

Spending Patterns and Cost of Living for Younger versus Older Households

By Jun Nie and Akshat S. Gautam

Economists often use measures of inflation—the percent change in the aggregate price level in a given period—to estimate changes in the cost of living. For example, an annual inflation rate of 2 percent means that the average household will spend 2 percent more to purchase the same basket of goods this year than in the previous year. However, this aggregate measure can mask large differences in the actual cost of living faced by households with different spending patterns. Older households, for example, typically spend more on health-related services, while younger households spend more on education. If prices in the health-care and medical services sector rise at a faster rate than prices in the education sector, older households may, in turn, experience a higher inflation rate than younger households.

Measuring possible differences in the cost of living across age groups requires a comprehensive picture of these groups' spending across expenditure categories as well as how prices in these categories change over time. We use the Consumer Expenditure Survey, the most comprehensive household-level expenditure data set in the United States, to measure the spending patterns of households at different ages. After exploring these differences across age groups, we then combine the expenditure data with price data from the Bureau of Labor Statistics to examine differences in the cost of living faced by different age groups.

Jun Nie is a senior economist at the Federal Reserve Bank of Kansas City. Akshat S. Gautam is a research associate at the bank. This article is on the bank's website at www.KansasCityFed.org

Our results suggest that older households in general have faced slightly higher inflation rates than younger households over the past four decades. This is mainly because older households spend relatively more on health-related expenses, which have had a higher inflation rate than expenses such as transportation and leisure, on which younger households spend relatively more. In addition, we find that the inflation gap between older and younger households has narrowed significantly over the last four decades as the inflation rate of health-related expenses has declined. The difference in spending patterns of older and younger households has remained relatively stable over time and contributed little to the declining inflation gap.

Section I discusses related research and the data used in the analysis. Section II highlights that older households spend more on health, rent, and household goods and services, while younger households spend more on education, communication, transportation, and leisure. Section III reports the implied inflation gap between younger and older households and demonstrates that this gap has narrowed over time.

I. Related Literature and Data

Total household spending accounts for nearly 70 percent of U.S. GDP, suggesting changes in the spending patterns of households or the age composition of the U.S. population may have macroeconomic implications. Researchers therefore have used various data sets to explore the dynamics of household consumption across age profiles. In general, consumer spending is “hump-shaped” over the life cycle: spending ramps up in early adulthood, peaks around age 40 to 50 and then declines with age (Attanasio and Weber 1995; Gourinchas and Parker 2002; Villaverde and Kruger 2007). This hump-shaped spending pattern may just reflect that earnings and wealth are also hump-shaped over the life cycle, as changes in consumption usually follow changes in income and wealth (Wolff 1992; Huggett 1996). However, declining expenditures in old age may also reflect reductions in work-related expenses and spending on items such as food away from home, which tend to decrease as people age and retire (Aguila, Attanasio, and Meghir 2011; Hurd and Rohwedder 2008). Indeed, Aguiar and Hurst (2013) disaggregate nondurable expenditures into more detailed consumption categories and find that the decline in spending on nondurable goods after middle age is essentially

driven by three categories: food, nondurable transportation, and clothing/personal care.¹

To provide a more complete picture of both the composition and patterns of household spending across different age groups, we use the Consumer Expenditures Survey (CEX) data set from the Bureau of Labor Statistics (BLS). The CEX contains the most detailed information on household spending in the United States and is used extensively by researchers and policymakers alike. However, constructing a consistent household-level panel data set based on the CEX is challenging. Unlike other traditional macroeconomic data sets, CEX data are released in different data files, and their formats and structures vary across different years. In addition, the CEX has undergone numerous changes to its file structure and survey design over the years, requiring researchers to have a clear understanding of where each variable is stored and how to merge data files with different formats. Furthermore, most household data in the CEX files are stored at a highly disaggregated level—specifically, at the Universal Classification Code (UCC) level.² These UCCs are used to construct aggregate spending and income categories, but they often change year to year due to the deletion of old UCCs or the addition of new ones.

To address these challenges, we examine the UCCs across different years and construct expenditure categories that are consistent in their definition. Defining categories in a consistent way allows us to construct a data set that covers 36 years from 1983 to 2018 and contains expenditure information for roughly 7,000 households each year.³

This data set, in turn, allows us to make new contributions to a wide body of research on household spending patterns. For example, although Attanasio and Weber (1995), Gourinchas and Parker (2002), and Villaverde and Kruger (2007) study differences in spending at the aggregate level, we examine more detailed consumption categories to assess how they contribute to the differences at the aggregate level. In addition, with more than 600 expenditure items in the CEX, we provide a more complete picture on spending patterns than Hurd and Rohwedder (2008), who use the Health and Retirement Survey to focus on a particular age group of households. Finally, we cover a larger set of consumption categories and focus on a longer time horizon than Aguiar and Hurst (2013) and Aguila, Attanasio, and Meghir (2011), who also

use disaggregated CEX data. We then combine our disaggregated price data to construct age-specific inflation rates and quantify how these differing consumption patterns may have led to differences in the cost of living for different age groups.

