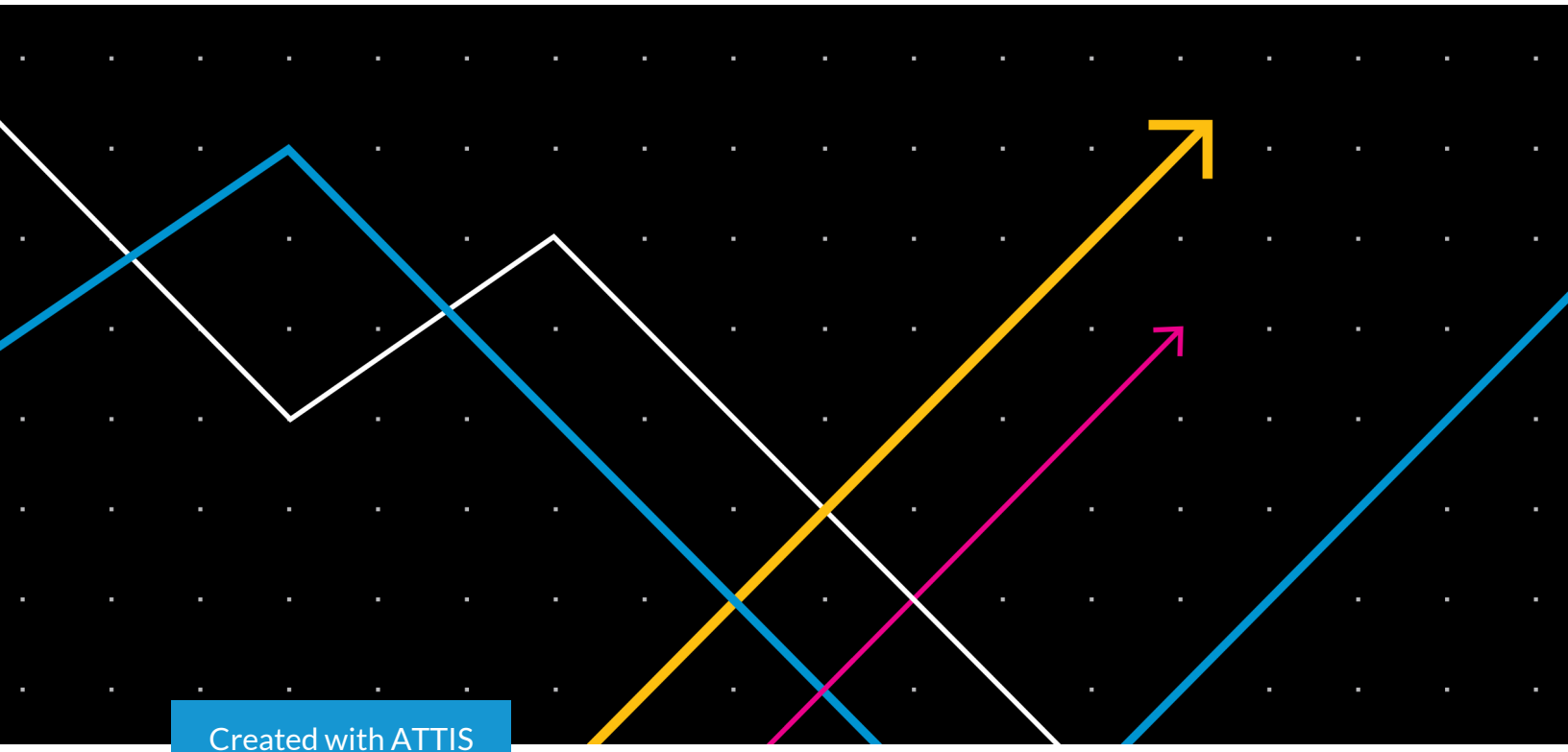

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TECHNICAL REPORT

Simulating the Effects of a $15 an Hour Federal Minimum Wage on Poverty and Resources

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URBAN INSTITUTE

Robert Wood Johnson Foundation

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The Urban Institute's Analysis of Transfers, Taxes, and Income Security (ATTIS) microsimulation model allows Urban experts to examine how today's safety net supports US families and how changes to it could affect their economic well-being. By using data and evidence created with ATTIS, today's decisionmakers are better positioned to advance equitable and effective policy solutions that help individuals and families meet their basic needs. To learn more, visit urban.org/attis.

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Executive Summary

This technical report describes the methods used to estimate the potential impacts of a $15.00-per-hour minimum wage on poverty, family earnings, and family resources, using the Urban Institute's state-level microsimulation model: the Analysis of Transfers, Taxes, and Income Security (ATTIS) model (Acs, Giannarelli, Werner, and Biu 2022). It serves as a technical resource for readers of that analysis interested in more detail on the methodology and provides a detailed case study of how a comprehensive microsimulation model can be used to assess the impacts of a change in policy with numerous secondary impacts.

The ATTIS model uses household data from the American Community Survey (ACS) and allows for both national and state-level analysis. The model is comprehensive, computing payroll taxes and federal and state income taxes and estimating eligibility, benefits, and enrollment for all the major benefit programs—Supplemental Security Income (SSI), Temporary Assistance to Needy Families (TANF), child care subsidies through the Child Care and Development Fund (CCDF), public and subsidized housing, the Supplemental Nutritional Assistance Program (SNAP), the Low-Income Home Energy Assistance Program (LIHEAP), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and unemployment benefits. ATTIS can also adapt an available survey data file to better represent a different year and can impose externally established changes in employment.

The data supporting this analysis include an ACS data file we modified to better represent population characteristics, employment levels, and income amounts in 2022. We augmented that data file by developing a set of baseline simulations reflecting taxes and means-tested benefits in 2022 (described in the "Setting the Baseline for 2022" section below). The technical approach to the minimum wage analysis involved modifying wage rates in response to the hypothetical increase in the federal minimum wage; capturing the secondary impacts of the wage increases on families' taxes, tax credits, and means-tested benefits; and imposing various assumptions about how higher wages might affect employment. We use the Supplemental Poverty Measure (SPM) to assess poverty.

As described in Acs and colleagues (2022), these methods suggest that a $15.00-per-hour minimum wage could reduce the SPM poverty rate by 2.1 to 2.4 percentage points across a range of assumptions about job loss. This translates to between 6.9 and 7.6 million people having their families' incomes raised above the poverty level. The microsimulation methodology also allows us to consider in greater detail the secondary impacts of the minimum wage increase on benefits and taxes, the variation across

families in the degree to which their total resources are affected, and the antipoverty impacts for narrower subgroups of the population. Findings include the following:

- If we assume that a $15.00-per-hour minimum wage does not create any loss of employment, higher wages reduce aggregate means-tested benefits by an amount equal to about 5 percent of the total increase in pretax wages, and aggregate taxes (including payroll taxes and federal and state income tax liabilities after all tax credits) rise by about 21 percent of the total increase in pretax wages.
- If we do not model any job loss, 81 percent of people in households with at least one person getting a wage increase are estimated to experience an increase of at least 1 percent in family resources; fewer than 1 percent of affected people experience a reduction in family resources, which can occur if the earnings increase triggers the loss of a benefit.
- If we assume that any affected worker has some chance of losing employment for at least a portion of the year, 79 percent of people in affected households experience an increase in family resources of at least 1 percent, and about 3 percent would experience a reduction of at least 1 percent.
- People affected by the minimum wage increase whose family resources before the increase were less than half the SPM poverty threshold are the most likely to experience large increases. Among this group of affected people, if we do not assume any job loss, 38 percent experience an increase in family resources of at least 50 percent.
- Among working-age adults, Hispanic women and Hispanic men are projected to experience the largest reductions in SPM poverty. When we assume that any affected individual has a chance of some job loss during the year, the SPM poverty rate is projected to decline by 4.4 percentage points for Hispanic women (compared with 2.5 points for all working-age women); and the SPM poverty rate is projected to decline by 4.2 points for Hispanic men (compared with 2.3 percentage points for all working-age men).

In this technical report, we describe how we projected available ACS data to represent 2022; summarize key aspects of the 2022 baseline simulations; and explain the approaches used to impose the $15.00-per-hour minimum wage, capture the secondary impacts, and simulate potential reductions in employment. We also describe the extent of secondary impacts and present the different types of results that occur across families. The methodological information could be useful to individuals considering the results presented in the corresponding brief by Acs and colleagues (2022) and the detailed results illustrate key capabilities of microsimulation modeling.

Errata

This report was revised September 23, 2022. On page 13, we clarified that we adapted the Congressional Budget Office's (2019) process for applying employment elasticities in our simulations rather than using the precise parameters from CBO's analysis.

Simulating the Effects of a $15 an Hour Federal Minimum Wage on Poverty and Resources

Modifying the Data to Represent 2022

To estimate the effects of a $15.00-per-hour minimum wage as if it were imposed in 2022, we modified an existing ACS data file, as actual data for 2022 will not be available until late 2023. We used the 2018 ACS as the underlying data source because data for 2021 are not available yet and data collection for the 2020 ACS was affected by the pandemic. Also, the use of the 2018 data (instead of 2019) allowed us to build on earlier work that prepared the ACS data for use within ATTIS.[1] Starting from the 2018 ACS data, we projected the data to represent the US population, employment levels, wage rates, and other elements of the economy in 2022. Some notable differences between 2018 and 2022 include a lower employment-to-population ratio in 2022, a larger and somewhat older population, and substantially higher wages and prices because of inflation. All those differences could affect the antipoverty impacts of a minimum wage increase. We adjusted the size and characteristics of the population, the numbers of employed people, and the levels of various types of income.

Population Adjustment

We used a set of modified population weights reflecting a total of 322 million people living in households, instead of the total of 319 million in the 2018 ACS data. (ATTIS does not include effects for people in institutions and other group quarters.) We adjusted the original weights by different factors depending on a person's demographic characteristics and state of residence to capture expected changes in the population's size and composition. For example, Hispanic people constitute 18.4 percent of the 2018 population according to the unadjusted 2018 ACS data, and in the adjusted data Hispanic people constitute 18.9 percent.[2] As another example, the 2018 ACS shows that 22.9 percent of the population is under age 18 and 15.9 percent is age 65 or over; in the adjusted data, the portion under 18 is slightly lower (22.5 percent) and the portion age 65 or over is higher (17.3 percent). The adjustments were developed based on 2021 Census Bureau population projections and may not fully capture the characteristics of the 2022 population.[3]

Employment Adjustment

We adjusted employment in the ACS data to come close to actual employment data at of the start of 2022, and to approximate a combination of actual and projected data for increased employment through the remainder of the year.

