

# Decoding the Surge in the 2022 SPM Threshold: The Influence of Inflation and Other Factors

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## **Abstract**

The SPM thresholds increased on average between 2.02 percent for owners with mortgages and 2.28 percent for renters between 2010 and 2021. In 2022 the thresholds increased between 9.74 percent for renters and 10.05 percent for owners with mortgages. This article provides an explanation as to why the 2022 SPM thresholds increased so much more than in previous years. Three factors drive the change in the 2022 threshold relative to the historic time series based on the 2021 methods: prices, updating the data used to produce the threshold, and improvements to the code used to impute in-kind benefits. The impact of improving the in-kind benefits imputation code and updating the data account for between 2.54 percentage points for renters and 2.85 percentage points for owners with mortgages. In contrast, inflation account for 7.21 percentage points of the increase. The overwhelming contribution of inflation to the increase in the thresholds is not a surprise given the year-over-year inflation rate for 2022 was considerably higher compared to previous years.

## **Acknowledgements**

I would like to express my deep appreciation to Thesia I. Garner and Brett Matsumoto of the U.S. Bureau of Labor Statistics Office of Prices and Living Conditions for their helpful comments and suggestions. I would also like to thank Juan Munoz for his assistance in producing the data necessary to conduct this analysis.

## Introduction

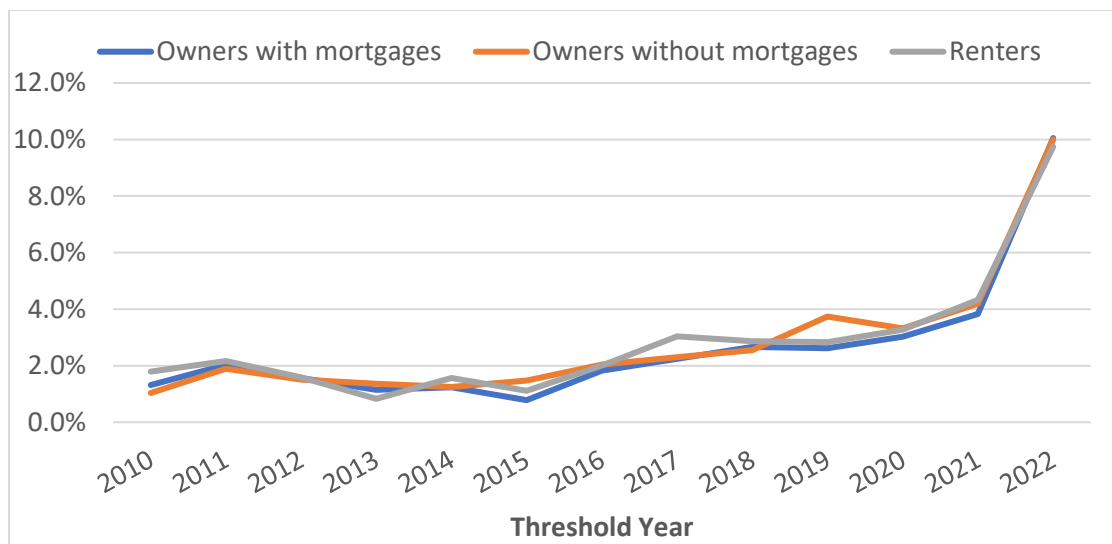
On September 30, 2020, the Interagency Technical Working Group (ITWG) on the Supplemental Poverty Measure (SPM) voted on a series of changes to be made to the SPM methodology. All of the [ITWG SPM approved changes](#) were implemented with the production and release of the 2021 SPM poverty report with statistics for 2020.<sup>1</sup> For continuity, the BLS produced a historical series of thresholds going back to 2009 using the approved changes. See Table 1.<sup>2</sup>

Table 1: Historical SPM Thresholds for Two Adults, Two Children Households by Tenure