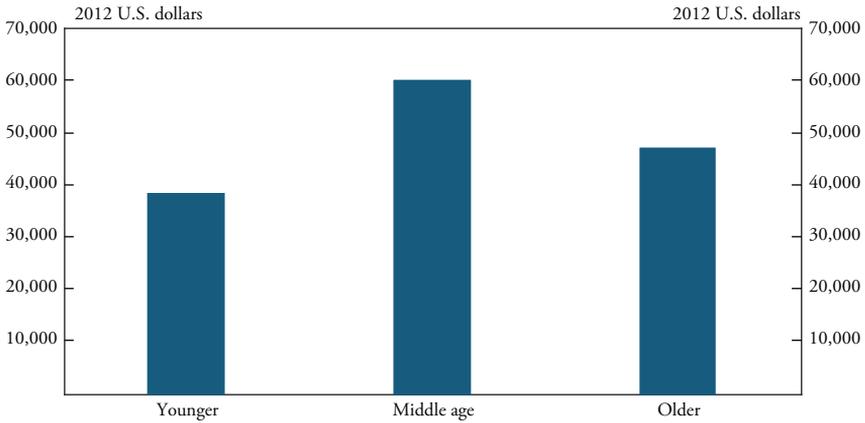
II. Spending Patterns by Age Group

As the CEX data from the BLS contain a wide range of spending categories—including some nonconsumption categories, such as spending on mortgages and insurance premiums—we extend Blundell and others' (2008) definition to more recent years to isolate household consumption expenditure items. In addition, we also include spending on health care and education, two categories likely to differ across age groups, on our list. We then divide households into three age groups to explore their spending behavior: younger households (those with a household head age 29 or younger), middle-age households (those with a household head age 30–60), and older households (those with a household head age 61 or older).⁴

Chart 1 shows that at the aggregate level, household spending is hump-shaped over the life cycle, consistent with Attanasio and Weber (1995). In particular, the chart shows that middle-age households on average spent around \$60,000 (measured in 2012 dollars) per year from 1983 to 2018, about \$21,000 more than the average spending for younger households (\$38,500) and about \$13,000 more than the average spending for older households (\$47,200). As mentioned in the previous section, this hump-shaped expenditure pattern may simply reflect the co-movement of consumption with households' income and wealth, which are also hump-shaped over the life cycle. However, it may also reflect changes in households' spending preferences as they age.

To account for potential shifts in spending categories over time, we next break down households' spending into six major categories. Specifically, we follow the BLS in combining our 600 CEX items into six major spending categories: health, household goods and services, rent, education and communication, transportation and leisure, and food.⁵ As Table 1 shows, each of these six categories includes multiple sub-categories. For example, "transportation and leisure" includes around 300 underlying UCCs, while "household goods and services" includes about 200 UCCs.

Chart 1
Average Real Spending across Age Groups, 1983–2018



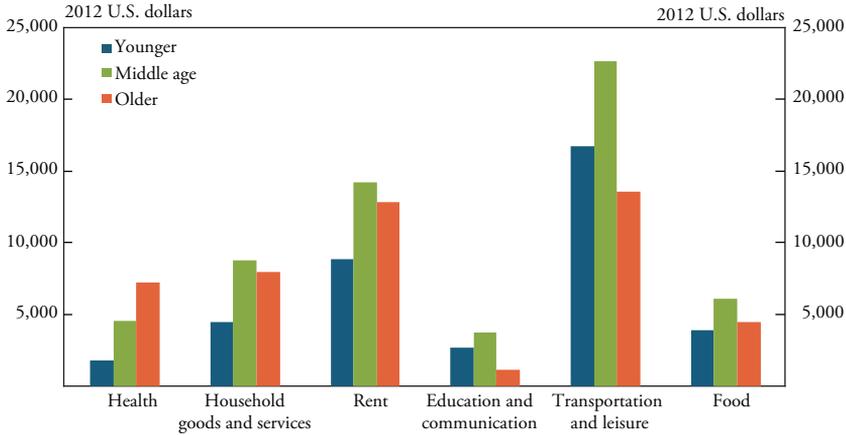
Sources: BLS, Inter-university Consortium for Political and Social Research (ICPSR), and authors' calculations.

