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COMPARING PAST AND PRESENT INFLATION

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Comparing Past and Present Inflation

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ABSTRACT

There have been important methodological changes in the Consumer Price Index (CPI) over time. These distort comparisons of inflation from different periods, which have become more prevalent as inflation has risen to 40-year highs. To better contextualize the current run-up in inflation, this paper constructs new historical series for CPI headline and core inflation that are more consistent with current practices and expenditure shares for the post-war period. Using these series, we find that current inflation levels are much closer to past inflation peaks than the official series would suggest. In particular, the rate of core CPI disinflation caused by Volcker-era policies is significantly lower when measured using today's treatment of housing: only 5 percentage points of decline instead of 11 percentage points in the official CPI statistics. To return to 2 percent core CPI inflation today will thus require nearly the same amount of disinflation as achieved under Chairman Volcker.

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Full series of headline and core inflation with OER correction and constant weights for different years is available at:

<http://larrysummers.com/category/inflation/>

1. Introduction

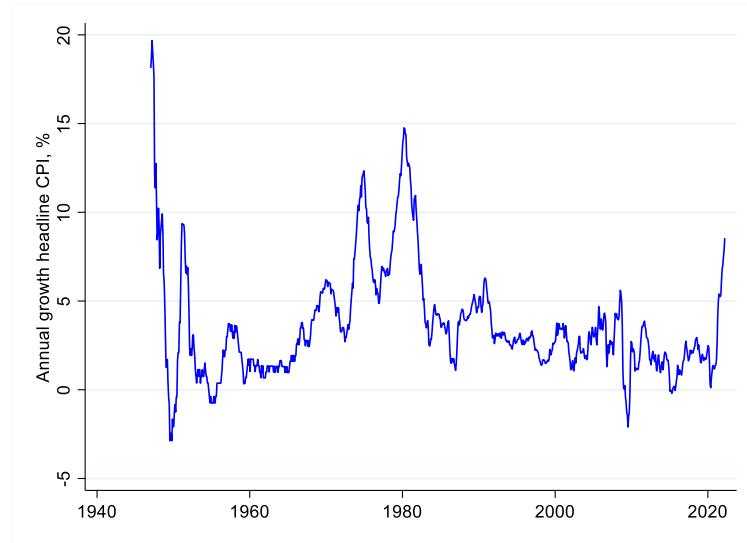
As concerns about US inflation have grown, the Consumer Price Index (CPI) has come under closer scrutiny.² The CPI grew 8.3 percent in the twelve months ending in April, down slightly from the previous month but still well above any other period since 1981 (Figure 1). While a worrying figure, this remains far below the official March 1980 peak of 14.8 percent. That the headline number had already fallen to 2.5 percent by July 1983, following the policy decisions of Federal Reserve Board Chairman Paul Volcker, has served as the exemplum of the power of hawkish monetary policy (Goodfriend and King 2005). Since much less of a decline is needed to return to trend today, some commenters have suggested that policymakers might be able to decrease inflation towards desired levels without large macroeconomic consequences (DeLong 2022; Krugman 2022). Yet, methodological changes in the CPI over time make drawing conclusions from these types of intertemporal comparisons fraught.

This paper shows that using the movement of the published CPI during past disinflationary periods to explore the current situation can lead researchers astray. For example, in arguing against policymakers falling “behind the curve” in the face of rising inflation, Blanchard (2022) showed that today’s gap between core inflation—which removes volatile food and energy prices—and real interest rates is approaching about 70 percent of the 1975 gap. We argue against using official CPI inflation to assess this gap. Most importantly, prior to 1983 measurement of shelter inflation was mechanically responsive to Federal Reserve interest rate policy via mortgage rates. This method made pre-1983 peak CPI inflation measures, especially

² Throughout this paper we use CPI as a shorthand for CPI-U, the Consumer Price Index for All Urban Consumers.

during the Volcker-era, artificially high at the beginning of the tightening cycle, and declines look artificially fast.

Figure 1: Headline CPI inflation, 1946-present



Source: Bureau of Labor Statistics.

Note: Percent change from 12 months earlier.

To better contextualize the current run-up in inflation, this paper constructs new historical series for CPI headline and core inflation that are more consistent with current practices and expenditure shares for the entirety of the post-war period. Using publicly available Bureau of Labor Statistics (BLS) data for the post-war period, we develop new estimates of CPI headline and core inflation that can be better compared across time. The full series is available on our website at <http://larrysummers.com/category/inflation/>. Our analysis reveals that current inflation, especially core inflation, is considerably closer to previous peaks than in the official series. Official core CPI inflation peaked at 13.6 percent in June 1980, whereas we estimate that core inflation was 9.1 percent in that same month when adjusting for the treatment of shelter

inflation. Our estimates also suggest that the local trough of core CPI inflation in 1983 was considerably higher than originally reported. Overall, these estimates imply that the rate of core CPI disinflation caused by Volcker-era policies is significantly lower when measured using the current treatment of housing: only 5 percentage points of decline instead of 11 percentage points in the official CPI statistics. To return to 2 percent core CPI today, we thus need disinflation of a similar magnitude as Chairman Volcker achieved.

Similar issues affect conclusions drawn from comparisons of current inflation with other periods of elevated inflation. Recent work suggests that the years following World War II have strong similarities to the current inflation environment (e.g., Rouse et al., 2021; DeLong, 2022). We show that due to the greater weight of transitory goods components —especially food and apparel—in the index of the 1940s and 1950s, past inflation spikes were higher and more short-lived than today’s. When using current weights, we estimate that the peak of core CPI inflation in June 1951 falls from 7.2 to 5 percent, and the peak of headline CPI inflation falls from 9.4 to just 3.3 percent. These two points serve as a caution against overly optimistic forecasts of an inexpensive disinflation in the current cycle —the disinflation that needs to be achieved now is large by historical standards.

The rest of this paper is structured as follows. Section 2 reviews the methodology used by the Bureau of Labor Statistics (BLS) informing homeownership costs before and after the changes introduced in 1983 and suggests that it is natural to expect that past inflation would be lower using current methods. Section 3 describes the data we employ and different statistical models we use for creating more consistent CPI measures both to deal with the measurement of housing and the relatively more “sticky” nature of the index today. Section 4 presents our estimates for

the post-war inflations and disinflations using our measures and shows the current situation is of a similar magnitude with past episodes. Section 5 offers some concluding observations.

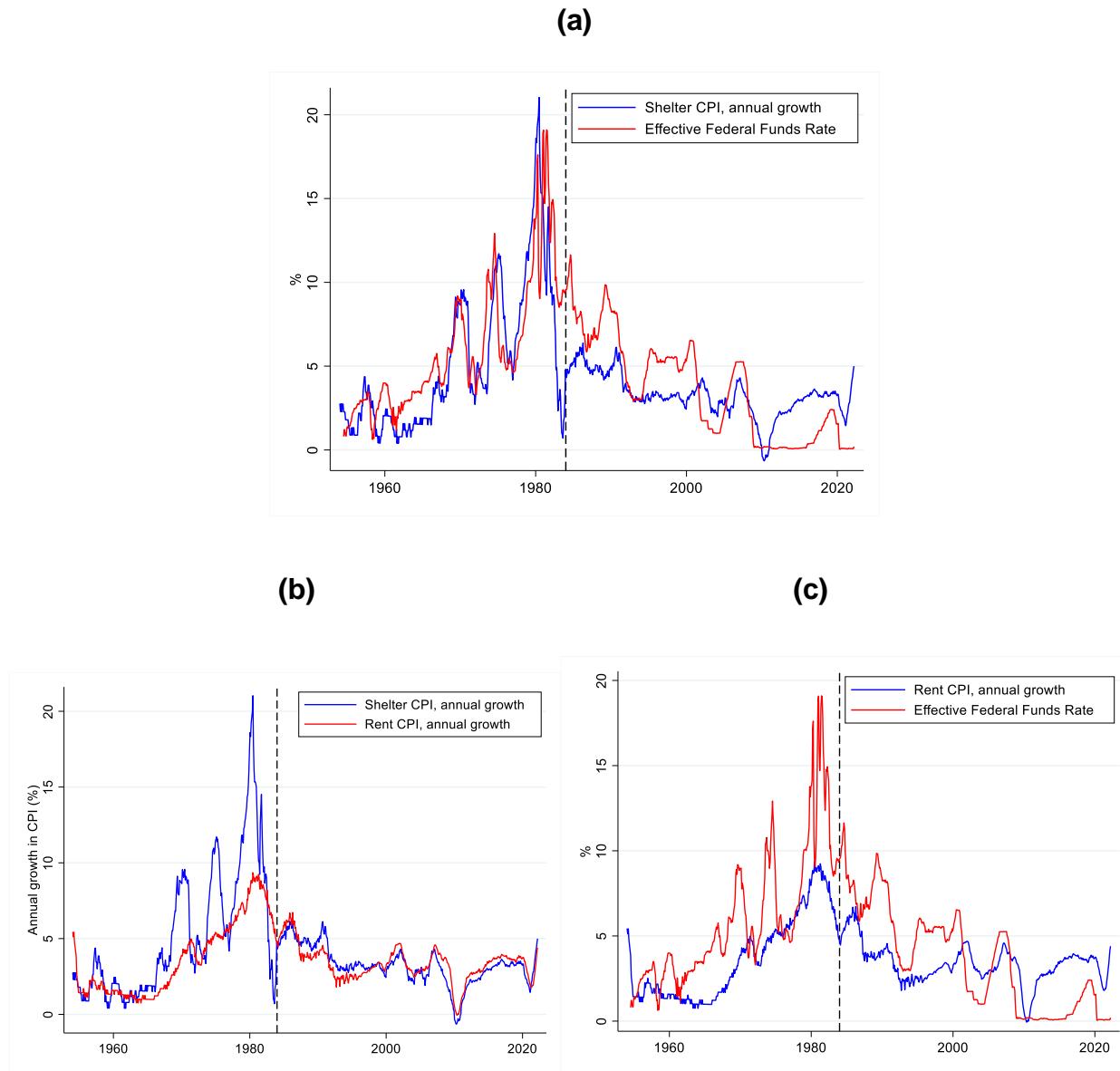
2. Measuring Housing Inflation

Housing is both an investment and a consumption good. On the one hand, it is the largest fixed investment that most Americans make in their lives.³ On the other hand, it provides a service, shelter, that is consumed daily. Between 1953 and 1983, the Bureau of Labor Statistics (BLS) valued homeownership costs for the CPI without disentangling these two qualities. It produced a measure that broadly captured changes in the expenses of homeowners, taking house prices, mortgage interest rates, property taxes and insurance, and maintenance costs as inputs. More specifically, the home-purchase expenditure weight was the net purchase of owner-occupied houses in the survey period, and the mortgage-interest expenditure weight was the total interest (undiscounted) that would be paid over half the term on all mortgages incurred during the survey period (Duggan et al. 1997). Shelter costs were thus directly affected by monetary policy, due to the effect of the federal funds rate on mortgage rates. This methodology was without conceptual foundation and its use resulted in a substantial upward bias in the CPI (Gillingham 1980; Gillingham 1983). The approach produced a volatile shelter series pre-1983, as shown in Figure 2(a), that moved almost in step with the federal funds rate until 1983. Much more so than rents, these estimates were responsive to changes in interest rates as seen in the pre-1983 period of Figure 2(c). During the tightening cycles of 1967-1969, 1972-1974, and 1977-1981, shelter inflation increased sharply, only to fall precipitously when the pace of tightening slowed down.⁴

³ This has been the case throughout American history. See, for example, Shelton (1966).

