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Budget Model

Impact of Inflation by Household Income

Summary: We estimate that inflation in 2021 will require the average U.S. household to spend around $3,500 more in 2021 to achieve the same level of consumption of goods and services as in recent previous years (2019 or 2020). Moreover, we estimate that lower-income households spend more of their budget on goods and services that have been more impacted by inflation. Lower-income households will have to spend about 7 percent more while higher-income households will have to spend about 6 percent more.

Introduction

On December 10, the Bureau of Labor Statistics released the Consumer Price Index (CPI) for November 2021. The CPI measures the average change over time in the prices paid by consumers for goods and services. The overall index went up by 6.8 percent from a year ago, and this level of inflation was last seen in 1982. However, the increases in price were uneven across items in the CPI basket. For example, the price of food rose by 6.1 percent compared to a year ago, while the average energy price jumped by 33.3 percent. There was also a noticeable difference between commodities and services. While the one-year price increases for shelter and other services (excluding energy services and shelter) were 3.8 percent and 2.9 percent respectively, the price increase for commodities (excluding food and energy commodities) was 9.4 percent.[1]

These price increases do not affect all households in the same way because the consumption baskets of high-income and low-income households differ. In this blog, we use the Consumer Expenditure Survey and the recently released CPI to investigate how much price changes increase the expenditure for households at different income levels. Since we do not yet have data on changing consumption patterns for 2021, we analyze the increased costs under two different assumptions: (1) that consumption patterns remained the same in 2021 as in 2020, and (2) that consumption patterns remained the same in 2021 as in 2019. It seems likely that households in 2021 may follow consumption patterns along some combination of the two, with some pandemic patterns becoming more fixed even as households return to pre-pandemic behavior. Because we hold consumption patterns fixed for this analysis, we do not account for income effects, i.e., any consumption changes due to changing purchasing power, and substitution effects, i.e., any consumption changes due to changing relative prices.

Consumer Expenditure Survey

The Consumer Expenditure Survey (CE) is a nationwide household survey conducted by the Bureau of Labor Statistics that provides information on expenditures, income, assets and demographic characteristics of U.S. consumers. We use the Quarterly Interview Survey for 2019 and for 2020 to find out how U.S. households spend their money and how that varies across income groups. We aggregate the survey's expenditure items into five major categories: food, energy, shelter, commodities less food and energy commodities, and services less energy services and shelter.[2] Households are divided into seven income groups where the cutoffs are the 20th, 40th, 60th, 80th, 90th and 95th percentiles of the income distribution.[3] Figure 1 shows the average nominal total expenditure by households in each income group in 2019 and 2020. As expected, higher-income groups had relatively higher expenditures in both years. During the pandemic, spending on consumption rose for lower-income households but it decreased for higher-income households. Comparing 2020 spending to 2019 spending, we find that the bottom three income groups increased their total expenditure by $1,499 for the bottom quintile, $518 for the second quintile, and $321 for the middle quintile. At the same time, the top income groups decreased their total expenditure by $168 for the fourth quintile, $3,331 for the 80th to 90th percentile, $4,002 dollars for the 90th to 95th percentile, and $12,175 for the top 5 percent.