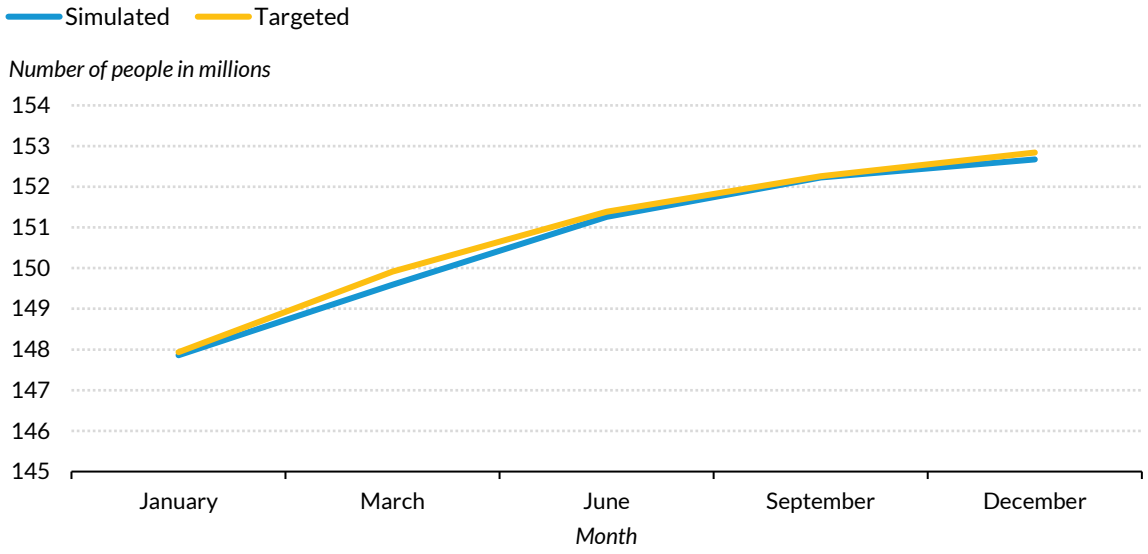
We modified employment in the early months of the projected 2022 data to mimic information from the monthly Current Population Survey (CPS) files regarding the portion of adults with earnings.[4] We targeted the overall portion with earnings (57.4 percent) as well as the portions with earnings in numerous demographic subgroups, including categorizations by age group; sex; race and ethnicity; marital status; whether a parent of a young child (under age 6), a parent of an older child, or not a parent; educational attainment; citizenship status; and metropolitan status. We also targeted the distribution of employed people by occupation from the monthly CPS data, and the distribution of jobs by state and by industry from the Bureau of Labor Statistics' Establishment Survey.[5] To reach these start-of-year targets, we probabilistically selected some people with earnings in the 2018 data to be out of work at the start of 2022. The probability a person with earnings at the start of 2018 was selected to be out of work at the start of the year in the data representing 2022 varied by the aforementioned characteristics; we came very close to the targeted percentage of each subgroup with earnings.

Among the people selected to be out of work at the start of 2022 (who worked at the start of 2018), the duration of nonwork varied by industry and state, capturing the relative increases in numbers of jobs by industry according to Establishment Survey data through spring of 2022 (when these projections were completed), and the expected overall trend in job numbers for the rest of the year according to the Survey of Professional Forecasters conducted by the Philadelphia Federal Reserve Bank in early May 2022.[6] (We used the trend rather than specific numbers because our concept—people with earnings—is slightly different from numbers of jobs.) Specifically, among the 2018 workers selected to be out of work at the start of 2022, some were simulated to only be out of work in January 2022 (and to have earnings again starting in February); others were simulated to be out of work January and February, and so on, with some people simulated as having no earnings throughout the year. The simulated trend in monthly employment closely matched the targeted trend, with the number of people with earnings in December 2022 (152.8 million) 3.3 percent higher than the number in January 2022 (147.9 million). See figure 1 for more details.

FIGURE 1

Simulated and Targeted Numbers of People with Earnings

January 2022 and the end of each quarter



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Source: Simulated data are from the Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022. Targeted figures start from the actual January 2022 figure from the monthly Current Population Survey, with the anticipated trend of increase through 2022 based on the Philadelphia Federal Reserve Bank's (2022) second quarter survey of professional forecasters.
Note: To allow differences between the simulated and targeted data to be visible, the graphic shows only the range from just below to just above the numbers relevant during this period.

A final adjustment involved selecting a small number of individuals working full time in the 2018 data and reducing their weekly hours by half in the simulated 2022 data to capture that the percentage of part-time workers was slightly higher in 2022 than in 2018 among some subgroups—in particular, parents of young children, people in food preparation and serving-related occupations, and people with no more than a high school diploma. We phased out the imposition of part-time status using the same trend used to phase out the simulated job loss. In months when an individual was simulated to work part time instead of full time, the worker's earnings were reduced by half (e.g., 40 hours per week were reduced to 20 hours per week).

Wage and Salary Adjustments

We adjusted earnings to capture nominal increases in overall earnings over the four-year period and to capture the higher minimum wages in many places in 2022 compared with 2018.

Initially, we inflated all wage and salary values in the data by 19.4 percent, which was computed as the percentage increase in average weekly hourly wages from 2018 to 2021, according to monthly CPS data (12.6 percent), multiplied by an additional 6 percent increase to account for expected inflation from 2021 to 2022.[7]

Next, we adjusted wages to reflect minimum wage increases in many states (and in some cases in cities or counties) between 2018 and 2022. To do this, we first computed an implied hourly wage for each worker by dividing annual earnings by the product of weeks of work and usual hours per week.[8] (This process assumes that people work at the same pay rate for the whole year.) We then compared that pay rate to the 2018 and 2022 minimum wages in the person's state, or in some cases their city or county. If the person appeared to have a wage at or above the applicable 2018 minimum (using the earnings before the 19.4 percent increase) but below the applicable 2022 minimum wage even after the 19.4 percent increase, we increased their earnings by an additional amount to bring their wages up to that minimum.[9] This process used the minimum wages in place in each state as of January 2022. (If a state increased their minimum wage subsequent to January 2022, our 2022 wages in that state do not capture that increase.)

In some cases, the minimum wage in a state is more complex than a single number, and to the extent possible we tried to capture those variations. For the following states, we captured at least one city- or county-specific rate: California, Colorado, Illinois, Maine, Maryland, Minnesota, New York, Oregon, and Washington. Also, some states and localities have minimum wages that differ by the size of the employer; if a person's 2018 wage rate was in the range suggesting they might be covered by the small-employer minimum wage, we raised their 2022 wage to the new wage for small employers.[10]

As an example of the various steps, consider a person working 52 weeks for 40 hours each week, with original 2018 earnings of $15,200, in a place where the minimum wage increased from $7.25 to $9.00 per hour. The person's original 2018 earnings suggest a wage rate of $7.31:

$$\frac{15{,}200}{52\ x\ 40} = \$7.31$$

After the initial 19.4 percent adjustment to earnings, the revised earnings give a wage rate of $8.72, which is still lower than the 2022 minimum wage of $9.00 in their area. We therefore increase the person's 2022 annual earnings up to $18,720 to produce an implied wage of $9.00 per hour.

As a final step, we compared the distribution of 2022 hourly wages in each state produced by this process to the distribution according to monthly CPS data across the first three months of 2022. Specifically, we looked at the information collected only from each survey's outgoing rotation groups

(ORG), asking those individuals about their exact hourly or weekly wages. In general, the wage distribution in the adjusted ATTIS data included too many wage earners at lower levels. Based on an assumption that this is partly because of an overreporting of average hours of work per week among lower-earning workers (who are more likely to work variable schedules), we assumed that wage earners with implied wages between $7.00 and $15.00 per hour overreported their average hours per week by three hours; this assumption results in a slight increase in implied hourly wage relative to the results without this adjustment.[11]

Following all of the adjustments, we compared the hourly wages in the simulated ATTIS data representing 2022 with the hourly wage data in the January through March CPS data (table 1). The overall median hourly wage among workers in the ATTIS 2022 data is $23.26, which is very close to the figure of $23.57 in the CPS. The simulated ATTIS data have 5.6 percent more workers with wages between $7.00 and $15.00 per hour, and 3.3 percent fewer workers with wages between $15.00 and $18.00 per hour; however, within each of those ranges, the median wage for the group is within a few cents of the comparable median in the CPS data.

TABLE 1

Comparison of Wage Data in Projected ACS with Monthly CPS

January through March 2022

	Number of Workers Jan–Mar, Average			Median Wage, Jan-Mar, Average		
Wage category	Projected ACS (millions)	CPS (millions)	ACS/CPS (%)	Projected ACS ($)	CPS ($)	ACS/CPS (%)
$7–$15	22.6	21.4	105.6	12.05	12.00	100.4
$15–$18	20.0	20.7	96.7	15.99	16.00	99.9
All workers	140.9	140.6	100.3	23.26	23.57	98.7

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022. Authors' tabulations of Current Population Survey monthly surveys for January, February, and March 2022.

Notes: ACS = American Community Survey; CPS = Current Population Survey. The tabulations include people whose earnings are entirely or primarily from wages and salaries. The CPS wage data are from the explicit questions about hourly or weekly pay that are asked of each month's outgoing rotation groups. Workers whose wage was missing were excluded from the tabulations. Each ACS and CPS number is the average of the three individual monthly numbers.

Adjustments to Other Income Amounts

We adjusted several income amounts in addition to earnings to capture nominal increases between 2018 and 2022. The adjustments varied by the type of income, as follows:

- We increased **Social Security** amounts by 12.0 percent, equal to the actual cumulative cost-of-living adjustments from January 2019 through January 2022.[12]
- We increased **interest, dividends, and rent** by 4.7 percent. We computed the percentage increase so that the combination of the increase in individual amounts and the larger weighted number of recipients resulted in an 8 percent aggregate increase in personal income receipts on assets, as shown in National Income and Product Accounts data.[13]
- We increased **pension income** by 7.25 percent, equal to half of the presumed increase in the Consumer Price Index for urban consumers (CPI-U) over the four-year period from 2018 to 2022; we use half of the increase because some types of retirement incomes increase with inflation and others do not.[14]
- We increased **child support income** amounts by 5.5 percent, half of the expected increase in the CPI-U over the two-year period from 2020 to 2022; this assumes no net increase in child support amounts in the two years from 2018 to 2020 because of the COVID-19 pandemic.
- We increased **reported unemployment insurance benefit** by 10.5 percent, equal to the estimated CPI-U change from 2017 to 2021; in this case, a lag is used because most recipients of unemployment benefits had their benefit amounts computed based on wages over a base period that occurred largely before 2022. (Additional 2022 recipients of unemployment insurance benefits were assigned through simulation to adjust for underreporting.)
- We increased **self-employment income amounts** by 19.4 percent, which is the same as the initial increase applied to wages, as described earlier.
- We increased **income amounts collected in the ACS "other income" question, other than unemployment compensation and child support (likely including worker's compensation, veterans' benefits, and others)** by 7.25 percent, equal to half of the presumed CPI-U change between 2018 and 2022; we use half of the CPI-U increase because some income types in this "catch-all" variable might increase with inflation, and others might not.[15]

All of these income adjustments were made to individual-level amounts; the aggregate weighted amounts in our 2022 data differ from the aggregate weighted amounts in the underlying 2018 "ACS data by more than the percentage increases mentioned above, due to the fact that the population weights are, on average, larger in the 2022 data. Also, cash means-tested benefit amounts were not adjusted because they were entirely simulated as part of the baseline process (see below).