⁴ Besides the mechanical relationship between monetary policy and homeownership costs, the old approach faced several other criticisms. Other forms of interest payments, such as credit card spending, were not part of the consumer basket. Moreover, consumers either paid for the home purchase price or the mortgage payments, but not both. Including both led to a larger share of housing in the consumption basket. Furthermore, the old methodology assumed all homeowners had the same 30-year fixed-rate mortgage.

Figure 2: Shelter CPI inflation and the Federal Funds Rate, 1954-present



Source: Bureau of Labor Statistics.

Notes: Percent change from 12 months earlier. Change in OER initiated January 1983.

In 1983, after ten years of study, the BLS exchanged homeownership costs for owners' equivalent rent (OER) (Gillingham and Lane 1982). By estimating what a homeowner would receive for their home on the rental market, the BLS stripped away the investment aspect of housing to isolate owner-occupiers' consumption of residential services. Since this 1983 shift,

shelter CPI has been much less volatile and much more correlated with rent CPI (Figure 2(b)).

Of course, this shadow price of owner-occupied shelter is not observed. The BLS uses statistical techniques to infer OER using rental prices for similar units in the area.⁵ In particular, the estimated average OER value is determined by a linear regression of imputed rents on property value, income, and number of rooms from the Consumer Expenditure Survey.⁶ This procedure is done for all units, not just newly signed leases or newly purchased houses, with housing units in the sample queried every six months. Estimated OER will therefore lag spot prices and is mechanically correlated with rents.⁷

The 1983 housing changes had large effects on both headline and core measures of inflation. In December 1982, “homeownership” received 26.1 percent of the weight of the overall CPI index. For the core CPI, it was a full 36.1 percent. In its last month, homeownership costs were reported to have declined by 1.7 percent from November to December as the financing, taxes, and insurance component, which mostly varied with mortgage rates, declined 3.7 percent. In January 1983, owners’ equivalent rent of residence (OER) accounted for only 13.5 percent of the weight for the overall CPI in its first month of existence. It was reported to have grown 0.7 percent from December 1982. The BLS was aware that there would be a large discontinuity in the published

⁵ For a recent discussion of methods see Gindelsky et al. (2019).

⁶ For complete details, see Chapter 17 of the BLS handbook of methods. The linear regression coefficients are then applied to decennial census values for the same independent variables to estimate the average owners’ equivalent rent for each segment via the nonlinear regression

$$OER = \beta_0 + (\beta_1 \times propval) + (\beta_2 \times propval^2) + (\beta_3 \times income) + (\beta_4 \times rooms) ,$$

where *OER* is the predicted value that the home would rent for, *propval* is the market value of the home, *income* is the income of the consumer unit, and *rooms* is the number of rooms in the house. The BLS repeats this procedure across different geographic areas. After the modelling process, CPI weights are then determined by surveys of homeowners.

⁷ For further discussion of this lag structure, see Bolhuis et al. (2022)

weights and measures with the change in methodology. To allow the public and researchers to better prepare for the transition, beginning in 1978, the BLS started publishing the CPI-U-X1 series which used the OER concepts to create an alternative, overlapping series. This allowed for comparison of the OER effect prior to the redesign, with investigations showing a lower peak for the alternate series (DeLong 1997). Following the changeover of the official CPI-U to its current OER approach in 1983, the CPI has undergone numerous other changes, from quality adjustments for used cars, to using geometric means to calculated price changes for subcomponents, and more.⁸ To keep track of all these changes, and their possible effects, the CPI publishes a CPI for all Urban Consumers Research Series (CPI-U-RS) which seeks to answer the question: “what would have been the measured rate of inflation from 1978 forward had the methods currently used in calculating the CPI-U been in use since 1978.”⁹ As we explore our own measures, which seek to answer slightly different questions, we also investigate the CPI-U-RS and show that it leads us to similar though slightly more conservative conclusions. Because the CPI-U-RS is only published from 1978 forward, we must “backcast” our own measures to study the pre-1978 inflation cycles.

⁸ For full list see: <https://www.bls.gov/cpi/research-series/r-cpi-u-rs-changes.htm>.

⁹ These series are available at <https://www.bls.gov/cpi/research-series/r-cpi-u-rs-home.htm>.

3. New Estimates of Historical CPI Inflation

Basic CPI Methodology

In the CPI, the urban areas of the United States are divided into 32 geographic areas, called index areas.¹⁰ The set of all goods and services purchased by consumers is divided into 211 categories called item strata: 209 Commodities and Services item strata, plus the 2 housing item strata that are the main focus of this paper. This results in over 7,000 item-area combinations.

We abstract away from this level of detail and focus on the nationwide groups that are most consistent from 1946 to present. It is the evolution of the weights assigned to different components over time and their varied performances on which we focus for our second major adjustment to past CPI measures.

Aggregation and Reweighting

Once sampling and analysis are used to produce a measured price increase for each of the 7,000 plus indexes, a modified Laspeyres price index is used to aggregate basic indexes into the published CPI-U. The Laspeyres index uses estimated quantities from the predetermined expenditure reference period to weight each basic item-area index. These quantity weights currently remain fixed for a two-year period, and are replaced in January of each even-numbered year when the aggregation weights are updated. In a Laspeyres aggregation, consumer substitution between items is assumed to be zero. The CPI is not a pure Laspeyres index as the goods basket

¹⁰ This discussion borrows largely from the BLS's *Handbook of Methods*, last updated in November of 2020.

has evolved significantly over time with new inventions and higher income levels. We describe the full reweighting schedule in the Appendix.

Data

We use public data from the BLS over time to explore the change in the nature of inflation during the post-war period. Our dataset contains 32 components that cover around 90 percent of the overall CPI since 1946, as listed in Appendix Table 1. Figure A.1 in the Appendix plot the inflation rate of components over time.

We also collect data on quantity weights and relative importance of CPI components over time.¹¹ In Appendix Figure A.2, we plot the evolution of relative importance ratios of the components over time. Since the 1940s, consumer spending has shifted from goods to services. As a result, the weights and relative importance of goods components has fallen over time, mainly driven by a decline in the importance of food and apparel. The mirror image of this trend is that the weights and relative importance of housing, medical care, education, and personal care have increased since the start of the post-war period.

Using our data on inflation rates and weights of the 32 components, we construct two new measures of CPI inflation. First, we replicate the official headline and core CPI inflation rate. To ensure our bottom-up estimate of official headline CPI equals the published series, we add a

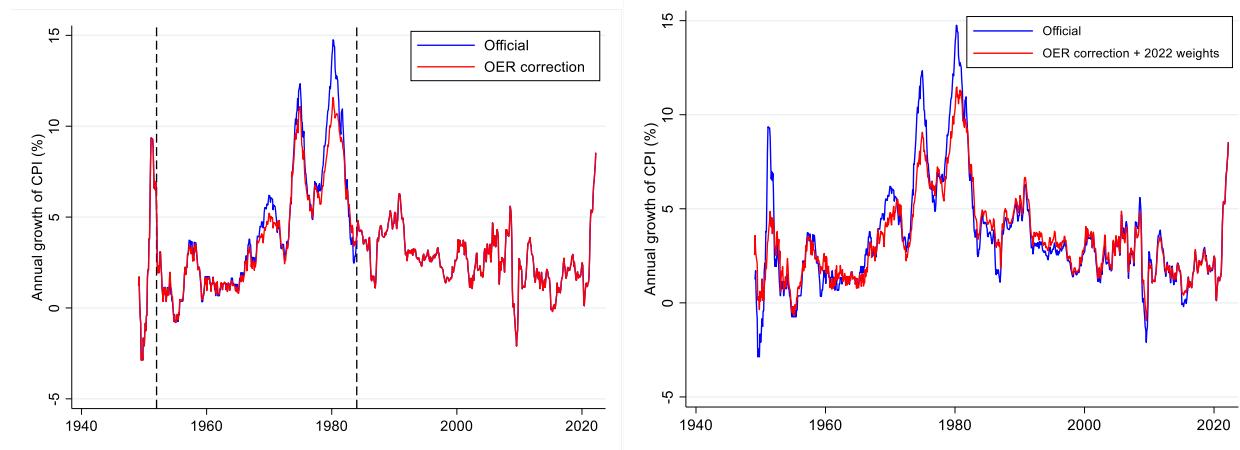
¹¹ The relative importance of a component is its expenditure or value weight. When the quantity weights are collected, they represent average annual expenditures. For years other than the base year, relative importance ratios represent an estimate of how consumers would distribute their expenditures as prices change over time, but consumers do not change their real consumption patterns. Note that weights are estimated using micro data on expenditures, whereas relative importance ratios are not directly observed.

residual CPI component. This residual component mainly covers recreation and information. We then adjust CPI inflation pre-1983 by estimating OER using the CPI rent series. We backcast what we think that OER inflation would have been pre-1983 had the post-1983 method been used. We do this by regressing OER on rental inflation post-1983. For 1979 to 1983, we check our estimates against the retroactive CPI-U-RS series of the BLS that measures CPI inflation consistently using current methods. Finally, to assess the importance of differences in the volatility of CPI components for overall inflation, we create a second version of the estimated CPI series that uses 2022 quantity weights over the entire period while also adjusting the pre-1983 data with estimated OER. Our online dataset also includes series that use constant weights from other time periods.

4. Findings

Our estimates suggest that the current inflation rate is closer to the peak of other cycles than the official CPI data suggest. Figure 3 shows that the peak of the Volcker-era inflation (March 1980), currently understood to have been at 14.8 percent, is only 11.4 percent when adjusted for the switch from homeownership costs to OER. The growth in core CPI at its peak in June 1980 falls from 13.6 percent to 9.1 percent when measured using the OER method as seen in Figure 4. The large differences between the official and adjusted series reflect both the substantial weight of OER in the index, especially in core CPI, and the lower peaks of estimated OER relative to homeownership costs. From a low of 14.5 percent weight in 1983, as Americans have shifted more of their consumption towards housing, OER has risen to represent 24.3 percent of overall CPI and 30.6 percent of core CPI in 2022. While past inflation peaks are lower using the consistent methodology, the average inflation rate pre-1983 would also have been lower. Our estimates show that the mean headline inflation rate between 1949 and 1983 is 0.4 percentage points lower when accounting for the shift to OER.

