Weight (wait) up! Increasing the Relevance of Consumer Price Index Weights

Tuesday, January 10, 2023

Every year on February 14, there is a celebration of love. This February, BLS will celebrate an improvement in the Consumer Price Index (CPI), which we hope you will love. Beginning with the January 2023 index, scheduled for publication on February 14, 2023, BLS plans to update the spending weights in the calculation of the CPI every year instead of every 2 years. Spending weights indicate what share of total expenditures each item represents. This change will improve the relevance of CPI spending weights by using the most recent consumer spending information. By improving the relevance of spending weights, BLS can improve the accuracy of the CPI.

Background

Prices of goods and services that make up the CPI market basket are updated every month, but their spending weights are updated every 2 years. This biennial weight revision was an improvement BLS made in 2002. Before 2002, we updated spending weights every 10 years. The International Labour Organization (ILO) publishes a manual of methods and practices about the consumer price indexes for national statistical organizations. The 2020 ILO manual recommends updating spending weights at least every 5 years.

Exhibit 1 is an example of the biennial weight revision timeline. In this example, consumer spending information obtained from the Consumer Expenditure Surveys is collected in 2019 and 2020. These 2 years of spending information are analyzed during the following year (2021) to estimate the biennial spending weights BLS will use to calculate CPI indexes in 2022 and 2023. The biennial weight revision timeline creates an average lag of 3 years from when we collect the consumer spending data to when we begin using the spending weights. Shortening this average lag will improve the relevance of spending weights.

Exhibit 1. Biennial revision of consumer expenditure weights, 2019–23

Survey activity	Year
Consumer Expenditure Surveys respondents purchase goods and services, and data collection and processing begin.	2019–20
Data collection continues for the first few months of 2021. Data processing continues through the end of the year.	2021
CPI measures price change using 2019–20 market basket (index reference period).	2022–23

To improve the timeliness and accuracy of the CPI, BLS plans to update spending weights annually beginning with the January 2023 index, scheduled to be released on Valentine's Day. Exhibit 2 shows the annual weight revision timeline.

Exhibit 2. Annual revision of consumer expenditure weights, 2021–23

Survey activity	Year
Consumer Expenditure Surveys respondents purchase goods and services, and data collection and processing begin.	2021
Data collection continues for the first few months of 2022. Data processing continues through the end of the year.	2022
CPI measures price change using 2021 market basket (index reference period).	2023

In this example, consumer spending information is collected throughout 2021. We analyze this single year of spending information in 2022 to estimate the annual spending weights that would be used in CPI indexes released in 2023. The annual weight revision timeline creates an average lag of 2 years from when we collect the consumer spending data to when we begin using the spending weights. Consumer spending information collected and obtained in 2021 and processed in 2022 will be used in 2023 indexes. Annual weight revisions will increase the relevance of the spending weights being used to calculate the CPI by an average of one year.