Table 1
Summary of Six Major Categories

| Major categories | Expenditures included | Approximate UCCs included |
|------------------------------|---|---------------------------|
| Health | Health insurance, medical equipment, and medical services | 60 |
| Household goods and services | Household furnishing and operations, utilities, personal care, miscellaneous spending | 200 |
| Rent | Rent (including owner-equivalent rent) | 15 |
| Education and communication | Education and communication services (including telephone services, computers, and electronics) | 40 |
| Transportation and leisure | Vehicles, public transportation, gasoline and fuel, food away from home, apparel, alcoholic beverages, recreation | 300 |
| Food | Food at home | 5 |

Source: BLS and ICPSR.

Chart 2

Average Real Spending across Six Major Categories
by Age Group, 1983–2018

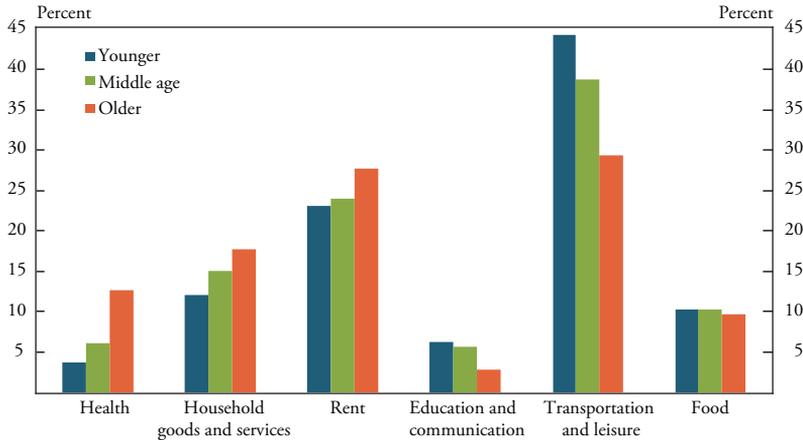
Sources: BLS, ICPSR, and authors' calculations.

Chart 2 plots average real spending across these major categories for the 1983–2018 period and shows that spending indeed differs by age across categories. Although middle-age households had the highest spending in nearly all categories, older households spent the most on health. Although younger households spent less than middle-age households in all categories, younger households outspent older households on education and communication and on transportation and leisure.

As total spending differs across age groups, comparing absolute spending levels in each category may be misleading. Therefore, Chart 3 shows the *share* of spending in each category for all three age groups from 1983 to 2018. For the first three categories (health, household goods and services, and rent), spending shares increase with age and are not hump-shaped. For example, health spending accounts for about 4 percent of total spending among younger households, 6 percent of total spending among middle-age households, and 13 percent of total spending among older households. In contrast, for the next two categories, education and communication and transportation and leisure, the spending shares decrease with age. The spending shares for food seem to be the same across age groups. This simple disaggregation highlights that spending patterns vary across ages and categories.

Chart 3

Average Spending Shares across Six Major Categories by Age Group, 1983–2018



Sources: BLS, ICPSR, and authors' calculations.

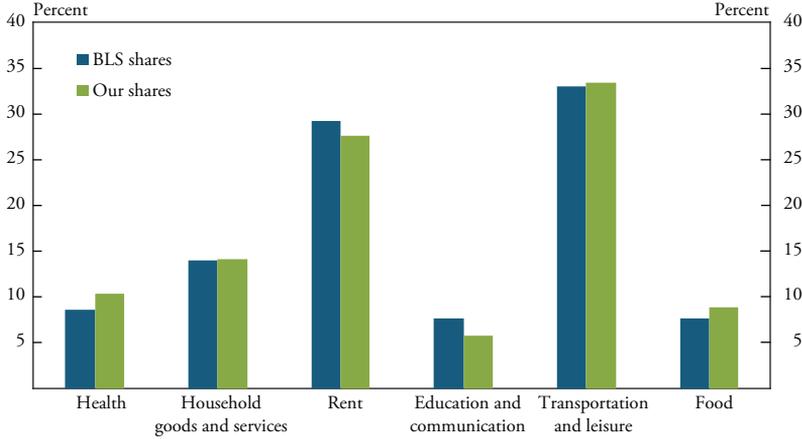
As a check for validity, we compare the average spending shares constructed from our data set with the corresponding shares of similarly defined categories published by the BLS (in the Consumer Expenditure tables) for the 2015–18 period, the most recent years for which data are available. As Chart 4 shows, the shares from the two data sets are comparable across categories.