Figure 1: Total expenditure by income groups in 2019 and 2020

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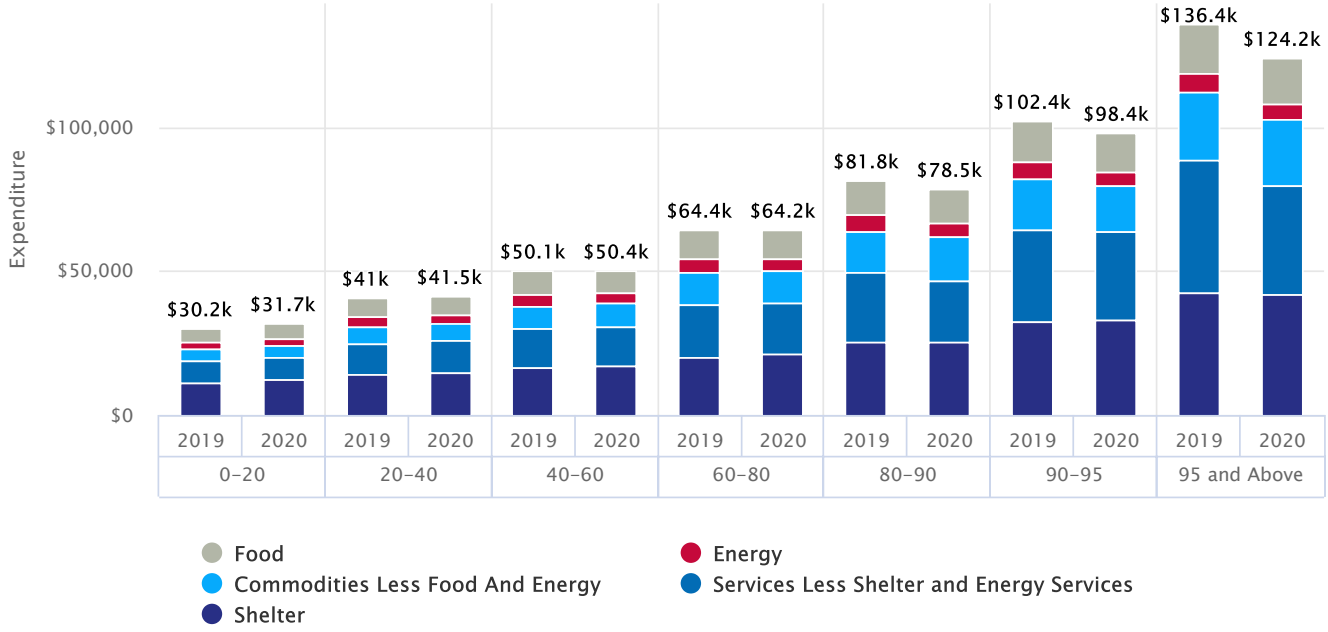

The consumption baskets of income groups differ in composition. Figure 2 shows the share of household expenditure on each major category of items by income groups in 2019 and in 2020. Lower-income groups spent relatively more on food, energy, and shelter, while higher-income groups spent relatively more on other commodities and services.

Figure 2: Expenditure shares on major groups of items by income groups in 2019 and 2020

