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Variation in the Inflation Experiences of Households

Remarks by

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It is a pleasure to join you to discuss differences in how households at different income levels experience inflation.[1] I look forward to hearing from the panelists, who are doing important and interesting research on this topic.

By law, the Federal Reserve is assigned the responsibility to pursue price stability and maximum employment. The Federal Open Market Committee (the Committee) has long recognized the connection between stable, low inflation and maximum employment. Forty years ago, Paul Volcker noted that the dual mandate isn't an either-or proposition and that runaway inflation "would be the greatest threat to the continuing growth of the economy… and ultimately, to employment."[2]

Maximum employment and stable, low inflation benefit all Americans, but are particularly important for low- and moderate-income families. The combination of good job opportunities and stable, low inflation provides purchasing power to fill up gas tanks and grocery carts and pay housing and medical costs, leaving room to build emergency cushions and invest in education; retirement; and, for some, small businesses. Indeed, the Employment Act of 1946 called on the federal government to promote "maximum employment, production, and purchasing power."[3]

While national data do not directly disaggregate the differential effects of inflation by household income groups, a variety of evidence suggests that lower-income households disproportionately feel the burden of high inflation. Lower-income families expend a greater share of their income on necessities; have smaller financial cushions;

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[1] I am grateful to Kurt Lewis of the Federal Reserve Board for his assistance in preparing this text. These views are my own and do not necessarily reflect those of the Federal Reserve Board or the Federal Open Market Committee.

[2] Paul Volcker (1979), interview on "The MacNeil/Lehrer Report," *PBS,* October 10, p. 10, https://fraser.stlouisfed.org/files/docs/historical/volcker/Volcker_19791010.pdf.

[3] See the Declaration of Policy on page 1 of the Employment Act of 1946, available at https://fraser.stlouisfed.org/files/docs/historical/congressional/employment-act-1946.pdf.

and may have less ability to switch to lower-priced alternatives. Arthur Burns noted in the late 1960s that "there can be little doubt that poor people…are the chief sufferers of inflation."[4]

Today, inflation is very high, particularly for food and gasoline. All Americans are confronting higher prices, but the burden is particularly great for households with more limited resources. That is why getting inflation down is our most important task, while sustaining a recovery that includes everyone. This is vital to sustaining the purchasing power of American families.

Whose Cost of Living?

In assessing inflation faced by American consumers, economists and policymakers generally rely on the change in the consumer price index (CPI) or the change in the price index for personal consumption expenditures (PCE).[5] Since January 2012, the Committee's price-stability goal has been specified as a longer-run goal of 2 percent in terms of annual PCE inflation.[6] Both CPI and PCE inflation metrics are

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[4] Quoted in John Palmer (1973), *Inflation, Unemployment, and Poverty* (Lexington, Mass.: Lexington Books), as referenced in Alan Blinder and Howard Esaki (1978), "Macroeconomic Activity and Income Distribution in the Postwar United States," *Review of Economics and Statistics,* vol. 60 (November), pp. 604–9.

[5] CPI and PCE inflation generally move together but vary in important ways, including variations generated by differences in the scope of the purchases considered in the households' baskets, differences in the weights assigned to different categories of spending, and different formulas used to aggregate the underlying weighted price changes. For a recent comparison of CPI and PCE measures, see Noah Johnson (2017), "A Comparison of PCE and CPI: Methodological Differences in U.S. Inflation Calculation and their Implications," BLS Statistical Survey Paper (Washington: Bureau of Labor Statistics, November), https://www.bls.gov/osmr/research-papers/2017/pdf/st170010.pdf.