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>Owners with mortgages</b>	\$24,472	\$24,793	\$25,296	\$25,691	\$25,985	\$26,307	\$26,513	\$26,998	\$27,604	\$28,337	\$29,080	\$29,959	\$31,107	\$34,235
<b>Owners without mortgages</b>	\$20,201	\$20,410	\$20,795	\$21,110	\$21,397	\$21,664	\$21,984	\$22,432	\$22,949	\$23,534	\$24,413	\$25,222	\$26,279	\$28,909
<b>Renters</b>	\$24,008	\$24,437	\$24,966	\$25,363	\$25,573	\$25,973	\$26,262	\$26,788	\$27,601	\$28,391	\$29,194	\$30,150	\$31,453	\$34,518

Figure 1 shows the year-to-year percent change in the SPM thresholds for two adults, two children households by housing tenure. The SPM thresholds increased on average between 2.02 percent for owners with mortgages and 2.28 percent for renters between 2010 and 2021. In 2022 the thresholds increased between 9.74 percent for renters and 10.05 percent for owners with mortgages. This article provides an explanation as to why the 2022 SPM thresholds increased so much more than in previous years.

Figure 1: Year-to-Year Percent Change in SPM Thresholds for Two Adults, Two Children Households by Tenure



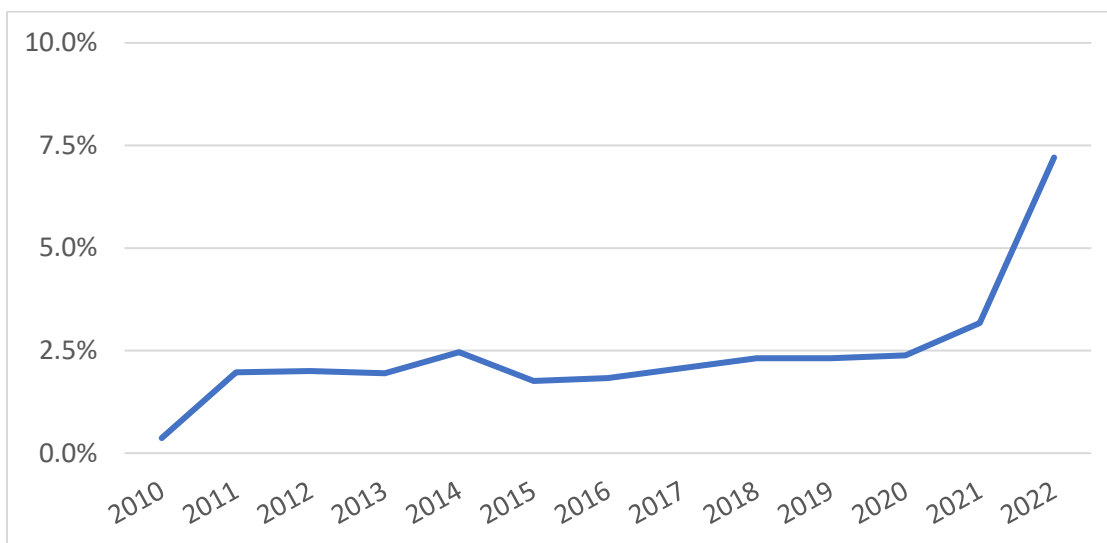
Source: U.S. Bureau of Labor Statistics

<sup>1</sup> For a summary of the changes to the thresholds and resources with impacts on poverty statistics visit the [Census Bureau](#) website.

<sup>2</sup> See the BLS SPM website for more details about the historic time series.

Three factors drive the change in the 2022 threshold relative to the historic time series based on the 2021 methods: prices, updating the data, and improvements to the code used to impute in-kind benefits. The first two factors, prices and updating the data, are common to all thresholds. Data from the previous five years of Consumer Expenditure Surveys (CE) are used to produce the thresholds for each year. For example, the 2022 thresholds are based on CE data collected in 2017 quarter two through 2022 quarter one while the 2021 thresholds are based on data collected in 2016 quarter two through 2021 quarter one. Thus, updating the threshold year leads to a change in the underlying data. The quarterly expenditures and in-kind benefits data for the five years are updated to threshold year dollars using a composite consumer price index that is referred to as the FCSUti CPI-U, where FCSUti refers to the primary components of the thresholds: food, clothing, shelter, utilities, telephone, and internet.<sup>3</sup> Accordingly, the year-to-year changes in the SPM thresholds will be affected by changes in the price level, or inflation. Figure 2 illustrates the year-over-year inflation rate for the FCSUti price index from 2010 to 2022.