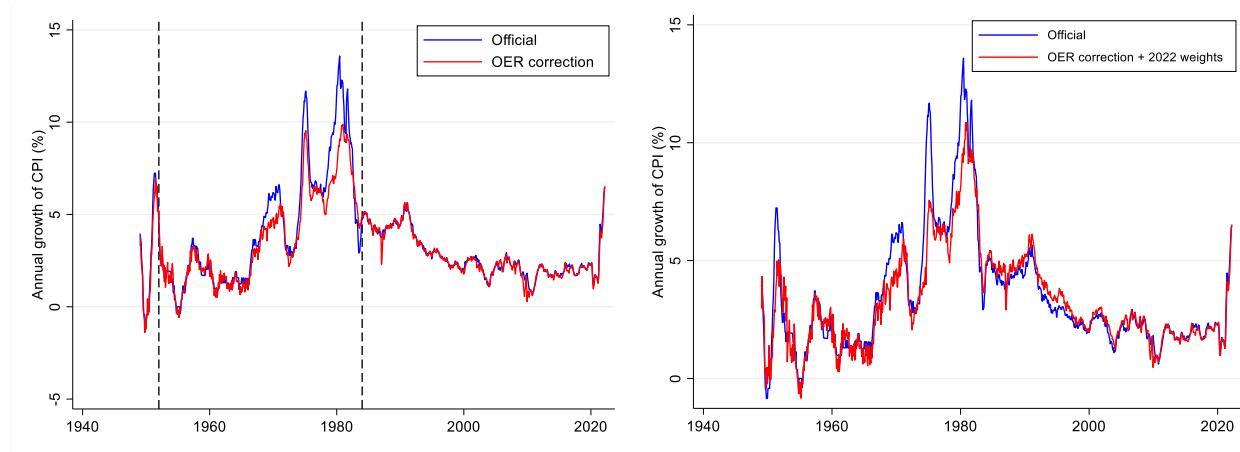
Figure 3: Official and Estimated Headline CPI



Source: Bureau of Labor Statistics, authors' calculations

Notes: Percent change from 12 months earlier. Left-hand side: Homeownership costs are replaced with estimated OER pre-1983. Right-hand side: Homeownership costs are replaced with estimated OER pre-1983 and quantity weights are fixed at 2022 levels.

Figure 4: Official and Estimated Core CPI



Source: Bureau of Labor Statistics, authors' calculations

Notes: Percent change from 12 months earlier. Left-hand side: Homeownership costs are replaced with estimated OER pre-1983. Right-hand side: Homeownership costs are replaced with estimated OER pre-1983 and quantity weights are fixed at 2022 levels.

Table 1: Past Inflation Cycles and Today

		Headline CPI			Core CPI		
		Official	Today's Basis	Today's Basis and weights	Official	Today's Basis	Today's Basis and weights
1949-54¹	Start	-2.9	-2.9	0.1	0.4	-0.2	0.3
	Peak	9.4	9.4	3.3	7.2	6.9	5.0
	End	-0.7	-0.7	-0.5	-0.4	-0.4	-0.6
	Reflation	12.3	12.3	3.2	6.8	7.1	4.7
	Disinflation	10.1	10.1	3.8	7.6	7.3	5.6
1972-76²	Start	2.7	2.4	2.2	2.8	2.2	2.1
	Peak	12.3	11.0	9.1	11.7	9.5	7.8
	End	4.9	5.1	5.9	6.1	6.3	6.1
	Reflation	9.6	8.6	6.9	8.9	7.3	5.7
	Disinflation	7.4	5.9	3.2	5.6	3.2	1.7
1978-83³	Start	6.5	5.7	5.6	6.5	5.0	4.9
	Peak	14.8	11.6	11.4	13.6	9.1	9.8
	End	2.5	3.4	3.4	3.0	4.3	3.6
	Reflation	8.3	5.9	5.8	6.1	4.1	4.9
	Disinflation	12.3	8.2	8.0	10.6	4.8	6.2
Today⁴	Start	0.1	0.1	0.1	1.2	1.2	1.2
	Peak	8.5	8.5	8.5	6.5	6.5	6.5
	Reflation	8.4	8.4	8.4	5.3	5.3	5.3
	Disinflation (to 2% target)	6.5	6.5	6.5	4.5	4.5	4.5

Sources: Bureau of Labor Statistics, Authors' calculations

Notes: We define 'Start' and 'End' as the local minima of official annual headline CPI growth at the start and end of each cycle. We define 'Peak' as the local maximum of official annual headline CPI and core CPI growth for each cycle. For official core CPI, we use the CPI less food series for the period before 1958. Today's basis: Homeownership costs are replaced with estimated OER pre-1983. Today's basis and weights: Homeownership costs are replaced with estimated OER pre-1983 and quantity weights are fixed at 2022 levels.

¹ Start: July 1949. Peak: February 1951 for headline and June 1951 for core. End: October 1954.

² Start: June 1972. Peak: December 1974 for headline and February 1975 for core. End: December 1976.

³ Start: April 1978. Peak: March 1980 for headline and June 1980 for core. End: July 1983.

⁴ Start: May 2020. Peak: March 2022 for both headline and core.

More broadly speaking, past inflationary cycles would have been less volatile using the consistent methodology that uses OER. The pace of reflation during the cycle upswings, and the pace of disinflation during the cycle downswings are lower under today's methodology , as summarized in Table 1. These differences imply that the responsiveness of the CPI to monetary policy was considerably lower during the 1960s and 1970s than the official CPI statistics suggest. We stress that any consequences of the difference in measurement are larger for core CPI than for headline CPI, due to the considerably larger weight of OER in core CPI.

Our estimates align with the retroactive CPI-U-RS series of the BLS that measures CPI inflation consistently using current methods. Figure A.3 in the Appendix plots the CPI-U-RS series for headline and core inflation, which overlap with our estimates for the period 1979-1983. Whereas the CPI-U-RS series estimates the peak of headline inflation during the Volcker-era in March 1980 at 11.8 percent, we estimate our peak in the same month at 11.6 percent. For core inflation, both our adjusted series and the CPI-U-RS peak at 9.9 percent in December 1980, well below the officially reported number of 12.2 percent for that month.

An alternative approach to making CPI more comparable is to attempt to apply pre-1983 techniques to this moment. This has been pursued Lee and Barton (2022), which extends work of Hazell et al. (2020). After performing the complementary process, they also find that past and present inflation look more similar than originally reported, with current levels higher than official series due to the recent increase in mortgage rates.

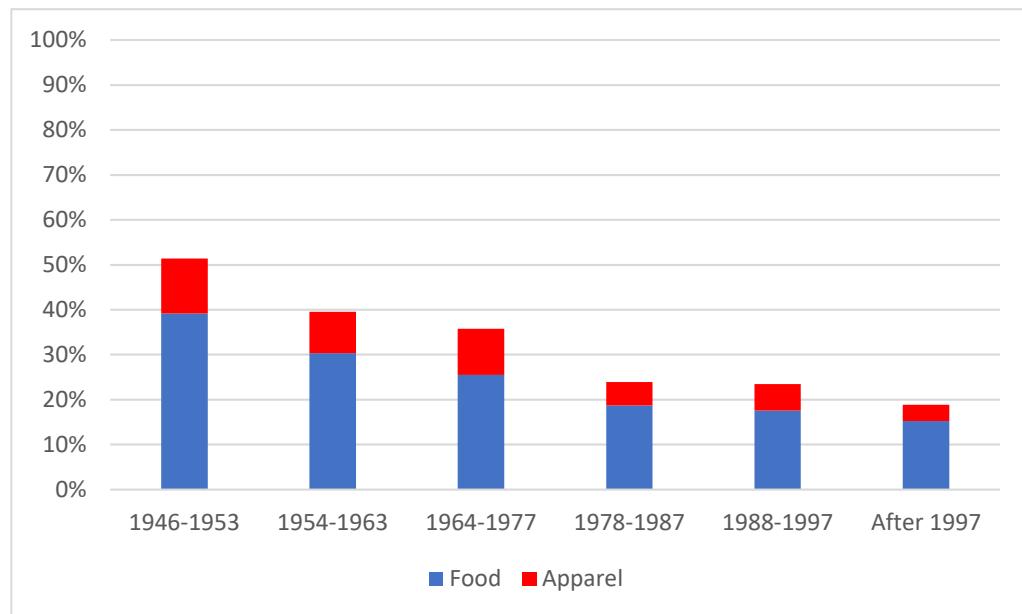
Our estimates also indicate that past inflation cycles look more volatile than today's due to the greater weight of transitory goods components in past measurements. In the early 1950s, for example, food and apparel accounted for close to 50 percent of the headline CPI index (Figure 5). After the growth rate of these components shot above 10 percent due to Korean war-induced

shortages, headline inflation fell from 9 to 2 percent within a year. Today, however, food and apparel only receive 17 percent of the weight of headline CPI. We estimate that the peak of headline CPI inflation in 1951 would have been 3.3 percent, instead of 9.4 percent, when measuring CPI using today's weights. Our adjusted peak of core CPI inflation in 1951 is 5 percent, compared to an official peak of 7.2 percent.

During the inflation cycle of the early 1970s, both the treatment of shelter inflation and the greater weight of volatile goods components pushed up official CPI inflation compared to current methods. When adjusting for the treatment of OER, our estimate of the peak of core CPI inflation in February 1975 falls from 11.7 to 9.5 percent. We estimate that the peak of core CPI inflation in 1974 would have been only 7.8 percent when using today's weights coupled with the OER correction. The pre-Volcker adjusted trough was still 5.9 percent, suggesting the lessons from the early 1970s for decreasing currently elevated inflation to around 2 percent are limited.

The index bears witness to this shift from transitory goods components to less volatile services, with sticky industries gaining weight in the CPI across the board (Bryan and Meyer, 2010). The current approach renders housing inflation particularly sticky (Bolhuis et al., 2022). Such changes in measurement methods complicate comparisons between CPI rates from different periods. By constructing CPI series using constant weights, we aim to improve the comparisons of CPI inflation over time.

Figure 5: Average Food and Apparel Weight in Headline CPI by Revision



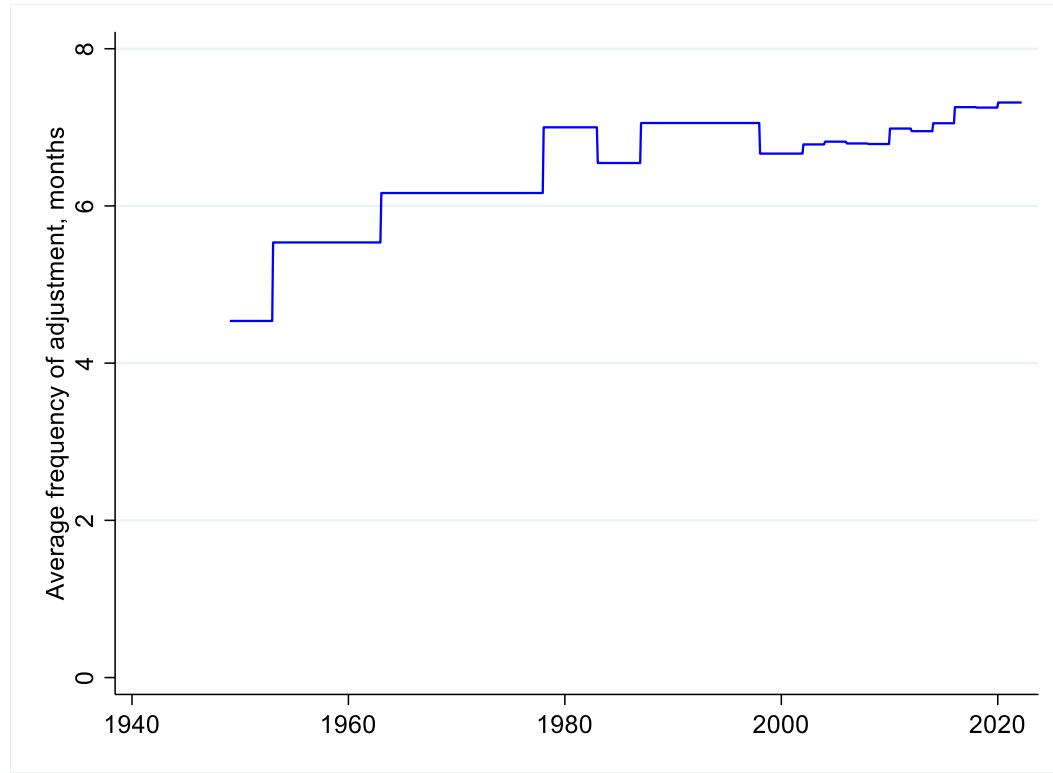
Source: Bureau of Labor Statistics, authors' calculations

Note: Arithmetic mean of relative weight during each period.