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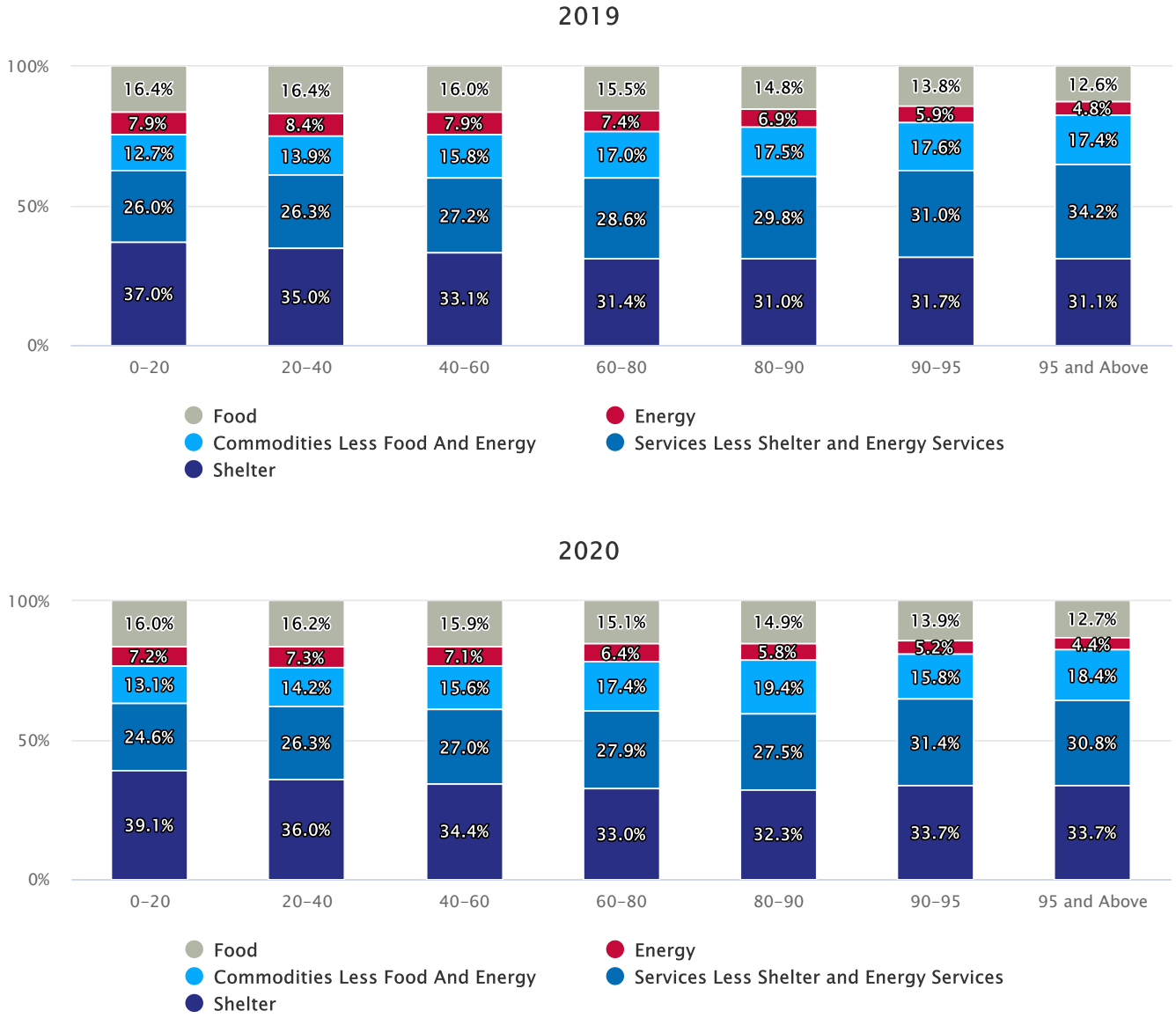

Increase in expenditure from higher prices

Figure 3 shows the increase in the average expenditure by consumption category and by income groups due to higher prices over the year ended in November 2021 under each of the two assumptions on consumption patterns.[4] Due to their higher spending, we find that higher-income groups had a bigger increase in expenditure across all five categories. For example, under the fixed 2020 bundle, the bottom 20 percent saw their expenditure go up by $309 for food, $761 for energy, $476 for shelter, $390 for other commodities, and $224 for other services. For the 2020 bundle, the top 5 percent spent an additional $961 on food, $1,824 on energy, $1,607 on shelter, $2,144 on other commodities, and $1,100 on other services.