[6] The specific price-stability target of an inflation rate of 2 percent, as measured by the annual change in the price index for personal consumption expenditures, was announced as part of the Statement on Longer-Run Goals and Monetary Policy Strategy following the January 2012 Federal Open Market Committee (FOMC) meeting. For more information, see the current version of that statement at https://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf as well as Chair Bernanke's discussion of the decision at the January 24, 2012, press conference: https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20120125.pdf. For additional information regarding the FOMC's preference for using a PCE-based measure of inflation, see the discussion of the change from CPI to PCE inflation projections in the February 2000 *Monetary Policy Report* at https://www.federalreserve.gov/boarddocs/hh/2000/february/fullreport.pdf#page=7.

assembled from a collection of underlying elementary price indexes for narrow subsets of goods and services.[7] The price changes each month for the goods and services in these subsets are combined into measures of overall inflation by calculating a weighted average of all these subindexes, where the weights are based on average aggregate consumer expenditures in each category.

Using a national average of consumer expenditures to weight the categories has intuitive appeal. This measure is particularly useful, for example, in adjusting measures of overall expenditure for changes in prices to determine how much real growth has occurred between two periods. However, using a national average of expenditures to weight the categories has limitations when it comes to representing the true cost of living experienced by different types of households.

U.S. Households Have Different Inflation Experiences

Each household in the United States has a particular consumption bundle whose prices and quantities combine to make up that household's cost of living. If we could start with each individual household's cost of living and aggregate across households by giving equal weight to each household, it would create an economy-wide cost-of-living index. The change in such a cost-of-living index would represent the average inflation experienced by U.S. households. Instead, because the CPI and PCE indexes weight every dollar of expenditure equally, these indexes implicitly weight each household's cost of

[7] According to the CPI section of the *Handbook of Methods,* the CPI survey collects about 94,000 prices per month to find prices in 243 basic item categories in 32 geographic areas, facilitating the creation of basic indexes for each of the resulting 7,776 item-area combinations that compose the CPI. See Bureau of Labor Statistics (2020), "Consumer Price Index," *Handbook of Methods* (Washington: BLS, November), https://www.bls.gov/opub/hom/cpi/home.htm.

living proportionally to their total expenditure.[8] Since lower-income households represent a relatively smaller share of overall expenditure, the inflation associated with their consumption baskets is underrepresented in the official consumer price indexes.

It would be useful to have data about consumer inflation broken out by demographic groups, similar to labor market and personal-income data, in order to assess the differential effect of inflation across different groups of households.[9] U.S. statistical agencies do not collect the information needed to accurately assess inflation at a household level, and it would require a large change in the way these agencies go about their work to do so. Nonetheless, recent research has begun to assess variation in the ways different households experience inflation.

Households at different income levels could experience differential inflation effects for several reasons: Consumption shares could differ systematically for low- and high-income households; the goods and services within each consumption category could differ; the ability to substitute for lower-priced alternatives of the same item could differ; and prices paid for the same good could differ systematically due to differences in access. I will briefly touch on these four reasons.

First, low- and moderate-income households could experience inflation that diverges from the average because their consumption baskets differ systematically from the average. [10] Lower-income households spend 77 percent of their income on

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[8] These two approaches are referred to as the democratic and plutocratic indexes, respectively. For more information on the literature of cost-of-living measurement and plutocratic and democratic indexes, see Robert A. Pollak (1998), "The Consumer Price Index: A Research Agenda and Three Proposals," *Journal of Economic Perspectives,* vol. 12 (1), pp. 69–78.

[9] See Austan Goolsbee (2021), "The Missing Data in the Inflation Debate," *New York Times,* December 30, https://www.nytimes.com/2021/12/30/opinion/inflation-economy-biden-inequality.html.

[10] See Pew Charitable Trusts (2016), *Household Expenditures and Income,* Issue Brief (Washington: Pew, March), https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2016/03/household-expenditures-and-income.

necessities—more than double the 31 percent of income spent by higher-income households on these categories.[11]