We formalize this shift towards sticky components of the CPI by constructing a time-varying measure that reflects the average frequency of price adjustment, weighing each component by its quantity weight. We take data on price adjustment from Bryan and Meyer (2010). Figure 6 plots the evolution of this measure over time. We estimate that the average frequency of price adjustment has increased from 4.5 months in the late 1940s to 7.3 months in 2022. This secular change is mainly driven by the increase in the weights of more sticky services components at the expense of more transitory goods components such as food and apparel.¹²

¹² Appendix Table A.2 contains the estimated frequency of adjustment from Bryan and Meyer (2010) by component. Most food and apparel components have adjustment frequencies below five months, whereas the frequency of price adjustment of most services components is above 10 months.

Figure 6: Average Frequency of Price Adjustment, Headline CPI Components

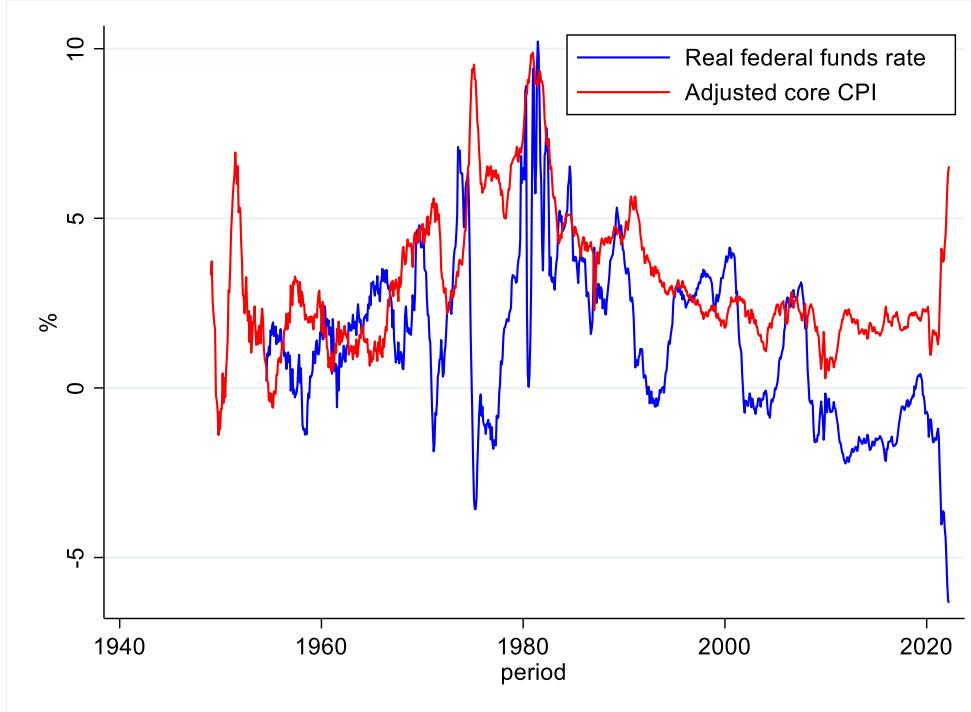


Source: Bureau of Labor Statistics, Bryan and Meyer (2010), authors' calculations

Finally, we assess the implications of our new estimates of headline CPI inflation for real interest rates and the monetary policy stance over time. Much has been made of the discrepancy between high inflation and the low real monetary policy rate in the United States (e.g., Dudley, 2022). Recently, Blanchard (2022) emphasizes the similarities between the 1975-1983 inflation cycle and the current one. During both inflationary upswings, the real federal funds rate —measured as the nominal federal funds rate minus the annual core CPI inflation rate- has fallen sharply below zero. And during both periods, a ‘policy gap’ —measured as the difference between core inflation and the real federal funds rate- has opened up. Our new estimates imply that the current policy gap is already roughly equal to the peak gap of the Volcker-era (Figure 7). The March

2022 gap stood at 12.7 percentage points, and we estimate that the gap peaked in April 1975 at 12.1 percentage points when adjusting for the treatment of OER. The smaller adjusted gap serves to make the analysis of Blanchard (2022) overly conservative.

Figure 7: Historical Policy Gap Using Estimates Adjusted for Treatment of OER



Sources: Bureau of Labor Statistics, Board of Governors of the Federal Reserve System, Authors' calculations

Notes: For adjusted core measure, homeownership costs are replaced with estimated OER pre-1983 and quantity weights are fixed at 2022 levels throughout. Real Federal Funds Rate is measured as the effective federal funds rate minus OER and weight-adjusted core inflation over the previous 12 months

5. Conclusions

This paper highlights that the way that housing inflation was measured in the CPI made previous inflationary cycles look more volatile and responsive to Fed policy. We draw two sets of conclusions. First, our observations imply that the current inflation regime is closer to that of the late 1970s than it may at first appear. In particular, the rate of CPI disinflation engineered in the Volcker-era is significantly less when measured using today's treatment of housing. In order to return to 2 percent core CPI today, we need nearly the same 5 percentage points of disinflation that Volcker achieved.

In its pre-1983 form, shelter inflation would decline mechanically as interest rate increases subsided, adding fuel to rapid disinflations. Not only is the current housing component of CPI unlikely to decline swiftly, but recent research indicates that housing inflation is likely to continue growing in the coming months (Bolhuis et al., 2022). With private sector rent growth currently still at 16 percent, residential inflation is likely to move towards 7 percent by the end of 2022, contributing almost 3 percentage points to core CPI inflation. Compared to previous inflationary cycles, housing will thus serve as a significant hindrance to rapid disinflation whereas it used to move the official series substantially lower.

Second, our estimates suggest that past inflation cycles were more volatile than today's due to the greater weight of transitory goods components in past indices. With current procedures, the inflation taken out of the system in 1950s and 1970s looks significantly more modest. Overall, some optimistic interpretations which underplay the magnitude of the required disinflation to return to trend inflation today are called into question by the analysis in this paper. One thing that is not called into question is the great work performed by the people of the Bureau of Labor

Statistics; our corrections do not at all denigrate current processes, they are just a tool for better intertemporal contextualization.

It is important to note that the Federal Reserve's preferred measure of inflation since 2000 is the Personal Consumption Expenditure (PCE) price index, which has measured rent inflation consistently and does not suffer from the housing issue that we explore.¹³ It is also true, however, that the Volcker-era run-up and decline in core PCE were not as large as they were for the CPI with the peak actually occurring in 1975. Despite its non-primacy in the Federal Reserve policy process, the Bureau of Labor Statistics recently reported that over 2 million workers were covered by collective bargaining agreements which tied their wages to the CPI. The CPI index also affects the incomes of almost 80 million people because of statutory action: 47.8 million Social Security beneficiaries, about 4.1 million military and Federal Civil Service retirees and survivors, and about 22.4 million food stamp recipients.¹⁴ The CPI is also used as an input for myriad other contracts in the United States that will touch nearly every American household.¹⁵ In this way, a slower than desired decline in the CPI could become self-reinforcing in the CPI and PCE as inflation takes more time to exit the system. In addition, we note that the public and journalists tend to look first to the CPI for the current state of inflation.¹⁶ Finally, we note that

¹³ For further discussion of the policy reasons for having chosen the PCE over the CPI, see Bullard (2013). He notes that the Federal Reserve was monitoring CPI closely until the changeover and still includes it in analysis.

¹⁴ The Boskin Commission studied bias in the computation of the CPI and its impact on Social Security payments and future deficits (Boskin et al., 1996). See Boskin and Jorgensen (1997) for a discussion on the role of homeownership costs and OER in the measurement of the cost of living over time. Gordon (2006) and Baker (2016) discuss the historical importance of the Boskin Commission report.

¹⁵ For uses of the CPI, see <https://www.bls.gov/cpi/overview.htm>.

¹⁶ For recent examples, see Cox (2022) and Goodkind (2022).

PCE inflation data are only available from 1960 onwards which prevents us from analyzing the inflation cycle after the Korean War without making use of the CPI. The role of measured CPI versus PCE inflation in forming long-term inflation expectations is left for future exploration.

Lastly, this paper does not aim to model or estimate the underlying idiosyncratic sectoral shocks that give rise to heterogeneity in the inflation rate of CPI components (Carvalho & Gabaix, 2013; Baqaee & Farhi, 2022). Doing this would require detailed input-output tables, unavailable for some of the periods that we study in this paper. We leave such work for future research.

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Appendix

Table A.2: Components and Subcomponents of Constructed CPI Series

Component	Subcomponent
Food and beverages	Cereals and bakery products Meats, poultry, fish, and eggs Dairy and related products Fruits and vegetables Nonalcoholic beverages and beverage materials Sugar and sweets Fats and oils Other (prepared) foods Food away from home Alcoholic beverages
Housing	Rent of primary residence Other renters' cost (incl. lodging away from home) OER and insurance (prev. home purchase and upkeep or homeownership) Fuel oil and other fuels Energy services (piped gas and electricity) Telephone, water, sewer Household furnishings and operations
Apparel and upkeep	Men's and boys' apparel Women's and girls' apparel Footwear Other (incl. Infants' and toddlers' apparel)
Transportation	New and used motor vehicles Motor fuel Other (incl. parts, equipment, maintenance, repair, insurance) Public transportation
Medical care	Medical care commodities Medical care services
Education	Educational books and supplies Tuition, other school fees, and childcare
Other goods and services	Tobacco and smoking products
Personal care	Personal care products Personal care services
Residual	Residual (incl. recreation and information)

Historical CPI reweightings

From 1940-1950 the weights for the CPI came from a consumer survey conducted from 1934-1936. It was modified for goods that were not available for purchase during the war. In 1950 weights were updated to reflect a 1947–49 survey of consumer expenditures. In 1953, the CPI used weights drawn from a 1950 survey of consumer expenditures conducted in central cities and attached urbanized areas. Starting in 1964, the CPI began to use quantity weights from the consumer survey that was in the field in 1960 and 1961. In 1987, with the fifth comprehensive revision weights were constructed based on the 1982–84 Consumer Expenditure Survey and the 1980 Census. These were used until 1998 when weights were updated based on the 1993–95 Consumer Expenditure Survey and the 1990 census. Beginning in 2002, the CPI implemented biennial weight updates in January of every even year based on Consumer Expenditure Surveys from the two years preceding the revision—2017 and 2018 surveys were used for 2020, for example, and 2019 and 2020 began being used in 2022.

