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## Is Your Inflation Different?

Not everyone experiences the same inflation. What does that mean for monetary policy?

For much of the last two decades, if inflation drew any mention from economists or central bankers, it was mostly to note how low it was. But after more than a year of accommodative fiscal and monetary policy in response to the COVID-19 pandemic, the conversation has shifted. Official inflation measures have ticked up in recent months to levels not seen in decades.

Under the Fed's new monetary policy framework announced last year, the Federal Open Market Committee (FOMC) has signaled a greater willingness to allow inflation moderately above its 2 percent long-run target for some time following a period of inflation below target. In the past, the Fed often acted to preempt a rise in inflation, but policymakers have indicated they will now wait to change interest rate policy until inflation pressures actually emerge in the data. (See "The Fed's New Framework," *Econ Focus*, First Quarter 2021.)

At a press conference following the April 27-28 FOMC meeting, Fed Chair Jerome Powell said that before increasing interest rates, "We want to see labor market conditions consistent with maximum employment, we want to see inflation at 2 percent, and we want to see it on track to exceed 2 percent."

But which inflation signals will Fed officials be watching? Inflation is typically defined as a generalized and sustained increase in prices across the economy. But prices rarely change evenly across all goods and services at the same time. Recently, for example, prices for lumber and used cars shot up due to supply constraints coupled with increasing demand. Moreover, households spend money on different things. That means an uptick in inflation in some products or services could affect



households unevenly. Should central bankers take this into consideration when determining the appropriate stance for monetary policy?

### BUILDING AN INFLATION INDEX

Measuring inflation requires tracking what people buy as well as how much they pay for it. Doing that for every purchase across the entire economy is a daunting task for any researcher. Some U.S. economists experimented with creating price indexes for a limited set of goods in the 19th century. The federal government became involved in tracking prices following the creation of the Bureau of Labor Statistics (BLS), then called the Bureau of Labor, in 1884.

According to a 2014 history by BLS economist Darren Rippey, the BLS first started working on a cost-of-living index for families by studying expenditures and retail prices from 1888 through 1890. At the turn of the 20th century, presidents increasingly called upon the BLS to mediate labor disputes between industry and union leaders and to track price changes during the two world wars. This work ultimately led to the creation of the Consumer Price Index, or CPI.

Although the methodology behind the CPI has evolved over the decades, the BLS's fundamental approach has remained the same. It surveys households about the goods and services they buy and collects data on prices using both surveys and on-the-ground

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research. Using this data, the BLS constructs a “market basket” of goods and services intended to capture the consumption patterns of the average urban household. Goods and services are lumped into one of eight large groups and receive weights based on their share of the typical household budget. Price changes for goods and services that account for a larger share of household spending carry more weight in the overall CPI measure of inflation.

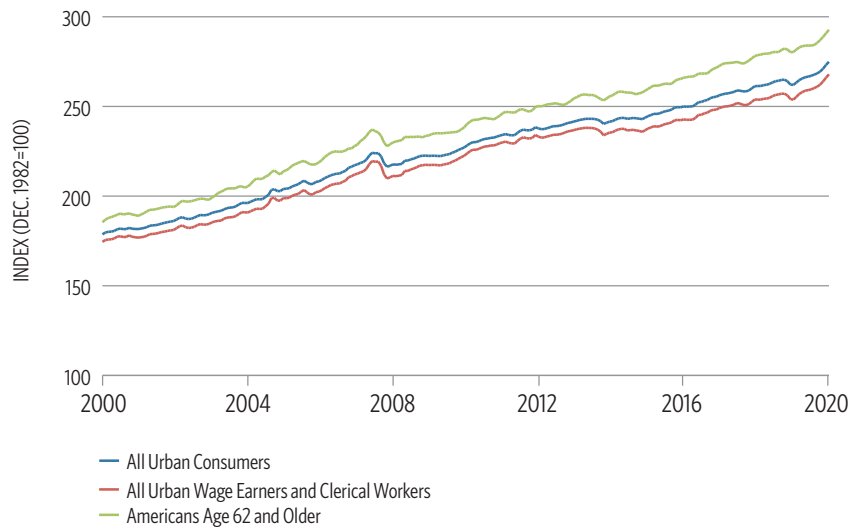
Over time, the CPI has become the most widely used and cited benchmark for inflation in the U.S. economy. Firms look at it when making decisions about adjusting their prices and wages. And the federal government uses the CPI to make cost-of-living adjustments to welfare programs like Social Security as well as to update tax brackets.

That said, the CPI has limitations, which have prompted the development of other price indexes. The basket of goods that households purchase is not static. Consumers respond to price increases in some goods by substituting cheaper alternatives. For example, if the price of beef goes up, households might buy less beef and more chicken. The BLS does periodically update its market basket, but on a lag, meaning the CPI doesn’t capture substitutions like these until long after the fact. For instance, from the end of 2017 through the end of 2019, the BLS used consumer survey data collected in 2015 and 2016.