Several studies have found that the consumption baskets of lower-income households have experienced higher-than-average inflation rates over time. Research from the Bureau of Labor Statistics (BLS) has examined the effect of different consumption baskets by using the same elementary price indexes as used in the official CPI but assigning the weights of these components to reflect the consumption bundles of different types of households. A 2021 working paper by BLS staff based on data from 2003 to 2018 found that a price index reflecting the consumption basket for households in the lowest-income quartile grew *faster* than the overall CPI, while a price index reflecting the consumption basket for households in the highest-income quartile grew more *slowly* than the overall CPI.[12] A 2015 BLS study found a similar result using data from 1982 to 2014.[13] Of course, the recent sharp increases in inflation may have affected the

[11] The values for the share of income spent in each category were constructed using microdata from the 2020 Consumer Expenditure Interview Survey (CEX). For full-income reporters with strictly positive values for total expenditure and income after tax, the income share of expenditure in a given category is the ratio of expenditure in a given category to income after tax. The numbers reported are the sum of the median income share from each of the four categories, where each is defined as the weighted median of these ratios for households in the bottom and top quintiles of the income distribution. Consumption categories are defined as in the CEX.

[12] The study used data from the Consumer Expenditure Survey to construct a consumption basket for households in the lowest quartile of income as well as in the highest quartile of income. The authors calculated a Laspeyres index for the consumption basket of households in the lowest and highest income quartiles. From December 2003 to December 2018, the annualized percent change in the index for the lowest income quartile was 2.25 percent, and the annualized percent change in the index for the highest income quartile was 1.97 percent; the CPI-U had an annualized percentage change of 2.07 percent over that period. See Josh Klick and Anya Stockburger (2021), "Experimental CPI for Lower and Higher Income Households," BLS Working Paper 537 (Washington: Bureau of Labor Statistics, March), https://www.bls.gov/osmr/research-papers/2021/pdf/ec210030.pdf.

[13] Three different baskets of "basic necessities" were considered in this study. The base experimental index included food, shelter, and clothing, and the additional two baskets included the components of the base index and added energy, and then both energy and medical care, respectively. During the period examined, the rate of overall consumer inflation was 2.78 percent, as measured by the regular CPI-U for All Items. In comparison, the base experimental index rose at an average annual rate of 2.91 percent from December 1982 to December 2014. The base-plus-energy experimental index increased at an average annual rate of

consumption bundles of lower-income households relative to the average differently than in previous cycles.

While these studies allow for differences in the weighting of price indexes across different income groups, they rely on the same elementary price indexes for subcategories of goods and services. As a result, they may miss additional sources of variation in the inflation rates experienced by households at different income levels.

This consideration brings us to the second point: Households with different levels of income may purchase significantly different items even within the same elementary index categories for goods and services. To take an extreme example, caviar and canned tuna are both in the same elementary index. The demand and supply dynamics for those products are likely quite different, meaning that their relative price dynamics are poorly described by a single index.

Third, households at different income levels may have differing abilities to substitute for lower-priced alternatives within an elementary category. Consider a price increase for a breakfast cereal that increases the prices of both the brand-name cereal and the corresponding lower-priced store-brand cereal but maintains a differential between them. A household that had been purchasing brand-name cereal could save money by purchasing store-brand cereal instead, perhaps even eliminating any effect of the price increase on their actual spending while purchasing the same quantity of cereal in that

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2.75 percent over the same period. The base-plus-energy-and-medical-care experimental index rose at an average annual rate of 2.99 percent during the same timeframe. See Jonathan Church (2015), "The Cost of 'Basic Necessities' Has Risen Slightly More than Inflation over the Last 30 Years," *Beyond the Numbers: Prices & Spending*, vol. 4 (June), no. 10, https://www.bls.gov/opub/btn/volume-4/the-cost-of-basic-necessities-has-risen-slightly-more-than-inflation-over-the-last-30-years.htm.

narrow category. However, a household that was already purchasing the store brand would have to either absorb the increase in cost or consume less within that category.