One advantage of our data set over the BLS set is that we can aggregate the underlying spending categories up to different levels. To compare the spending shares of older and younger households in more detail, we aggregate the UCC-level data up to the 17 subcategories that make up the six categories shown in Table 1.⁶

Chart 5 shows the average difference in spending shares between older and younger households for all 17 categories across our sample years (1983–2018), where a positive difference indicates that older households spent more than younger households in that category. This difference varies from a level above 4 percentage points to below –8 percentage points, suggesting again that younger and older households' spending differs considerably across expenditure categories. For example, older households' share of spending on health insurance is about 4.9 percentage points higher than the share for younger households. In contrast,

Chart 4

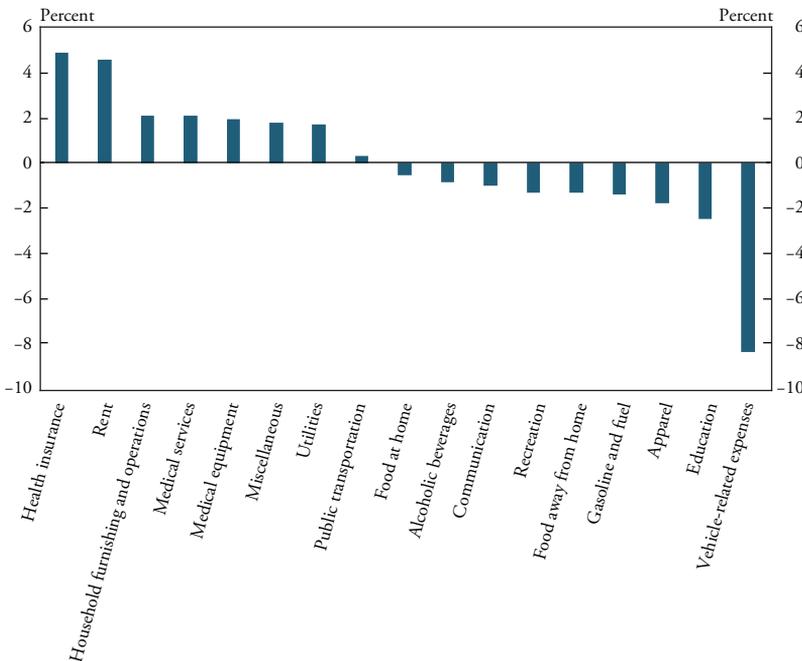
Comparison of Our Shares versus BLS Shares
(Average, 2015–18)



Sources: BLS, ICPSR, and authors' calculations.

Chart 5

Average Difference in Spending between Older and Younger Households for 17 Categories, 1983–2018



Sources: BLS, ICPSR, and authors' calculations.

older households' share of spending on vehicle-related expenses is about 8.5 percentage points lower than the share for younger households.

