

U.S. Inflation Inequality between 2010 and 2023

YiLi Chien, Shih-Yang Lin, and Yi-Chan Tsai

Abstract

Following the literature that uses data from the Consumer Expenditure Survey and the consumer price index, this article examines U.S. households' inflation experiences during the recent period from 2010 to 2023. We construct group-specific market baskets to reflect diverse spending patterns and identify key differences in inflation. Our main finding is that, although average inflation was higher and more volatile during this period, inflation inequality remained stable or even declined compared with the earlier period. Nevertheless, despite the overall similarity in households' inflation experiences, the underlying drivers of inflation—by consumption category and specific subcategory—can differ significantly.

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1. INTRODUCTION

Inflation is a key economic indicator that directly influences household purchasing power, yet its effects are not uniformly felt. This phenomenon, known as inflation inequality, has been documented in the United States through various studies using data from the Bureau of Labor Statistics (BLS). Early work by Michael (1979) and Hagemann (1982) analyzed consumer price index (CPI) data from the 1970s, while subsequent research by Hobbijn and Lagakos (2005) and McGranahan and Paulson (2006) extended this analysis using BLS data spanning the mid-1980s to the early 2000s.

Our study contributes to this literature by examining more recent data from 2010 to 2023, offering updated insights into inflation inequality during a period characterized by significant economic transitions. This time-frame encompasses the low-inflation recovery following the global financial crisis, the economic disruptions caused by the COVID-19 pandemic, and the subsequent high-inflation period marked by global supply chain disruptions. These diverse economic conditions, coupled with substantial changes in consumption expenditure patterns during the pandemic (Cavallo, 2024), provide a rich context for examining how inflation experiences differ across the population.

Measuring inflation inequality is crucial for economists, policymakers, and central bankers because unequal

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price changes create unequal inflation expectations (Jonung, 1981; D’Acunto et al., 2021).¹ These expectation gaps generate heterogeneous household responses that complicate standard readings of aggregate inflation (Weber et al., 2022; D’Acunto and Weber, 2024). They help explain differences in consumption, saving, investment, and debt and why otherwise similar households respond differently to the same monetary and fiscal policies, yielding distinct policy implications (Dietrich, 2024).

Moreover, inflation inequality exacerbates disparities in household welfare—both in consumption and in overall well-being. For consumption, Aguiar and Bils (2015) find that U.S. consumption inequality has closely tracked income inequality since 1980, implying that resource gaps map directly into living-standard gaps. Inflation inequality intensifies this pattern by cutting the purchasing power of lower-income households more. For well-being, Prati (2024) shows that heterogeneity in perceived inflation helps explain differences in reported life satisfaction, even after controlling for sociodemographic factors and income. These patterns call for targeted policies that reduce inflation inequality, thereby improving household welfare on both material and subjective margins.

We focus specifically on analyzing inflation inequality across several household characteristics, including income, housing tenure status, family composition, and age. By integrating expenditure data from the Consumer Expenditure Survey (CES) with price data from the CPI, we construct market baskets that reflect the diverse spending patterns of different groups. This methodological approach follows that established by Hobijn and Lagakos (2005) and McGranahan and Paulson (2006), allowing for meaningful comparisons with their findings from earlier periods.

Furthermore, by constructing tailored market baskets that capture the varied spending behaviors of different groups, we highlight the nuances of inflation at both aggregate and disaggregated levels. Our analysis decomposes overall price changes into contributions from distinct consumption categories such as food, shelter, utilities, fuels, and services. This detailed breakdown enables us to identify the key drivers of inflation and assess how these factors differ across households.

Our main overall finding is that, although average inflation was higher and more volatile during our sample period, inflation inequality remained stable or even declined compared with the prior period. One notable exception is the case of renters versus homeowners. We find a slight increase in inflation inequality along this dimension (higher inflation for renters), despite the fact that housing affordability did not deteriorate for most of the sample period. Consistent with the existing literature, the inflation experiences of different groups are highly correlated and similar in magnitude.

Nevertheless, despite the overall similarity in inflation experiences across households, both the underlying drivers of inflation by consumption category and the specific subcategories within major consumption categories can differ significantly. While most households require access to food, the specific consumption bundles used to meet this need vary across different household groups. For example, lower-income households tend to spend more on food at home, whereas higher-income households spend more on food away from home.

Our analysis starts with the classical inflation inequality exercise across household incomes. Our findings reveal that income-based inflation inequality persists, with lower-income households experiencing consistently higher average annual inflation rates than higher-income households. Our findings are consistent with earlier studies, including McGranahan and Paulson (2006), who documented a similar inflation gap of approximately 0.20 percentage points between income quartiles for the period 1983–2005.

When examining inflation inequality by family composition, we find that households with or without children experience remarkably similar overall inflation rates. However, these households consume different baskets of goods and services. Even among households with children, their consumption bundles vary depending on the age of the child. Households with young children allocate a relatively larger share of their expenditures to household-related categories—particularly housing operations and shelter—and spend relatively less on health care, transportation, and education than households with older children. This finding is consistent with previous research by Hobijn and Lagakos (2005), who reported that households with older children systematically faced higher inflation than childless households due to the high cost of college education. In our data, however, educational inflation plays a smaller role among these households.

Another notable departure from prior literature concerns the inflation experiences of elderly households. While previous studies by Hobijn and Lagakos (2005) and McGranahan and Paulson (2006) found that elderly households typically faced higher inflation—primarily due to healthcare expenses—our analysis reveals that, in recent years, elderly and non-elderly households have experienced nearly identical overall inflation rates. This marks a significant shift from the 1987–2005 period, during which elderly households faced approximately 0.2 to 0.3 percentage points higher annual inflation. The historical inflation gap was largely driven by medical

1. Forward guidance works only insofar as households update expectations in the intended direction.

care and shelter costs. However, in recent years, elderly households have allocated a smaller share of their total spending to shelter. Combined with the surge in shelter inflation during 2022 and 2023, this change has narrowed the inflation gap between young and old groups.

Inflation outcomes also exhibit notable variation across housing tenure. On average, renters experienced annual inflation rates approximately 20 to 25 basis points higher than those faced by homeowners. This disparity stems largely from renters allocating a greater share of their expenditures to shelter, which saw significant price increases during the sample period. Rising rents were temporarily suppressed during the COVID-19 pandemic due to government policies aimed at supporting renters, but they quickly adjusted back to trend once those policies were lifted. The inflation gap is especially pronounced among low-income renters, who bore the highest inflation burden across all tenure-income combinations. Compared with McGranahan and Paulson (2006), who found negligible inflation differences between renters and homeowners (ranging from -0.04% to 0.03%), our findings suggest a growing divergence in inflation experiences by tenure status in the post-2010 period.

Finally, our study complements Mori and Sánchez (2025) and differs in scope and method. They construct real-time, monthly Fisher indices of inflation and real expenditure growth by PCE expenditure quintiles, forecast CE-to-PCE shares, and document modest yet persistent dispersion: Since 2000, lower-expenditure households have borne slightly higher cumulative inflation, faced greater volatility, and recovered unevenly after COVID-19. In contrast, we study 2010–2023 and build group-specific CES–CPI Törnqvist–Theil indices by income, housing tenure, age, and family composition, with category- and subcategory-level decompositions to quantify the sources of inflation inequality.

The remainder of the article is structured as follows. Section 2 describes the data sources and the methodology used to construct group-specific inflation indices. Section 3 presents the core empirical findings, analyzing inflation inequality across income quintiles, family composition, age, and housing tenure. Each subsection focuses on a different demographic dimension and decomposes the inflation gap to uncover its primary sources. Section 4 concludes by summarizing the main insights of our findings.

2. DATA AND METHODOLOGY

2.1 The Data Procedure

Our analysis integrates expenditure data and price data to calculate the inflation rates across different households. The consumption expenditure data come from the Consumer Expenditure Survey (CES) by the BLS. The CES tracks spending across almost all product categories. All service and goods items of the survey are grouped into 41 subcategories and further organized into 12 main categories according to the CES.²

The CES survey provides information on household characteristics, including income, age, education attainment, household size, home-ownership status, marital status, and ethnicity. We then divide consumers into different groups according to their characteristics. The classification criterion is reported in Appendix 1.

