A History of BLS Research Consumer Price Indexes and The Equivalized Income Quintile Series

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Bureau of Labor Statistics

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CPI Family of Indexes

Official Indexes

CPI-U	CPI-W	Chained CPI-U

CPI Family of Indexes: comparison

Official Indexes

CPI-U	CPI-W	Chained CPI-U

December 2022 12-month change calculated from published indexes:

6.44%	6.25%	Final released Nov. 2023, Interim 6.47%

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CPI Family of Indexes: research preview

Official Indexes

CPI-U	Chained CPI-U	CPI-W

Research Indexes

Alternate measures
of consumer price change 1

Use /
Purpose

Alternate measures of consumer price change 2

Use

Scope

Alternate measures
of consumer price change 3
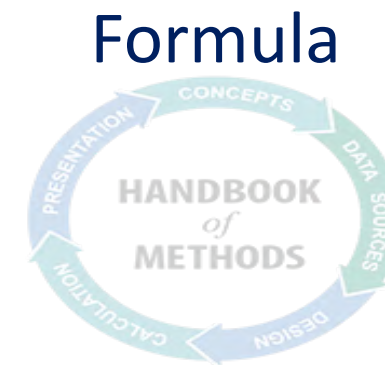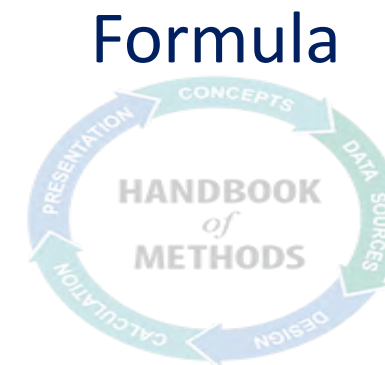
Use

Scope

Formula

HANDBOOK
of
METHODS

BLS

Alternate measures
of consumer price change 4

Use

Scope

Formula

Aggregation

Alternate measures
of consumer price change 5

Use

Scope

Formula

Aggregation

Data
source(s)

Alternate measures
of consumer price change 6

Use

Scope

Formula

Aggregation

Data
source(s)

Limitations
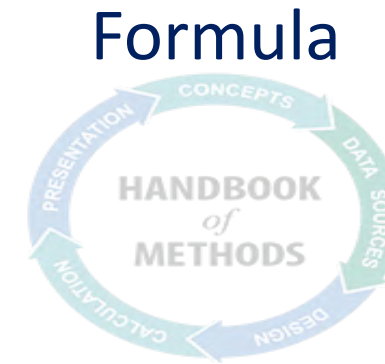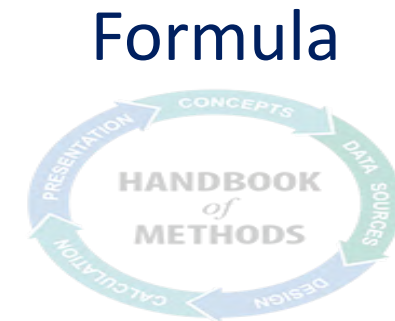
CPI Family of Indexes: research examples