Figure 2: Year-Over-Year FCSUti Inflation Rate



The third factor, improvements to the imputation of in-kind benefits, only applies to the 2022 threshold. Improvements to the imputation code include: expanding the Women, Infant, and Children (WIC) program universe to include women greater than age 45 years when their children are less than 5 years of age; using annual monthly average WIC based on fiscal year rather than rolling 3-month averages; a revision to the code to assign free and reduced school lunches based on before money income and official poverty thresholds; and not adding imputed WIC benefits to food expenditures once a state fully implemented the administration of these benefits via electronic benefit transfer (we assume that electronic benefits are already reported in food expenditures, which is the same assumption made for the Supplemental Nutrition Assistance Program). For all but the latter change, improvements in the imputation code follow the methods used by the Census Bureau for measuring SPM resources, which is

<sup>3</sup> The FCSUti index is processed as an annual average for the urban population. Upper-level index estimation for the FCSUti index is comparable to the CPI-U as a modified Laspeyres formula.

more than just income. Of the three factors, inflation accounts for a majority of the change in the thresholds from 2021 to 2022.

### **Background on the SPM**

The SPM was developed in 2010 as a supplement to the official poverty measure. Since then, it has been published annually, providing valuable insights into poverty in the United States.<sup>4</sup> The Bureau of Labor Statistics, specifically the Division of Price Index and Number Research (DPINR), is responsible for calculating reference unit SPM thresholds which the Census Bureau then uses, after adjusting for household composition and geographic differences in housing costs, to produce poverty statistics. The reference unit SPM thresholds are based on out-of-pocket expenditures for food, clothing, shelter, utility, telephone, and internet, and imputed values for select in-kind government benefit programs (FCSUti).<sup>5</sup> Five years of quarterly data from the U.S. Consumer Expenditure Survey, Interview are used as the basis of the thresholds. The reference unit is composed of consumer units (CUs) with two adults and two children. However, the estimation sample is composed of CUs with at least one child; an equivalence scale is used to convert FCSUti values for CUs with one child into those representing the CUs with two adults and two children. Quarterly FCSUti values are converted to annual threshold year dollars by multiplying each quarter of data by four and updating using the FCSUti price index. Each year since the introduction of the ITWG approved changes of 2021, the thresholds are based on 1.2 times 83% of FCSUti around the median.<sup>6</sup> The additional 20% is applied to FCSUti to account for other basic goods and services like personal care and non-work-related transportation. Separate thresholds by housing tenure group --, homeowners with mortgages, one for homeowners without mortgages, and renters -- are produced as a function of their associated shelter and utilities values. The estimation sample is limited to include only CUs from these specific housing tenure groups. In other words, CUs living rent free, those living in student housing, and owners for which no information is provided regarding whether they have a mortgage are not included in the estimation sample. To learn more about the methodology used to derive the thresholds, you can visit the DPINR SPM [webpage](#).

### **Analysis**

To understand the impact of each factor contributing to the increase in the 2022 thresholds, we begin with the 2021 thresholds and apply each factor independently. See the Appendix for a complete derivation of the analysis.

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<sup>4</sup> Shrider, Emily A. and John Creamer, U.S. Census Bureau, *Current Population Reports, P60-280, Poverty in the United States: 2022*, U.S. Government Publishing Office, Washington, DC, September 2023. <https://www.census.gov/content/dam/Census/library/publications/2023/demo/p60-280.pdf>

<sup>5</sup> Low Income Housing Energy Assistance Program (LIHEAP), National School Lunch Program (NSLP), Supplemental Nutrition and Assistance Program (SNAP), Women, Infants, and Children Program (WIC), and rental assistance. Prior to September 2021, when the 2020 thresholds were published, these benefits were not included in the previously published thresholds. However, to examine the impact of accounting for these to the derivation of the thresholds, a set of revised 2019 thresholds were produced that included the benefits; these were compared to the previously published 2019 thresholds that did not include the benefits. See “Methodology to Produce the SPM Thresholds (2019 revised, 2020 and 2021)” for changes to the methodology used to produce the thresholds: <https://www.bls.gov/pir/spmhome.htm>

<sup>6</sup> The median for the production of the thresholds is defined as the mean of FCSUti expenditures inherent within the 47th-53rd FCSUti percentile range.