The market consumption baskets of various consumer groups are constructed by integrating data from two CES surveys: the quarterly Interview Survey and the weekly Diary Survey. The Interview Survey captures major expenses such as rent and vehicle purchases, while the Diary Survey records frequent, smaller purchases such as groceries and dining out. To ensure comparability between the two datasets, we convert both the weekly Diary Survey data and the quarterly Interview Survey data to an annual frequency.³

A key concern in integrating data from the Interview and Diary surveys is that the household samples in the two surveys are independent. To address this issue, we first show that household characteristics reported in both of the surveys exhibit strong alignment, supporting the reliability of combining both datasets for unified analysis—at least when conditioned on household groups (see Table 13 in Appendix 1). We then calculate expenditure shares for households within each group. Specifically, we estimate consumption expenditures at the group level rather than at the individual household level (see Appendix 2 for more details).

2.2 Inflation Index

For price data, we use the unadjusted, unchained Consumer Price Index for All Urban Consumers (CPI-U) published by the BLS. Since the CPI and CES datasets classify consumption items differently, we harmonize the two using a detailed mapping. Appendix 3 provides a more comprehensive description of the procedure used to align price data with expenditure data.

2. In the CES official classification, there are 13 main categories. In our analysis, we adopt the CES main categories but exclude items classified as “cash contributions” and “personal insurance and pensions,” as these do not directly correspond to goods or services included in the CPI. Furthermore, we separate alcoholic beverages from the food category following McGranahan and Paulson (2006). The grouping of subcategories considers the concordance with CPI data. As a result, our classification consists of 12 main categories and 41 subcategories.

3. More specifically, we follow the BLS guidelines in Section 6.3.1, “Developing a Weighted Calendar Year Estimate,” from the Consumer Expenditure Surveys Public Use Microdata Getting Started Guide.

Our measure of the inflation rate uses the Törnqvist–Theil index. This inflation index is widely used because it provides a more accurate measure of the true cost-of-living index, capturing both direct price changes and consumer substitution behavior. Unlike fixed-weight indices such as Laspeyres, which overstates inflation by ignoring substitution, and Paasche, which understates inflation by fully incorporating substitution, the Törnqvist–Theil index adjusts dynamically by using average expenditure shares from both periods. This approach reflects how consumers reallocate their spending when relative prices change, reducing substitution bias. By incorporating flexible weighting, the Törnqvist–Theil index offers a more reliable tool for measuring inflation and tracking economic trends.

Let g represent a demographic group, k denote a main consumption category, j denote a subcategory of consumption, and t indicate the year. The average price paid by group g for category k in year t is denoted by $p_{k,t}^g$. The inflation rate for main category k within demographic group g , denoted as $\pi_{t,t+1}^{gk}$, is defined as

$$1 + \pi_{t,t+1}^{gk} = \frac{p_{k,t+1}^g}{p_{k,t}^g}.$$

By applying the Törnqvist–Theil index formula, the overall inflation rate for group g is given by

$$(1) \quad 1 + \pi_{t,t+1}^g = \prod_{k=1}^n \left(\frac{p_{k,t+1}^g}{p_{k,t}^g} \right)^{w_{t,t+1}^{gk}},$$

where the inflation weight of category k , $w_{t,t+1}^{gk}$, is defined as the equally weighted average of its corresponding consumption shares between the two periods:

$$w_{t,t+1}^{gk} = \frac{s_{k,t}^g + s_{k,t+1}^g}{2}.$$

Similarly, the Törnqvist–Theil inflation index at the main category level is expressed as an aggregation of its subcategory price indices:

$$(2) \quad 1 + \pi_{t,t+1}^{gk} = \prod_{j=1}^m \left(\frac{p_{j,t+1}^k}{p_{j,t}^k} \right)^{w_{t,t+1}^{gkj}},$$

where

$$w_{t,t+1}^{gkj} = \frac{s_{j,t}^{gk} + s_{j,t+1}^{gk}}{2}.$$

The price of subcategory j within main category k , denoted as $p_{j,t}^k$, is obtained from the CPI-U series. Since $p_{j,t}^k$ is directly obtained from CPI-U data, these prices do not vary by demographic group. Therefore, our measure of inflation inequality across demographic groups arises exclusively due to differences in their consumption baskets. Since the underlying price indices at the subcategory level are identical for all groups, variations in inflation rates stem from differing expenditure shares rather than price discrepancies.⁴ Groups that allocate a larger portion of their spending to categories experiencing higher price increases will face higher inflation rates. Conversely, those with expenditure patterns weighted toward relatively stable or declining price categories will experience lower inflation.

To demonstrate this point more clearly, we spell out the specific formulas used to measure the contribution of main and subcategories to cumulative inflation. Appendix 4 shows that, after a few simple steps of algebra, the inflation rate for group g between period t and $t + 1$ can be approximated as

$$\pi_{t,t+1}^g \approx \sum_{k=1}^n w_{t,t+1}^{gk} \sum_{j=1}^m w_{t,t+1}^{gkj} \left(\frac{p_{j,t+1}^k}{p_{j,t}^k} \right),$$

4. Using a single CPI series for each of the 41 subcategories across all household types overlooks item-level inflation heterogeneity. For example, within “food at home,” high-income households may purchase organic or specialty items, whereas low-income households more often buy generics and basic staples. Because firms introduce more new products targeted at higher-income consumers and competition among these varieties tends to dampen their price growth (Jaravel, 2019), our estimates can thus underestimate inflation inequality.

Table 1
Average Inflation Rates and Expenditure Shares by Category

Main category	Infl. rate (%)	Exp. share (%)
Alcoholic beverages	2.00	1.03
Apparel and services	0.78	3.59
Education	2.93	2.46
Entertainment	0.92	5.81
Food	3.02	15.11
Health	2.72	9.18
Housing	2.99	39.67
Miscellaneous	3.16	1.30
Personal care products and services	1.65	1.44
Reading	1.57	0.22
Tobacco and smoking	4.43	0.69
Transportation	2.48	19.50

where the inflation rate of subcategory goods and services, $\frac{p_{j,t+1}^k}{p_{j,t}^k}$, does not vary across group g by construction. That is, according to our measure, any inflation inequality between groups must result from the consumption expenditure share across main and subcategories of goods and services, $w_{t,t+1}^{gk}$ and $w_{t,t+1}^{gkj}$. Finally, the cumulative inflation rate for group g between period t and $t + s$ is given by

$$\pi_{t,t+s}^g \approx \sum_{l=1}^s \sum_{k=1}^n w_{t+l-1,t+l}^{gk} \sum_{j=1}^m w_{t+l-1,t+l}^{gkj} \left(\frac{p_{j,t+l}^k}{p_{j,t+l-1}^k} \right).$$

Therefore, our measure of inflation inequality across demographic groups arises exclusively due to differences in their consumption baskets.

2.3 Inflation Rates and Consumption Expenditure Shares

Table 1 reports the average annual inflation rates and expenditure shares for each main category. Our sample period spans from 2010 to 2023, covering both the low-inflation period following the global financial crisis and the high-inflation period after the COVID-19 pandemic. We observe significant variations in inflation rates across different consumption categories. The main categories with high inflation rates and non-trivial expenditure shares are education, food, health, housing, and transportation, with inflation rates ranging from approximately 2.5% to 3%. Categories with lower inflation rates include (i) apparel and services and (ii) entertainment, with inflation rates below 1%.

Finally, Figure 1 compares the BLS-published CPI-U with our estimated Törnqvist–Theil index. The strong alignment between the two measures demonstrates that our estimated index effectively captures aggregate inflation trends, validating its reliability as an alternative inflation measure. Note that deviations in 2015 and 2022 may reflect differences in weighting methodologies or short-term price fluctuations; but, overall, the Törnqvist–Theil index successfully tracks the inflation dynamics reported by the BLS.

Note that the expenditure share of medical services reflects only out-of-pocket spending—co-pays, deductibles, fees, and premiums paid directly by households—and excludes employer contributions and government payments. This narrow measure of medical expenditure introduces a downward bias relative to the true medical expenditure. Such a bias could affect our measure of inflation inequality across groups, although the direction is unclear. It depends on the relative magnitude of the bias across groups, and it is not obvious which groups are more affected than others.

