and we assume 8-year-olds need two months of full-day summer care. To the extent that parents need their children to be in care for additional time in the summer, we are underestimating the total cost of care.

We assume that 12-year-olds need full-day care during the summer months only; thus, our two months of imputed summer costs are added to families with three and four children. For families with four children, we assume child care is not necessary for the fourth child, who is assumed to be 16 years old.

State-level estimates for school-age child care are not available for Minnesota and North Dakota. Regional averages, based on the Census Bureau regions and divisions, are taken for these states (U.S. Census Bureau 2013). Minnesota and North Dakota fall into the West North Central Division; for these states we thus use regional averages constructed from the states in this division (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota).

Transportation

The family budgets have county-level transportation data as opposed to transportation costs based solely on metropolitan statistical area size. Prior to the 2018 update, the family budget calculator used MSA-based estimates from the Federal Highway Administration's 2009 National Highway Transportation Survey. The current calculator uses data provided

by the Center for Neighborhood Technology (CNT) and derived from CNT's Housing and Transportation affordability Index (H+T Affordability Index). Transportation costs in the H+T index are estimated by adding up three major components of transportation costs: auto ownership, auto use, and transit use. These components were estimated by CNT using data from the Consumer Expenditure Survey, the 2015 National Transit Database, CNT's AllTransit database, and the Illinois Department of Natural Resources (CNT 2017).

In the data provided to EPI, CNT modified these costs to account for the different family sizes in the Family Budget Calculator, as well as to account for assumptions made about trip purpose. Adults in all family types are assumed to be working and, for the purposes of CNT's cost model, are assumed to be commuters. At our request, CNT adjusted the miles traveled component of their equation to only include work and nonsocial trips for the first adult in a household, and only work trips for the second adult (in two-adult households). Using national data from the 2009 National Highway Transportation Survey, this comes to 72 percent of average total vehicle miles traveled for the first adult, and 45 percent of average total vehicle miles traveled for the second adult, if applicable.

This 2022 update inflates the transportation data to 2020 dollars using the regional transportation CPI (BLS 2021c).

Health care

Health care expenses have two components: Affordable Care Act (ACA) health insurance exchange premiums and out-of-pocket expenditures. The Family Budget Calculator assumes that families have purchased insurance through the health insurance exchanges created by the ACA.

Premiums are obtained through The Henry J. Kaiser Family Foundation's *2021 Health Insurance Marketplace Calculator* (Kaiser 2021), compiled from the U.S. Department of Health and Human Services (HHS 2021a).

Premiums

Premium costs are obtained through the Henry J. Kaiser Family Foundation's *2021 Health Insurance Marketplace Calculator* (Kaiser 2021), compiled from the U.S. Department of Health and Human Services (U.S. Dept. HHS 2021a). Premiums are based on the lowest-cost bronze plan in the rating area, adjusted for family size, age of user, and tobacco surcharge (Kaiser 2021). The family budgets assume all adults are 40-year-old nonsmokers.

Out-of-pocket costs

The method for calculating out-of-pocket costs for the current Family Budget Calculator follows the 2018 methodology and both differ slightly from the prior editions of the calculator because those relied on data from HHS's Medical Expenditure Panel Survey (MEPS), specifically the geocoded restricted-use MEPS files, which are not publicly

available after the 2012 data year file. For the current Family Budget Calculator, we calculate out-of-pocket costs using three-year averages from the restricted-use geocoded version of the MEPS "Household Component (Full year Consolidated Files)" for 2017, 2018 and 2019, adjusted to 2020 dollars (U.S. Dept. HHS 2017b). The new data were provided by request, according to the specifications listed below, by the Agency for Healthcare Research and Quality onsite data center (AHRQ 2021).

We assume that everyone has private health insurance (defined by the variable PRIV12 in the public-use files). Out-of-pocket medical expenditures are calculated for adults and children separately by region and are differentiated between MSAs and non-MSAs for those covered by private insurance (U.S. Dept. HHS 2021b). Costs are estimated as follows:

- We use the regional breakdown of costs for both adults and children (with the regions defined as Northeast, Midwest, South, and West).
- The data are further divided within each region into MSA data and non-MSA data. For out-of-pocket costs, we use metro area data for counties in metro areas and we use nonmetro data for nonmetro counties (see the above section titled "Definition of areas" for more detail on the distinction).
- We classify a child (regardless of family size) as age 17 and under, and an adult as age 18–64 (using the variable AGE12X). We do not break down data for children into smaller age groups or by gender because the resulting sample sizes are too small.
- Adult out-of-pocket costs are the average costs (variable TOTSLF12) for adults ages 18–64 with private insurance in the region where the family resides (Northeast, Midwest, South, or West) and for the metropolitan classification of their location within that region.
- Child out-of-pocket costs are the mean costs for children ages 0–17 with private insurance for the region and for the metropolitan classification within that region.
- We compute total out-of-pocket costs (OOP) in the following way:

  [(number of adults) × (adult OOP)] + [(number of children) × (child OOP)]

- The total out-of-pocket costs are adjusted for inflation to 2020 dollars using the regional breakdowns of the Consumer Price Index-All Urban Consumers for Medical Care (CPI-U-MC) from the Bureau of Labor Statistics (BLS 2021d).
- When computing the mean, we use a population weight (variable PERWT12F).

Total health care costs

We compute total health care costs in the following way:

[Total premium] + [Total out-of-pocket cost]

EPI's family budgets do not take into consideration the two types of health insurance subsidies available through the state and federal health insurance exchanges: the

premium tax credit and the cost-sharing subsidy. Therefore, the health care budget may be overestimated for some families.