We begin with the effect of inflation. Table 2 presents the 2021 thresholds as published and the 2021 thresholds updated to 2022 dollars. Note, both sets of thresholds are based on CE data from 2016 quarter two through 2021 quarter one and use the same in-kind benefits imputation code. Thus, the only difference between the two sets of thresholds is that expenditures and in-kind benefits are updated to 2021 dollars in one case and 2022 dollars in the other. Updating the data from 2021 dollars to 2022 dollars does not affect the ranking of CUs since the same inflation rate is applied to all CUs. As a result, updating to 2022 dollars can be interpreted as multiplying the thresholds by a scalar, where the value of the scalar is the inflation rate from 2021 to 2022. The percentage change for all thresholds is 7.21 percent, which is equivalent to the annual percentage change in the FCSUti price index for 2021 to 2022.<sup>7</sup>

Table 2: Changes Due to Inflation for Two Adult, Two Children Thresholds

	2021 Threshold Published	2021 Threshold in 2022 Dollars	Difference	Percent Change
<b>Owners with mortgages</b>	\$31,107	\$33,349	\$2,242	7.21%
<b>Owners without mortgages</b>	\$26,279	\$28,173	\$1,894	7.21%
<b>Renters</b>	\$31,453	\$33,719	\$2,267	7.21%

Table 3 presents the published 2021 thresholds and the thresholds after improvements to the in-kind imputation code were incorporated. Note, both sets of thresholds are based on data from 2016 quarter two through 2021 quarter one and are reported in 2021 dollars. The code improvements resulted in a marginal drop in thresholds for owners with mortgages, and marginal increases for the other two housing tenure group thresholds.

Table 3: Changes Due to Improvements in Code to Impute In-Kind Benefits in 2021 Dollars for Two Adult, Two Children Thresholds

	2021 Threshold Published	2021 Threshold with Code Improvements	Difference	Percent Change
<b>Owners with mortgages</b>	\$31,107	\$31,040	-\$68	-0.22%
<b>Owners without mortgages</b>	\$26,279	\$26,466	\$186	0.71%
<b>Renters</b>	\$31,453	\$31,526	\$73	0.23%

To demonstrate the impact on the thresholds of updating the CE data on which the thresholds are based, Table 4 compares the 2021 published thresholds with an alternative version that does not use lagged data. The latter employs the same 2017 quarter two to 2022 quarter one CE data as the 2022 published threshold. In contrast, the former uses 2016 quarter two to 2021 quarter one data. Both thresholds are calculated using the same version of the code and are reported in 2021 dollars. The differences between these thresholds illustrate the impact of updating the data to the most recent five years, resulting in a 0.43 percent increase in the thresholds for owners without mortgages up to a 2.16 percent increase for owners with mortgages.

<sup>7</sup> The FCSUti price index for 2021 and 2022 is 118.996 and 127.571, respectively.

Table 4: Change Due to Updating the Data in 2021 Dollars for Two Adult, Two Children Thresholds

	2021 Threshold Published	2021 Threshold Non-lagged	Difference	Percent Change
<b>Owners with mortgages</b>	\$31,107	\$31,780	\$673	2.16%
<b>Owners without mortgages</b>	\$26,279	\$26,393	\$114	0.43%
<b>Renters</b>	\$31,453	\$32,078	\$625	1.99%

However, the two factors -- improvements to the in-kind benefits imputations and differences in the data reference period -- are not independent. Both factors influence the ranking of FCSUtI values, which are used to determine the range around the median. Table 5 presents the 2021 published thresholds alongside a version that incorporates both factors. The combined effects of the improvements to the in-kind benefits imputations and updating the reference period for data do not simply sum up when applied independently. For example, the cumulative impact on owners with mortgages (2.66 percent) exceeds the sum of the effects when applied individually (1.94 percent).