Figure A.1: Inflation Rate of Subcomponents over Time

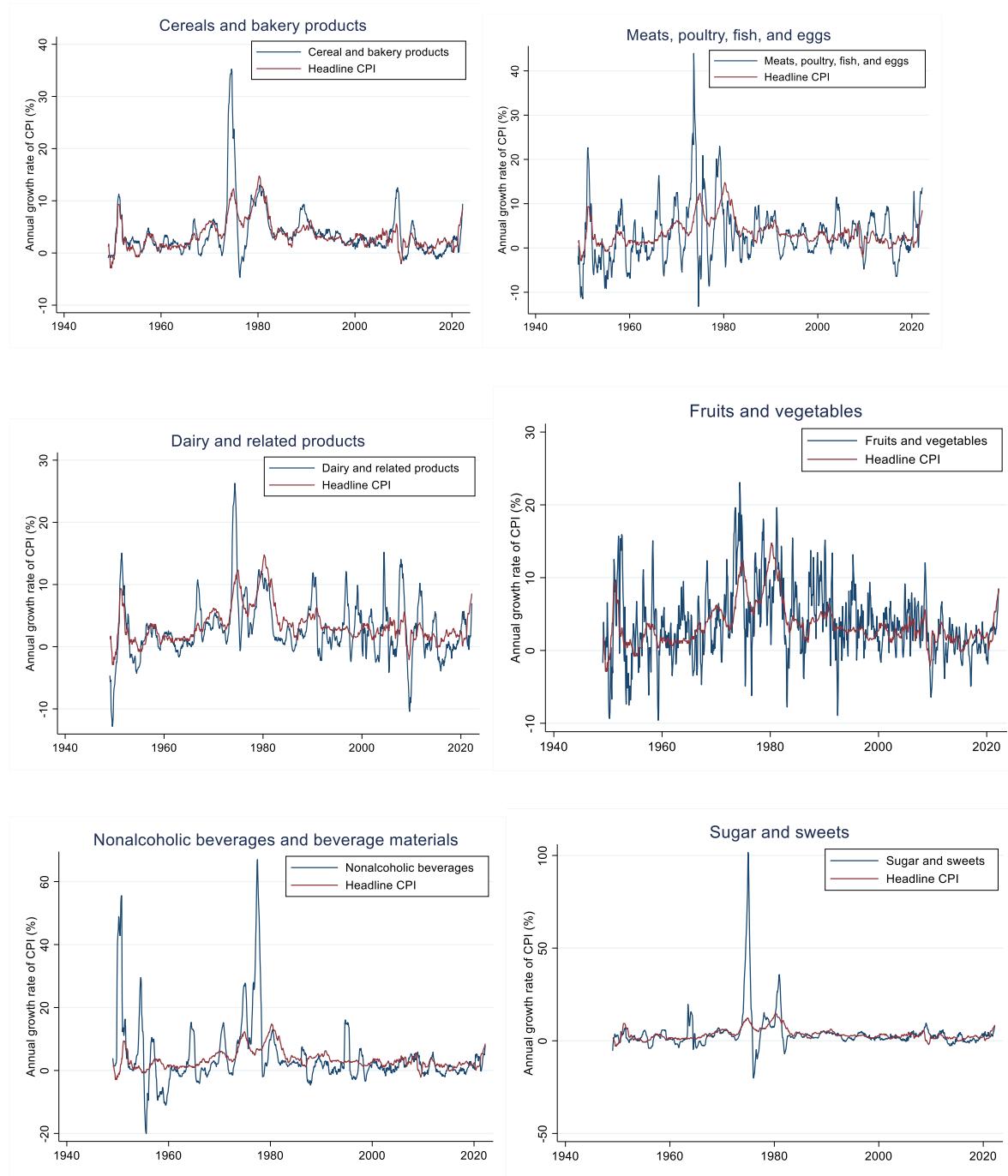


Figure A.1: Inflation Rate of Subcomponents over Time (continued)

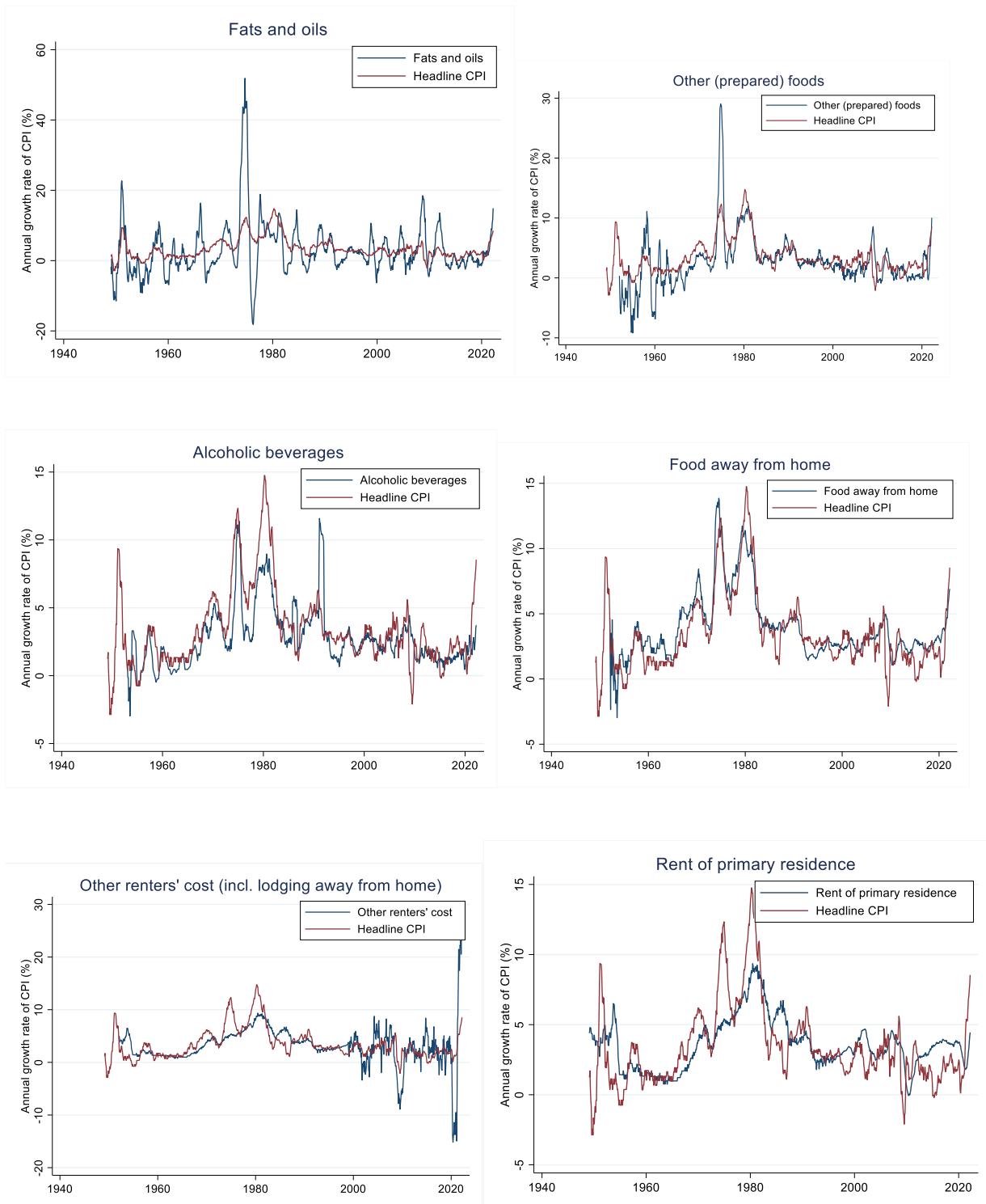


Figure A.1: Inflation Rate of Subcomponents over Time (continued)

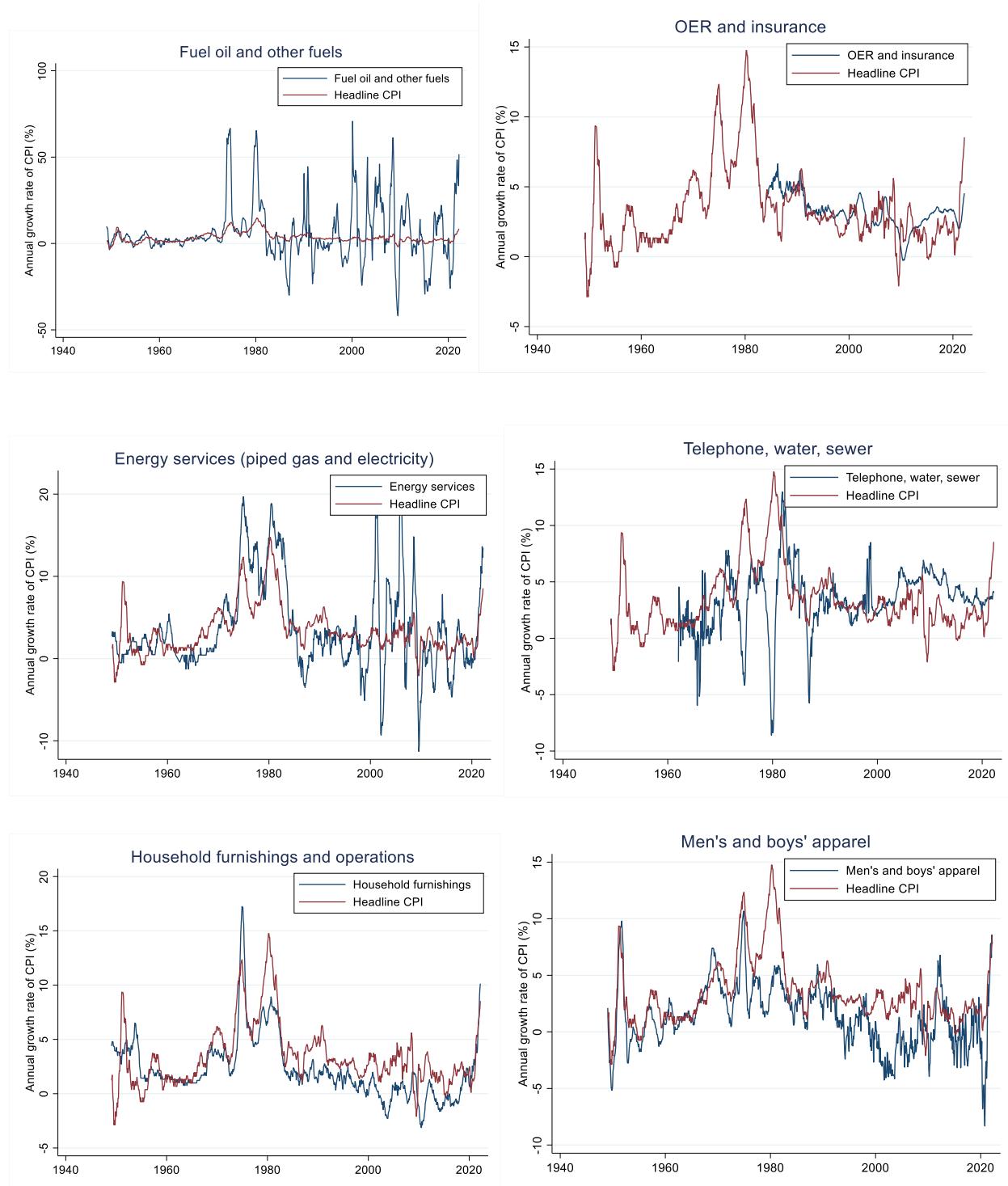


Figure A.1: Inflation Rate of Subcomponents over Time (continued)