This can result in mismeasurement when consumption habits are changing rapidly. A 2020 paper by Alberto Cavallo of Harvard University found that the CPI underestimated inflation during the COVID-19 lockdown. That is because households spent more on things like food, which experienced inflation, and less on fuel and transportation, which experienced deflation. Cavallo estimated that because of these changes in household consumption, actual inflation in the United States in September 2020 was 1.9 percent, compared to 1.4 percent according to the CPI.

## Older Households Experience Higher Inflation

A Comparison of Different CPIs



NOTE: “Americans Age 62 and Older” is an experimental CPI constructed by the BLS.  
SOURCE: U.S. Bureau of Labor Statistics

Other inflation measures, like the Personal Consumption Expenditures (PCE) price index released by the Bureau of Economic Analysis, attempt to account for consumer substitutions when constructing their market basket. The PCE also applies different weights to goods and services than the CPI.

Both the CPI and PCE also have “core” measures of inflation, which strip out price changes for food and fuel. While both of those categories make up an important part of many households’ budgets, their prices tend to be more volatile in the short run. Their inclusion in price indexes can muddy the long-run inflation signal, which matters for institutions like the Fed tasked with keeping long-run prices stable. For these reasons, the Fed has used core PCE as its benchmark measure of inflation since 2000.

### WHAT DO HOUSEHOLDS EXPERIENCE?

The goal of inflation indexes like the CPI and PCE is to produce a single measure of inflation for the whole economy. To do that, researchers attempt to capture changes in the cost

of living experienced by the average household. It should come as no surprise, then, that the experiences of many households deviate from that average.

Households spend money on different things and pay different prices for the same types of goods and services. The BLS Consumer Expenditure Survey, which tracks households’ spending by income and other demographic characteristics, shows that low-income households spend a greater share of their income on core needs — housing, food, and transportation — than higher-income households. Household spending and income also vary considerably by age. People spend a greater share of their income on health care as they age. Prices for both medical care and education have been rising more rapidly than prices for goods and services generally. As a result of these and other consumption differences, any given household could be experiencing inflation that is very different from the CPI or PCE numbers. Indeed, the BLS has constructed an experimental CPI for older Americans, which shows they tend to experience higher inflation. (See chart.)

“There is no such thing as ‘the’ inflation rate,” says Greg Kaplan of the University of Chicago, whose research has explored price dispersion for goods and services. “The economy is made up of billions of prices, all moving differently.”

Economists have long been aware that groups might face different inflation rates because of different consumption patterns. Several studies have attempted to measure this by creating separate market baskets based on household characteristics, such as age, income, or education. A 2005 article by Bart Hobijn of the San Francisco Fed and Arizona State University and David Lagakos of Boston University found that household inflation rates varied substantially around the reported CPI numbers from 1987 through 2001. This variation was mostly driven by higher inflation rates for education, health care, and gasoline, which made up different shares of household budgets. For example, older households experienced higher inflation because of their higher health care expenses, as did lower-income households because they are more sensitive to changes in gas prices.

Households could also be experiencing different inflation because they pay different prices for the same types of goods and services. More recently, economists have been able to use richer price datasets collected from retail stores with price scanners to study how much people actually pay for things. In a 2017 article in the *Journal of Monetary Economics*, Kaplan and Sam Schulhofer-Wohl of the Chicago Fed used price scanner data collected from 500 million transactions from 2004 through 2013 to estimate household inflation differences. They found that the annual inflation households experienced varied by as much as 9 percentage points, and most of that variation was driven by the households paying different prices for the same goods. In Kaplan and Schulhofer-Wohl’s sample, this resulted in households earning less than \$20,000 a year experiencing

higher inflation than those making more than \$100,000 a year.

There are several other reasons why low- and high-income households might pay different prices for the same types of goods. A 2021 paper by David Argente of Pennsylvania State University and Munseob Lee of the University of California, San Diego found that higher-income households were better able to substitute away from goods with increasing prices during the Great Recession, reducing the inflation they experienced compared to lower-income households.

This could have been facilitated by a greater array of choices for products available to high-income households. A 2019 article in the *Quarterly Journal of Economics* by Xavier Jaravel of the London School of Economics and Political Science found that from 2004 to 2015, there was greater innovation and competition in products catering to high-income households than low-income ones. He argued that this kept prices for those products down, allowing high-income households to experience lower inflation.

### DO THESE DIFFERENCES MATTER?

These studies clearly point to the fact that inflation varies across households. How might that matter for policymakers?

The answer partly depends on how persistent these differences are. For example, if low-income households always experience higher inflation than high-income households, that would mean that the income inequality gap is actually growing faster than aggregate inflation measures would suggest. And if older households always experience higher inflation than younger households because of medical expenses, then cost-of-living adjustments based on overall CPI to programs like Social Security could be undershooting the needs of recipients.