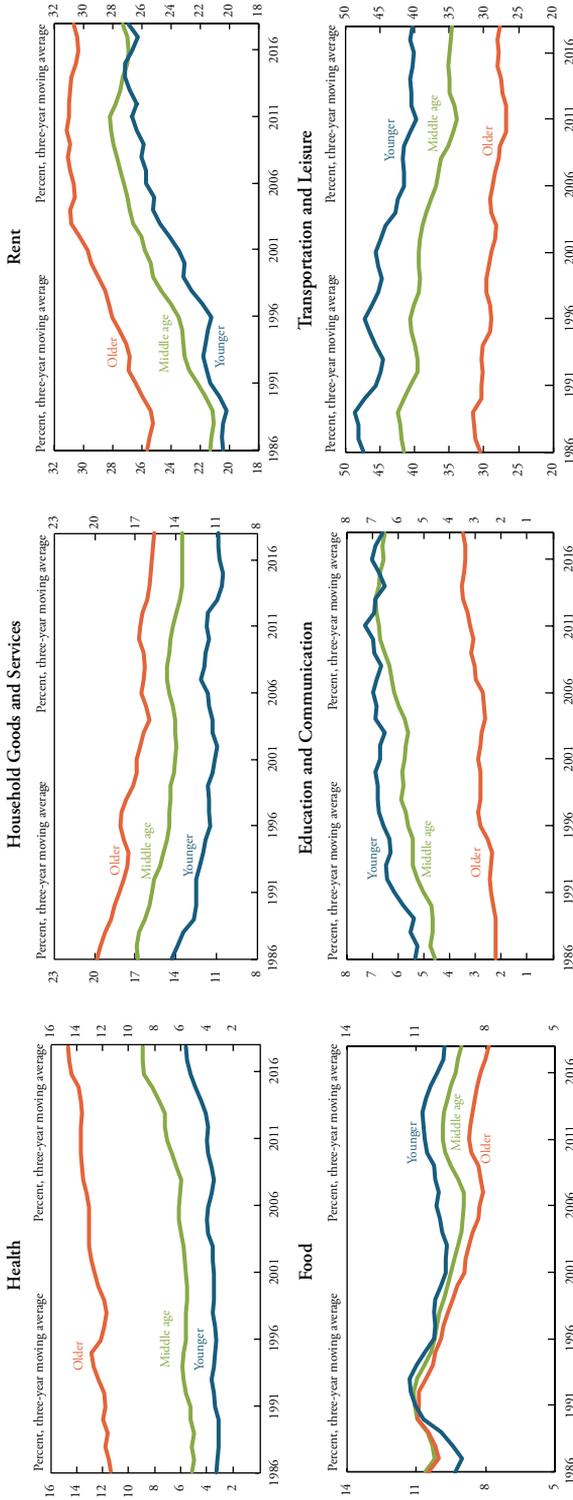
Although the average difference shows clear differences in spending shares between older and younger households, it does not reveal how these shares may have changed over time. To answer this question, we examine a time series of our data. The upper panels of Chart 6 show that spending shares on health, household goods and services, and rent were higher for older households (orange lines) than younger households (blue lines) for all years in our sample. Although the share of spending on health and rent has risen over time for all three age groups, the share of spending on household goods and services has declined. The bottom panels of Chart 6 show that spending shares on food, education and communication, and transportation and leisure were higher for younger households than older households for most years in our sample. Although the share of spending on education and communication has risen over time for all age groups, the share of spending on transportation and leisure has declined. Finally, the share of spending on food has remained relatively stable over time for all age groups, though the share for older households has declined slightly.

Overall, decomposing aggregate expenditures into major components uncovers large differences in spending patterns across age groups. These differences are clear in both absolute levels and in relative shares. In addition, spending shares for major categories show common trends across age groups, leaving differences in the spending shares across age groups relatively stable over time.

III. Implied Inflation Rates for Different Age Groups

The large differences in expenditures across age groups could translate to different inflation rates faced by households in these age groups. For example, if prices increase more quickly for goods and services that primarily older households consume, the inflation rate may be higher for older households than for younger households. To assess this possibility, we follow Hobijn and Lagakos (2005) and McGranahan (2006) and combine relevant subcategories' CPI price data from the BLS with the expenditure data constructed in the previous section to measure age-specific inflation rates. Specifically, we calculate the inflation rate for a particular age group at time t as follows:

Chart 6
Trends in Spending Shares of Six Major Categories over Time across Age Groups, 1986–2018



Note: Panels begin in 1986 because we plot the three-year moving averages to show smoothed trends.
Sources: BLS, ICPSR, and authors' calculations.

$$\pi_t^{age} = \sum_{i=1}^N S_{i,t}^{age} \cdot \pi_{i,t}, \quad (1)$$

where *age* refers to the particular age group, *N* represents the number of consumption categories (six in our case), $S_{i,t}^{age}$ represents the average share of spending on consumption category *i* relative to total spending for households in age group *age*, and $\pi_{i,t}$ denotes the inflation rate of consumption category *i* in year *t*.⁷

Consistent with prior research, we assume that different households face the same price for the same expenditure item even though in reality, people may purchase the same item at different prices. For example, more patient households may be able to purchase the same car at a lower price than households who have less time to shop around. We make this assumption mainly because we lack the data to measure differences in prices.

Chart 7 shows that the average inflation rate is higher for older households than for younger households, though the difference is not large. Specifically, the average inflation rate for younger, middle-age, and older households is 2.46, 2.54, and 2.78 percent, respectively. In other words, older households face a 0.32 (2.78 – 2.46) percentage point higher inflation rate than younger households. Accumulated over a 20-year horizon, the cost of living has increased around 10 percentage points more for older households than younger households.