Official Indexes

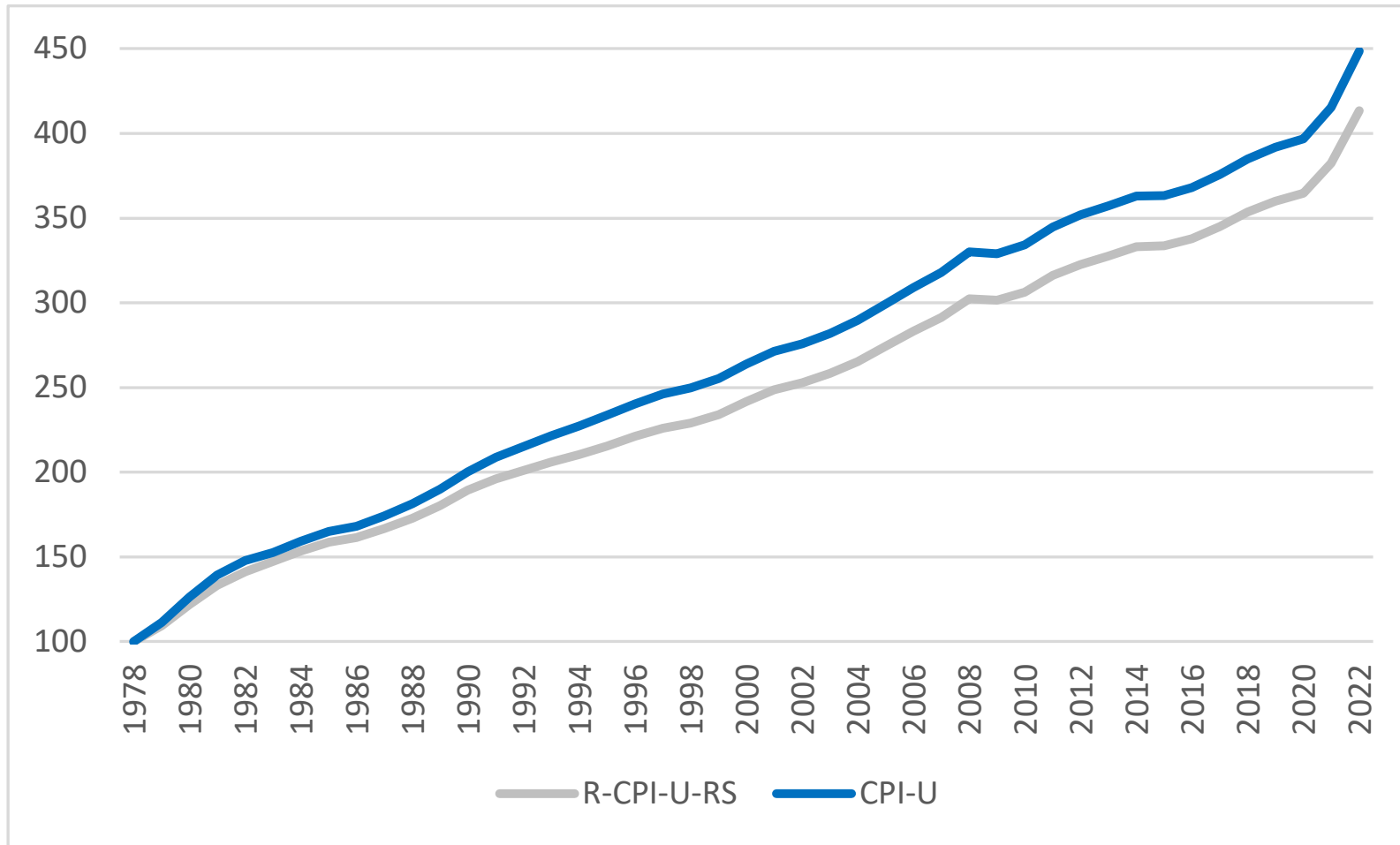|		
CPI-U	CPI-W	Chained CPI-U

Research Indexes

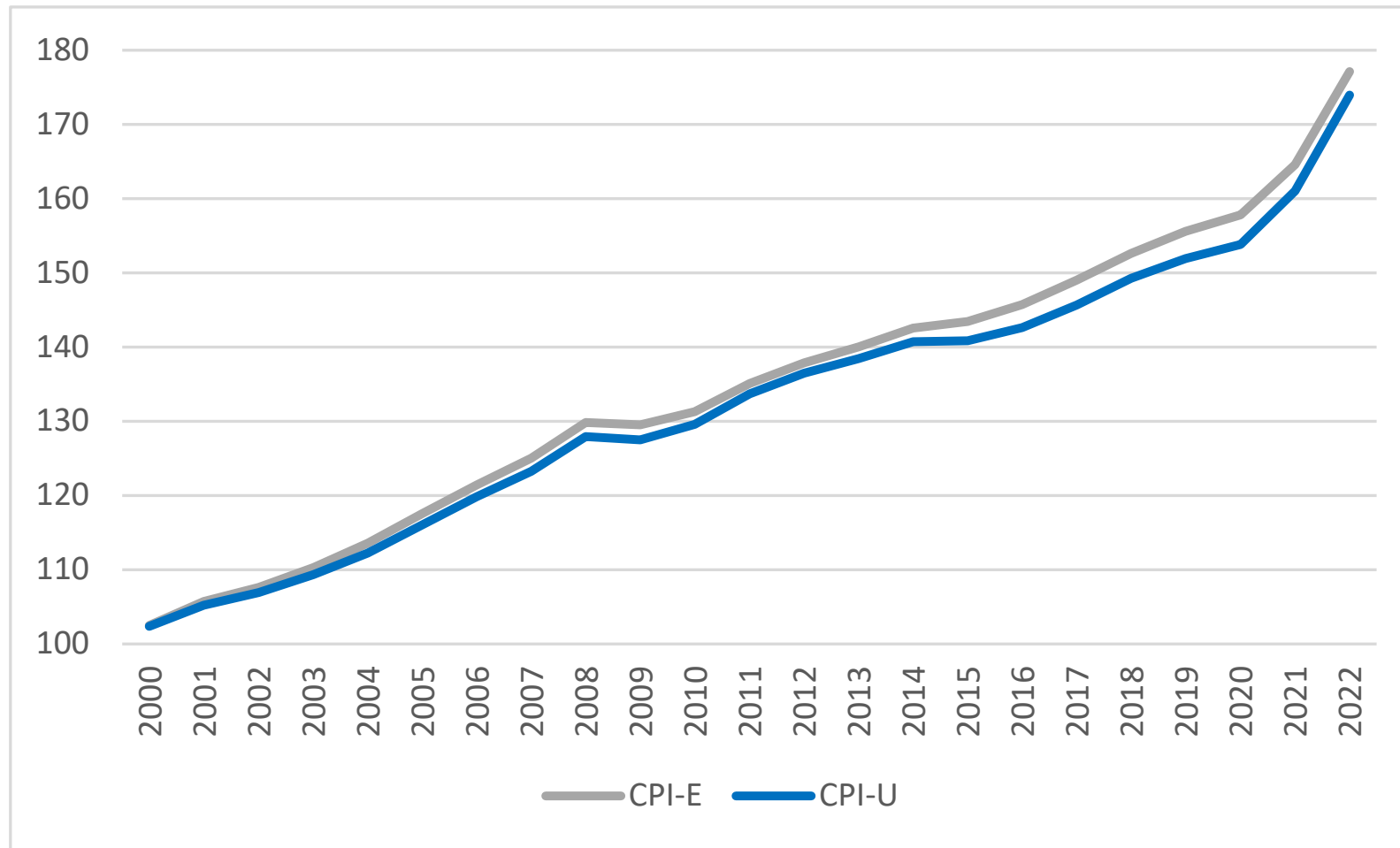|	
R-CPI-U-RS	R-HICP R-COICOP
R-CPI-E	

Retroactive Series (annual average)