3. INFLATION INEQUALITY

3.1 By Income Quintile

Our analysis begins with a classical inflation inequality exercise by segmenting households by income.⁵ Specifically, we calculate inflation rates across income quintiles from 2010 to 2023. The average annual inflation rates

5. We follow the approach of Jaravel (2019) and define household income as pre-tax family income.

Figure 1
Comparison of Törnqvist-Theil Index versus BLS Published CPI-U

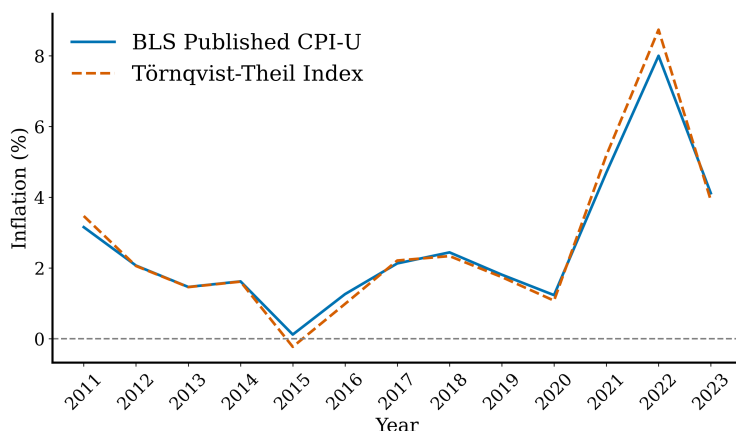
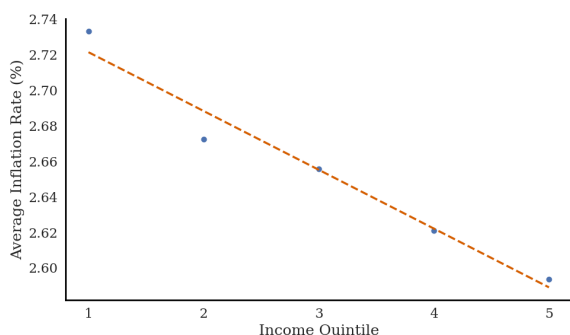
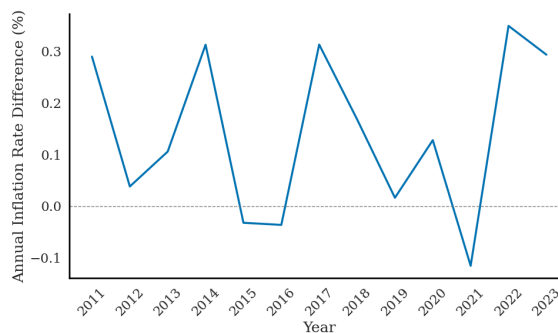


Figure 2
Inflation Inequality by Income Quintile

(a) Average inflation rates



(b) Inflation rate differential



for each quintile are presented in Figure 2(a), which reveals a clear negative correlation between inflation and income levels: Lower-income households tend to experience higher inflation rates.

The average annual inflation rates for the top and bottom income quintiles are 2.59% and 2.73%, respectively, yielding an average difference of 14 basis points. This magnitude is consistent with earlier findings by McGranahan and Paulson (2006), who report an average inflation difference of approximately 20 basis points between the top and bottom income quartiles over the 1983–2005 period. In comparison, Jaravel (2019) finds a more substantial inflation gap based on data from 2004 to 2015, reporting annual inflation rates of 1.86% for the top income quintile and 2.20% for the bottom quintile, a difference of 0.34 percentage points. Thus, according to our findings, while inflation disparities across income groups persist, the gap appears to have narrowed slightly over time, even as overall inflation has increased.

This recent decline in inflation inequality across income groups is consistent with findings from the BLS. Aligning with the timeframes of Jaravel (2019)'s and our studies, the inflation gap between the top and bottom income quintiles fell from 0.3 percentage points during 2006–2015 to 0.21 percentage points during 2010–2023.⁶

Figure 2(b) illustrates the annualized percentage-point inflation differential between the bottom and top income quintiles over time. The data reveal that the bottom quintile consistently faces higher inflation rates compared with the top quintile in most periods. There is no noticeable trend indicating either widening or narrowing of this inflation differential over the observed timeframe.

6. However, this comparison comes with the caveat that the BLS uses a different data procedure to define income groups, which may affect comparability.

Table 2
Cumulative Inflation Rates Difference: Bottom versus Top Quintile

Top category	%	Bottom category	%
Housing	1.440	Transportation	-0.808
Household furnishings and equipment	-0.235	Motor fuels	0.253
Household operations	-0.571	Public and other transportation	-0.090
Housekeeping supplies	0.135	Vehicle insurance	0.456
Shelter	0.950	Vehicle purchases	-1.211
Utilities, fuels, and public services	1.163	Vehicle rental and other charges	-0.158
Food	1.153	Education	-0.372
Food at home	1.625	Tuition and other school fees	-0.405
Food away from home	-0.465	Entertainment	-0.140
Tobacco and smoking	0.528	Fees and admissions	-0.445
Cigarettes	0.493	Other recreational goods	0.234
		Televisions, radios, sound	0.092

NOTE: This table reports the percentage-point differences in cumulative inflation rates experienced by households in the bottom income quintile relative to those in the top income quintile. The top three and bottom three categories are shown in the left and right columns, respectively. To conserve space, some subcategories are omitted.

We further investigate the sources of inflation inequality between the bottom and top income quintiles by decomposing 13-year (2011–2023) cumulative inflation contributions by consumption category. Overall, households in the bottom quintile experienced higher cumulative inflation—1.78 percentage points more—than those in the top quintile. Table 2 presents a decomposition by consumption category, showing the cumulative inflation differential between bottom- and top-quintile households over the sample period.

Low-income households faced higher inflation in three major categories: housing, food, and tobacco, while experiencing lower inflation in transportation and education. However, there is substantial variation within subcategories, reflecting differing consumption baskets across income groups. For example, within the housing category, low-income households allocate a larger share of their consumption to shelter and utilities and a smaller share to household operations and furnishings. A similar pattern emerges in food consumption: Low-income households devote a greater share of their spending to food at home rather than dining out, which makes them more exposed to increases in grocery prices. In the transportation category, low-income households spend more heavily on expenditures for fuel and insurance, whereas high-income households are more affected by the prices of vehicle purchases. These examples illustrate that inflation exposure can vary substantially across subcategories. While all households require access to transportation, housing, and food, the specific consumption bundles they use to satisfy these needs differ across income groups, resulting in inflation inequality.

The inflation differential between low- and high-income households can be further decomposed into two potential drivers: (i) categories in which pre-existing large differences in consumption shares between household groups are amplified by high inflation in those categories and (ii) categories in which consumption-share differences between groups change significantly over time, even if the category's inflation rate remains relatively stable.

To disentangle the two mechanisms, we take the Törnqvist–Theil index—our benchmark measure, which incorporates time-varying average expenditure shares—and compare it with a fixed-base-period index, the Geometric Laspeyres. The Geometric Laspeyres index captures the amplification of inflation inequality due to pre-existing gaps in expenditure shares, whereas the Törnqvist–Theil index additionally reflects the effect of evolving consumption structures.

Overall, the results are nearly identical: Average annual inflation rates differ by 14 basis points under the Törnqvist–Theil index and by 13 basis points under the Geometric Laspeyres index, indicating that time-varying consumption shares contribute only modestly to overall inflation inequality—about 10 basis points over the entire 2010–2023 period.