Table 5: Combined Change of Code Improvements and Updating the Data in 2021 Dollars for Two Adult, Two Children Thresholds

	2021 Threshold Published	2021 Threshold Non-lagged with Code Improvements	Difference	Percent Change
<b>Owners with mortgages</b>	\$31,107	\$31,934	\$826	2.66%
<b>Owners without mortgages</b>	\$26,279	\$26,966	\$687	2.61%
<b>Renters</b>	\$31,453	\$32,197	\$744	2.37%

To isolate the impact of the interaction of the two factors on the thresholds, we decompose the total difference into three components: differences attributable to code improvements (as shown in Table 2), differences due to updating the data (as shown in Table 3), and differences resulting from the interaction of the two factors. The latter is obtained by subtracting the first two components from the total. The findings presented in Table 6 show that this interaction effect leads to an increase in thresholds for owners with mortgages of \$221, an increase of \$387 for owners without mortgages, and an increase of \$46 for renters.

Table 6: Interaction Effect from Code Improvements and Updating the Data in 2021 Dollars for Two Adult, Two Children Thresholds

	Total Difference	Total Percent Change	Difference Due to Code Improvements	Percent Change Due to Code Improvements	Difference Due to Updating Data	Percent Change Due to Updating Data	Difference Due to Interaction	Percent Change Due to Interaction
<b>Owners with mortgages</b>	\$826	2.66%	-\$68	-0.22%	\$673	2.16%	\$221	0.72%
<b>Owners without mortgages</b>	\$687	2.61%	\$186	0.71%	\$114	0.43%	\$387	1.47%
<b>Renters</b>	\$744	2.37%	\$73	0.23%	\$625	1.99%	\$46	0.15%

Table 7 presents the complete analysis. Note, the sum of the percent changes for the individual components does not equal the year-to-year percent change. This discrepancy occurs because the

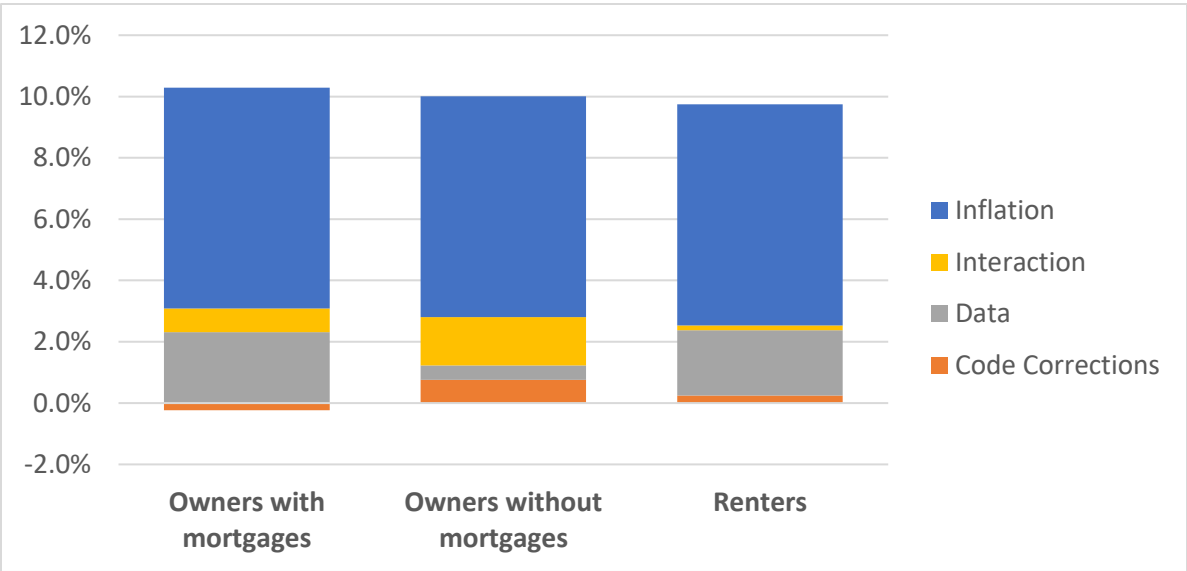
changes due to code improvements, updating the data, and the interaction effect are all calculated using 2021 dollars. For the sum of changes of the individual factors to equal the year-to-year change, all changes need to be in 2022 dollars. After updating the percent changes to 2022 dollars (i.e., multiplying the percent change due to code improvements, updating the data, and the interaction effect by the inflation rate) the sum of the changes due to the individual factors equals the year-to-year change. For example, the sum of the changes due to code improvements, updating the data, and the interaction term for owners with mortgages is 2.66 percent. Multiplying 2.66 percent by the inflation rate (1.0721) gives 2.85 percent, which when added to the percent change due to inflation yields the year-to-year percent change of 10.05 percent.