But many of the studies that found evidence of household inflation differences also found that those differences

weren’t persistent. In their 2005 article, Hobijn and Lagakos found that a household that experienced higher-than-average inflation in one year didn’t necessarily experience it in the next year. And in a 2009 paper with co-authors, Hobijn also found that most characteristics like income or age were poor predictors of how much inflation a household would experience. Inflation varied more within groups of households than across groups. Kaplan and Schulhofer-Wohl came to similar conclusions in their 2017 study.

“Household inflation differences do not tend to accumulate over time, except for households that spend a significant part of their income on tuition and medical care,” says Hobijn.

As a result, household-specific inflation indexes tend to follow aggregate measures like the CPI or PCE over the long run.

Still, even short-term inflation differences across households could matter when there is a sudden, unexpected change in inflation. For example, it is well-known that an unexpected spike in inflation redistributes wealth from lenders to borrowers, since borrowers can pay back their debts with money that is worth less than when they took out the loan. If certain groups of households tend to experience higher inflation at any given time, then they could also be more exposed to a sudden change in prices.

Similar to Jaravel’s finding, Javier Cravino and Andrei Levchenko of the University of Michigan and Ting Lan of the International Monetary Fund documented in a 2020 article in the *Journal of Monetary Economics* that the prices for goods consumed by high-income households tend to be “stickier,” meaning they don’t change as much as the prices for things consumed by middle-income households. This would insulate higher-income households from an unexpected spike in inflation. Additionally, households that own their homes might also be better insulated from inflation shocks than renters, since the interest rates on many

mortgages are fixed and don't change if other rates in the economy go up. This would also tend to favor wealthier households.

At the same time, other studies point to ways that some poorer households may also be able to insulate themselves from unexpected inflation. A pair of 2015 articles found that unemployed individuals experienced lower inflation than workers, on average. This seems to be because they were able to allocate more time to visiting a variety of stores in search of the lowest prices.

### IMPLICATIONS FOR THE FED

What should monetary policymakers make of household inflation differences? The FOMC has explicitly stated that it views the Fed's price stability mandate from Congress as a long-run goal.

"The inflation rate over the longer run is primarily determined by monetary policy, and hence the Committee has the ability to specify a longer-run goal for inflation," the FOMC wrote in its statement on longer-run goals and monetary policy strategy, last affirmed in January 2021.

On one hand, given this long-run view, it makes sense for policymakers to focus on aggregate measures of inflation for the whole economy that strip out as much short-run variability as possible, like core PCE. The New York Fed has developed an Underlying Inflation Gauge specifically to try and track movements of persistent inflation in the economy. Likewise, the Atlanta Fed created a sticky-price

CPI composed of a basket of goods that change prices rarely in order to measure the underlying, long-run inflation trend.

On the other hand, if households experience different levels of inflation, that could influence the effectiveness of any monetary policy changes the Fed makes. For instance, Cravino, Lan, and Levchenko noted in their article that because the prices of goods consumed by high-income households are stickier, their response to a monetary policy shock will be lower than the response of middle-income households.

Surveys have also often demonstrated that many households misestimate the level of inflation in the economy as measured by the CPI or PCE. This has sometimes been interpreted as households simply being uninformed. But in their 2017 article, Kaplan and Schulhofer-Wohl theorized that if households are in fact facing different levels of inflation, it could explain why they don't pay much attention to aggregate inflation measures. That could make it challenging for the Fed to use monetary policy to steer inflation across the entire economy.

"When the dispersion of inflation rates across households is large, it seems challenging for the Fed to be able to fine-tune average inflation," says Kaplan.

Differences in experienced inflation also feed into different expectations for future inflation, complicating the Fed's job of trying to keep long-run expectations anchored near its 2 percent target.

Finally, broad price indexes like the

CPI and PCE that are slow to adjust to changes in consumer behavior can send the wrong signals to policymakers in times of crisis. As Cavallo's 2020 paper on the COVID-19 lockdown suggests, inflation in the United States was moderately higher than aggregate measures indicated at the time. Jaravel and Martin O'Connell of the Institute for Fiscal Studies had similar findings in a 2020 article that looked at inflation in the United Kingdom during the pandemic.

The Fed has shown an interest in learning more about the variation in household inflation rates. In 2015, the Chicago Fed created the Income Based Economic Index to measure inflation rates for different socioeconomic and demographic groups. The market baskets for each group were constructed using the BLS Consumer Expenditure Survey data. Overall, the Chicago Fed found few persistent differences across groups, although older households experienced somewhat higher inflation, while lower-income and lower-education households experienced inflation that was more variable.

The Fed's new monetary policy framework places greater emphasis on the varying employment experiences of different groups, declaring its maximum employment mandate a "broad-based and inclusive goal." The new framework doesn't describe the Fed's inflation goal in that way, but it is possible that policymakers may also take an increased interest in studying how different groups experience inflation. **EF**

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