Table 3 reports the inflation inequality decomposition based on the Geometric Laspeyres index. Compar-

Table 3**Cumulative Inflation Rates Difference (based on Geometric Laspeyres index): Bottom versus Top Quintile**

Top category	%	Bottom category	%
Housing	0.782	Transportation	-0.889
Household furnishings and equipment	-0.220	Motor fuels	0.134
Household operations	-0.626	Public and other transportation	0.066
Housekeeping supplies	0.129	Vehicle insurance	0.391
Shelter	0.234	Vehicle purchases	-1.151
Utilities, fuels, and public services	1.267	Vehicle rental and other charges	-0.150
Food	1.381	Education	-0.387
Food at home	1.832	Tuition and other school fees	-0.450
Food away from home	-0.443	Entertainment	-0.004
Tobacco and smoking	0.710	Fees and admissions	-0.462
Cigarettes	0.682	Other recreational goods	0.324
		Televisions, radios, sound	0.096

NOTE: This table reports the percentage-point differences in cumulative inflation rates experienced by households in the bottom income quintile relative to those in the top income quintile. The top three and bottom three categories are shown in the left and right columns, respectively. To conserve space, some subcategories are omitted.

ing Tables 2 and 3, we see that, at the category level, the time-varying-share index highlights where changes in consumption structures matter. For housing, the Törnqvist–Theil index exceeds the Geometric Laspeyres by 0.657 percentage points ($= 1.440\% - 0.782\%$), indicating that differences in consumption shares for housing have widened over time—mainly because low-income families have increased their housing expenditure share while high-income families have reduced theirs. A similar but smaller widening effect appears in transportation (+0.081%) and health (+0.039%). In contrast, food (0.229%), tobacco and smoking (0.182%), and entertainment (0.136%) record negative values, indicating that consumption share differences in these categories have narrowed over time. In particular, low-income families have reduced their food expenditure share, whereas high-income families have increased theirs.

These findings are consistent with prior literature. Hobijn and Lagakos (2005) show that low-income households are particularly vulnerable to inflation when gasoline prices rise. Similarly, McGranahan and Paulson (2006) find that lower-income households allocate a larger share of their budgets to tobacco and shelter, whereas higher-income households spend relatively more on new vehicles.

Obviously, household heterogeneity extends beyond income differences. Inflation disparities may also reflect other household characteristics such as age, household member composition, or housing tenure. We therefore turn to these factors to further investigate the underlying drivers of inflation inequality.

3.2 By Household Composition and Child Age

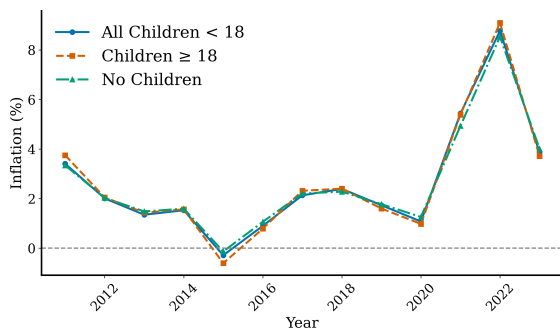
Many countries around the world, especially in developed and some developing regions, have experienced sustained drops in birth rates over recent decades. The United States is no exception in this regard. Motivated by this demographic trend, this subsection examines whether households with children face different inflation rates, depending on the age of their children.

Our results show little overall inflation variation across groups. Households with no children experienced an average inflation rate of 2.624%, those with all children under 18 faced a rate of 2.617%, and households with at least one child aged 18 or older saw a slightly higher rate of 2.626%. These findings seem to contrast with Hobijn and Lagakos (2005), who report that households with children under 18 typically face lower inflation than childless households, primarily due to their reduced spending on fast-rising categories such as health care and college tuition. In our analysis, however, inflation exposure appears broadly similar regardless of household composition.⁷ The inflation dynamics for all three household types are plotted in Figure 3(a), which shows

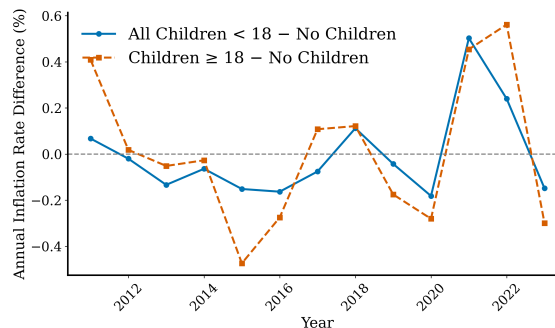
7. These findings remain robust even when families are further divided into narrower child age groups. All groups experienced similar average inflation rates—around 2.6%—with only minimal differences between households with and without children.

Figure 3
Inflation Rate Dynamics by Household Composition and Child Age

(a) Inflation rates



(b) Inflation rate differential



that inflation rates across the groups generally move together over time. In most years, the differences between them are small, suggesting broadly similar inflation experiences across household types.

Figure 3(b) further shows the annual inflation rate differences between households with children and those without. The blue and orange lines represent the inflation rate differentials for households with young children (all children under 18), and households with older children (aged 18 or older), respectively—both relative to childless households. We find that these inflation differences tend to comove with the overall level of inflation. During the COVID-affected years (2021 and 2022), when inflation was high, households with children experienced slightly higher inflation. Conversely, during the low-inflation period from 2013 to 2016, households with children experienced slightly lower inflation than their childless counterparts. Overall, the differences between the groups are minimal throughout the sample period, suggesting broadly similar inflation experiences across household types.

While the average inflation rates are nearly identical across groups, the sources of inflation differ. Table 4 analyzes the contribution of inflation inequality across expenditure categories by comparing households with children to those without. Households with children (including both younger and older than 18) face higher inflation in transportation, food, and education. In contrast, households without children experience higher inflation in health, housing, alcoholic beverages, and miscellaneous. Within the housing category, inflation patterns also differ: households without children are more affected by shelter inflation, while those with children face higher inflation in household operations.

To further investigate the heterogeneity in inflation experiences across households, we next examine how inflation varies depending on the age of children in the family. Specifically, Table 5 presents the additional cumulative inflation rate faced by households with only children under the age of 18, compared with those with at least one child aged 18 or older. The results reveal distinct inflation patterns associated with child age. Families with younger children tend to experience higher inflation in housing-related categories, particularly in shelter and household operations, reflecting the increased demand for living space, utilities, and childcare-related services. In contrast, households with older children face greater inflation in categories such as health care, transportation, and education. These differences in inflation exposure closely mirror the shifting composition of household consumption as children grow older, highlighting how the evolving needs of children influence family spending patterns over time.

Table 4
Cumulative Inflation Rates Difference by Children Status

Top category	%	Bottom category	%
Transportation	0.747	Health	-0.759
Motor fuels	0.212	Drugs	-0.115
Vehicle purchases	0.589	Medical care services	-0.634
Food	0.473	Housing	-0.556
At home	0.403	Household operations	0.421
Away from home	0.070	Housekeeping supplies	-0.015
Education	0.338	Shelter	-0.982
Tuition and other school fees	0.298	Utilities	0.058
		Alcoholic beverages	-0.136
		Miscellaneous	-0.135

NOTE: This table reports the percentage-point differences in cumulative inflation rates experienced by households with children relative to households without children. The top and bottom main categories are shown in the left and right columns, respectively. To conserve space, some subcategories are omitted.

Table 5
Cumulative Inflation Rates Difference by Children Age

Top category	%	Bottom category	%
Housing	1.468	Health	-0.573
Furnishings and equipment	0.050	Medical care services	-0.484
Household operations	1.024	Transportation	-0.487
Housekeeping supplies	-0.053	Maintenance and repair	-0.124
Shelter	0.998	Vehicle insurance	-0.545
Utilities	-0.550	Vehicle purchases	0.204
Apparel and services	0.122	Education	-0.383
		Tuition and other school fees	-0.365

NOTE: This table reports the percentage-point differences in cumulative inflation rates experienced by households with young children (under 18) relative to households with child aged 18 or older. The top and bottom main categories are shown in the left and right columns, respectively. To conserve space, some or all subcategories under “Apparel and services,” “Health,” “Education,” and “Transportation” are omitted.

Our results indeed echo the narrative proposed by Hobijn and Lagakos (2005), who emphasize the role of healthcare and education costs in driving inflation differences across family types. Our findings suggest that families with older children—particularly those of college age—are more exposed to rising education and medical expenses, while families with younger children experience higher inflation in shelter and childcare-related categories. These category-level differences are largely offset by opposing movements in other components, resulting in similar overall inflation rates across household types.

3.2.1 Interaction between Children and Income

We further examine whether poor families with children experienced higher inflation compared with their richer counterparts. Despite overall income-based inflation inequality, our results show almost no inflation inequality by income among families with all children under 18: 2.63% average annual inflation for the bottom income quintile and 2.60% for the top income quintile.

It is somewhat striking that, for families with all children under the age of 18, overall inflation inequality appears to be less correlated with income. To further investigate this pattern, we examine the underlying drivers in terms of consumption categories. The results are reported in Table 6.