Setting the Baseline for 2022

Following the adjustments, the modified ACS data are treated as if they represent 2022. We developed "baseline" simulations of each key benefit and tax program. A baseline simulation is one that applies the policy rules for a particular tax or benefit that were actually in place during the year of the data, with the goal of capturing actual eligibility, taxes, benefits, and caseloads during that year. The ATTIS baseline simulations use detailed representations of policies (including state variations), capture interactions across programs, and reflect the fact that in many programs, a family's eligibility status or potential benefit could vary from month to month. We developed 2022 baseline simulations for the following programs:

- Unemployment insurance benefits
- SSI
- TANF
- Child care subsidies through programs funded by CCDF[16]
- Public and subsidized housing through federal programs
- SNAP
- WIC
- LIHEAP
- Payroll taxes
- Federal income taxes and credits
- State income taxes and credits

With only one exception, these simulations used 2022 policies (to the extent they are known) to determine tax liabilities, tax credits, eligibility for benefits, and potential benefit amounts. For programs with extensive state variation in policies (in particular, TANF, CCDF, and state income taxes), full information on detailed 2022 policies was not known, and we made assumptions about 2022 policies based on the most recently available information.

The one exception to the use of 2022 policies for this analysis is the SNAP program. For SNAP, we primarily used 2022 policies, but we modeled the program *without* the use of two special policies that have been in place during the COVID-19 public health emergency, which were still in effect at the time this report was published. Those two policies are (1) the use of "emergency allotments," which generally

results in an individual or family receiving the maximum SNAP benefit applicable to the number of people in the unit, regardless of their income (compared with the standard policy that reduces the benefit as income increases); and (2) lessened restrictions on the eligibility of full-time students for SNAP. Both of these policies could alter the impact of a minimum wage increase on family resources. With the emergency allotments in place, a family with higher wages from a wage increase would likely not experience any reduction in SNAP; and with greater eligibility for full-time students, family sizes could be larger and therefore benefits would also be larger. For this analysis, SNAP was modeled as though the COVID-19 public health emergency was no longer in place. This allows the policy results to better represent the secondary impacts of a minimum wage increase in a more standard policy environment. However, because of this choice, the "baseline" poverty rates presented later in this report cannot be interpreted as current-law estimates for 2022.

For all of the benefit programs, the simulations included procedures to select a caseload of recipients from among the people and families simulated to be eligible. For the benefits that the survey asks about, people who are eligible and who reported receipt are either included in the simulated caseload automatically (SSI), or are generally included (TANF, SNAP, and unemployment benefits), and other recipients are selected from among those simulated to be eligible to reach target levels of participation based on administrative data. For programs not asked about in the survey (subsidized child care, public and subsidized housing, LIHEAP, and WIC), the caseload is entirely simulated.

The simulated caseloads were aligned to come close to our best information about the size of the actual caseloads in 2022 and, when available, the characteristics of those caseloads. For some programs, information on the numbers of recipients in early 2022 was already available at the point this work was being conducted. For example, at the point we completed this work, WIC caseload data were already available for the first quarter of 2022; following alignment, the simulated first-quarter caseload is within 0.1 percent of the actual first-quarter caseload overall and within 10 percent of actual caseload in all but one state. In other cases, little or no information was available on 2022 caseloads, and assumptions were made about the likely number of 2022 recipients based on the most recent data were available. For example, in the case of the TANF program, the most recent caseload data available from the federal government for all states was for September 2021; we obtained spring 2022 caseload data from state sources for about half of the states and assumed that in the other states, the relative change in caseload from September 2021 was the same as the average change in the states for which we had obtained data (an increase of 1.7 percent). The simulated caseload in the first quarter of the year was aligned to within 0.3 percent of the resulting national target and was within 10 percent of the actual or assumed target in 49 states.

Imposing a $15.00 an Hour Federal Minimum Wage, Including "Spillover" Effects

The policy examined in the corresponding brief by Acs and colleagues (2022) is an increase in the federal minimum wage from $7.25 per hour to $15.00 per hour. For a given individual identified as receiving a wage increase because of an increase in the minimum wage, imposing the policy in a way that raises a particular person's wage to exactly the new minimum is straightforward. For example, if a person's implied hourly wage (after all the adjustments described earlier) is $10.00 per hour, imposing the minimum of $15.00 means that their earnings are increased by 50 percent. However, assumptions are required about which workers might be affected by the increase, the treatment of workers with apparent wages below their area's current minimum, and whether some increases might occur beyond what is legislatively required (sometimes called "spillover" increases).

Whose Wages Are Affected and By How Much

We model impacts for all people who have wage or salary income in our 2022 data and whose implied hourly wages are in a range that we think could be affected by the increase. We did not attempt to apply the rules regarding jobs exempt from minimum wage laws (including seasonal workers, informal workers, some workers with disabilities, and others), because the ACS does not have sufficient information to precisely identify those groups and also because their wages might be affected even if that would not be legally required. Also, we did not model any wage increases for workers with both wage or salary income and self-employment income because we do not have enough information in the ACS to determine the hourly pay for only the wage and salary portion of their earnings. (Although we know the distribution of earnings between the two types of work when individuals have both types, the ACS does not indicate how many weeks or hours they spent on each type of work.) Therefore, for the portion of people with both wages and self-employment income, we did not model any increase because of the minimum wage policy of $15.00 per hour.

For this analysis, we modeled increases in wage rates for all wage earners with a 2022 wage between $3.62 (which is half of the federal minimum of $7.25) and $18.00 per hour (figure 2). People with an implied wage below $7.25 are not increased to $15.00 per hour but instead are assumed to have their hourly pay increased by $7.75 (the difference between $7.25 and $15.00). Those with a 2022 wage from $7.25 to $12.00 are increased to exactly $15.00 per hour.

FIGURE 2

Assumed New Wage for Each Original Wage if Federal Minimum Wage Increased to $15 an Hour

Source: Authors' graphical representation.
Notes: Representation of assumptions about how much workers' wages would change if the federal minimum wage increased to $15 an hour based on their original (pre-minimum-wage increase) hourly wage.

For people earning $12.00 to $18.00 per hour in 2022, we assume that their employers would raise their wages to something higher than $15.00 per hour to preserve some distinctions in pay between those paid close to the new minimum wage and those who were below it. For the range of original wages from $12 to just under $15 per hour, the assumed new wage is computed as follows:

$$If\ \$12.00\ <\ current\ 2022\ wage\ \leq\ \$15.00, then\ new\ wage\ =\$15.00\ +\ \frac{1}{2}(current\ 2022\ wage\ -\ 12)$$

For example, a person whose 2022 wage is $13.00 before the new policy is assumed to begin earning $15.50:

$$If\ current\ wage\ is\ \$13.00, new\ wage\ =\$15.00\ +\ \frac{1}{2}(13\ -\ 12)\ =\$15.50$$

A person whose 2022 wage is $14.00 before the new policy is assumed to begin earning $16.00:

$$If\ current\ wage\ is\ \$14.00, new\ wage\ =\$15.00\ +\ \frac{1}{2}(14\ -\ 12)\ =\$16.00$$

Further, we believe that people paid just above $15.00 an hour would also see modest increases in their pay to preserve pay distinctions. We believe the spillover effects could extend to 20 percent above

the new minimum. In other words, people earning between $15.00 and $18.00 an hour will also be affected by an increase in the minimum wage to $15.00. The assumption developed for the analysis in Acs et al. (2022) is

$$If\ \$15.00 < current\ 2022\ wage < \$18.00,$$

$$then\ new\ wage\ =\ current\ 2022\ wage\ + \frac{1}{2}(18 - current\ 2022\ wage)$$

A person whose wage is $16.00 before the new policy is assumed to begin earning $17.00:

$$If\ current\ wage\ is\ \$16.00, new\ wage = \$16.00 + \frac{1}{2}(18 - 16) = \$17.00$$

A person whose wage is $17.00 before the new policy is assumed to begin earning $17.50:

$$If\ current\ wage\ is\ \$17.00, new\ wage =\ \$17.00 + \frac{1}{2}(18 - 17) = \$17.50$$

Note that we did not vary these assumptions by state; even in states with state minimum wages well above $7.25, we used the same range and the same increases. This assumes that a nationwide increase to a minimum wage of $15.00 could have broad impacts on the US labor market. See the corresponding brief by Acs and colleagues (2022) for more discussion of these choices and references to key research papers used to guide the choices.

The choices of who is affected and by how much are based on reasonable assumptions but are subject to uncertainty. Other analyses have made different decisions. For example, the analysis of minimum wage increases conducted as part of the National Academy of Sciences (2019) child poverty analysis, which included a smaller increase in the minimum wage, did not model any changes in wages for people who appeared to be earning below $7.00 per hour. Differences in these methodological choices will affect the results to some extent.

Treatment of Tipped Workers

The final methodological choice regarding how individual workers' wages would change was not including any special treatment of workers in jobs likely to be paid at the tipped minimum wage (currently set at $2.13 at the federal level but higher in some states). Under the tipped minimum wage, workers must still receive total pay of at least the prevailing minimum wage for all workers, but a portion of that can come from tips. For example, in a state that has not raised either the regular or tipped minimum wage, a waiter may receive only $2.13 per hour from the employer, as long as tips equal

at least $5.12 per hour (the difference between $7.25 and $2.13). If tips are not at that level or higher, then the employer is required to pay more than $2.13 to make up the difference.

In our modeling, we do not make any explicit assumptions about increases in the tipped minimum wage. Instead, we assume that a tipped worker's total hourly pay—including base pay and tips—will rise in exactly the same way as the hourly pay of a nontipped worker. For example, a waiter with an implied current wage of $10.00 per hour in a place using the federal minimums—who is apparently receiving $2.13 in base pay and $7.87 per hour in tips—is assumed to begin to earn $15.00 per hour; a waiter with an implied wage of $8.50 in a place with a 2022 state minimum of $8.00 and a state tipped minimum of $5.00 is also raised to $15.00 per hour. This would be consistent with a scenario with no separate tipped minimum wage and no tips or a scenario in which the level of tips changes following an increase in the tipped minimum wage. We chose not to use separate procedures for tipped workers because of the uncertainty about how tips might change in a new environment. See appendix F in National Academy of Sciences (2019) for a discussion of explicit approaches to modeling the impact of a minimum wage on tipped workers.

Changing Wages in the Data

The assumptions described above result in 56.0 million people receiving a wage increase. Within that group, about half worked full time (at least 35 hours per week) and for the full year (50 weeks or more). On average, the people receiving a wage increase worked about 1,600 hours during the year (about three-quarters of full-time hours). For every person assumed to be affected by the wage increase, we modified their earnings to reflect the higher wage. We make the simplifying assumption that people earn the same pay rate across the year. If we assume that a higher minimum wage does not cause any loss of employment, the average annual wage increase is about $4,600 per person, with an aggregate increase in wages of $255.5 billion.

Modeling Job Loss

As discussed in the corresponding brief by Acs and colleagues (2022), substantial discussion and disagreement in the economic literature exists regarding whether an increase in the minimum wage would cause a reduction in low-wage jobs, and if so, by how much. For this analysis, we tested three scenarios: (1) no job loss, (2) some job loss for people whose original wages are less than $15.00 per hour, and (3) some job loss for people whose original wages are up to $18.00 per hour. For both of the

job-loss scenarios, we model that the likelihood of job loss is higher for teenagers than for adults and is higher for those whose wages would be increased by a larger amount. We do not capture other possible variations in the likelihood of job loss, for example variations by sex, race, or ethnicity, among people in the same age group with the same degree of wage change. See Couch and Fairlie (2010) for an analysis of differences in job loss by race during an economic downturn.