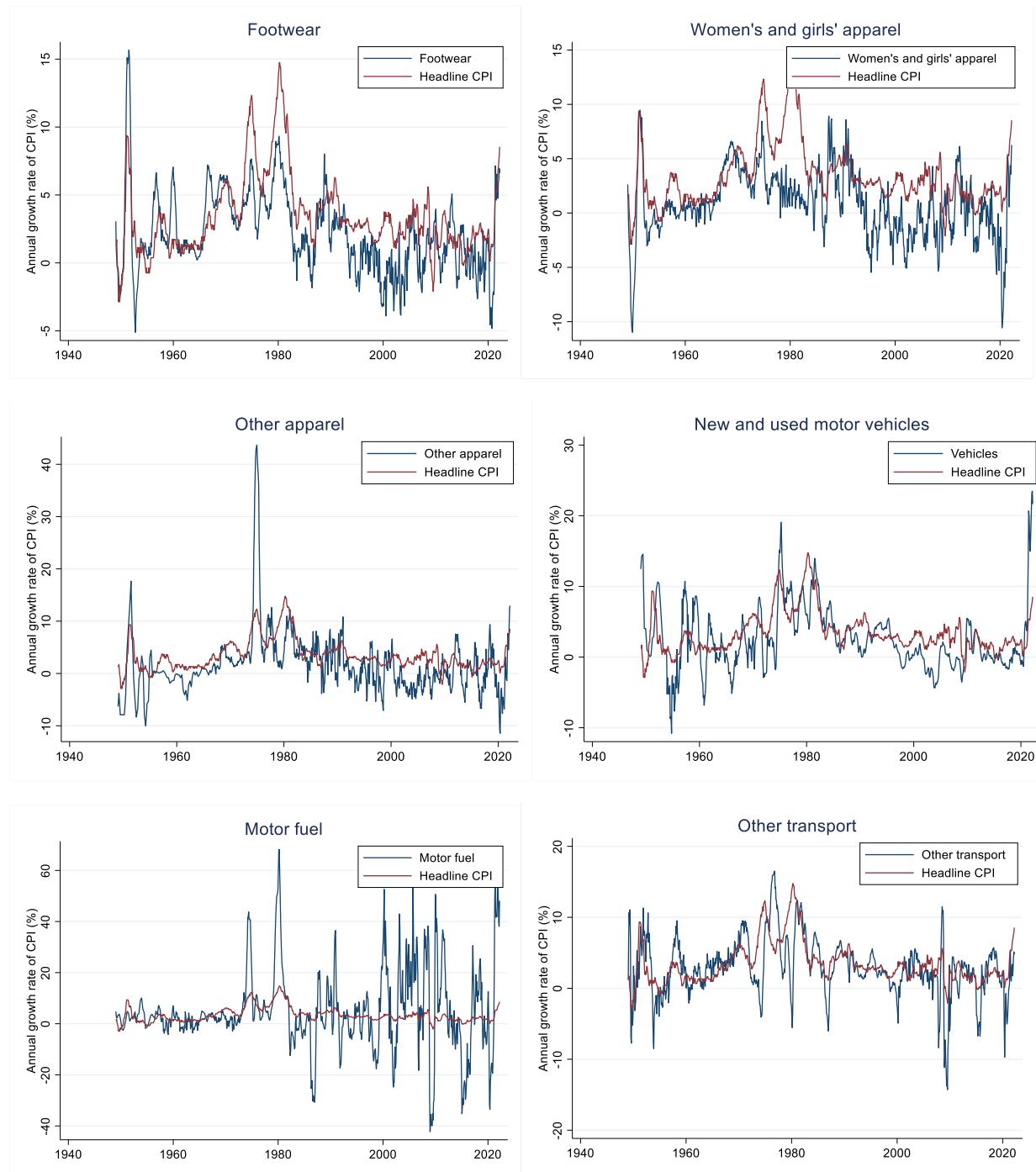


Figure A.1: Inflation Rate of Subcomponents over Time (continued)

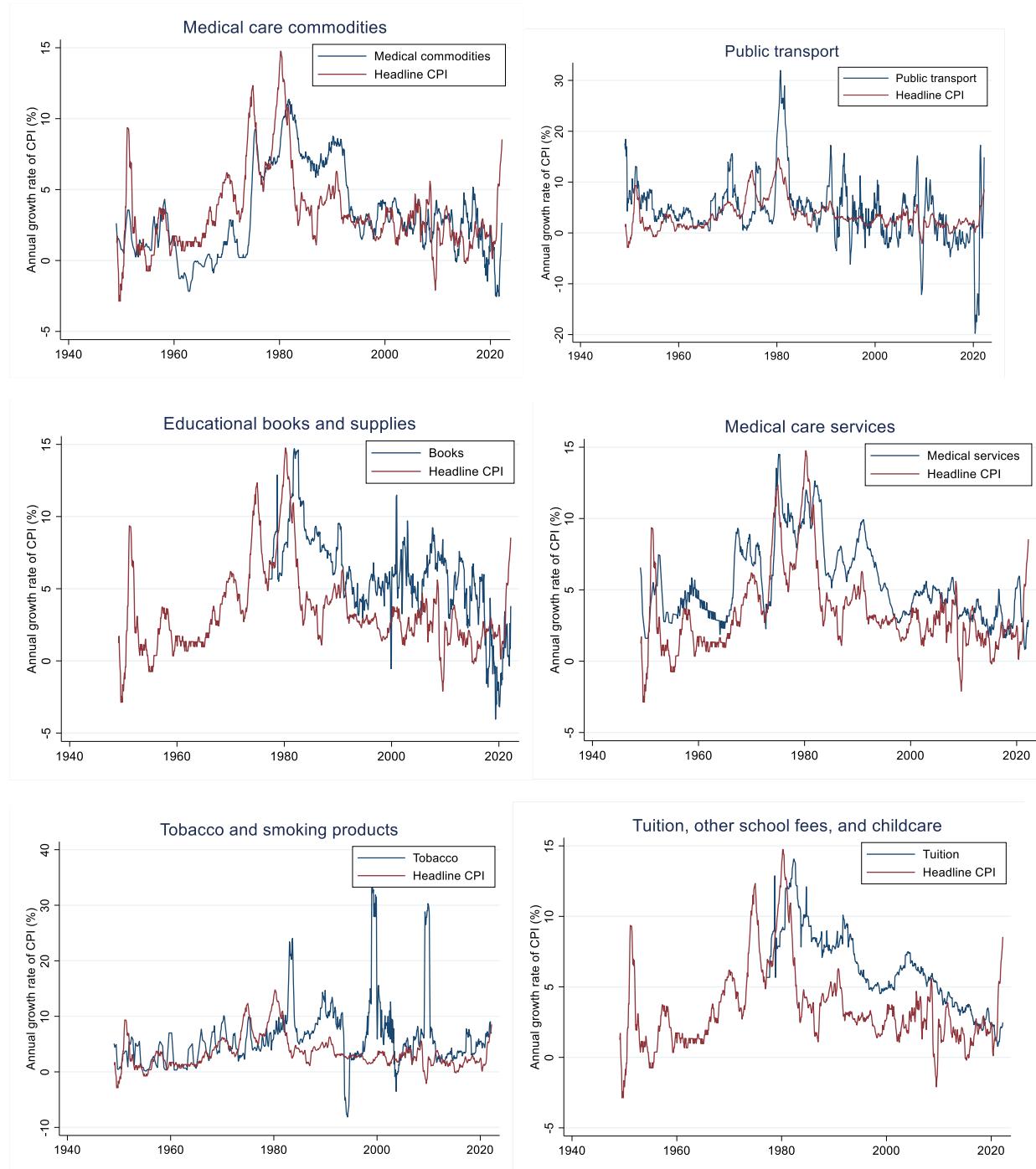


Figure A.1: Inflation Rate of Subcomponents over Time (continued)