Other necessities

Our calculation of "other necessities" is derived from Bureau of Labor Statistics (BLS) Consumer Expenditure Survey (CEX) data (BLS 2021a). We define "other necessities" as items that do not fall into the aforementioned categories but that are necessary for a modest yet adequate standard of living. Since the COVID-19 pandemic materially changed the mix of goods and services consumed in 2020 and the Family Budget Calculator strives to be less subject to idiosyncratic volatility, we use the 2019 and not the 2020 expenditures to calculate other necessities. We include the following expenditures from the CEX in our "other necessities" calculation: apparel, personal care, household supplies (including furnishings and equipment, household operations, housekeeping supplies, and telephone services), reading materials, and school supplies. In editions of the Family Budget Calculator prior to the 2018 update, we also included the CEX expenditures "entertainment" and "other miscellaneous items" in our total for "other necessities," but for now we leave these two categories out of our calculations so that we can more narrowly assess what is the bare minimum income required to get by.

We use the CEX data for families in the second fifth from the bottom of the overall income distribution (those in the 20th- to 40th-percentile range). Using the 2019 CEX expenditure table "Quintiles of income before taxes," we sum the values of the categories mentioned above to create an "other necessities" aggregate number, and then divide this by CEX food and housing costs. In 2019, we determine this proportion to be 36.2%. Therefore, we estimate the cost of other necessities by applying this percent to each respective family budget's food and housing costs.

Taxes

The family budget components, without taxes, sum to the family's post-tax income. To calculate the family budget tax component, a pre-tax income level must be estimated using a tax rate and the post-tax income.

We use the National Bureau of Economic Research's TAXSIM, a microsimulation model of the U.S. federal and state income tax systems accessed online. We use Version 32 to calculate these tax rates (NBER 2021). The TAXSIM model accepts 32 input variables, including state, marital status, dependent exemptions, wage income, other incomes, rent paid, child care expenses, and capital gains and losses (Feenberg and Coutts 1993). We run the TAXSIM model for each family type across all county and metro areas. Although the TAXSIM Version 32 includes the Economic Impact Payments as part of the Coronavirus Aid, Relief, and Economic Security Act, we remove them to reflect a more evergreen and less idiosyncratic Family Budget Calculator.

Our input variables are (variables not listed are input as zero):

- State
- Marital status ("single" for one-adult families, "married" for two-adult families)
- Dependent exemptions (one for each child)
- Wage and salary income of taxpayer (entire post-tax family budget for one-adult families)
- Wage and salary income of spouse (for two-adult families, the post-tax family budget was split evenly between the two adults)
- Rent paid (the annual cost of rent for each family budget, which is used to calculate state property tax rebates in certain states)
- Child care expenses (the annual cost of child care for each family budget)
- Number of dependents under age 17 (one for each child)

The TAXSIM model takes these inputs and calculates three outputs: federal tax liability, state tax liability, and Federal Insurance Contributions Act (FICA) tax liability (for Social Security and Medicare taxes). Additionally, the TAXSIM model calculates FICA liability as the full 15.3 percent tax from both the employer and employee side; we cut this in half to more accurately represent the typical taxpayer's FICA liability. Local taxes, such as county- or city-level income taxes, are not included in this model. Sales taxes are also not included in the "taxes" category (they are instead wrapped into the costs of taxable expenditures in other categories).

Of course, we cannot simply input the post-tax family budgets as the wage incomes and use the TAXSIM output as the tax rates. The tax rate must be based on the pre-tax income levels. To obtain an accurate tax rate and accurately calculate the income tax liability for each family, we first input the post-tax family budgets and obtain the tax rates and establish these as a lower floor for tax rates. (Because the pre-tax incomes will almost always be higher than these post-tax incomes, these tax rates must be lower than the actual tax rate given our assumptions about sources of income and the income ranges we are considering). We then establish an upper bound of tax rates by taking the post-tax family budgets, multiplying by 1.25, and inputting the resulting amounts into the TAXSIM model.

Once we have the lower and upper bounds of tax rates, we calculate an accurate average of these tax rates using a weighting procedure, described below:

1. Multiply the lower bound (post-tax family budget) and upper bound (post-tax family budget × 1.25) inputs by (1 – calculated tax rate)
2. Calculate the difference between the actual post-tax family budget and the lower bound calculated in step 1: [post-tax family budget – lower bound]
3. Calculate the difference between the upper bound and the actual post-tax family budget calculated in step 1: [upper bound – post-tax family budget]
4. Calculate the difference between the upper bound and the lower bound calculated in step 1: [upper bound – lower bound]

5. Calculate the weight for the lower bound: upper-bound post-tax budget difference divided by the upper–lower difference:
$$\frac{[upper\ bound - post\ tax\ family\ budget]}{[upper\ bound - lower\ bound]}$$
6. Calculate the weight for the upper bound, which is equal to [1 – weight for lower bound (calculated in step 5)]
7. Multiply the lower-bound tax rate from TAXSIM by the lower-bound weight from step 5: lower-bound tax rate $\times \frac{[upper\ bound - post\ tax\ family\ budget]}{[upper\ bound - lower\ bound]}$
8. Multiply the upper-bound tax rate from TAXSIM by the upper-bound weight from step 6: upper-bound tax rate $\times$ [1 – lower weight (calculated in step 5)]
9. Add these two weights to get the final, weighted tax rate: [step 7 + step 8]

The final tax rate calculated in step 9 is then applied to the post-tax family incomes [post-tax family budget $\times$ (1 + final weighted tax rate)], to obtain a pre-tax income. The difference between the pre- and post-tax incomes is the annual tax bill for the family budget unit.

In cases where the post-tax budget exceeds the bounds, we increase the budget multiplier by increments of .05 (1.30, 1.35, 1.40, 1.45, 1.50) until the post-tax budget no longer exceeds the upper bound.

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