Table 6
Inflation Difference by Income among Families with Younger Children

Top category	%	Bottom category	%
Food	2.625	Health	-1.395
At home	2.844	Medical care services	-1.375
Away from home	-0.213	Education	-0.959
Tobacco and smoking	0.622	Tuition and other school fees	-0.979
Cigarettes	0.596	Transportation	-0.751
Housing	0.503	Motor fuels	0.597
Household operations	-1.308	Public and other transportation	-0.083
Housekeeping supplies	0.187	Vehicle insurance	0.486
Shelter	0.321	Vehicle purchases	-1.625
Utilities	1.311	Vehicle leases and others	-0.135

NOTE: Conditional on the families with all children under age 18, this table reports the percentage-point differences in cumulative inflation rates experienced by households in the bottom income quintile relative to those in the top income quintile. The top and bottom three main categories are shown in the left and right two columns, respectively. To conserve space, some or all subcategories are omitted.

Consistent with the patterns reported in Table 2, low-income households allocate a larger share of their consumption to the same top three categories—food, tobacco, and housing—with a particularly high share devoted to food at home. The muted inflation inequality observed among families with young children primarily stems from differences in the spending patterns of high-income households. A comparison of Table 6 and Table 2 reveals that the most significant factor is the relatively higher health expenditure among high-income households. Unlike other high-income households, those with all children under 18 experience greater inflation in medical care services, which substantially reduces the inflation inequality gap. A second contributing factor is the higher spending share allocated to tuition and other school fees among these high-income households.

A likely narrative that emerges from this analysis is that low-income families with young children may face difficult trade-offs between essential needs such as food and medical care services. Due to their limited income, their spending patterns tend to lean heavily toward food, with relatively lower allocations to healthcare and educational services. This observation highlights the burden of inflation inequality: Even when the overall inflation rates experienced by different household groups appear similar, they may conceal substantial differences in welfare, as some households are forced to choose between two essential goods and services. In particular, the lower spending on education-related expenses—such as tuition and other school fees—among low-income families has important long-term implications.

A large body of research, most notably by Cunha and Heckman (2007) and Heckman (2006), shows that early childhood investment is a key determinant of human capital formation, with long-lasting effects on cognitive and non-cognitive skills, health, and labor market success. Persistent disparities in education expenditure for children at a young age may therefore compound over time, amplifying inequality across generations and undermining social mobility as emphasized by Deming (2009). In this light, inflation inequality that disproportionately squeezes essential spending in low-income households may have far-reaching consequences, not only for current well-being but also for the intergenerational persistence of disadvantage.

In contrast, inflation inequality by income persists among families with at least one child aged 18 or older. Specifically, the bottom quintile faces a higher average annual inflation rate by 14 basis points compared with the top quintile (2.73% versus 2.59%). Table 7 decomposes the underlying drivers in terms of consumption categories. Among low-income families, housing and food are the two main contributors to inflation, whereas high-income households spend more on education. This finding is consistent with the argument made by Hobijn and Lagakos (2005), who note that rising college tuition can disproportionately increase inflation inequality for families with older children. Our results complement this view by showing that high college tuition may also contribute to inflation inequality by effectively excluding low-income households, who are less likely to incur such expenditures due to affordability constraints.

Moreover, for families with children, spending priorities appear to shift with the age of the children. Comparing Table 6 and Table 7, we find that low-income families with younger children are more vulnerable to

Table 7
Inflation Difference by Income among Families with Older Children

Top category	%	Bottom category	%
Housing	2.579	Education	-1.626
Furnishings and equipment	-0.300	Tuition and other school fees	-1.595
Household operations	-0.083	Health	-0.559
Housekeeping supplies	0.086	Medical care services	-0.567
Shelter	1.040	Transportation	-0.263
Utilities	1.825	Maintenance and repair	-0.208
Food	1.350	Motor fuels	0.402
At home	1.914	Public and other transportation	-0.075
Away from home	-0.554	Vehicle insurance	0.699
Tobacco and smoking	0.597	Vehicle purchases	-0.950
Cigarettes	0.578	Vehicle leases and others	-0.123

NOTE: Conditional on the families with at least one child older age 18, this table reports the percentage-point differences in cumulative inflation rates experienced by households in the bottom income quintile relative to those in the top income quintile. The top and bottom three main categories are shown in the left and right two columns, respectively. To conserve space, some or all subcategories are omitted.

rising grocery prices, while those with older children face greater challenges from housing costs. Among high-income households, families with younger children allocate more to healthcare, but this shifts toward education as children grow older.

In summary, conditional on the child's age, inflation inequality across income levels reveals that the low-income households are less likely to afford expensive service such as health care and high education. Inflationary pressures in basic goods for low-income households are offset by higher exposure to education and health-related costs among high-income households. As a result, the overall inflation inequality remains low across various groups. Overall, the income gradient in inflation exposure is household-type-specific, emerging clearly only where spending patterns on necessities diverge sharply between income groups.

3.2.2 Interaction between Children and Marriage Status

As documented earlier, households with and without children experience almost the same overall inflation rate. However, there is an interesting interaction between children's presence and marital status. During our sample period, married couples without children faced the lowest average inflation rate at 2.55%. Married couples with children under 18 experienced a slightly higher rate of 2.61%. Single parents with children under 18 faced an average rate of 2.65%, while single consumers without children experienced the highest rate at 2.72%.⁸

We now explore inflation differentials within childless households by marital status. Table 8 compares cumulative inflation rate differences between households with and without children for married couples. A few subcategories stand out as major contributors to the overall inflation differential. For married couples, those without children face higher inflation in medical care services. In contrast, married couples with younger children face a higher inflation burden in housing, especially in the subcategories of household operations and shelter.

For single households with children, a similar pattern emerges: Housing, entertainment, and apparel are the major contributors to inflation. In contrast, single consumers without children exhibit consumption patterns similar to married couples without children, with relatively higher spending on tuition and medical services. Nevertheless, single consumers face higher inflation exposure in vehicle insurance compared with their married counterparts.

In short, the data suggest that having children—regardless of marital status—significantly affects a household's consumption bundle. Households with children tend to face higher inflation in housing, likely reflecting

8. Families with children tend to face similar inflation rates regardless of the children's age or the parents' marital status. For instance, married couples with children under 6, aged 6–17, and over 17 experienced inflation rates of 2.64%, 2.61%, and 2.61%, respectively. Single fathers and single mothers with children under 18 faced slightly higher rates of 2.72% and 2.63%. A residual group categorized as "Other family type" had an average inflation rate of 2.63%.

Table 8
Inflation Difference by Children Status among Married Couple

Top category	%	Bottom category	%
Health	1.405	Housing	-3.264
Drugs	0.241	Furnishings and equipment	0.096
Medical care services	1.132	Household operations	-2.691
Education	0.276	Shelter	-1.157
Tuition and other school fees	0.283	Utilities	0.433
Entertainment	0.267	Apparel and services	-0.121

NOTE: Conditional on married couples, this table reports the percentage-point differences in cumulative inflation rates experienced by households without children relative to those with children. The top and bottom three main categories are shown in the left and right columns, respectively. To conserve space, some subcategories are omitted.

Table 9
Inflation Difference for Single Consumer versus Single Parent

Top category	%	Bottom category	%
Transportation	0.771	Housing	-1.400
Maintenance and repair	0.129	Household operations	-0.675
Motor fuels	0.321	Housekeeping supplies	0.073
Public and other transportation	-0.065	Shelter	-1.162
Vehicle insurance	0.658	Utilities	0.392
Vehicle purchases	-0.284	Entertainment	-0.150
Education	0.488	Apparel and services	-0.100
Tuition and other school fees	0.465		
Health	0.434		
Drugs	0.075		
Medical care services	0.348		

NOTE: Conditional on single households, this table reports the percentage-point differences in cumulative inflation rates experienced by households without children relative to those with children. The top and bottom three main categories are shown in the left and right columns, respectively. To conserve space, some subcategories are omitted.

greater needs for space and household services. In contrast, households without young children are more vulnerable to inflation in education and healthcare. Overall, the data underscore the substantial exposure of families with children to rising housing costs.

3.3 By Household Age

Similar to many advanced countries, the United States is undergoing a demographic shift toward an aging society, with a growing proportion of older individuals and a shrinking share of younger people. This trend is driven by increased life expectancy and declining birth rates. As society ages, understanding the key drivers of inflation inequality between younger and older households becomes increasingly important.