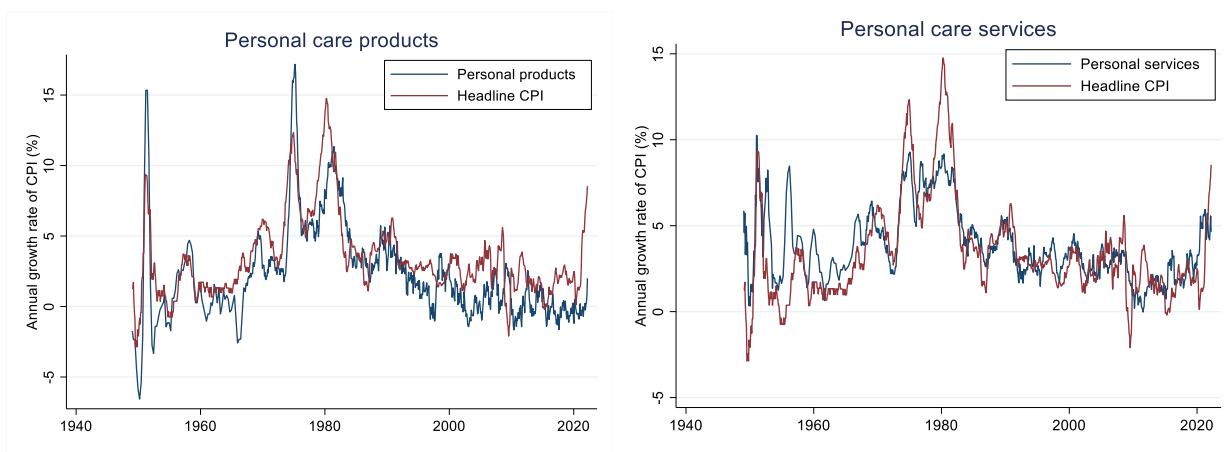


Figure A.2: Relative Importance Ratios over Time

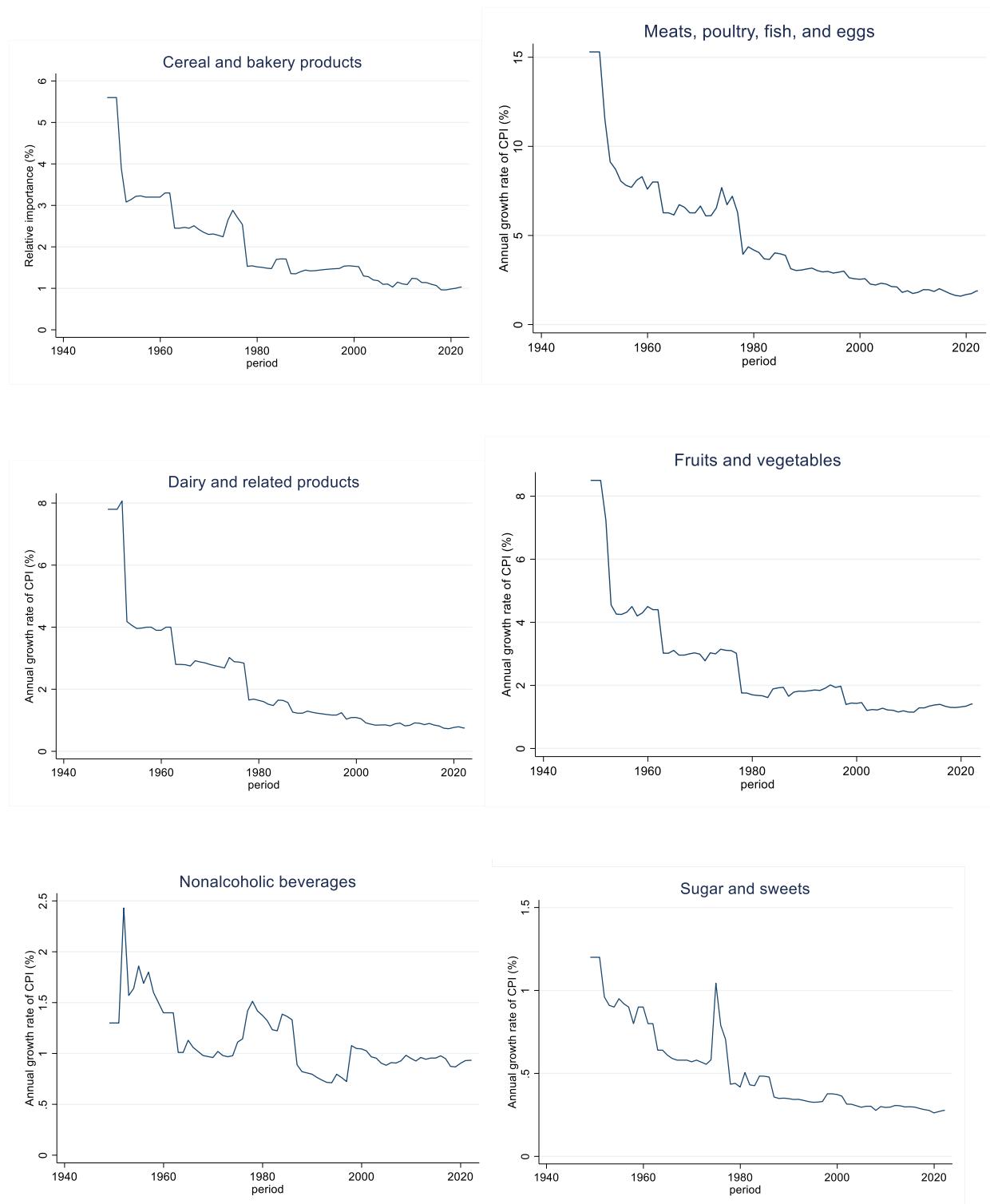


Figure A.2: Relative Importance Ratios over Time (continued)

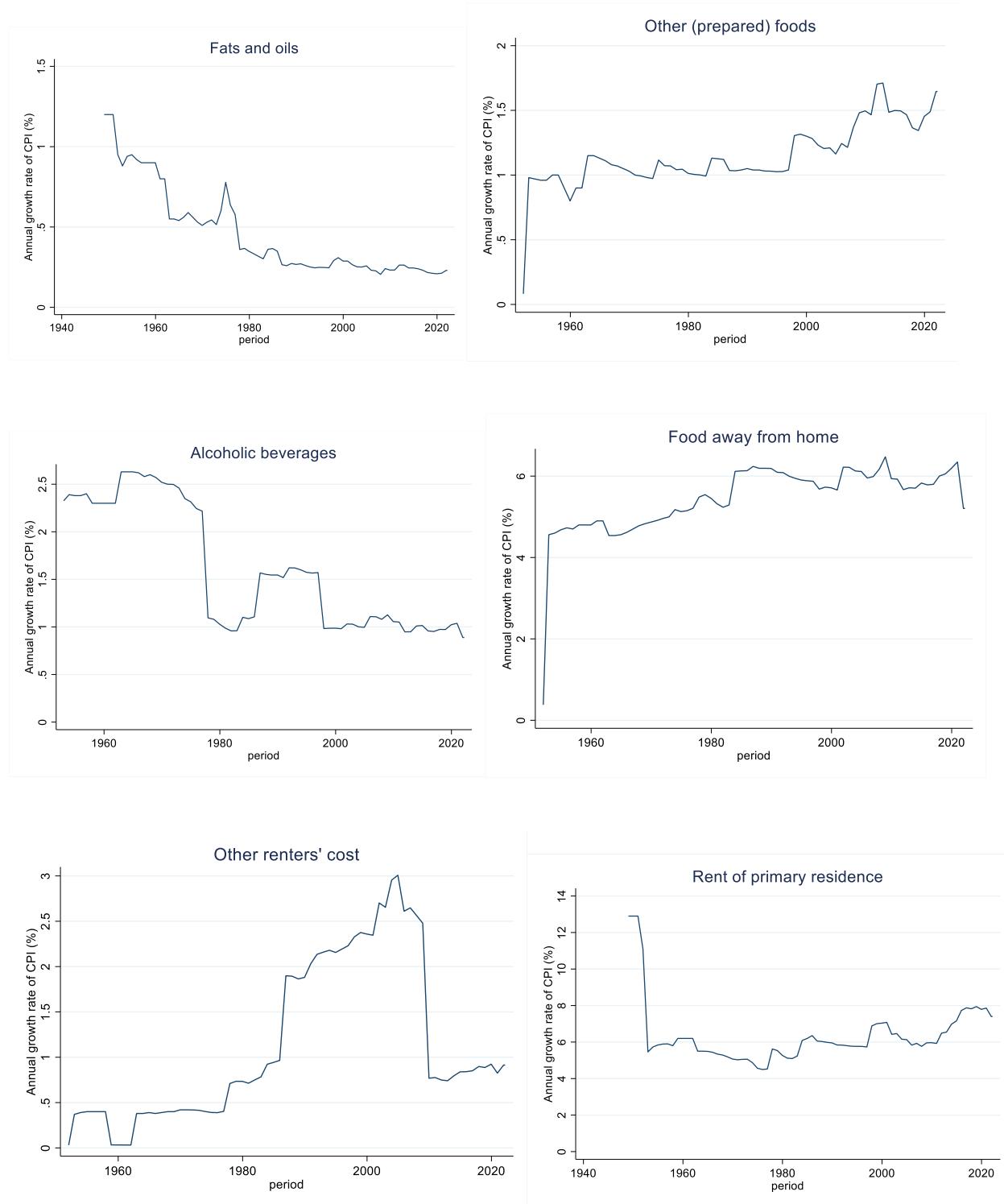


Figure A.2: Relative Importance Ratios over Time (continued)

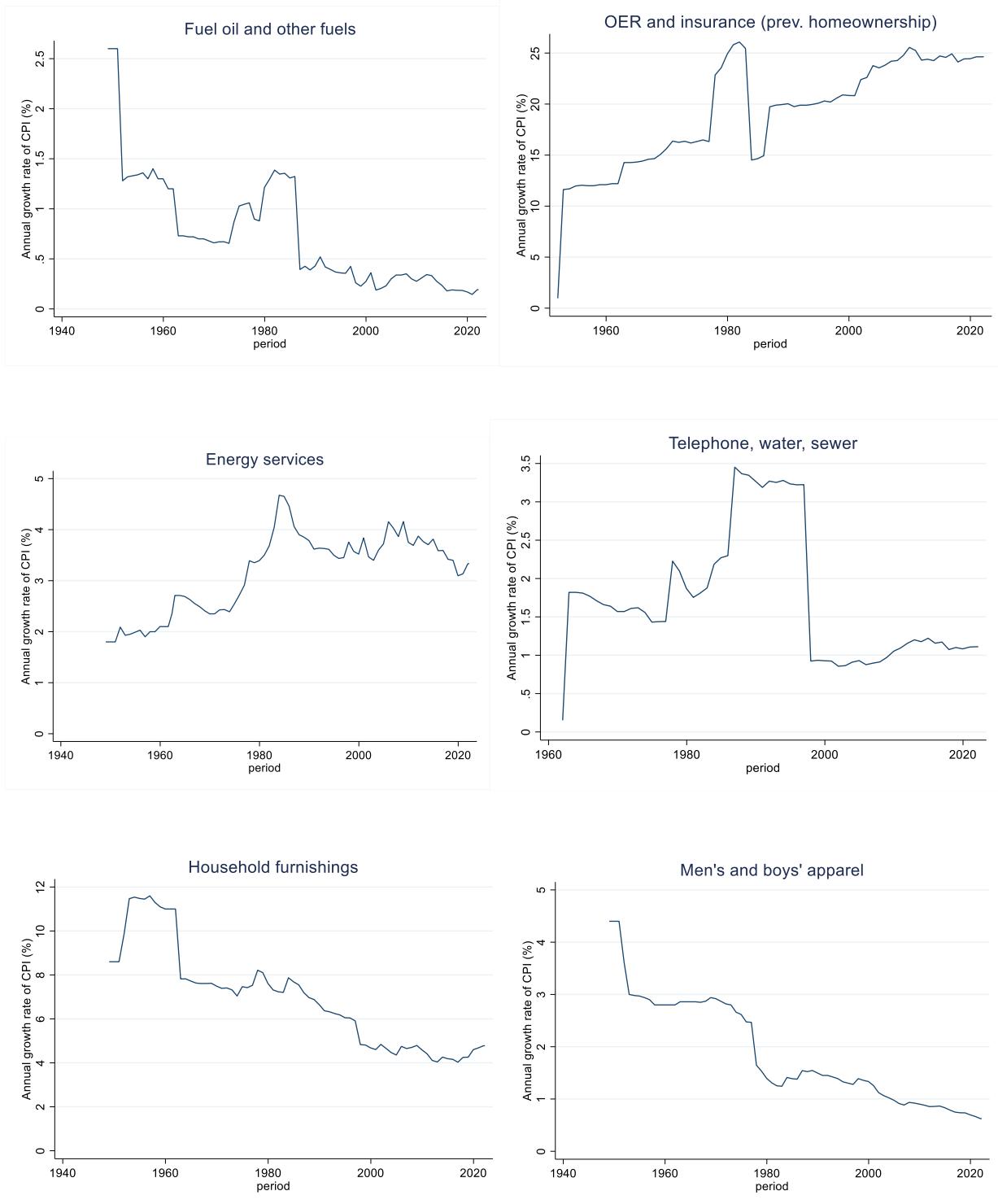


Figure A.2: Relative Importance Ratios over Time (continued)