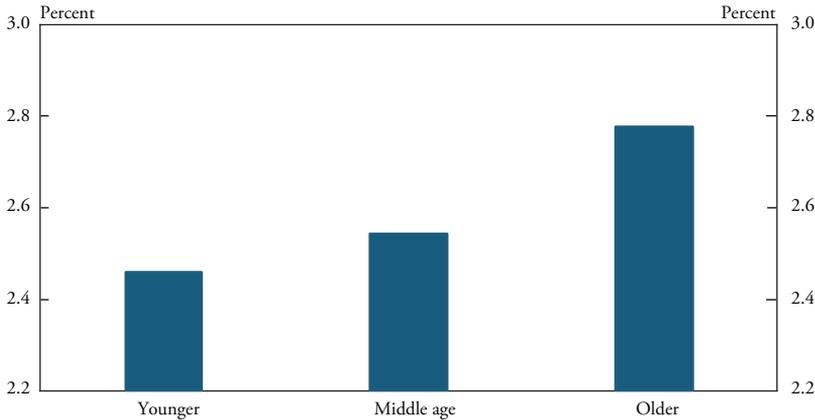
These differences in cost of living could be the result of changes in the inflation rate of certain categories or changes in each age group's spending shares on these categories. To illustrate this, we use equation (2) to express the difference in the inflation rate between older and younger households as:

$$\pi_t^{old} - \pi_t^{young} = \sum_{i=1}^N [(s_{i,t}^{old} - s_{i,t}^{young}) \cdot \pi_{i,t}], \quad (2)$$

where $s_{i,t}^{old} - s_{i,t}^{young}$ is the difference in spending shares for subcategory *i* between older and younger households and $\pi_{i,t}$ is the inflation rate for that subcategory in a given year *t*. This expression shows that the larger the gap in the spending share, the larger the category's contribution to the inflation gap. In addition, the expression shows that if a difference in spending shares between the two age groups is positive, a higher inflation rate for that category will lead to a larger contribution to the inflation gap from that category.

Chart 7

Average Inflation Rate by Age Group, 1984–2018



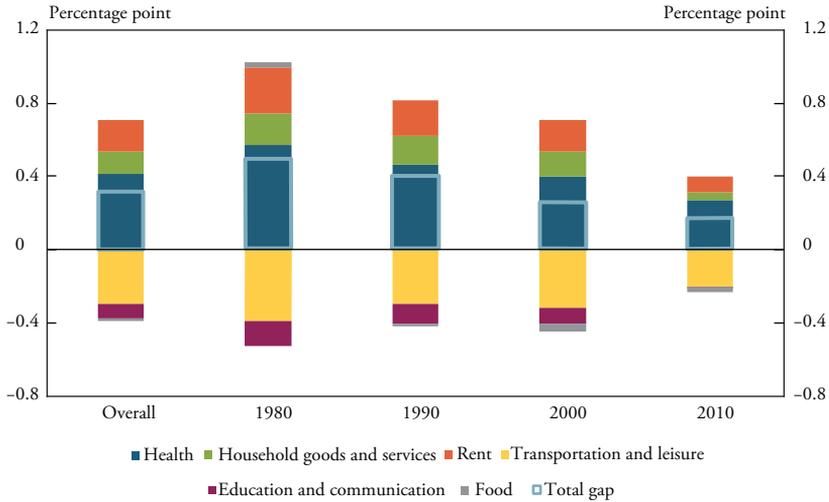
Sources: BLS, ICPSR, and authors' calculations.

The results from this decomposition show that the higher inflation rate experienced by older households has been largely driven by their spending in three subcategories: health, rent, and household goods and services. The first bar in Chart 8 shows that the health, rent, and household goods and services categories contributed 0.42, 0.17, and 0.12 percentage points, respectively, to the average inflation gap in the 1984–2018 period, which was partly offset by the transportation and leisure (–0.29 percentage point) and education and communication (–0.08 percentage point) categories. Food did not contribute much to the inflation gap, as the spending shares were about the same for older and younger households. Adding up the contributions from these different components yields a total inflation gap of 0.32, illustrated by the light blue box in the first bar.

The second through fifth bars in Chart 8 show that the inflation gap between older and younger households has shrunk over the last 40 years. In general, the shrinking inflation gap is due to declining contributions from all categories, though the contribution from the health category declined the most over the last four decades (from 0.57 percentage point in 1980 to 0.27 percentage point in 2010). In addition, the general decline in contributions across categories is due to falling inflation rates and not due to a decline in spending differences between

Chart 8

Contributions to the Inflation Gap between Older and Younger Households, Overall (1984–2018) and by Decade



Sources: BLS, ICPSR, and authors' calculations.

older and younger households. As Table 2 shows, the inflation rates for all categories have declined from the 1980s to the 2010s. In particular, the health and education categories saw the largest inflation declines of around 3.9 and 4.4 percentage points, respectively. However, the health category has made a larger contribution to the change in the overall gap because the difference in health-related spending between the two age groups is much larger than the difference in education and communication spending.