Table 7: Complete Decomposition of Year-to-Year Percent Change for Two Adult, Two Children Thresholds

	Reported in 2021 Dollars						2022 Threshold Published	Year-to-Year Percent Change
	2021 Threshold Published	Percent Change Due to Code Improvements	Percent Change Due to Updating Data	Percent Change Due to Interaction	Percent Change Due to Inflation	Sum of Percent Changes		
Owners with mortgages	\$31,107	-0.22%	2.16%	0.72%	7.21%	9.87%	\$34,235	10.05%
Owners without mortgages	\$26,279	0.71%	0.43%	1.47%	7.21%	9.82%	\$28,909	10.01%
Renters	\$31,453	0.23%	1.99%	0.15%	7.21%	9.58%	\$34,518	9.74%
	Updated to 2022 Dollars						2022 Threshold Published	Year-to-Year Percent Change
	2021 Threshold Published	Percent Change Due to Code Improvements	Percent Change Due to Updating Data	Percent Change Due to Interaction	Percent Change Due to Inflation	Sum of Percent Changes		
Owners with mortgages	\$31,107	-0.24%	2.32%	0.77%	7.21%	10.06%	\$34,235	10.05%
Owners without mortgages	\$26,279	0.76%	0.46%	1.58%	7.21%	10.01%	\$28,909	10.01%
Renters	\$31,453	0.25%	2.13%	0.16%	7.21%	9.75%	\$34,518	9.74%

Figure 3 shows the year-to-year change by the individual components. The impact of improving the in-kind benefits imputation code was the smallest, resulting in a change between negative 0.23 percent for owners with mortgages and 0.76 percent for owners without mortgages. Updating the data had a larger impact on the thresholds, ranging from 0.46 percent for owners without mortgages up to 2.32 percent for owners with mortgages. The interaction of the two effects led to a further increase in the threshold, but even when accounting for the combined effect of the code improvements and updating the data (i.e., the percent change due to code improvements plus the percent change due to updating the data plus the percent change due to the interaction) the thresholds only increased between 2.54 percent for renters and 2.85 percent for owners with mortgages. In contrast, inflation contributed to a 7.21 percent increase in the thresholds, which is more than three times the combined effect of the other two factors.

Figure 3: Percent Change in Thresholds for Two Adults, Two Children Households by Factors, 2022 Dollars



Source: U.S. Bureau of Labor Statistics

The increase in the SPM thresholds from 2021 to 2022 was primarily due to inflation, which is not surprising. The inflation rate in 2022 is considerably higher compared to previous years. The findings presented in this analysis highlight the significant impact an inflationary shock can have on the poverty threshold; however, a spike in the threshold does not mean the poverty rate will also spike. The poverty rate is an interplay between the threshold and resources. Thus, the poverty rate may remain stable if nominal resources also rise in line with inflation.