Figure 3: Increase in expenditure by consumption category across income groups

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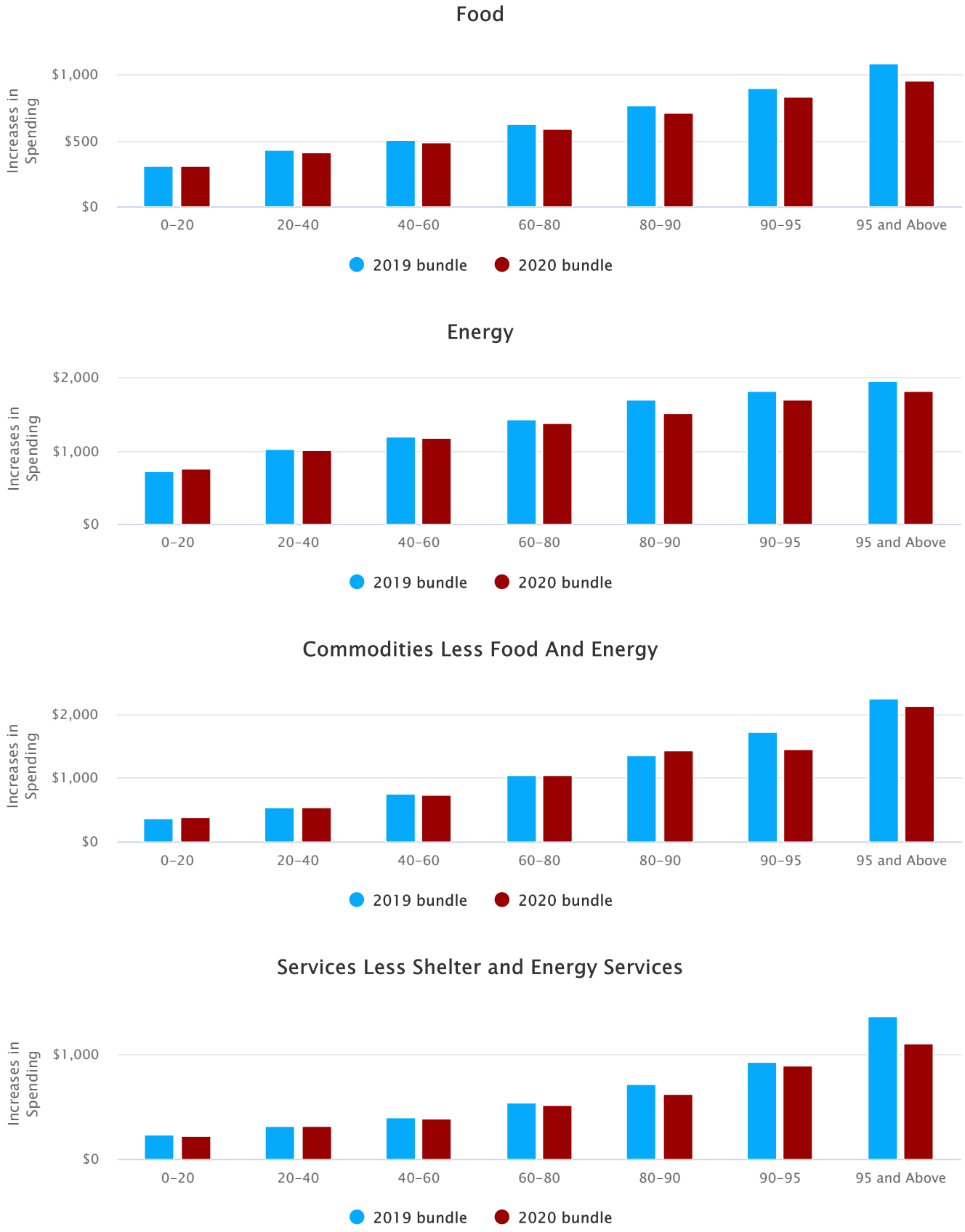