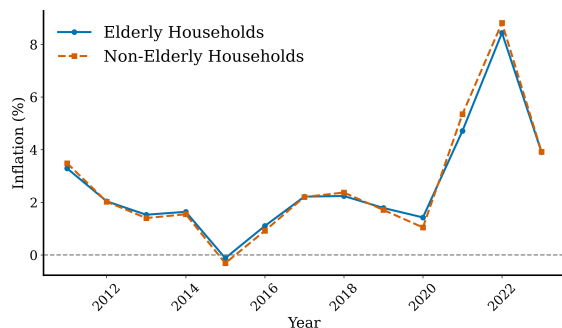
We therefore examine inflation inequality between younger and senior households, defining elderly households as those in which the head of household is at least 62 years old. We find that the average annual inflation rates for elderly and non-elderly groups are nearly identical—2.61% and 2.63%, respectively.⁹

As shown in Figure 4(a), which plots the annual inflation rates for younger and older households, the two groups' inflation experiences closely track each other over time. Figure 4(b) further illustrates the inflation rate

9. Our elderly inflation estimate closely aligns with the Bureau of Labor Statistics' Research Consumer Price Index for Americans aged 62 and older (R-CPI-E), which averaged 2.60% from 2010 to 2023. As a robustness check, we further divide households into four age bins (25–34, 35–44, 45–64, and 65+), yielding mean annual inflation rates of 2.64%, 2.63%, 2.61%, and 2.62%, respectively. These results confirm the minimal difference between the 62+ and non-elderly groups (2.61% vs. 2.63%).

Figure 4
Inflation Rate Dynamics by Household Age

(a) Inflation rates



(b) Inflation rate differential

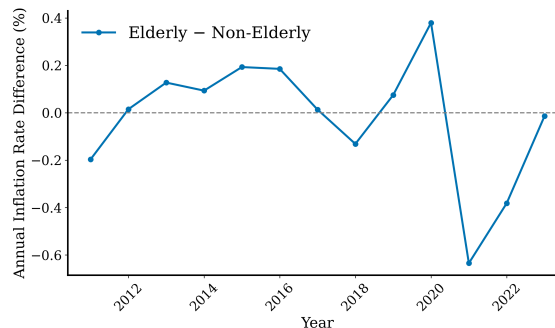
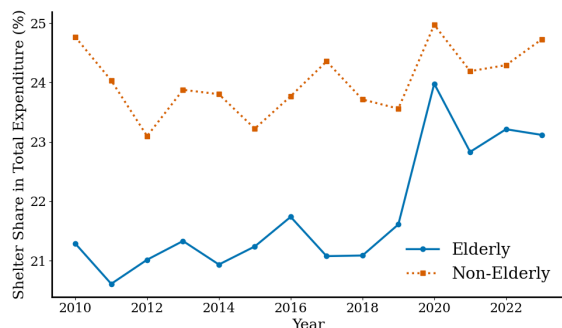
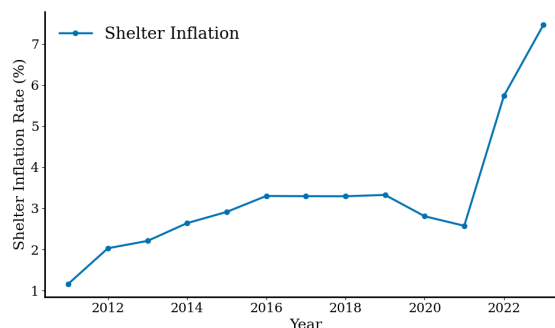


Figure 5
Shelter Expenditure Share by Age

(a) Shelter share in total expenditure (%)



(b) Shelter inflation rate (year-over-year)



NOTE: The left panel shows shelter share in total expenditure, calculated as the product of the expenditure share on shelter within housing and the expenditure share on housing in total consumption. The right panel displays the shelter inflation rate, measured as the year-over-year percentage change in the shelter price index.

difference between age groups. It shows that senior households experience slightly more stable inflation than their younger counterparts: Inflation for the elderly tends to be relatively lower when aggregate inflation is high and relatively higher when aggregate inflation is low. Nevertheless, the overall differences are small.

Both Hobijn and Lagakos (2005) and McGranahan and Paulson (2006) reported a higher inflation differential of approximately 20 to 30 basis points larger for the elderly during the 1987–2005 period. This historical gap was largely driven by rapid increases in medical care prices, which rose 5.34% annually from 1987 to 2005. Previous literature suggests shelter costs also played a role, as elderly households generally allocate a larger share of spending to housing-related categories. However, this pattern has reversed in recent years, as shown in the left panel of Figure 5. The figure shows that the elderly now allocate a smaller share of total expenditure to shelter compared with previous decades. The right panel indicates that shelter inflation has remained consistently above 2%, and in 2022 and 2023 it exceeded 5%. This elevated shelter inflation now helps equalize inflation between younger and older households, rather than increasing the gap.

To provide a more detailed perspective, we decompose the inflation differential between elderly and non-elderly households by expenditure category, as shown in Table 10. Elderly-headed households continued to experience significantly higher inflation in medical care services. However, they faced lower inflation in transportation compared with their non-elderly counterparts. Notably, housing made only a modest contribution to the overall inflation gap: Although older households spend more on utilities, this was largely offset by their lower spending on shelter. Additionally, elderly households experienced relatively lower inflation in categories such as education and food away from home, which helped counterbalance the elevated costs associated with health-related expenses, thereby reducing the overall inflation differential.

Table 10
Inflation Difference: Elderly versus Young

Top category	%	Bottom category	%
Health	2.371	Transportation	-1.055
Drugs	0.264	Motor fuels	-0.337
Medical care services	2.076	Vehicle purchases	-0.812
Medical supplies	0.025	Education	-0.758
Miscellaneous	0.216	Tuition and other school fees	-0.697
Reading	0.075	Food	-0.470
		At home	0.099
		Away from home	-0.568
		Housing	-0.294
		Housekeeping supplies	0.095
		Shelter	-0.840
		Utilities	0.438

NOTE: This table reports the percentage-point differences in cumulative inflation rates experienced by old households relative to young households. The top and bottom three main categories are shown in the left and right columns, respectively. To conserve space, some subcategories are omitted.

In sum, our analysis suggests that the inflation gap between younger and older households has narrowed in recent years. Beyond their lower housing expenditure share, smaller allocations to transportation, education, and food have further contributed to this convergence.

3.4 By Housing Tenure

After the Great Financial Crisis, the housing market experienced a decade-long period of subdued activity and stagnant prices, which made housing more affordable—at least compared with the period immediately preceding the crisis. In addition, low mortgage rates also contributed significantly to housing affordability. Nevertheless, housing became increasingly unaffordable starting in the later stages of the COVID-19 pandemic. Home prices surged during the pandemic, and mortgage rates rose rapidly afterward. As a result, by 2023, housing affordability reverted to the level right before the financial crisis.¹⁰

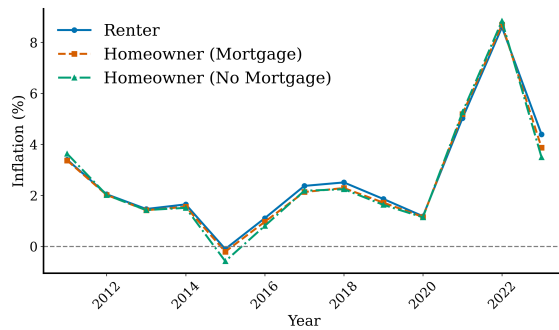
Our sample period mostly overlaps with a time when housing was relatively more affordable. Despite this, we observe widened inflation inequality between renters and homeowners, compared with the findings of the past literature. The average annual inflation rates are 2.61% for homeowners without a mortgage, 2.56% for homeowners with a mortgage, and 2.71% for renters. On average, renters experienced 0.10 percentage points higher annual inflation than homeowners without a mortgage and 0.15 percentage points higher than homeowners with a mortgage. Moreover, because we use a common CPI shelter series for all household types, cross-group differences arise only through shelter expenditure weights. Over our sample (2010–2023), the annualized inflation rates are 3.49% for owners' equivalent rent (OER) and 3.92% for rent of primary residence. Since the CPI shelter aggregate is dominated by OER, it tracks OER more closely than market rents; therefore, using a common shelter series likely understates renter–homeowner inflation inequality. Even under this conservative measurement, these differentials are larger than those reported in McGranahan and Paulson (2006), who find nearly zero renter–homeowner inflation differences (ranging from –4 to 3 basis points, depending on whether housing costs are measured using owner's outlays or rental equivalence).