## Appendix. Derivation of Decomposition

The percent change in the SPM threshold from 2021 to 2022 is

$$\% \Delta SPM^h = \frac{\Delta SPM^h}{SPM_{21}^h}$$

where the subscript represents the threshold year, the superscript  $h$  represents housing tenure, specifically owners with mortgages, owners without mortgages, and rents, and  $\Delta SPM^h$  is

$$\Delta SPM^h = SPM_{22}^h - SPM_{21}^h$$

$SPM_y^h$  can be written as a function of the data ( $d_y$ ), methods ( $m_y$ ), and price level ( $p_y$ ) for year  $y$ . Using this definition,  $\Delta SPM^h$  can be rewritten as

$$\Delta SPM^h = SPM^h(d_{22}, m_{22}, p_{22}) - SPM^h(d_{21}, m_{21}, p_{21})$$

To isolate the effect inflation (i.e., going from  $p_{21}$  to  $p_{22}$ ) has on the change in  $SPM^h$  we can add and subtract the value of  $SPM^h$  when calculated using the data for the 2021 threshold ( $d_{21}$ ), the methods for the 2021 threshold ( $m_{21}$ ), and the prices for 2022 ( $p_{22}$ ).

$$\Delta SPM^h = SPM^h(d_{22}, m_{22}, p_{22}) - SPM^h(d_{21}, m_{21}, p_{21}) + SPM^h(d_{21}, m_{21}, p_{22}) - SPM^h(d_{21}, m_{21}, p_{22})$$

The difference between  $SPM^h(d_{21}, m_{21}, p_{22})$  and  $SPM^h(d_{21}, m_{21}, p_{21})$  represents the change in  $SPM^h$  due to inflation.

$$\Delta SPM^h = SPM^h(d_{22}, m_{22}, p_{22}) - SPM^h(d_{21}, m_{21}, p_{22}) + \Delta Inflation$$

The remaining terms on the right-hand side of the equation represents the change in the threshold due to updating the data and methods in 2022 dollars.

$$SPM^h(d_{22}, m_{22}, p_{22}) - SPM^h(d_{21}, m_{21}, p_{22}) = \Delta Data \text{ and Methods in 2022 dollars}$$

Because updating prices applies equally to all CUs, it does not affect the ranking of the CUs of change which CUs fall within range around the median (i.e., 47<sup>th</sup> to 53<sup>rd</sup> percentile). Thus, it is equivalent to multiplying  $SPM^h$  by a scalar, where the scalar is the inflation rate. We can rewrite the equation as the inflation rate from 2021 to 2022  $\left(\frac{p_{22}}{p_{21}}\right)$  times the change due to the data and methods in 2021 dollars.

$$\begin{aligned} \Delta Data \text{ and Methods in 2022 dollars} &= \frac{p_{22}}{p_{21}} \left( SPM^h(d_{22}, m_{22}, p_{21}) - SPM^h(d_{21}, m_{21}, p_{21}) \right) \\ &= \frac{p_{22}}{p_{21}} \Delta Data \text{ and Methods in 2021 dollars} \end{aligned}$$

Substituting this result back into our equation for  $\Delta SPM^h$  yields

$$\Delta SPM^h = \frac{p_{22}}{p_{21}} \Delta Data \text{ and Methods in 2021 dollars} + \Delta Inflation$$

This equation can be substituted into our formula for the percentage change in the SPM threshold.

$$\% \Delta SPM^h = \frac{\frac{p_{22}}{p_{21}} \Delta \text{Data and Methods in 2021 dollars} + \Delta \text{Inflation}}{SPM_{21}^h} + \% \Delta \text{ShelterAdj}$$

The equation above can be rewritten as the percent change due to a change in the data and methods times the inflation rate plus the percent change due to prices plus the percent change due to the shelter adjustment.

$$\% \Delta SPM^h = \frac{p_{22}}{p_{21}} \% \Delta \text{Data and Methods} + \% \Delta \text{Inflation} + \% \Delta \text{ShelterAdj}$$

The percent change due to the data and methods can be separated into its individual components, but because changes to the data and methods both affect the ranking of expenditures within the estimation sample there will be an interaction component as well as the individual components.

$$\% \Delta SPM^h = \frac{p_{22}}{p_{21}} (\% \Delta \text{Data} + \% \Delta \text{Methods} + \% \Delta \text{Interaction}) + \% \Delta \text{Inflation} + \% \Delta \text{ShelterAdj}$$