Modeling job loss requires an assumption about the probability that workers will lose employment for a given change in wages—in the language of economics, the "elasticity" of demand for labor in response to a change in the price of labor. We start with the Congressional Budget Office's (2019) suggested median employment elasticity of -0.128 for all teenagers in the scenario of a $15.00-per-hour minimum wage. We then use a modified version of the the Congressional Budget Office's (2019) process for adjusting the initial elasticity so that it can appropriately be applied to the teen workers affected by the minimum wage increase, with each teen's likelihood of job loss based on that person's wage change. In economic notation, the formula for computing this modified elasticity is as follows:

$$e \times \frac{1}{P_{direct}} \times \frac{\%\Delta MW}{\%\Delta W_{direct}}$$

In this equation, e is the elasticity for all teens, P_{direct} is the percentage of teens who would be directly affected, $\%\Delta MW$ is the percent change in the statutory minimum wage, and $\%\Delta W_{direct}$ is the average percent change in the wages of directly affected teenagers. In our data, P_{direct} = 0.71, $\%\Delta MW$ = 107 percent, and $\%\Delta W_{direct}$ = 41 percent. Therefore, the modified elasticity for teens is as follows:

$$\frac{-0.128}{0.71} \times \frac{1.07}{.41} = -0.47$$

Following NAS (2019), we assume the elasticity for affected adults is one-third that for teens (-0.16).

The elasticities are applied based on each person's own wage increase. For example, if an adult's wage would rise from $10.00 to $15.00 (a 50 percent increase), that person's probability of job loss was 8 percent (the product of 0.5 and 0.16). We generated a random number for each person potentially subject to job loss; if the random number was less than the probability, the person was modeled to lose employment.

These procedures resulted in identifying 2.9 million people as losing at least some employment during the year when job loss is a possibility for people with original wage rate up to $15 per hour, and 3.2 million people when job loss is a possibility for people with original wage rate up to $18 per hour. In the scenario with the greater amount of job loss modeled, the 3.2 million people who are simulated to lose at least one month of employment during the year equals 1.9 percent of all workers. Those percentages vary across the states because of differences in states' wage distributions, which affect the

portion of workers who are affected and the estimated increase in their wages (table 2). The number of people with any job loss ranges from 0.8 percent of affected workers in the District of Columbia (which already has a minimum wage over $15.00 per hour, but where workers could be affected by minimum wage increases in neighboring states) to 3.0 percent of affected workers in Wyoming (which has maintained the federal minimum wage).

TABLE 2

Portion of All Workers Simulated to Have Some Employment Loss during the Year under a $15.00 Federal Minimum Wage

Scenario with job loss possible for any affected worker

Location	Percentage (%)
US Total	**1.9**
Alabama	2.3
Alaska	1.2
Arizona	1.8
Arkansas	2.1
California	1.5
Colorado	1.9
Connecticut	1.3
Delaware	2.1
Dist. of Columbia	0.8
Florida	2.1
Georgia	2.1
Hawaii	1.1
Idaho	2.7
Illinois	1.7
Indiana	2.3
Iowa	1.8
Kansas	2.4
Kentucky	2.1
Louisiana	2.6
Maine	1.4
Maryland	1.3
Massachusetts	1.2
Michigan	2.1
Minnesota	1.6
Mississippi	2.7

Location	Percentage (%)
Missouri	2.2
Montana	2.0
Nebraska	2.1
Nevada	1.9
New Hampshire	1.5
New Jersey	1.5
New Mexico	2.0
New York	1.4
North Carolina	2.4
North Dakota	1.5
Ohio	2.1
Oklahoma	2.7
Oregon	1.6
Pennsylvania	1.9
Rhode Island	1.4
South Carolina	2.4
South Dakota	2.1
Tennessee	2.2
Texas	2.3
Utah	2.6
Vermont	2.0
Virginia	1.7
Washington	1.4
West Virginia	2.4
Wisconsin	2.0
Wyoming	3.0

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022.
Notes: The methodology assumes that the larger the percentage increase in a person's wage if a $15.00 per hour was put in place, the greater the chance that a person would lose some employment during the year. This table provides the percentages of workers modeled to have *any* employment loss during the year; on average, employment loss affects five months of the year.

For individuals selected to experience at least some job loss, the duration of job loss varies. Implicitly, we assume that although a person may lose a job initially, that person could find other employment at some point during the year. We use the same probabilities for the duration of being out of work as we do for the individuals who are presumed out of work for part of 2022, despite having been

employed in the original 2018 data because of the COVID-19 recession (the employment adjustment process described earlier as part of the preparation of the 2022 data). Some people are modeled to only lose employment in January, others for January and February, and so on, with some people losing employment for the full year. People lose all of their wages during the assigned period of job loss. On average, people who are identified as experiencing any job loss because of the minimum wage increase are modeled as losing about five months of work; this duration is less than a full year because of regaining jobs during the year and because a portion of those selected for job loss did not work the entire year. A source of uncertainty and imprecision in our estimates is the extent to which the duration of unemployment or joblessness among individuals who we project to lose jobs because of the minimum wage increase differ from the durations projected for those projected to be out of work at the start of 2022 because of lingering effects of the COVID-19-related economic downturn.

Because our model allows some of those who lose jobs to return to work later in the year, annual earnings may still increase for people with job loss. As an example, consider a person who previously earned $8.00 per hour for 52 weeks, at 40 hours per week, which is $16,640 for the year, or $320 per week. This person's hourly wage is increased to $15.00 per hour, which is $600 per week—a weekly pay increase of $280. However, assume that we simulate this person to lose employment for three months (13 weeks). Relative to the situation prior to the $15.00 per hour minimum wage, in those 13 weeks this person loses $4,160 (the product of $320 and 13). However, in the remaining 39 weeks, relative to the original earnings, this person gains $10,920 (the product of $280 and 39). The gain in the 39 weeks substantially exceeds the loss in the 13 weeks of job loss; this individual is modeled to have an increase in annual earnings of $6,760 (the difference between $10,920 and $4,160). Of course, in cases when the job loss affects a higher portion of the person's weeks of work, or the wage gain from the minimum wage increase is smaller, the job loss might reduce annual earnings.

Modeling Changes in Benefits, Taxes, and Expenses

For each of the three scenarios—no job loss, job loss for some people with an original wage under $15.00 per hour, and job loss for some people with an original wage under $18.00 per hour—we used ATTIS to capture the full range of secondary impacts that could occur from an increase or decrease in earnings. This involved resimulating each of the programs listed in the discussion of the 2022 baseline simulations, with only one exception: choosing not to model any unemployment insurance benefits for people modeled to have job loss. We chose that approach for two reasons: First, not all people who lose their job receive unemployment benefits. In particular, teenage workers who were relatively new to the

labor force at the point they lost the job might not have sufficient wages in the year prior to job loss to qualify for benefits under their states' rules, and many students are ineligible for unemployment insurance benefits. Second, because COVID-19-related expansions and extensions of unemployment benefits have expired, most people would be eligible for benefits for no more than 26 weeks. Because in reality some of the workers projected to lose jobs would start receiving unemployment benefits, our projections of net resources may be too low and our projected poverty rates may be too high. (Other assumptions may work in the opposite direction.)

Types of Changes That Can Occur

For all of the other benefit and tax programs—SSI, TANF, CCDF, public and subsidized housing, SNAP, WIC, LIHEAP, payroll taxes, federal income taxes and credits, and state income taxes and credits—we captured the extent to which the higher earnings (and, when applicable, job loss) would affect levels of potential benefits, tax credits, or tax liability.

The potential changes in benefit programs include the following:

- **SSI:** SSI counts earnings in determining eligibility and benefit levels, after disregarding the first $65.00 plus 50 percent of remaining earnings, and the benefit declines as income increases. The program considers income not only from the people receiving the benefits but also from a recipient's spouse and from the parents of a minor child who is a recipient. Therefore, if wages increase because of a higher minimum wage, some people could become eligible for a lower benefit because of their own earnings or the earnings of a spouse or parent. In months of job loss, some people might become eligible for a higher benefit or become newly eligible for a benefit.
- **TANF:** TANF counts recipients' earnings in determining eligibility and benefit levels, after applying disregards that vary widely across the states. In most states, the program also considers the earnings of parents who are ineligible to be recipients (e.g., because of unauthorized immigrant status) when determining eligibility status and potential benefits for their children. Some families could lose TANF eligibility or become eligible for a lower benefit because of higher wages, or gain some months of eligibility or higher benefits in months of job loss.
- **Child care subsidies through CCDF:** All states count earnings in determining eligibility, and in most states, the level of income affects the family's portion of the payment for the child care services. Therefore, higher wages could mean a higher copayment, or in some cases a loss of

eligibility depending on the state's income limits. In the actual program, these changes would generally not be immediate because the program uses a 12-month certification period and in many cases, increases in copayments are not allowed during that period; however, we model the changes as if they occur when the earnings change occurs to pick up the longer-run impacts. Additional changes could occur if a family's TANF status changed as a result of the minimum wage increase because in some states, families with TANF do not have to pay copayments. Finally, some families lose CCDF eligibility because of job loss.[17]

- **Public and subsidized housing through federal programs:** Public and subsidized housing programs count the earnings of all household members in determining eligibility and compute the household's required contribution to the rent. In general, households must pay 30 percent of their net income in rent. Therefore, higher wages or the loss of a job could mean a change in the required rental payment or, in some cases, a change in eligibility. Additionally, a household's rental payment could be affected by a change in TANF or SSI income that was triggered by a change in wages.
- **SNAP:** SNAP counts earnings after a 20 percent disregard. Under the standard program rules being used in this analysis (rather than the special rules in place during the COVID-19 public health emergency), the unit's income determines eligibility and also determines the benefit level, with the benefit level equal to the maximum allowable benefit for the unit's size minus 30 percent of their net income. Therefore, higher wages or the loss of a job could mean a change in benefit or in some cases, a change in eligibility. Additionally, a household's SNAP eligibility status or benefits could also be affected by a change in TANF or SSI income that was triggered by a change in wages. Changes in housing or child care expenses caused by changes in eligibility or family payments in those programs could also affect SNAP.
- **WIC:** WIC counts all earnings of people in the economic unit as determined by the program when determining eligibility, with no earnings disregards. Higher wages or the loss of a job could mean a change in whether the infants, young children, or mothers in the family are eligible for the benefit. Note that WIC benefits do not vary with a family's income; all eligible people in a particular category (e.g., infants) receive the same package of benefits regardless of whether the family is far below the income limit or very close to the limit.
- **LIHEAP:** LIHEAP counts all earnings of household members in determining eligibility, with no disregards. Higher wages or the loss of a job could mean a change in whether the household is eligible for LIHEAP. In the actual program, in some states, the level of benefit could also be affected by a change in earnings, because some states give higher amounts to lower-income

households; however, ATTIS does not capture that effect and instead assigns the same average per-household benefit for all recipients in a particular state.

The simulations also pick up some changes in program participation from the higher minimum wage, even in the absence of a change in eligibility. If a person or family that previously received a benefit becomes eligible for a lower benefit because of an increase in wages, we assume that participation continues but at the reduced benefit amount; in other words, we assume that the person or family does not stop participating because of the lower benefit. However, if a person or family becomes eligible for a higher potential benefit, or becomes newly eligible for a program because of job loss, the possibility of beginning to participate is modeled. Probabilities of participation in these cases are based on the probabilities of participation for otherwise similar families (technically, assistance units) in the baseline simulation.