Finally, beyond the variation in inflation that comes from households buying different goods, research also shows that differences in inflation can result from households paying different prices for identical goods. Using transaction-level data, researchers found that almost two-thirds of the variation in inflation across households comes from differences in prices paid for identical goods, with only about one-third coming from differences in the mix of goods within broad categories.[14] As a result of these differences, households with lower incomes, more household members, or older household heads experienced higher inflation on average. Variations in the prices paid for identical goods could reflect differences in the ability of some households to stock up when prices are discounted or to buy in bulk and save—options only available to households with the means to buy in larger quantities, adequate capacity to store larger quantities, or the flexibility to delay purchases if there is an opportunity to save in the future.

In addition, evidence suggests that inflation could be lower for items purchased online rather than from brick-and-mortar stores, suggesting that households who do not have full access to online shopping options could face a higher cost of living. One study

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[14] See Greg Kaplan and Sam Schulhofer-Wohl (2017), "Inflation at the Household Level," *Journal of Monetary Economics,* vol. 91 (November), pp. 19–38. For a sample of 500 million transactions by about 50,000 U.S. households from 2004 to 2013, the authors found that over the nine years from the third quarter of 2004 through the third quarter of 2013, average inflation cumulates to 33 percent for households with incomes below $20,000 but to just 25 percent for households with incomes above $100,000.

This finding does not hold for housing, where a recent study found that housing inflation tends to be relatively similar across income quintiles, even though the share of income spent on housing varies considerably by income group. See table 2 and the related discussion in Daryl Larsen and Raven Malloy (2021), "Differences in Rent Growth by Income 1985-2019 and Implications for Real Income Inequality," FEDS Notes (Washington: Board of Governors of the Federal Reserve System, November 5), https://doi.org/10.17016/2380-7172.3006.

of online transactions made between 2014 and 2017 found that online inflation averaged more than 1 percentage point per year lower than the equivalent CPI measure of the relevant product categories.[15]

We are only beginning to understand the ways in which inflation experiences vary from household to household, how this variation correlates with income and demographic information, and how these divergent inflation experiences change over time.[16] This developing area of research will benefit from conferences like this one that help expand the frontier of our knowledge about the heterogeneity of experienced inflation.

Implications for the Outlook and Policy

High inflation places a burden on working families who are concerned about how far their paychecks will stretch as well as seniors living on fixed incomes. So now let me turn briefly to what we are seeing on inflation and the outlook for jobs and growth.

Headline PCE inflation for February came in at 6.4 percent on a 12-month basis. Food and energy account for an outsized one-fourth share of this high level of inflation and also constitute an outsized share of expenditure for lower-income Americans, who

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[15] The study used a matched set of entry-level item categories to create a digital price index (DPI) to compare with the equivalent CPI measure and found that overall DPI inflation is more than 1 percentage point per year lower than CPI inflation in those categories. Broken out by major groups, inflation was lower in the DPI than in the equivalent CPI in every category other than medicine and medical supplies. See Austan Goolsbee and Peter Klenow (2018), "Internet Rising, Prices Falling: Measuring Inflation in a World of E-Commerce," *AEA Papers and Proceedings,* vol. 108 (May), pp. 488–92.

[16] For example, a recent study also suggests that the differential rates of inflation between low- and high-income households varies over the cycle: The gap between the inflation associated with goods purchased by lower-income households relative to higher-income households rises during recessions and narrows during recoveries. See David Argente and Munseob Lee (2021), "Cost of Living Inequality During the Great Recession," *Journal of the European Economic Association,* vol. 19 (April), pp. 913–52, https://doi.org/10.1093/jeea/jvaa018. Another recent working paper documents that prices rise more for products purchased relatively more by low-income households (necessities) during recessions and that the aggregate share of spending devoted to necessities is countercyclical. See also Jacob Orchard (2022), "Cyclical Demand Shifts and Cost of Living Inequality," SSRN Working Paper (Rochester, NY: SSRN, February 12), https://dx.doi.org/10.2139/ssrn.4033572.

spend 26 percent of their income on food at home and transportation, compared with 9 percent for high-income Americans.[17]