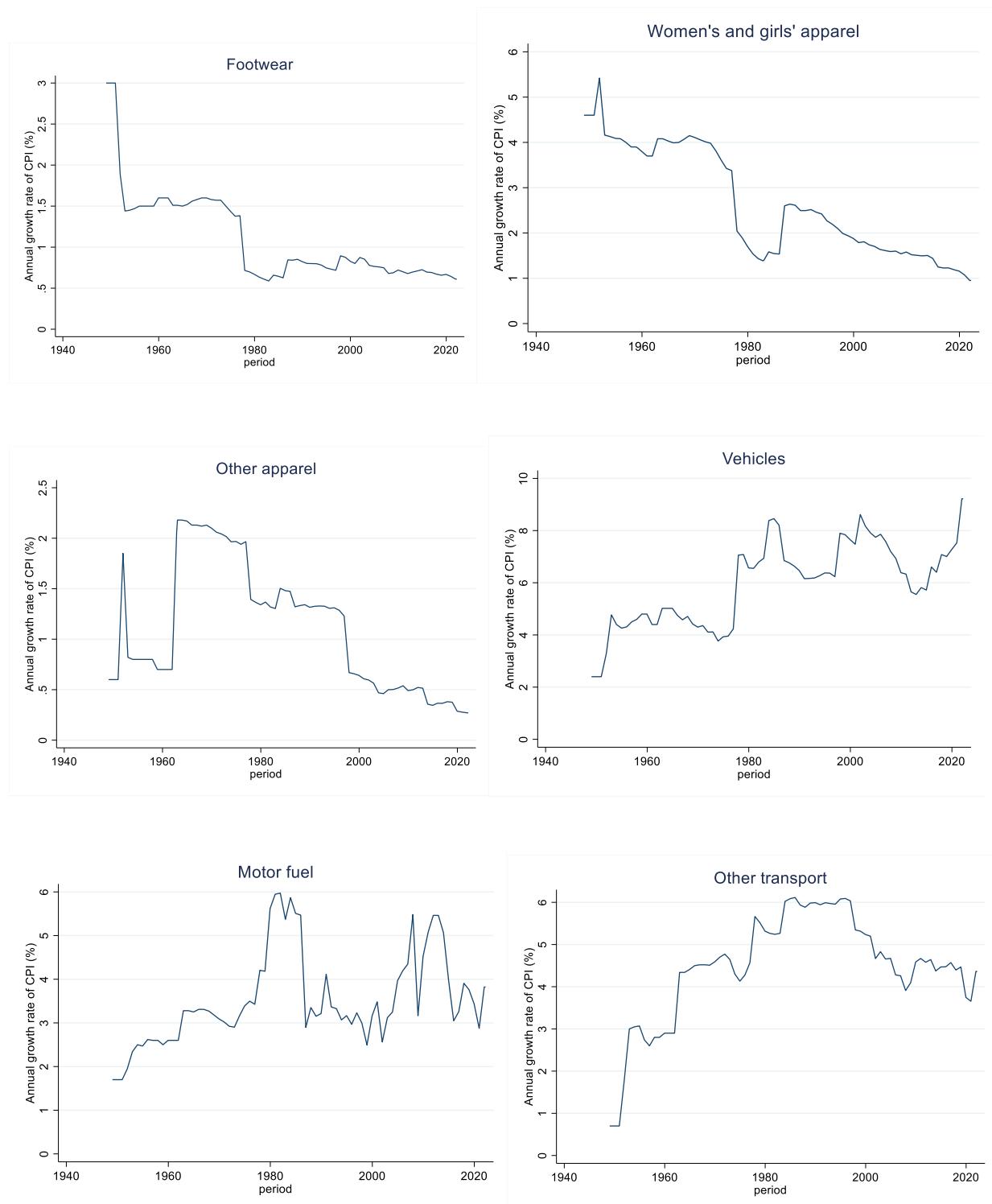


Figure A.2: Relative Importance Ratios over Time (continued)

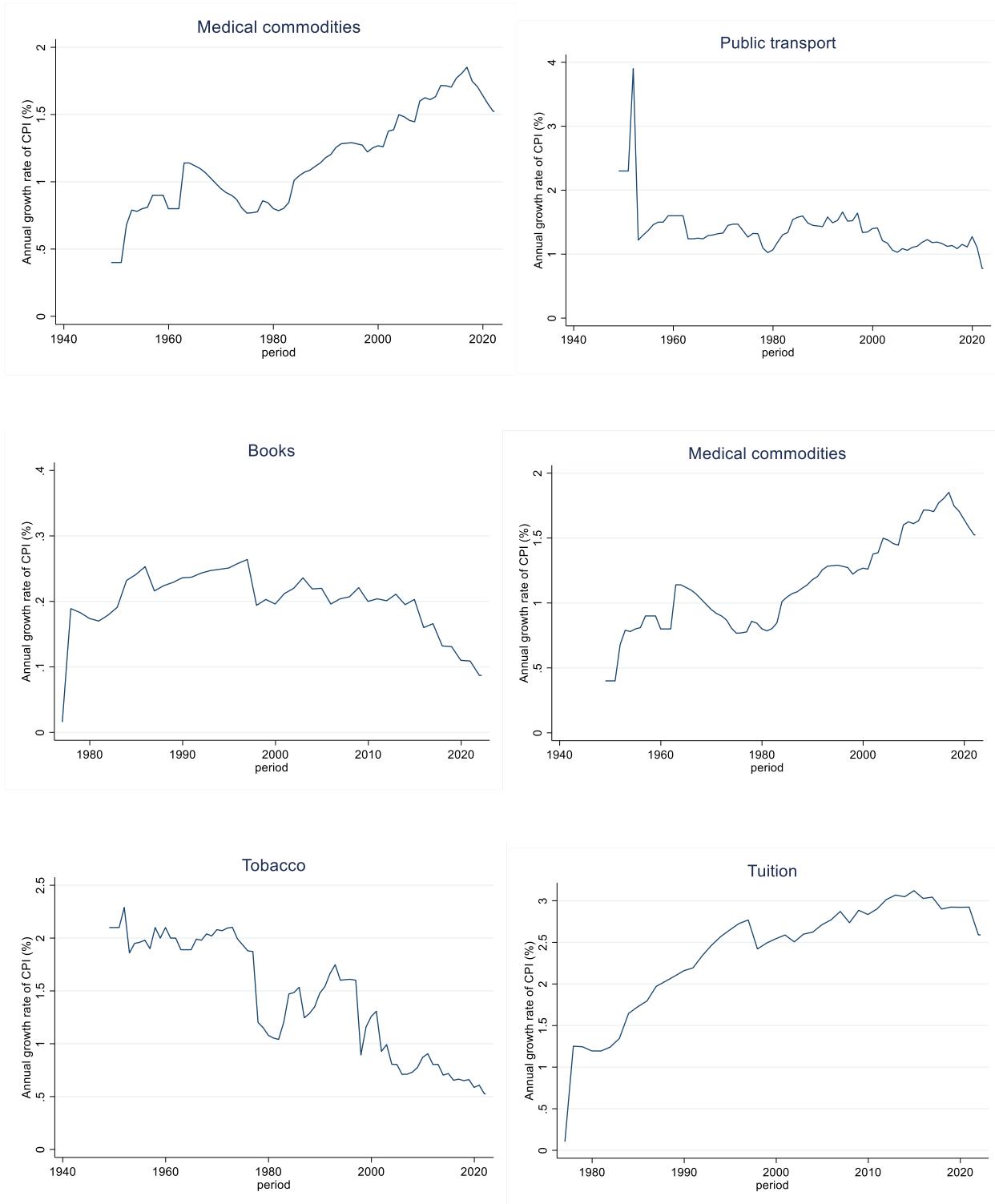


Figure A.2: Relative Importance Ratios over Time (continued)

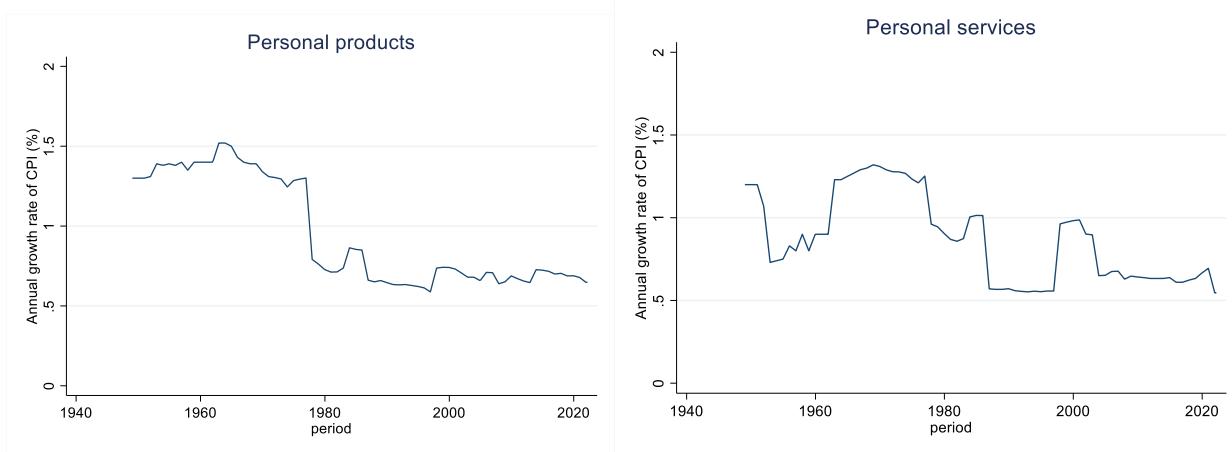
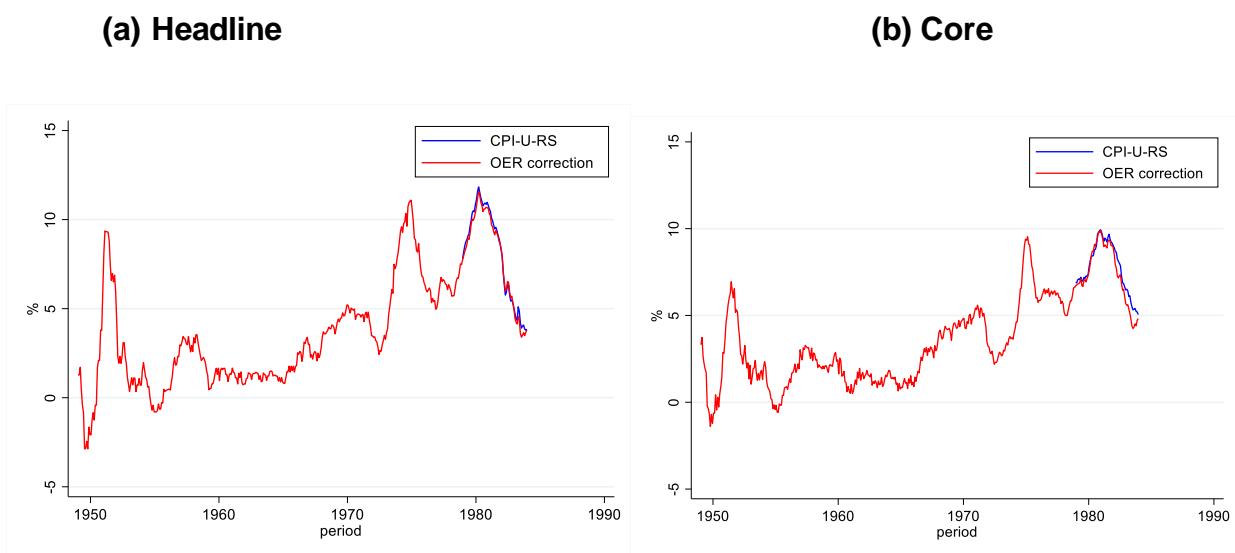


Figure A.3: CPI-U-RS series and Estimated Headline Core CPI



Sources: Bureau of Labor Statistics, Authors' calculations

Table A.2: Frequency of Price Adjustment

Subcomponent	Frequency of adjustment
Cereals and bakery products	3.3
Meats, poultry, fish, and eggs	1.9
Dairy and related products	2.6
Fruits and vegetables	1.3 (fresh), 3.2 (processed)
Nonalcoholic beverages and beverage materials	2.7
Sugar and sweets	3.6
Fats and oils	3.6
Other (prepared) foods	3.6
Food away from home	10.7
<u>Alcoholic beverages</u>	7.3
Rent of primary residence	11.0
Other renters' cost	3.1
OER and insurance	11.0
Fuel oil and other fuels	1.5
Energy services	1.6
Telephone, water, sewer	14.3
Household furnishings and operations	5.3
Men's and boys' apparel	3.2
Women's and girls' apparel	2.3
Footwear	3.4
Other (incl. Infants' and toddlers' apparel)	5.3
New and used motor vehicles	2.0
Motor fuel	0.7
Other (incl. parts, equipment, maintenance, repair, insurance)	4.1 (parts), 5.8 (repair), 5.9 (insurance)
Public transportation	9.4
Medical care commodities	6.2
Medical care services	14.0
Educational books and supplies	11.1
Tuition, other school fees, and childcare	11.1
Tobacco and smoking products	4.2
Personal care products	6.7
Personal care services	23.7

Source: Bryan and Myer (2010)