The potential changes in taxes and tax credits include the following:

- **Payroll taxes:** Higher wages would automatically mean higher payroll taxes, with the worker's share equal to 7.65 percent of the new earnings. Job loss would reduce the amount of payroll taxes owed, relative to the scenario with no job loss.
- **Federal income taxes and credits:** A change in annual wages could affect federal income taxes and credits in multiple ways, depending on a worker's circumstances, including the presence of children, other types of income, whether the person is married, and if so, the spouse's earnings. In some income ranges, higher wages could allow a tax unit to receive a higher EITC or a larger amount from the refundable portion of the child tax credit, potentially increasing their overall income, while in other income ranges, higher wages might increase overall income tax liability.
- **State income taxes and credits:** In the states that have income tax systems that include taxation of earnings, the impact of higher wages will vary depending on the state's tax brackets, rates, and tax credits, as well as on the amount of the earnings changes. Some tax units might become eligible for a higher state EITC, and some might begin to owe a higher amount of state income tax.

Note that we do not model any changes in the take-up of the federal EITC or state EITCs because of being eligible for a higher or lower amount because we model 100 percent take-up of EITCs by eligible tax units.

A final type of change that could occur in response to a change in wages is a change in families' spending. Four types of spending either affect the computation of the SPM or affect a means-tested

benefit: housing expenses, medical expenses, child care expenses, and other work expenses. We do not model any changes in unsubsidized housing expenses or medical expenses. That is, we assume that an increase in earnings does not result in families moving to a different apartment or spending more or less on out-of-pocket medical costs. In the case of child care expenses, we assume that families generally keep the same arrangement even after an earnings increase, although families losing a subsidy may be modeled to change to an informal unpaid arrangement; we also assume that families temporarily losing employment continue to need child care while searching for a new job. Finally, in the case of other work expenses, we do not model any increases in those costs for families with earnings increases; but we do assume that when a person stops working for one or more months, they no longer need to pay other work expenses in those months.

Simulated Changes in Benefit Programs and Taxes

Because of the above changes, we estimate that in the scenario without any job loss, the $255.5 billion increase in wages is offset by a total $13.0 billion reduction in benefits (equal to 5.1 percent of the total wage increase) and a $53.8 billion increase in tax liability (equal to 21.1 percent of the total wage increase). See table 3 for more information. In the aggregate, therefore, the increase in families' net economic resources is about 74 percent of the gross increase in wages. In the scenario with potential job loss for any affected worker, there is less increase in wages ($228.0 billion), benefits decline by $11.3 billion (5.0 percent of the increase in wages), and aggregate tax liability increases by $49.2 billion (21.6 percent of the increase in wages).

In all scenarios, the program with the largest decrease in benefits distributed is SNAP, which sees a decline of $8.5 billion in the scenario without job loss, and a decline of between $7.1 and $7.3 billion in the two job loss scenarios. These declines constitute between 8.7 and 10.4 percent of the total value of SNAP benefits in the baseline. (As noted earlier, we are modeling SNAP as if the public health emergency policies are not in place.) Benefits from each of three other programs—public and subsidized housing, SSI, and child care subsidies—decline by over $1 billion in each of the three scenarios modeled.

All three scenarios are also estimated to result in increases in the number of tax filers with positive federal income tax liability (in other words, their federal income tax liability exceeds the value of any refundable credit) with increases ranging from 4.5 million new returns with positive liability in our highest job loss scenario to 5.2 million in the simulation without any job loss. This corresponds with overall federal income tax liability increasing between $25.0 and $26.8 billion. Increasing the minimum

wage also increases the number of state income tax returns with positive tax liability and the total amount of state taxes in all three simulations.

The net amount of federal EITC distributed decreases by about $4.3 billion in each of the three scenarios. As mentioned above, depending on marital status, number of children, baseline earnings, and other factors, some workers may be eligible for a higher amount of EITC following the wage increase, but the net effect of the minimum wage increase is to decrease the amount of EITC. The effect on the CTC is the opposite, as the amount of CTC paid out (combining the refundable and nonrefundable portions) increases by between $2.8 and $3.1 billion. This difference from the EITC is because the CTC phases out at much higher levels of earnings, so the minimum wage increase is less likely to move people into the phase-out range for the CTC than the EITC.

TABLE 3

Aggregate Benefit and Tax Amounts before the Minimum Wage Increase, and Changes in Amounts under Each Scenario

		Changes from the Baseline		
		No Job Loss	Possible Job Loss Scenario	
	Baseline[a]	$15/hour minimum wage	People earning < $15	All affected workers
Wages (millions of dollars)	9,702,457	255,480	231,480	227,956
Aggregate benefits paid	245,603	-13,004	-11,511	-11,309
Aggregate tax liability (net of credits)	2,427,320	53,794	49,883	49,210
Benefit programs				
Supplemental Security Income				
Adult units receiving SSI (average monthly, in thousands)	7,356	-136	-114	-113
Disabled children receiving SSI (average monthly, in thousands)	1,011	-18	-17	-17
Aggregate annual benefits (millions of dollars)	65,023	-1,397	-1,167	-1,153
TANF benefits				
Families eligible for benefits (average monthly, in thousands)	5,030	-323	-237	-223
Families receiving benefits (average monthly, in thousands)	760	-31	-24	-22
Aggregate annual benefits (millions of dollars)	4,751	-172	-120	-109

		Changes from the Baseline		
		No Job Loss	Possible Job Loss Scenario	
	Baseline[a]	$15/hour minimum wage	People earning < $15	All affected workers
Child care subsidies				
Families eligible for child care subsidies (average monthly, in thousands)	5,816	-544	-616	-626
Families receiving subsidies (average monthly, in thousands)	1,161	-92	-111	-113
Aggregate annual value of subsidy (millions of dollars)	11,044	-1,087	-1,266	-1,279
Public and subsidized housing				
Number of households (any subsidy during year, thousands)	4,436	-57	-48	-48
Aggregate rent subsidies (millions of dollars)	49,610	-1,626	-1,463	-1,449
Supplemental Nutrition Assistance Program (SNAP)[a]				
Units eligible for benefits (average monthly, in thousands)	39,722	-3,994	-3,739	-3,700
Units receiving benefits (average monthly, in thousands)	22,192	-1,298	-1,096	-1,066
Aggregate annual benefits (millions of dollars)	81,309	-8,476	-7,268	-7,093
LIHEAP				
Households with benefits (thousands)	6,029	-255	-237	-236
Aggregate annual benefits (millions of dollars)	4,372	-201	-187	-187
Women, Infants, and Children program (WIC)[b]				
People with benefits (average monthly, in thousands)	5,322	-62	-55	-55
Aggregate annual benefits (millions of dollars)	4,029	-44	-40	-40
Tax liability and credits				
Payroll taxes (OASDHI)				
Workers subject to tax (thousands)	159,442	no change	-570	-622
Aggregate taxes paid (worker's taxes only, millions of dollars)	644,564	19,187	17,374	17,107
Federal income taxes				
Numbers of returns (thousands)				
Positive tax	111,246	5,197	4,569	4,505
Negative tax	20,867	-2,065	-1,993	-1,978
Total tax liability (millions of dollars)	1,404,470	26,837	25,270	24,964

		Changes from the Baseline		
		No Job Loss	Possible Job Loss Scenario	
	Baseline[a]	$15/hour minimum wage	People earning < $15	All affected workers
Federal earned-income tax credit				
Units with credit (thousands)	19,426	-2,510	-2,429	-2,408
Amount of credit (millions of dollars)	40,307	-4,327	-4,313	-4,282
Federal child tax credit/additional child tax credit[c]				
Units with child tax credit (thousands)	35,828	1,481	1,414	1,400
Units with additional child tax credit (thousands)	12,838	-433	-446	-446
Amount of child tax credit and additional child tax credit (millions of dollars)	113,337	3,055	2,842	2,798
State income taxes				
Numbers of returns (thousands)				
Positive tax	94,133	3,193	2,816	2,761
Negative tax	9,957	-1,360	-1,309	-1,290
Total tax liability (millions of dollars)	378,286	7,770	7,239	7,139

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security (ATTIS) model, using data from the 2018 American Community Survey, projected to reflect 2022.
Notes: LIHEAP = Low Income Home Energy Assistance Program; OASDHI = Old-Age, Survivors, and Disability Insurance; SNAP = Supplemental Nutrition Assistance Program; SSI = Supplemental Security Income; TANF = Temporary Assistance for Needy Families; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children. Affected workers are those with computed wages between $3.62 and $18.00.
[a] The baseline applies actual or estimated 2022 policies to the projected 2022 data, with the exception of SNAP. SNAP is modeled without the special policies in place during the COVID-19 public health emergency. Therefore, in our modeling, SNAP benefits generally decline when a family's countable income increases.
[b] ATTIS models WIC for mothers, infants, and children, but not for pregnant women.
[c] The data for the Child Tax Credit include the credit for other dependents.

Assessing Changes in the Supplemental Poverty Measure

To assess how an increase in the minimum wage to $15.00-per-hour could improve families' economic well-being, we use the SPM (Fox, Glassman, and Pacas 2020). Although the official poverty definition considers only a family's cash income, the SPM uses a much broader resource measure that adds in the value of noncash benefits (SNAP, WIC, LIHEAP, and the value of public or subsidized housing), adds the value of refundable tax credits, subtracts payroll taxes and other income tax liabilities, and subtracts medical out-of-pocket expenses, child care expenses, and other work expenses.[18]

Supplemental Poverty Measure Computation

For our implementation of the SPM, we follow the Census Bureau's procedures, but we use the dollar amounts for each family in our 2022 data—either the ACS-reported amounts projected to 2022, or 2022 amounts simulated or imputed by ATTIS. To reflect work expenses other than child care, the SPM uses the same fixed weekly amount for every worker; we adjusted the most recently available figure (for 2020) by inflation to arrive at a weekly amount of $44.01 for 2022. To incorporate medical out-of-pocket expenses, we started from imputed information developed by the Census Bureau for the 2018 ACS and inflated it to 2022.

The SPM compares the expanded resource measure to a different standard, or "threshold," than the official poverty measure. The SPM poverty thresholds vary not only by family size and composition but also by housing tenure (renter, owner with a mortgage, owner without a mortgage), and are further adjusted to reflect differences in housing prices across the country. Because 2022 SPM thresholds were not yet available at the point we did this work, we started from thresholds available for 2021 and adjusted for expected inflation to develop 2022 thresholds.

We first applied the SPM measure to compare each family's 2022 resources to their SPM threshold before any change in the minimum wage. We then repeated the computation for each of the three scenarios—minimum wage increase with no job, with some job loss for workers originally earnings less than $15.00 per hour, and with some job loss for workers originally earning up to $18.00 per hour.