The inflation dynamics for all three groups are plotted in Figure 6(a). Figure 6(b) further displays the inflation differentials between renters and the two homeowner groups. Both lines exhibit a similar pattern: Renters faced consistently higher inflation from 2012 to 2020. In contrast, during the COVID-19 pandemic (2021–2022), inflation was higher for homeowners. This is likely due to the U.S. government's implementation of various rent control and subsidy programs designed to protect renters during the pandemic. In 2023, the additional inflation burden faced by renters compared with homeowners rose significantly after these policy interventions were lifted.

10. See the Home Ownership Affordability Monitor provided by the Federal Reserve Bank of Atlanta.

Figure 6
Inflation Rate Dynamics by Housing Tenure

(a) Inflation rates



(b) Inflation rate differential

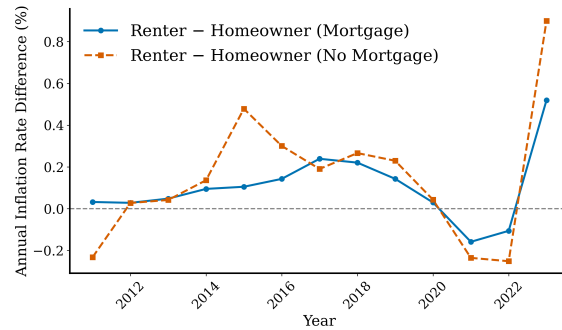


Table 11
Inflation Difference: Renter versus Homeowner

Top category	%	Bottom category	%
Housing	3.295	Health	-1.287
Furnishings and equipment	-0.269	Drugs	-0.104
Household operations	-0.412	Medical care services	-1.169
Housekeeping supplies	-0.084	Medical supplies	-0.015
Shelter	4.568	Transportation	-0.566
Utilities	-0.458	Maintenance and repair	-0.092
Tobacco and smoking	0.230	Motor fuels	-0.040
Food	0.164	Vehicle insurance	-0.039
At home	0.159	Vehicle purchases	-0.397
Away from home	0.005	Entertainment	-0.170
Apparel and services	0.135	Miscellaneous	-0.133

NOTE: This table reports the percentage-point differences in cumulative inflation rates experienced by renters relative to homeowners, including those with unreported mortgage status. The top and bottom main categories are shown in the left and right columns, respectively. To conserve space, some subcategories are omitted.

To shed light on the sources of inflation divergence between renters and homeowners, we decompose inflation contributions across expenditure categories. Table 11 presents the inflation differentials between the two groups. The difference is driven largely by the shelter subcategory: Renters experience 4.6% more cumulative inflationary pressure compared with the average homeowner. This heavier burden of housing inflation among renters comes at the cost of a reduced expenditure share on health. Renters also exhibit lower exposure to inflation in transportation, entertainment, and miscellaneous consumption goods.¹¹

We finally analyze the inflation differential among renters by income quintile. As shown in Table 11, renters face much higher housing inflation compared to homeowners. Low-income renters experience even higher housing expenditure inflation. Table 12 provides supporting evidence: The bottom income quintile experiences higher housing inflation than their top income counterparts. These low-income renters are less likely to own a vehicle or pay for medical services and, hence, face lower inflation exposure in the transportation and health categories.

In general, the inflation differential between renters in the bottom and top income quintiles reinforces

11. Large house-price swings have a limited direct effect on CPI inflation. During our sample period, the S&P CoreLogic Case-Shiller U.S. National Home Price Index increased by over 100%, while owners' equivalent rent increased by less than 60%. If owners' shelter costs were imputed directly from house prices, homeowners' cost of living would rise much faster than the CPI suggests, particularly for new buyers.

Table 12
Inflation Difference in Income among Renters

Top category	%	Bottom category	%
Housing	1.575	Transportation	-1.390
Furnishings and equipment	-0.110	Maintenance and repair	-0.070
Household operations	-0.496	Motor fuels	0.366
Housekeeping supplies	0.141	Public and other transportation	-0.125
Shelter	1.075	Vehicle insurance	0.216
Utilities	0.965	Vehicle purchases	-1.574
Food	1.120	Vehicle leases and others	-0.199
At home	1.888	Health	-0.358
Away from home	-0.754	Drugs	0.077
Tobacco and smoking	0.552	Medical care services	-0.437
Education	0.548	Medical supplies	0.003
		Miscellaneous	-0.209

NOTE: Conditional on renters, this table reports the percentage-point differences in cumulative inflation rates experienced by the bottom income quintile relative to the top income quintile. The top and bottom main categories are shown in the left and right columns, respectively. To conserve space, some subcategories are omitted.

the findings from the previous subsection. Households in the bottom income quintile are disproportionately affected by inflation in shelter, utilities, fuels, and food at home. In contrast, those in the top quintile are more impacted by inflation in vehicle purchases, food away from home, household operations, and medical care services.

4. CONCLUSION

By examining inflation inequality over the past decade, our analysis yields two key insights. First, although average inflation increased and became more volatile during the sample period, differences in inflation rates across demographic groups remained largely stable or even declined compared with earlier periods. A notable exception is the gap between renters and homeowners, where we find a modest rise in inflation inequality—even though housing affordability remained relatively unchanged for much of the period.

Second, despite the broad similarity in overall inflation trends across households, the underlying sources of inflation differ significantly by consumption category and subcategory. These differences are closely linked to household characteristics such as income, family composition, and age. For example, families with older children are more exposed to rising education and medical expenses, while families with younger children experience higher inflation in shelter and childcare-related categories. Even within the same consumption category, inflation exposure can vary substantially across subcategories depending on household characteristics. For instance, low-income households devote a greater share of their spending to food at home, while high-income households spend more on dining out. In short, differences in spending patterns lead to divergent inflation experiences, even when households face a similar overall inflation rate.

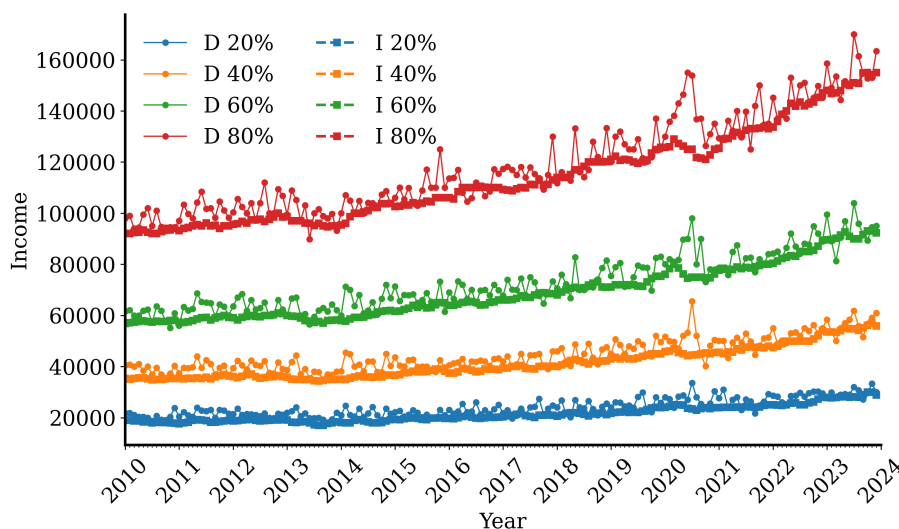
APPENDIX 1. CONSUMER CLASSIFICATION

To analyze variations in consumption patterns and inflation experiences, we classify consumer units based on their key characteristics, including age, homeownership status, household composition, and income level.

The elderly category includes households where either the reference person or their spouse is 62 years or older. Homeownership status is further divided into those who own their residence and those who rent. Among homeowners, we distinguish between those who are actively repaying a mortgage and those who have fully paid off their housing loans. Households in which the reference person or their spouse does not own the residence are classified as renters. Additionally, we identify households with at least one child younger than 18 years old.