Core inflation is also elevated, and inflationary pressures have been broadening out. Housing contributed about one-tenth of total PCE inflation in February and is the single greatest category of expenditures by far for lower-income Americans, who spend 45 percent of their income on housing, compared to 18 percent for high-income Americans.[18] Durable goods inflation, particularly in autos, accounted for slightly more than one-fifth of total PCE inflation in February, representing a much greater contribution to inflation than was the case pre-pandemic. High durable goods inflation reflects pandemic-related supply constraints as well as persistently elevated demand associated with the pandemic. I will be carefully monitoring the extent to which demand rotates back to services and away from durable goods, where it has remained consistently above pre-pandemic levels, and the extent to which the services sector is able to absorb higher demand without generating undue inflationary pressure.

Russia's invasion of Ukraine is a human tragedy and a seismic geopolitical event. The global commodity supply shock associated with Russia's actions skews inflation risks to the upside and is expected to exacerbate high prices for gasoline and food as well as supply chain bottlenecks in goods sectors. The recent COVID lockdowns in China are also likely to extend bottlenecks.

[17] These statistics are based on the median income share in each category, defined as the weighted median of these ratios for households in the bottom and top quintiles of the income distribution; see footnote 11 for additional detail.

[18] These statistics are based on the median income share in each category, defined as the weighted median of these ratios for households in the bottom and top quintiles of the income distribution; see footnote 11 for additional detail.

These geopolitical events also pose downside risks to growth. That said, the U.S. economy entered this period of uncertainty with considerable momentum in demand and a strong labor market. As of the March labor report, payroll employment has increased at a pace of 600,000 jobs per month over the past six months, and the unemployment rate has fallen by a percentage point over that period and is now close to its pre-pandemic level. In contrast, until recently, the recovery in labor force participation was lagging far behind. So it is particularly noteworthy to see that the pandemic constraints on labor supply are diminishing for the prime-age workforce: The prime-age participation rate jumped 0.7 percentage points for women in March, following a similar-sized jump for men in February. An increase in labor supply associated with diminishing pandemic constraints combined with a moderation in demand associated with tightening financial conditions, slowing foreign growth, and a large decrease in fiscal support could be expected to reduce imbalances later in the year.

Against that backdrop, I will turn to policy. It is of paramount importance to get inflation down. Accordingly, the Committee will continue tightening monetary policy methodically through a series of interest rate increases and by starting to reduce the balance sheet at a rapid pace as soon as our May meeting. Given that the recovery has been considerably stronger and faster than in the previous cycle, I expect the balance sheet to shrink considerably more rapidly than in the previous recovery, with significantly larger caps and a much shorter period to phase in the maximum caps compared with 2017–19. The reduction in the balance sheet will contribute to monetary policy tightening over and above the expected increases in the policy rate reflected in market pricing and the Committee's Summary of Economic Projections. I expect the

combined effect of rate increases and balance sheet reduction to bring the stance of policy to a more neutral position later this year, with the full extent of additional tightening over time dependent on how the outlook for inflation and employment evolves.

Our communications have resulted in broad market expectations for an expeditious increase in the policy rate toward a neutral level and a more rapid reduction in the balance sheet compared with 2017–19. Consistent with these expectations, we have already seen significant tightening in market financing conditions at longer maturities, which tend to be most relevant for household and business decisionmaking. For instance, 30-year mortgage rates have increased more than 100 basis points in just a few months and are now at levels last seen in late 2018.

Looking forward, at every meeting, we will have the opportunity to calibrate the appropriate pace of firming through the policy rate to reflect what the incoming data tell us about the outlook and the balance of risks. For today, every indicator of longer-term inflation expectations lies within the range of historical values consistent with our 2 percent target. On the other side, I am attentive to signals from the yield curve at different horizons and from other data that might suggest increased downside risks to activity. Currently, inflation is much too high and is subject to upside risks. The Committee is prepared to take stronger action if indicators of inflation and inflation expectations indicate that such action is warranted. We are committed to bringing inflation back down to its 2 percent target, recognizing that stable low inflation is vital to maintaining a strong economy and a labor market that works for everyone.