Example Families

Because of the secondary impacts from benefits and taxes discussed earlier, as well as changes in work expenses, the impacts of higher wages on specific families are complex. We present results for three example families to illustrate some of the changes. The situations covered by the example families are as follows:

- **Example 1:** Family's resources increase from 88 percent of their SPM poverty threshold to 126 percent
- **Example 2:** Family's resources increase from 109 percent of SPM poverty to 128 percent, despite one family member losing a job for 3 months
- **Example 3:** A single individual whose resources increase from 49 to 126 percent of the SPM threshold

The first example family (table 4) is an unmarried couple with a 1-year-old child, living in Alabama. They rent their home. Based on the family's specific location and their other characteristics, their SPM poverty threshold is $24,470. Both of the adults work (one for 15 weeks during the year for 27 hours a week, and the other for 35 weeks during the year, at 50 hours per week) and their combined wages before the minimum wage increase are $14,627. The family also received $4,988 from SNAP, $1,016 from TANF, $3,955 in housing subsidy, $423 from WIC, $1,904 in EITC, and $260 in additional refundable federal income tax credits. However, they paid $1,119 in payroll tax and $280 in state income tax, and they are estimated to have had $1,892 in medical expenses and $2,201 in work expenses. They also had childcare expenses of $56 during the portion of the year when both parents worked (with the low amount due to participation in the CCDF program). This brings their net resources to $21,627, or 88 percent of the SPM poverty threshold, meaning that they are counted as being below-poverty by this measure.

When we impose the wage increase, the pay rates of the adults increase, providing $15,405 in additional wages, bringing total wages to $30,032. This increase is offset, however, by a drop of $2,222 in SNAP, a reduction of $103 in TANF, and a reduction of $1,510 in housing subsidy (in other words, their portion of the rent increases by that amount). Their federal EITC *increases* by $161, and they retain their WIC benefit. Their federal taxes other than the EITC increase by $839, going from a net refund to a net liability; state income taxes are estimated to increase by $629, and payroll taxes increase by $1,179 (7.65 percent of the wage increase). They lose their eligibility for CCDF, and the model estimates that they would find unpaid arrangements rather than paying for unsubsidized care. We assume that their work-related expenses and medical expenses remain unchanged. Despite the reductions in resources and increases in taxes, their total resources are nevertheless higher by $9,141, or 59 percent of the $15,405 increase in wages. Their resources are now at 126 percent of the SPM poverty threshold, meaning that they are no longer counted as having below-poverty resources.

TABLE 4

Resources of Example Family 1 before and after Minimum Wage Increase

Unmarried couple with one child, age 1; no job loss

Annual Resources[a]	Before Minimum Wage Increase	After Minimum Wage Increase	Change
Added to resources ($)			
Earnings	14,627	30,032	15,405
SNAP[a]	4,988	2,766	-2,222
TANF	1,016	912	-103
Housing subsidy	3,955	2,446	-1,510
WIC	423	423	0
EITC	1,904	2,065	161
Subtracted from resources ($)			
Payroll taxes	1,119	2,297	1,179
Net federal income taxes other than EITC	-260	579	839
Net state income taxes	280	908	629
Child care expenses (net of subsidies)	56	0	-56
Work expenses	2,201	2,201	0
Out-of-pocket medical expenses	1,892	1,892	0
Summary measures			
Total resources[c] ($)	21,627	30,768	9,141
SPM poverty threshold ($)	24,470	24,470	
Family resources as a percentage of the SPM poverty threshold (%)	88.4	125.7	

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022.

Notes: EITC = earned-income tax credit, SNAP = Supplemental Nutrition Assistance Program; SPM = Supplemental Poverty Measure; TANF = Temporary Assistance for Needy Families; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children. Family includes an unmarried couple with 1 child, age 1, living in Alabama, and renting their home. Both parents receive a raise and neither loses any employment.

[a] The calculations use 2022 benefit and tax policies, with the exception that SNAP benefits are computed without the special policies in place during the public health emergency.

[b] "Total resources" are the sum of cash income, plus the value of noncash benefits, plus the EITC, minus net tax liabilities other than the EITC, minus child care and other work expenses, minus out-of-pocket medical expenses.

The second example family (table 5) includes an unmarried woman with her three children, who are ages 6, 17, and 19. They live in a rented home in Alabama in an area of the state with higher housing

costs than the first example family. Their SPM poverty threshold is $31,014, which is higher than the threshold in the first example because of their location and also because the family is larger. The mother works the entire year, and the 19-year-old works for 30 weeks, with combined annual earnings of $35,081 before the wage increase. The family also receives $1,711 in SNAP benefits over the year, plus $4,034 in EITC and $1,400 in the refundable portion of the CTC, and they have relatively low child care expenses for the 6-year-old ($728) because of a CCDF-funded child care subsidy. After also factoring in payroll taxes, state income taxes, other work expenses, and estimated medical expenses, their resources according to the SPM measure sum to $33,789, or 109 percent of their SPM poverty threshold.

When we model the $15.00-per-hour minimum wage, the mother and the 19-year-old each receive a raise. However, the 19-year-old loses employment for three months. Nevertheless, their aggregate earnings still increase by $5,525. Some elements of resources decline. In particular, there is a $462 reduction in their EITC, and they experience increases in federal and state income tax liability and payroll taxes. However, several other elements of resources increase. The mother's increased wages cause a loss of eligibility for CCDF subsidies, but the model estimates that they would forego any other nonparental child care and instead arrange for unpaid care, meaning that the loss of eligibility causes their estimated child care expenses to fall to $0. Their SNAP benefit changes in different directions in months with and without job loss, but the annual amount is $282 higher. Finally, the teen's three-month loss of employment means that work expenses fall by $557 ($44 times just under 13 weeks). Considering all of those changes, the family's SPM resources increase by $5,757, an increase which is slightly *greater* than the family's increase in gross earnings. Their total SPM resources including both the minimum wage increase and job loss stand at $39,546, or 128 percent of their SPM poverty threshold.

TABLE 5

Resources of Example Family 2 Before and After Minimum Wage Increase

Single parent with a 19-year old and two younger children; 19-year-old has some job loss

Annual Resources[a]	Before Minimum Wage Increase	After Minimum Wage Increase and Job Loss	Change
Added to resources ($)			
Earnings	35,081	40,606	5,525
SNAP[a]	1,711	1,992	282
EITC	4,034	3,572	-462
Subtracted from resources ($)			
Payroll taxes	2,684	3,106	423
Net federal income taxes other than EITC	-1,400	-1,196	204
Net state income taxes	1,180	1,426	246
Child care expenses	728	0	-728
Work expenses	3,609	3,051	-557
Out of pocket medical expenses	236	236	0
Summary measures			
Total resources[b] ($)	33,789	39,546	5,757
SPM poverty threshold ($)	31,014	31,014	
Family resources as a percentage of the SPM poverty threshold (%)	108.9	127.5	

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022.

Notes: EITC = earned-income tax credit; SNAP = Supplemental Nutrition Assistance Program; SPM = Supplemental Poverty Measure. Family includes a single parent with three children (ages 6, 17, and 19) in a higher-cost area of Alabama, parent and 19-year-old get a raise; 19-year-old loses work for three months.

[a] The calculations use 2022 benefit and tax policies, with the exception that SNAP benefits are computed without the special policies in place during the public health emergency

[b] "Total resources" are the sum of cash income, plus the value of noncash benefits, plus the EITC, minus net tax liabilities other than the EITC, minus child care and other work expenses, minus out-of-pocket medical expenses.

The third example (table 6) is an unmarried individual, with no children, living alone. Before the minimum wage increase, he earns $9,672, working full-year but part-time, at just below the statutory federal minimum wage. He does not receive the EITC because he is too young (he is 21 years old, and the minimum age for the childless EITC in 2022 is 25), and he does not receive any means-tested benefits. After subtracting a total of about $1,000 in a combination of payroll tax and state income tax, about $2,300 in work expenses, and a small amount of medical expense, his total resources in the baseline situation are $6,220, which is 49 percent of the SPM threshold where he lives. After the

minimum wage increase, his pay rate is assumed to increase by a full $7.75, increasing his annual earnings to $21,762. There are no offsets from losing benefits because he did not receive any benefits; he does owe more in payroll tax and state income tax and he begins to owe federal income tax, but his work expenses and medical expenses are assumed to be unchanged. His net resources more than double, rising to $15,943, or 126 percent of his SPM poverty threshold. The very large increases in both earnings and resources are due to a combination of the very large increase in hourly pay combined with the fact that there are no offsets from benefit reductions because he was not receiving any benefits in the baseline.

TABLE 6

Resources of Example Family 3 Before and After Minimum Wage Increase

Unmarried individual

Annual Resources[a]	Before Minimum Wage Increase	After Minimum Wage Increase	Change
Added to resources ($)			
Earnings	9,672	21,762	12,090
SNAP[a]	0	0	0
EITC	0	0	0
Subtracted from resources ($)			
Payroll taxes	740	1,665	925
Net federal income taxes other than EITC	0	881	881
Net state income taxes	244	805	561
Work expenses	2,289	2,289	0
Out-of-pocket medical expenses	180	180	0
Summary measures			
Total resources[c] ($)	6,220	15,943	9,722
SPM poverty threshold ($)	12,669	12,669	
Family resources as a percentage of the SPM poverty threshold (%)	49.1	125.8	

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022.

Notes: EITC = earned-income tax credit, SNAP = Supplemental Nutrition Assistance Program; SPM = Supplemental Poverty Measure; This "family" for poverty assessment purpose is an unmarried and childless individual, living alone.

[a] The calculations use 2022 benefit and tax policies, with the exception that SNAP benefits are computed without the special policies in place during the public health emergency.

[b] "Total resources" are the sum of cash income, plus the value of noncash benefits, plus the EITC, minus net tax liabilities other than the EITC, minus child care and other work expenses, minus out-of-pocket medical expenses.

These families do not represent all possible outcomes. Although all three of the example families gain resources, some families lose resources. Further, many families with below-poverty resources in the baseline gain resources, but their resources remain below poverty. Nevertheless, most families become better off to some extent (as shown below). Also, the situation that occurs for family 2, with a larger increase in resources than in net earnings from a reduction in child care or work expenses, is relatively common among families that include someone who loses employment.

Distribution of Affected People by Extent of Change in Resources

Because of the wide variation in family circumstances—including their starting pay rate, the benefit programs from which they receive help, and whether their current wages are in a range where increases cause the EITC to increase or decrease, among many other variations—an increase in the federal minimum wage would have very different impacts on the net resources of different families. In the scenario without job loss (shown in the top panel of table 7), among the 131.9 million people in affected households (households in which at least one person gets an increase in hourly pay), 81 percent experience an increase of at least 1 percent in family resources.[19] For most of the people experiencing an increase (52 percent of all people in affected households) the increase is from 1 to 10 percent; 29 percent of people in affected households experience a larger increase. A further 18 percent experience minimal change (an increase or decrease of less than 1 percent), and less than 1 percent of people in affected households see a net decline in family resources of greater than 1 percent. The reason that some people have a net decline in their resources, even without job loss, is that in some cases, higher wages may result in benefit losses and new taxes that, in combination, outweigh the amount of new earnings.