Finally, Chart 9 shows that the inflation gap between older and younger households tends to shrink as the overall inflation rate increases. Indeed, the correlation between the inflation gap and overall CPI inflation has been around -0.4 over the last 40 years, though it strengthened to -0.7 from 2000 to 2018. The negative correlation between the inflation gap and the overall inflation rate is mainly due to the fact that younger households spend more on transportation and leisure, a category that tends to see larger price increases than other categories when overall inflation is rising. As younger households spend more on transportation and leisure than older

Table 2

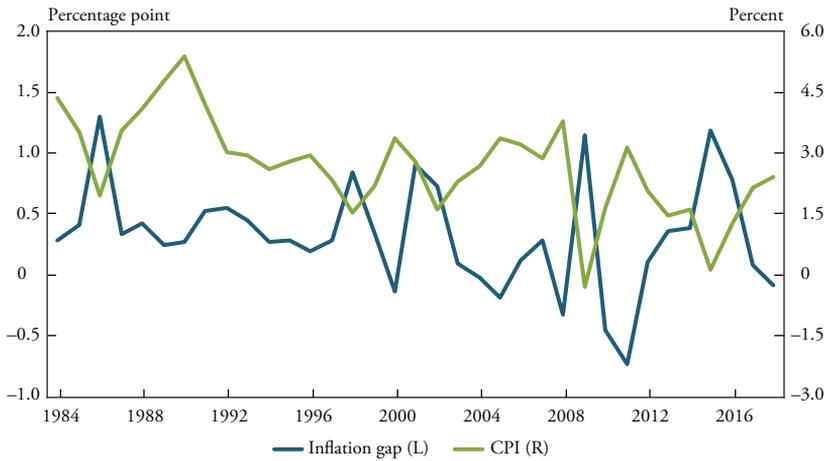
Average Inflation Rates for Six Major Categories by Decade (Percent)

| Decade | Health | Household goods and services | Rent | Education and communication | Transportation and leisure | Food |
|--------|--------|------------------------------|------|-----------------------------|----------------------------|------|
| 1980 | 6.79 | 2.97 | 4.95 | 4.44 | 2.19 | 3.84 |
| 1990 | 5.37 | 2.72 | 3.31 | 2.79 | 1.84 | 2.84 |
| 2000 | 4.25 | 2.62 | 3.03 | 2.10 | 2.23 | 2.75 |
| 2010 | 2.93 | 0.77 | 2.46 | 0.01 | 1.52 | 1.22 |

Sources: BLS, ICPSR, and authors' calculations.

Chart 9

Inflation Gap between Older and Younger Households and Headline CPI-U, 1984–2018



Sources: BLS, ICPSR, and authors' calculations.

households, their inflation rate rises faster relative to older households, thereby reducing the inflation gap.

To summarize, by using the expenditure shares to construct age-specific inflation rates, we find that compared to the large differences in spending shares across different age groups, the implied inflation gap is much smaller. In addition, the gap has declined in recent decades, as inflation rates have generally declined for various components.

Conclusions

Headline inflation statistics may mask differences in the cost of living faced by different age groups. However, measuring differences in these groups' relative cost of living requires detailed data on their spending across expenditure categories. We exploit a rich household-level expenditure data set to provide a comprehensive picture of younger, middle-age, and older households' spending patterns as well as how their inflation rates have changed over time. We find that older households have very different spending patterns than younger households. In particular, we find that older households spend more on health and medical services, household goods and services, and rent, while younger households spend more on education and communication and on transportation and leisure. In addition, we find that the shares of household spending on health, rent, and education and communication have risen for all age groups over the last 40 years, while the shares of spending on household goods and services and on transportation and leisure have declined.

To explore the implications of these different spending patterns on households' relative cost of living, we combine our expenditure data with subcategories' price data. We find that older households in general face slightly higher inflation rates than younger households, but the difference has narrowed significantly over the last four decades.

Endnotes

¹Nondurable transportation includes transportation expenses such as gasoline and vehicle repair but excludes spending on durables such as new or used cars and trucks.

²Overall, about 800 UCCs summarize households' relevant information on spending, income, demographics, assets, and so on. A given UCC thus may uniquely identify expenditures such as groceries, footwear, meals at restaurants, and alcoholic beverages, or income information such as the amount received in transfers, wages and salaries, and financial dividends.

³The CEX data are available from 1980. However, the first three years lack information on important variables such as owner-equivalent rent. To be consistent, we therefore start our data set in 1983. The official number of households surveyed by the BLS every year has been around 12,000 in recent years. Usable information can be extracted from about 4,000 to 8,000 households every year, with earlier years having fewer households. For the period 1980–95, we get the CEX data from the Inter-university Consortium for Political and Social Research (ICPSR), while the data from 1996–2018 come from the BLS.