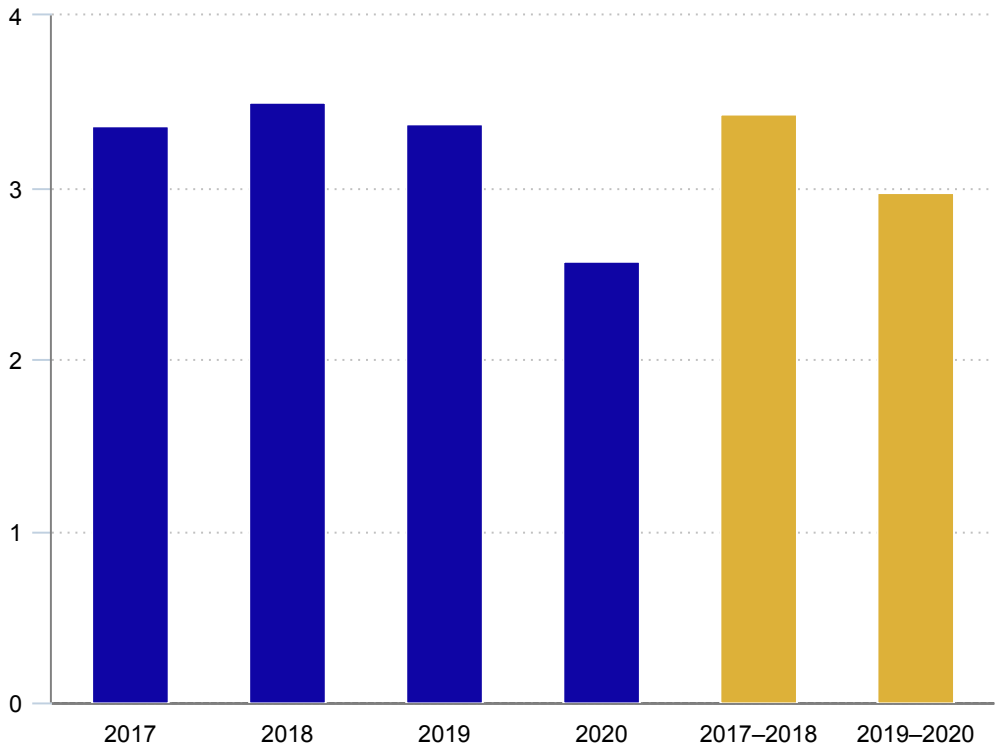
Visualizing spending weights

We can show spending weights as spending shares. The spending share of a good or service is its spending expressed as a percentage of spending for the entire market basket. These spending shares are an estimate of how consumers distribute their spending among all the goods and services in the market basket.

For example, the spending share of gasoline (all types) is its spending share as a percentage of the entire market basket. Using 2019–2020 biennial spending weights, the spending share of gasoline was 2.977. Between 2019 and 2020, the average urban consumer in the United States spent 2.977 percent of their total market basket spending on gasoline.

In the chart below, the four blue bars on the left represent the spending share of gasoline using annual spending weights. The two gold bars on the right represent the ratio using biennial spending weights for the urban population. This shows the proportion of spending consumers distributed towards gasoline from 2017 to 2020. In 2020, consumers distributed less of their spending towards gasoline than they did in previous years. As the graph shows, the decline in the relative importance of gasoline is incorporated more rapidly into the CPI using annual weights.

Spending share for gasoline (all types) using annual and biennial weights, Consumer Price Index for All Urban Consumers (CPI-U)