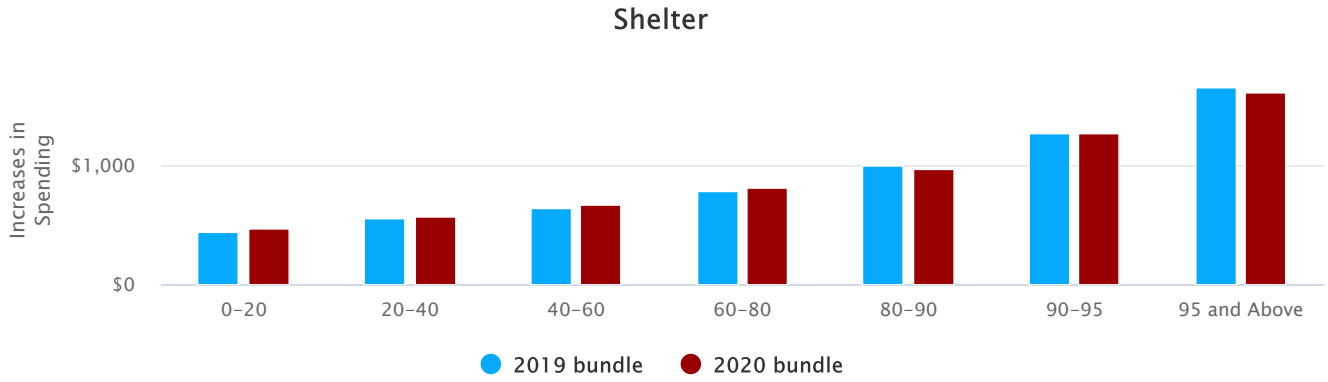

Table 1 shows the increase in the average total expenditure by income group, both as dollars and as a percent increase. Since higher-income groups had a bigger increase in expenditures in all categories, they also saw a bigger increase in total expenditure. For example, the bottom 20 percent saw their total expenditure go up by $2,064 (under the fixed 2019 bundle) while the top 5 percent saw an increase of $8,326 (under the fixed 2019 bundle). Assuming the fixed 2020 bundle, these increases change to $2,160 and $7,636 respectively.

However, because of variation in the composition of consumption bundles, we find that higher-income households had smaller *percentage* increases in their total expenditure. Higher-income households spent relatively more on services, which experienced the smallest price increases. On the other hand, lower-income households spent relatively more on energy whose prices had large increases. Under the fixed 2019 bundle assumption, the bottom 90 percent saw their consumption expenditure go up by between 6.7 percent to 6.9 percent in 2021. The top 5 percent, on the other hand, saw an increase of 6 percent. Under the fixed 2020 bundle assumption, the bottom 90 percent saw increases of 6.7 percent to 6.9 percent while the top 5 percent saw a 6.1 percent increase. Looking at the 60 to 80 percent quintile, those households saw an increased consumption expenditure of $4,441 (for the 2019 bundle) or $4,351 (for the 2020 bundle), representing an increase of 6.8 percent.

Table 1: Increase in the total consumption expenditure in dollars and in percentage

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Consumption Bundle	Income Group (%)	Increase in Expenditure ($)	Increase in Expenditure as a share of initial expenditure (%)
2019	0-20	2,064	6.8
2019	20-40	2,879	6.9
2019	40-60	3,505	6.9
2019	60-80	4,441	6.8
2019	80-90	5,533	6.7
2019	90-95	6,627	6.4
2019	95 and Above	8,326	6.0
2020	0-20	2,160	6.8
2020	20-40	2,858	6.9
2020	40-60	3,468	6.9
2020	60-80	4,351	6.8
2020	80-90	5,257	6.7
2020	90-95	6,164	6.3
2020	95 and Above	7,636	6.1

This analysis was written by Zheli He and Xiaoyue Sun and directed by Efraim Berkovich. Prepared for the website by Mariko Paulson.

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1. The Bureau of Labor Statistics does not publish the CPI of services excluding energy services and shelter. We calculate it using the relative importance and the published CPI of services less energy services and those of shelter. ↩

2. The shelter category includes rent costs and owners' equivalent rent. Owners' equivalent rent is an implied opportunity cost from living in housing owned by the household instead of renting it out. While it is not an actual expenditure on the household's budget, owners' equivalent rent represents foregone income whose loss becomes larger as rental costs increase. ↩

3. We use total household income before taxes in the CE to define the income groups. ↩

4. We use the CPI-U series to be consistent with our fixed consumption bundle assumptions since the chained CPI reweighs consumption bundles monthly. The CPI-U, on the other hand, holds the expenditure weights constant within a two-year span. ↩