⁴In robustness analysis, we use alternative age thresholds to define different age groups. Our main results still hold qualitatively.

⁵We separate rent from other non-rental household operating expenses included in the “household goods and services” category because rental expenses are less discretionary—that is, households have less control over changing them—than other spending categories. For details on how the BLS aggregates CEX categories, see the CEX-ISTUB hierarchy available at the BLS website. When constructing the expenditure categories, we also need our defined categories to match the relevant price indexes in Section III.

⁶Since we later use these underlying categories to construct age-specific inflation rates, we try to match our 17 categories to the BLS's underlying CPI subcategories.

⁷Equation (1) is a weighted average of different subcategories' inflation. This is an approximation of the growth of the aggregate price. We adopt this formula as it is easier to explain. We construct the price indexes for the six subcategories following a similar formula:

$$\pi_t^m = \sum_{k=1}^n s_{k,t} \cdot \pi_{k,t},$$

where n denotes the number of subcomponents in category m , $s_{k,t}$ denotes the share of spending in subcomponent k relative to total spending in m , and $\pi_{k,t}$ is the inflation rate of subcomponent k in year t . The price information for these subcomponents come from the similar underlying component indexes published by the BLS.

References

- Aguiar, Mark, and Erik Hurst. 2013. "Deconstructing Life Cycle Expenditure." *Journal of Political Economy*, vol. 121, no. 3, pp. 437–492. Available at <https://doi.org/10.1086/670740>
- Aguila, Emma, Orazio Attenasio, and Costas Meghir. 2011. "Changes in Consumption at Retirement: Evidence from Panel Data." *Review of Economics and Statistics*, vol. 93, no. 3, pp. 1094–1099. Available at https://doi.org/10.1162/REST_a_00140
- Attenasio, Orazio P., and Guglielmo Weber. 1995. "Is Consumption Growth Consistent with Intertemporal Optimization? Evidence from the Consumer Expenditure Survey." *Journal of Political Economy*, vol. 103, no. 6, pp. 1121–1157. Available at <https://doi.org/10.1257/aer.98.5.1887>
- Blundell, Richard, Luigi Pistaferri, and Ian Preston. 2008. "Consumption Inequality and Partial Insurance." *American Economic Review*, vol. 98, no. 5, pp. 1887–1921. Available at <https://doi.org/10.1257/aer.98.5.1887>
- Fernández-Villaverde, Jesus, and Dirk Krueger. 2007. "Consumption over the Life Cycle: Facts from Consumer Expenditure Survey Data." *Review of Economics and Statistics*, vol. 89, no. 3, pp. 552–565. Available at <https://doi.org/10.1162/rest.89.3.552>
- Gourinchas, Pierre-Olivier, and Jonathan A. Parker. 2002. "Consumption over the Life Cycle." *Econometrica*, vol. 70, no. 1, pp. 47–89. Available at <https://doi.org/10.1111/1468-0262.00269>
- Hobijn, Bart, and David Lagakos. 2005. "Inflation Inequality in the United States." *Review of Income and Wealth*, vol. 51, no. 4, pp. 581–606. Available at <https://doi.org/10.1111/j.1475-4991.2005.00170.x>
- Huggett, Mark. 1996. "Wealth Distribution in Life-Cycle Economies." *Journal of Monetary Economics*, vol. 38, no. 3, pp. 469–494. Available at [https://doi.org/10.1016/S0304-3932\(96\)01291-3](https://doi.org/10.1016/S0304-3932(96)01291-3)
- Hurd, Michael D., and Susann Rohwedder. 2008. "The Retirement Consumption Puzzle: Actual Spending Change in Panel Data." National Bureau of Economic Research, working paper 13929, April. Available at <https://doi.org/10.3386/w13929>
- McGranahan, Leslie, and Anna Paulson. 2006. "Constructing the Chicago Fed Income Based Economic Index – Consumer Price Index: Inflation Experiences by Demographic Group: 1983–2005." Federal Reserve Bank of Chicago, Working Paper no. 2005-20.
- Storesletten, Kjetil, Christopher I. Telmer, and Amir Yaron. 2004. "Consumption and Risk Sharing over the Life Cycle." *Journal of Monetary Economics*, vol. 51, no. 3, pp. 609–633. Available at <https://doi.org/10.1016/j.jmoneco.2003.06.005>
- Wolff, Edward N. 1992. "Changing Inequality of Wealth." *American Economic Review*, vol. 82, no. 2, pp. 552–558.