TABLE 7

Degree of Change in SPM Resources by Baseline Percent of SPM

People in households affected by minimum wage increase

	Percent of SPM Poverty in Baseline					
	Under 50%	**50 to <100%**	**100 to <15 0%**	**150 to <200%**	**200%+**	**All**
People in affected households (millions)	5.305	17.741	30.683	23.062	55.122	131.913
Percent distribution by degree of change, in scenario with no job loss (%)						
Resources decline by > 50%	0.3	0.0	0.0	0.0	0.0	0.0
Resources decline by > 25% to 50%	0.2	0.0	0.0	0.0	0.0	0.0
Resources decline by > 10% to 25%	0.4	0.1	0.1	0.0	0.0	0.1

	Percent of SPM Poverty in Baseline					
	Under 50%	50 to <100%	100 to <15 0%	150 to <200%	200%+	All
Resources decline by ≥ 1% to 10%	1.0	0.6	0.9	0.2	0.1	0.4
Resources change by < 1%	22.5	6.8	9.2	12.4	28.6	18.1
Resources increase by ≥ 1% to 10%	11.3	33.1	49.4	58.0	60.5	51.8
Resources increase by >10% to 25%	13.6	26.4	26.5	22.8	9.6	18.3
Resources increase by > 25% to 50%	12.5	19.0	10.9	5.7	1.1	7.0
Resources increase by > 50%	38.0	14.0	3.0	0.9	0.1	4.3
All	100.0	100.0	100.0	100.0	100.0	100.0
Percent distribution by degree of change, in scenario with job loss possible for all affected workers (%)						
Resources decline by > 50%	1.4	0.5	0.1	0.1	0.0	0.2
Resources decline by > 25% to 50%	0.8	0.5	0.4	0.2	0.1	0.3
Resources decline by > 10% to 25%	0.9	0.7	0.7	0.6	0.3	0.5
Resources decline by ≥ 1% to 10%	1.4	1.4	1.9	1.5	1.5	1.6
Resources change by < 1%	22.6	7.1	9.6	13.0	29.7	18.8
Resources increase by ≥ 1% to 10%	11.5	33.3	49.2	57.5	58.6	50.9
Resources increase by >10% to 25%	13.5	25.9	25.5	21.3	8.7	17.3
Resources increase by > 25% to 50%	12.3	18.0	10.0	5.0	0.9	6.5
Resources increase by > 50%	35.6	12.5	2.6	0.8	0.1	3.9
All	100.0	100.0	100.0	100.0	100.0	100.0

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022.
Notes: SPM = Supplemental Poverty Measure. Poverty data are for people in households in which any member received a wage increase. Poverty is based on resources that use 2022 benefit and tax policies, with the exception that Supplemental Nutrition Assistance Program benefits are computed without the special policies in place during the COVID-19 public health emergency. "SPM resources" are the sum of cash income plus the value of noncash benefits, plus the earned-income tax credit minus net tax liabilities other than the earned-income tax credit, minus child care and other work expenses, minus out-of-pocket medical expenses.

The likelihood of different impacts varies by the starting level of resources relative to the poverty threshold. In particular, the likelihood of family resources increasing by more than 50 percent is higher for the families with the lowest resources (relative to their SPM poverty threshold) at the outset. Among the 5.3 million people in affected households whose families have resources less than half of the SPM threshold in the baseline situation, 38 percent would experience an increase in resources of more than 50 percent. In contrast, the portion with that degree of increase in family resources is 14 percent

among people in families from 50 to 100 percent of SPM poverty, and 3 percent among people in families from 100 to 150 percent of SPM poverty.

In the scenario with job loss possible for any affected worker (shown in the bottom panel of table 7) the overall chance the someone in an affected household has a net decline in resources is higher than in the scenario without job loss, but it is still quite low, at 3 percent overall. Further, even with over 3 million people experiencing job loss, a large majority (about 79 percent) of people in households with any earnings change see their net resources increase by at least 1 percent. Families with job loss are more likely to have an overall reduction in resources when the months of job loss are a larger portion of the total months of work, and when they receive fewer means-tested benefits that may increase to offset the earnings reduction.

In the job loss scenario, as in the scenario without job loss, people in households at the lowest end of the income spectrum are most likely to very large resource increases. Also, people in families within 50 percent of the SPM threshold in either direction (from 50 percent to 150 percent of their family's SPM threshold) are the most likely to experience a resource increase overall, and people in families with resources at least 200 percent of the threshold are more likely to have only a small increase.

Changes in Supplemental Poverty Measure Poverty Rates

The increase in the minimum wage, without any job loss, is estimated to reduce the overall SPM poverty rate from 14.7 percent to 12.4 percent (table 8). However, note that the rate of 14.7 percent is not the same as a current-law SPM poverty rate estimate for 2022 because we modeled the SNAP program without the special policies in place during the public health emergency, and those policies had a substantial impact on poverty. See Wheaton and Kwon (2022).

In absolute terms, the scenario without any job loss is estimated to result in 7.6 million people having their families' economic resources raised above the SPM poverty threshold (table 9). That number equals 33 percent of the 23.0 million people in families with below-poverty income in households affected by the wage increase. For the other two-thirds of people with below-poverty resources in households experiencing a wage increase, various factors could contribute to remaining in poverty according to the SPM measure. One key issue it that many individuals affected by the wage increase either do not work full-time or do not work for the entire year; the fewer total hours worked, the less likely that the wage increase would bring a family's annual net resources over the poverty threshold. In addition, a wage increase for an individual family member is less likely to raise family

resources over the poverty threshold, all else equal, when the family is larger and when the family lives in a higher-cost area (because both of those characteristics result in higher SPM poverty thresholds).

When job loss is modeled, the reductions in poverty are smaller. When everyone with an original wage below $18 per hour has a chance of job loss, 6.9 million people have their families' resources raised above the poverty threshold, and the SPM poverty rate declines to12.6 percent.

In all of the scenarios, the percentage-point reductions in poverty are about the same for children and working-age adults, with much less reduction for people ages 65 and older. In the scenario without any job loss, the child poverty rate declines by 2.8 percentage points and the rate for working-age adults declines by 2.7 percentage points, but the rate for people ages 65 and older declines by only 0.6 percentage points. People in that age range are affected only if they are still working themselves, or if they are living with a spouse or other family member who is working.

TABLE 8

Change in SPM Poverty Rates from Increasing the Minimum Wage, by Employment Change Scenario and Age Group

		No Job Loss		Job Loss (Only < 15)		Job Loss (All)	
	Baseline rate (%)	Rate (%)	Percentage point change	Rate (%)	Percentage point change	Rate (%)	Percentage point change
All	14.7	12.4	-2.4	12.6	-2.2	12.6	-2.1
< 18	15.2	12.4	-2.8	12.6	-2.6	12.6	-2.5
18–64	14.3	11.6	-2.7	11.8	-2.5	11.9	-2.4
65+	15.7	15.1	-0.6	15.2	-0.6	15.2	-0.6

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022.

Notes: SPM = Supplemental Poverty Measure; poverty data are for the entire US population, not just affected workers and their families. Poverty is based on resources that use 2022 benefit and tax policies, with the exception that Supplemental Nutrition Assistance Program benefits are computed without the special policies in place during the COVID-19 public health emergency. For that reason, the baseline rates shown here cannot be interpreted as 2022 current-law Supplemental Poverty Measure poverty rates.

TABLE 9

Change in Numbers of People with Family Resources Below SPM Poverty Level from Increasing the Minimum Wage, by Employment Change Scenario and Age Group

In millions

		No Job Loss		Job Loss (Only < 15)		Job Loss (All)	
	Baseline number	Number	Change	Number	Change	Number	Change
All	47.453	39.879	-7.574	40.502	-6.951	40.599	-6.854
< 18	10.995	8.949	-2.046	9.123	-1.872	9.152	-1.843
18–64	27.675	22.501	-5.174	22.912	-4.762	22.974	-4.700
65+	8.783	8.430	-0.354	8.467	-0.316	8.472	-0.311

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022.

Notes: SPM = Supplemental Poverty Measure; poverty data are for the entire US population, not just affected workers and their families. Poverty is based on resources that use 2022 benefit and tax policies, with the exception that Supplemental Nutrition Assistance Program benefits are computed without the special policies in place during the COVID-19 public health emergency. For that reason, the baseline rates shown here cannot be interpreted as 2022 current-law Supplemental Poverty Measure poverty rates.

TABLE 10

Change in SPM Poverty Rates from Increasing the Minimum Wage by Employment Change Scenario and Race and Ethnicity for People Ages 18 to 64

By sex

		No Job Loss		Job Loss (Only < 15)		Job Loss (All)	
	Baseline rate (%)	Rate (%)	Percentage point change	Rate (%)	Percentage point change	Rate (%)	Percentage point change
Women							
All races/ethnicities	15.2	12.4	-2.8	12.7	-2.6	12.7	-2.5
AAPI people	16.5	14.0	-2.5	14.2	-2.3	14.2	-2.3
Black, non-Hispanic people	21.1	17.0	-4.1	17.4	-3.7	17.5	-3.7
Hispanic people	22.7	17.8	-4.9	18.2	-4.5	18.3	-4.4
White, non-Hispanic people	11.1	9.3	-1.8	9.4	-1.7	9.4	-1.7
People identifying as other race or multiple races	18.4	15.3	-3.1	15.4	-3.0	15.4	-3.0
Men							
All races/ethnicities	13.3	10.8	-2.6	11.0	-2.3	11.0	-2.3
AAPI people	16.5	14.1	-2.5	14.3	-2.3	14.3	-2.3

	Baseline rate (%)	No Job Loss		Job Loss (Only < 15)		Job Loss (All)	
		Rate (%)	Percentage point change	Rate (%)	Percentage point change	Rate (%)	Percentage point change
Black, non-Hispanic people	18.5	14.8	-3.7	15.2	-3.4	15.2	-3.3
Hispanic people	19.0	14.4	-4.6	14.7	-4.2	14.8	-4.2
White, non-Hispanic people	9.9	8.2	-1.6	8.4	-1.5	8.4	-1.5
People identifying as other race or multiple races	16.8	13.9	-2.9	14.1	-2.7	14.1	-2.6

Source: Urban Institute's Analysis of Transfers, Taxes, and Income Security model, using data from the 2018 American Community Survey, projected to reflect 2022.
Notes: AAPI = Asian American and Pacific Islander; SPM = Supplemental Poverty Measure; we use the term "Hispanic" throughout this report, as this is the primary terminology used by the US Census Bureau in the underlying American Community Survey. Poverty data are for all working-age adults not just affected workers and their families. Poverty is based on resources that use 2022 benefit and tax policies, with the exception that Supplement Nutrition Assistance Program benefits are computed without the special policies in place during the COVID-19 public health emergency. For that reason, the baseline rates shown here cannot be interpreted as 2022 current-law SPM poverty rates.

Within the group of working-age adults, the impacts of the change vary by race and ethnicity, and to a smaller extent for men compared with women (table 10). In the scenario without job loss, the estimated poverty rate falls the most for Hispanic women (a decline of 4.9 percentage points) and Hispanic men (a decline of 4.6 percentage points). Among Black people, the poverty rate declines by 4.1 percentage points for women and 3.7 percentage points for men. Within each racial and ethnic group, the percentage-point declines are generally slightly smaller for men than for women, which is partly because working-age men are less likely to be in poverty in the baseline compared with working-age women. In the scenarios that include job loss, the patterns remain the same, but the reductions in poverty are slightly lower.