To account for differences in income levels, we categorize consumer units into income quintiles based on their placement in the income distribution. Figure 7 illustrates the evolution of different income percentiles of consumer units from 2010 to 2023 using data from the CES. Overall, all income percentiles exhibit an upward trajectory, indicating a general increase in nominal income levels. Notably, while values from the Diary and Interview surveys closely align, the Interview data show substantially greater volatility. Given this instability, we define income quintiles on a monthly basis using values from the Diary survey, which provides more stable reference points for classification.

Figure 7
Income Percentile Over Time



NOTE: This chart contains eight lines, divided into two series: Solid lines represent data from the “Diary” survey, while dashed lines correspond to the “Interview” survey. Each series includes four lines representing different income percentiles (20%, 40%, 60%, and 80%), tracking income changes over time.

Table 13 presents the distribution of these demographic groups across income quintiles based on data from the Interview and Diary surveys. A comparison of the values in these tables reveals that the distributions are largely consistent across the two survey sources.

APPENDIX 2. HOUSEHOLD GROUP EXPENDITURE ESTIMATE

To estimate expenditure shares across household groups, we follow the BLS methodology by using Universal Classification Codes (UCCs)—six-digit codes that classify reported expenditures at the most detailed level. To ensure mutual exclusivity and consistency with BLS standards, we rely on the CES Source Selection File to determine the appropriate survey source for each UCC. Expenditure data are adjusted to a quarterly frequency to ensure comparability between UCCs from the Interview and Diary Surveys. Population weights are also applied to produce representative estimates.

After estimating expenditures for each household group, we aggregate them into subcategories and then further into main categories. We then compute the corresponding expenditure shares for each group.

Table 13
Households' Profiles by Income Quintile: Interview and Diary Survey Data

Item	All CU	Lowest 20%	Second 20%	Third 20%	Fourth 20%	Highest 20%
Interview survey data						
Average # People	2.47	1.67	2.17	2.51	2.85	3.15
College	39.86	16.80	23.72	34.93	49.97	73.83
Elderly	31.51	43.99	42.48	30.05	22.62	18.42
Homeowner						
with mortgage	37.68	12.36	21.31	35.38	52.75	66.56
without mortgage	26.44	29.55	33.63	26.74	21.83	20.43
Renter	33.85	52.16	43.14	36.65	24.86	12.60
Children status						
No children	60.99	78.89	69.13	60.80	52.23	43.92
With children under 18	23.42	13.29	18.85	23.34	28.13	33.51
With children over 18	15.58	7.82	12.02	15.86	19.64	22.57
Family type						
Married couple only	21.67	8.87	21.67	23.39	25.93	28.50
Married couple with children under 18	15.41	3.72	8.59	14.40	21.25	29.07
Single with children under 18	5.30	8.76	7.91	5.40	3.06	1.34
Single consumer	29.75	63.67	37.89	25.86	14.75	6.63
Other families	27.87	14.98	23.93	30.95	35.00	34.46
Diary survey data						
Average # People	2.53	1.78	2.26	2.59	2.89	3.14
College	41.79	18.58	25.33	36.70	52.98	75.20
Elderly	30.19	42.77	39.01	28.39	22.09	18.78
Homeowner						
with mortgage	40.91	15.05	24.57	38.78	56.59	69.38
without mortgage	23.16	27.52	29.95	23.17	18.59	16.58
Renter	32.97	51.21	42.55	35.56	22.99	12.64
Children status						
No children	59.70	76.77	67.47	59.14	51.76	43.44
With children under 18	24.76	15.15	20.39	24.71	29.39	34.09
With children over 18	15.54	8.08	12.14	16.15	18.84	22.47
Family type						
Married couple only	22.48	10.76	23.31	23.24	26.80	28.23
Married couple with children under 18	16.54	4.62	9.96	15.95	22.84	29.26
Single with children under 18	5.44	9.50	8.03	5.36	2.82	1.48
Single consumer	27.30	58.64	34.00	24.00	13.44	6.54
Other families	28.25	16.49	24.70	31.44	34.10	34.48

APPENDIX 3. CES CATEGORIES TO CPI ITEM MAPPING

The CPI-U data classifies expenditures of goods and services using the ELI (Expenditure Line Item), which is distinct from the CES classification, the UCC (Universal Classification Code). The CPI-U data are grouped into broader categories than those of CES data. To gauge the difference, we then categorize expenditures into subgroups and match them with CPI item codes, referencing the UCC to ELI Concordance Table provided by BLS.

It is important to note that the CPI-U does not publish indexes for every item but instead provides indexes at higher aggregation levels. There are fewer price indexes than the CES data, causing multiple CES items to map to a single Entry Level CPI Item. In addition, CES expenditures may correspond to multiple CPI items. To address the mismatch between CES expenditures and CPI price indexes, we group CES-defined UCCs into 41 distinct subcategories. This simplification ensures each subcategory corresponds to a single CPI series. We select the most appropriate CPI series using the UCC to CPI ELI Concordance Table and our judgment, resulting in a clear one-to-one mapping between our subcategories and CPI data.

Table 14 provides the mapping details between CES and CPI data categories, which is done on a monthly basis. Approximately 3.5% of expenditure entries in the Diary survey lack a recorded purchase month. For these cases, we assign the middle month of the corresponding quarter. The quantitative results remain the same when we exclude these entries.

Table 14
CES Categories to CPI Item Code Mapping

CES main category	No.	CES subcategory	CPI item code
Food	1	Food at home	SAF11
	2	Food away from home	SEFV
Alcoholic beverages	3	Alcoholic beverages at home	SEFW
	4	Alcoholic beverages away from home	SEFX
Housing	5	Shelter	SAH1
	6	Utilities, fuels, and public services	SAH2
	7	Household operations	SEHP
	8	Housekeeping supplies	SEHN
	9	Household furnishings and equipment	SAH3
Apparel and services	10	Men's apparel	SEAA
	11	Boy's apparel	SEAB
	12	Women's apparel	SEAC
	13	Girl's apparel	SEAD
	14	Children under 2 apparel	SEAF
	15	Footwear	SEAE
	16	Other apparel products and services	SEAG
Transportation	17	Vehicle purchases	SETA
	18	Motor fuels	SETB
	19	Maintenance and repair	SETD
	20	Vehicle insurance	SETE
	21	Vehicle rental, leases, licenses, and other charges	SETF
	22	Public and other transportation	SETG
Health	23	Medical care services	SAM2
	24	Drugs	SEMF
	25	Medical supplies	SEMG
Entertainment	26	Fees and admissions	SERF
	27	Televisions, radios, sound	SERA
	28	Pets	SERB
	29	Toys	SERE01
	30	Sporting goods	SERC
Personal care products and services	31	Photography	SERD
	32	Other recreational goods	SERE
	33	Personal care products	SEGB
Reading	34	Personal care services	SEGC
	35	Newspapers and magazines	SERG01
Education	36	Recreational books	SERG02
	37	Education books and supplies	SEEA
Tobacco and smoking	38	Tuition and other school fees	SEEB
	39	Cigarettes	SEGA01
Miscellaneous	40	Tobacco products other than cigarettes	SEGA02
	41	Miscellaneous	SEGD

APPENDIX 4. INFLATION INDEX APPROXIMATION

We start by taking the natural logarithm of both sides of equation (1):

$$\ln(1 + \pi_{t,t+1}^g) = \sum_{k=1}^n w_{t,t+1}^{gk} \ln(1 + \pi_{t,t+1}^{gk}).$$

For small inflation rates, the logarithmic function can be approximated by its argument, i.e., $\ln(1 + x) \approx x$ when x is close to zero. Applying this approximation to the equation above gives

$$(3) \quad \pi_{t,t+1}^g \approx \sum_{k=1}^n w_{t,t+1}^{gk} \pi_{t,t+1}^{gk}.$$

This result shows that inflation can be approximated as the weighted sum of main category-specific inflation rates. Following similar steps, the inflation for a main category can be further approximated by

$$\pi_{t,t+1}^{gk} \approx \sum_{j=1}^m w_{t,t+1}^{gkj} \left(\frac{p_{j,t+1}^k}{p_{j,t}^k} \right).$$

Substituting the above equation into equation (3), we can express cumulative inflation for group g as

$$\pi_{t,t+1}^g \approx \sum_{k=1}^n w_{t,t+1}^{gk} \sum_{j=1}^m w_{t,t+1}^{gkj} \left(\frac{p_{j,t+1}^k}{p_{j,t}^k} \right).$$

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