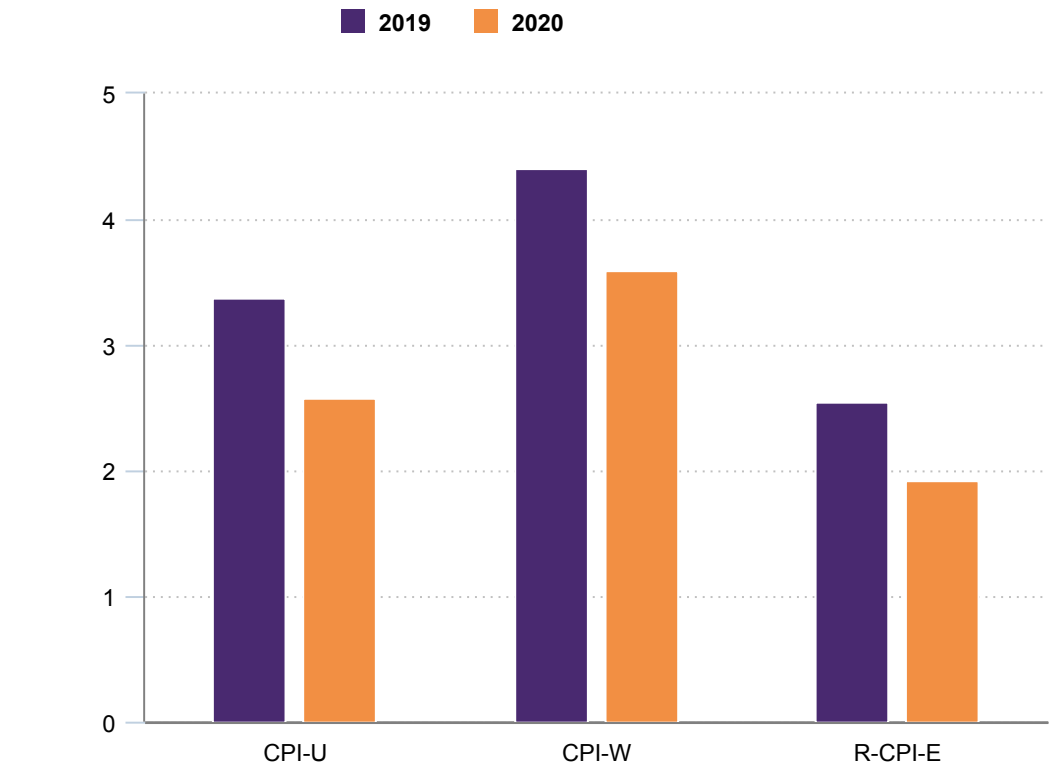


Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

Editor's note: Data for this chart are

We can also estimate spending shares for different populations. The next chart shows the different spending distributions for three CPI populations in 2019 and 2020. The three CPI populations are All Urban Consumers (CPI-U), Urban Wage Earners and Clerical Workers (CPI-W), and the elderly population (R-CPI-E). The wage earner and elderly populations are subsets of the urban population. The Social Security Administration's cost-of-living adjustments are calculated using data from the CPI-W.

Spending shares for gasoline (all types) using annual weights, by Consumer Price Index population



Click legend items to change data display. Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

Editor's note: Data for this chart are available in the table below.

Using 2020 annual spending weights, the spending share of gasoline was 2.57 for the urban population, 3.59 for the wage earner population, and 1.93 for the elderly population. All three populations distributed less of their spending on gasoline in 2020 than in 2019. The wage earner population distributed more of its spending on gasoline than the other two groups in both years.

We currently use 2019–2020 biennial spending weights to calculate the 2022 CPI indexes. Using biennial spending weights tempered the unprecedented shifts in consumer spending caused by the COVID-19 pandemic in 2020 from more normal consumer spending in 2019. The comparison of 2019–2020 biennial spending weights and 2020 annual spending weights in the first chart above show a simple example of the unique circumstances brought on by the pandemic. For more information on the decision to use 2019–2020 biennial spending weights for 2022 indexes, see the 2022 CPI weight update information.

Why wait until now?

In the late 1990s, when BLS was researching spending weight revisions and their impacts, we encountered the Goldilocks principle. Continuing to update spending weights every 10 years meant less relevance of CPI spending weights. Updating spending weights annually would increase the relevance of spending weights, but there was concern about possible upward bias in the long-term CPI because of "chain drift."

Chain drift refers to the difference between the chained and fixed-base versions of an index. Chain drift can occur when the updates to spending weights lag the volatility of short-term prices. An example of an item with volatile short-term prices is gasoline. In this case, the chained version of the index would be the CPI using the annual weight revision, where spending weights are updated annually using 1 year of consumer spending information. The fixed-based version would be if BLS did not update spending weights from a designated base period. For example, if the base period were 1999, the spending weights used to calculate the 1999 indexes would continue to be used for all future indexes. To learn more, see "Chain drift" in the Chained Consumer Price Index: 1999–2017.

The research from the 1990s suggested that chain drift did not result from biennial weight revisions. The biennial weight revision also lowered local area weight measurement error. For the full findings that supported using biennial weight revisions, see Expenditure Weight Updates and Measured Inflation.

So, updating spending weights every 2 years, biennial weight revisions, was just right—until now. More recent research from BLS suggests a single year of consumer spending information allows us to estimate more reliable spending weights. The findings also show that annual weight revisions do not result in significant upward bias in the long-term CPI. This was one of the biggest concerns during the 1990s research of spending weight revisions. For the full analyses see Reconsideration of Weighting and Updating Procedures in the US CPI and Improving Weight Representivity of Fixed Quantity Consumer Price Index Products.

Other statistical organizations have begun updating the spending weights for their CPI annually. Statistics Canada transitioned from biennial weight revisions, implemented in 2011, to annual weight revisions beginning in 2021.

Updating the CPI spending weights every 2 years already exceeds the ILO manual's minimum recommendation of updating CPI spending weights every 5 years. Transitioning from biennial spending weights to annual spending weights is another milestone towards our goal to improve the accuracy and timeliness of the CPI. This is not the end, as BLS continues to research methods to improve our data products. In the meantime, celebrate this milestone with us and show the CPI extra love on February 14, 2023, when BLS releases the January 2023 CPI using annual spending weights for the first time.

Spending share for gasoline (all types) using annual and biennial weights, Consumer Price Index for All Urban Consumers (CPI-U)

Year	Gasoline
2017	3.362
2018	3.497
2019	3.369
2020	2.571
2017–2018	3.431
2019–2020	2.977

Spending shares for gasoline (all types) using annual weights, by Consumer Price Index population

Index population	2019	2020	2019–2020
CPI-U	3.369	2.571	2.977
CPI-W	4.406	3.588	4.016
R-CPI-E	2.550	1.926	2.241

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