The degree of poverty reduction in the scenarios that include job loss depends in part on two key assumptions—the employment elasticities used for the simulations, and the fact that the simulations allowed people to regain employment during the year. We conducted alternate simulations with changes to each of those assumptions. First, we repeated the simulation in which job loss is possible for any affected worker using elasticities about twice as large as the ones used in the primary simulation—in other words, for a given percentage increase in a person's wage, we assumed the probability of job loss was almost twice as high as in the primary simulations. Although the number of people with any job loss increases from 3.2 million to 5.5 million, the SPM poverty rate still declines by 2.0 percentage points, and 6.3 million people have their families' resources raised above the SPM poverty threshold. Second,

we conducted a simulation in which we retained the original elasticities, but this time we did not allow any of the workers losing employment to regain employment during the year. In this test, the SPM poverty rate declined by 1.7 percentage points and the number of people with family resources raised above the SPM threshold was 5.5 million. Thus, these alternate assumptions still result in substantial reductions in SPM poverty.

Summary

The analysis of a federal-level minimum wage of $15.00 per hour in the corresponding brief by Acs and colleagues (2022) was generated using the Urban Institute's comprehensive ATTIS microsimulation model. Key aspects of the methodology included the following:

- Projecting an available 2018 ACS data file to better represent 2022, including adjustments to population weights, employment status, wage levels (to capture minimum wage increases between 2018 and 2022), and amounts of various types of income
- Augmenting the 2022 data to include detailed representations of all of the key benefit and tax programs, with caseloads of benefit programs aligned to come close to the available information about 2022 benefit receipt
- Imposing the $15.00-per-hour minimum wage assuming that there would be "spillover" effects—that is, that some people would receive a wage higher than the legally-required wage.
- Capturing the secondary impacts of the minimum wage increase on benefits and taxes
- Exploring different assumptions about whether a minimum wage increase to $15 per hour would cause any job loss. However, because ATTIS can capture monthly variations, we could model that even people losing their job for some number of months could begin to work again later in the year.

The use of microsimulation allows results to be examined in various ways. At the aggregate level, across the three scenarios, the overall SPM poverty rate declined by between 2.1 and 2.4 percentage points relative to the baseline, with the smallest antipoverty effect occurring in the scenario with the greatest job loss. Sensitivity tests show that even when we assume more job loss or a longer duration of job loss, poverty still declines. See Acs at al. (2022) for additional poverty results and average changes in earnings and total resources for affected families.

.Because changes in earnings may affect taxes, tax credits, and means-tested benefits, the change in a family's resources will usually differ from the change in gross wages. In this analysis, we projected that aggregate means-tested benefits would decline by an amount equal to about 5 percent of the aggregate wage increase, and taxes would increase by an amount equal to 21 or 22 percent of the aggregate wage increase. In the aggregate, the total increase in families' resources is 73 to 74 percent of the total increase in wages, depending on the scenario.

Because of differences in baseline benefit receipt, family composition, extent of employment, starting wage rates, and amounts of unearned income, the relative change in resources from the minimum wage increase varies across families. However, about four out of five people who are in a household with an affected worker experience an increase in net family resources, even in the scenario in which job loss is possible for all workers. In that scenario, 3 percent of all people in affected households experience a reduction in resources, with the remainder experiencing a negligible change (an increase or decrease in resources of less than 1 percent). People with the lowest incomes before the wage increase are the most likely to experience a large increase in family resources. Among people in affected households whose resources in the baseline were less than 50 percent of the SPM threshold, in the scenario when job loss is a possibility for any affected worker, 36 percent are projected to have their family resources rise by more than 50 percent.

A few key caveats apply to the results. All of the results assume that the minimum wage increase is fully imposed in 2022 (rather than phased in). The simulations assume no economic changes other than those explicitly modeled; for example, they do not incorporate either the possibility of higher prices (which would lower families' economic well-being) or stronger economic growth (which would increase families' economic well-being). Finally, to the extent that children growing up in families with resources above the poverty level are likely to have better outcomes in terms of education and labor market success than children in families with below-poverty resources, the estimated single-year poverty reductions might understate the full impacts (NAS 2019).

Microsimulation provides a methodology for hypothetically imposing a policy together with its secondary impacts on taxes and benefit, examining both the aggregate results and the variations in results, and testing out the sensitivity of results to varying assumptions. In this case, the analyses show that across a range of assumptions, poverty declines, and a large majority of people living in a household with an affected worker would see an increase in their family resources. Future work could incorporate new research into the labor market impacts of state-level and city-level minimum wage increases, and could consider more closely the variations in results across states and family circumstances.

Notes

[1] Key aspects of preparing ACS data for use within ATTIS include allocating annual weeks of employment and annual income amounts across the months of the year (to support month-by-month simulation of benefit programs); imputing whether each noncitizen is a lawful permanent resident, refugee, asylee, temporary resident, or unauthorized immigrant (because a noncitizen's legal status affects program eligibility); and imputing whether a parent's unmarried partner is also the parent of the children (this affects some programs' eligibility and benefit determinations).

[2] We use the term "Hispanic" throughout this report, as this is the primary terminology used by the US Census Bureau in the underlying ACS, which this analysis is based on. Survey respondents are asked to report race and ethnicity, including whether or not they identify as being of "Hispanic, Latino, or Spanish origin."

[3] The modified population weights were developed under prior work to allow the 2018 ACS to better represent 2021. The population changes between 2021 and 2022 were not extensive and we use that previously developed set of weights to represent 2022.

[4] The preparation of ACS data for use within ATTIS includes allocating weeks of employment across the year. For example, someone who reported working half the year in the 2018 ACS might have been probabilistically assigned to be working in January through June, but not July through December.

[5] Detailed data from the monthly Establishment Survey component of the Current Employment Statistics were obtained through the Bureau of Labor Statistics databases (https://www.bls.gov/data/). We used information by state, month, and industry (supersector).

[6] The projections were completed before the release of the Congressional Budget Office's most recent economic projections for 2022, which were released in late May 2022.

[7] For the increase in average weekly wages from 2018 to 2021, see "Database Series ID LEU0252881500," Bureau of Labor Statistics, last updated August 4, 2022, https://data.bls.gov/timeseries/LEU0252881500; the annual average is $998 in 2021, which is 12.6 percent higher than the estimated average of $886 in 2018. Estimated annual inflation from 2021 to 2022 was 6 percent in the Philadelphia Federal Reserve Bank's second quarter survey of professional forecasters (Federal Reserve Bank of Philadelphia, 2022). We multiplied 1.126 by 1.06 to arrive at an overall estimated average increase in an individual's earnings of 19.4 percent from 2018 to 2022. The National Income and Product Accounts show an even larger percentage increase in *aggregate* wages and salaries from the first quarter of 2018 to the first quarter of 2022, at over 25 percent according to their most recently released figures. (See Table 2.1, "Personal Income and Its Disposition," last revised on June 29, 2022), from Federal Reserve Bank of Philadelphia [2022]). We chose to use the 19.4 percent figure because it was primarily based on individual-level wage data.

[8] The ACS asks about a person's weeks of work in ranges. As part of the preparation of the data for use with ATTIS, we impute a specific number of weeks of work within the reported range based on probabilities computed from the CPS Annual Social and Economic Supplement.

[9] When determining if someone's wage was covered by 2018 minimum wage, we used a $0.25 "tolerance" to account for potential misreporting. That means in an area with a minimum wage of $7.25, anyone with a wage of at least $7.00 would be treated as covered.

[10] In an area with a lower minimum wage required for small employers, if a person's 2018 wage was at or above the area's 2018 minimum wage for small employers but less than the area's 2018 minimum wage for large employers, and their wage after the 19.4 adjustment was less than the area's 2022 minimum wage for small employers, we raised their wage to the 2022 minimum for small employers. If an area had more than two

minimum wages (for instance for small, medium, and large employers), we used the minimum wages for the smallest and the largest when adjusting wages.

[11] Jacobs (1998) compared self-reports of average hours of work with computed averages, and found that people whose computed average was less than 40 hours per week tended to report more hours than the actual figure. The self-reported number of hours was on average 6.5 hours higher than the computed average for people with a computed average of 1 to 19 hours per week, 1.9 hours higher for people with a computed average of 20 to 29 hours per week, and 1.1 hours higher for people with a computed average of 30 to 39 hours per week.

[12] The cost-of-living increases over the four-year period have been: 2.8 percent in January 2019, 1.6 percent in January 2020, 1.3 percent in January 2021, and 5.9 percent in January 2022. See "Cost-of-Living Adjustment (COLA) Information," Social Security Administration, accessed May 2022, https://www.ssa.gov/cola/.

[13] See data for quarter 1 of 2022 compared with quarter 1 of 2018 in "Personal Income and Its Disposition," Table 2.1, St. Louis Federal Reserve Bank, accessed May 2022, https://fred.stlouisfed.org/release/tables?eid=4083&rid=53.

[14] The annual CPI-U for 2021 was 7.9 percent higher than in 2018. (See "Data Series CUUR0000SA0," Bureau of Labor Statistics, last updated August 12, 2022, https://data.bls.gov/timeseries/CUUR0000SA0.) We assumed an additional 6 percent inflation for 2022, based on the Philadelphia Federal Reserve Bank's second quarter survey of professional forecasters (Federal Reserve Bank of Philadelphia, 2022). Based on those elements, we assumed total inflation of 14.5 percent from 2018 to 2022.

[15] Following questions about individual types of income—earnings, retirement income, Social Security, SSI, public assistance income, and investment income—the ACS asks a "catch-all" question that asks about any other type of income. The amount could include child support income, unemployment insurance benefits, workers compensation, veterans' benefits, and other types of income. As part of preparing ACS data for use in ATTIS, we use CPS-based imputations to allocate the "other" income to child support, unemployment benefits, or other types of income, so that child support and unemployment benefits can be considered separately from other types of income in some aspects of the simulations.

[16] For working families that are not simulated to receive a child care subsidy, we impute the likelihood of having child care expenses and the amount of expense using equations previously developed based on the Survey of Income and Program Participation, and aligned so that the incidence and average amount of child care expenses comes acceptably close to information reported in the CPS Annual Social and Economic Supplement, including variation by family income level.

[17] Families may be able to receive CCDF for a limited time period—often 3 months—during a period of job search. ATTIS did not capture that eligibility, and instead modeled families as being ineligible for CCDF in all months in which a parent was unemployed.

[18] The total value of public and subsidized housing is computed as the difference between the fair market rent and the amount the household must pay toward rent. The value included for purposes of SPM resources is capped at the portion of the poverty threshold that is treated as the portion needed for housing. The full SPM resource measure also subtracts the amount of child support a person pays to a child in another household and adds the value of free and reduced-priced school lunch; we do not model those aspects of the definition.

[19] The terms "household" and "family" have different meanings. The "household" refers to all people who live in the same dwelling unit. However, SPM poverty is assessed on a "family" basis, and some households include more than one family. For example, if two unrelated families share a home, and it is not the case that the adult in one family is the unmarried partner of the adult in the other family, then each family's SPM poverty data is assessed separately. In a small number of these multiple-family households, one family's resources are affected even though the only wage increase occurs in the other family. This can occur because some benefit programs either always or sometimes consider the entire household to be the "assistance unit," meaning that a change in eligibility or benefit level would affect the whole household. For example, if the household loses eligibility for LIHEAP because a person in one family gets a wage increase, the loss of LIHEAP affects both families.

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