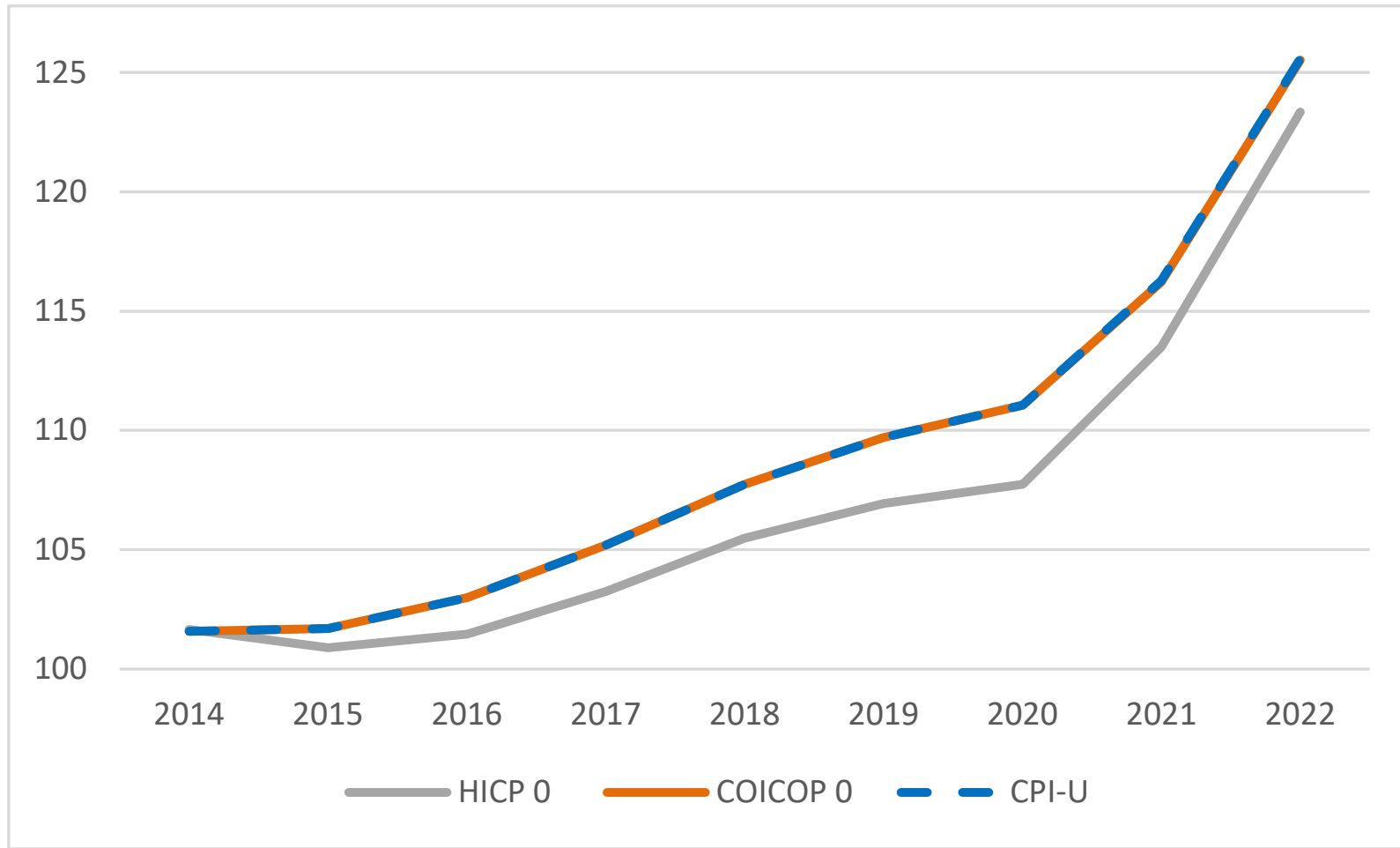## Improvements applied 1978 onward and subject to revisions

CPI-E (annual average)
Americans 62 years of age and older

R-HICP & R-COICOP (annual average)
Harmonized Index of Consumer Prices and Classification of Individual Consumption Acc. to Purpose

CPI Family of Indexes: research income

Official Indexes

CPI-U	Chained CPI-U	CPI-W

Research Indexes

R-CPI-U-RS	R-HICP R-COICOP
R-CPI-E	R-CPI-Income R-C-CPI-Income

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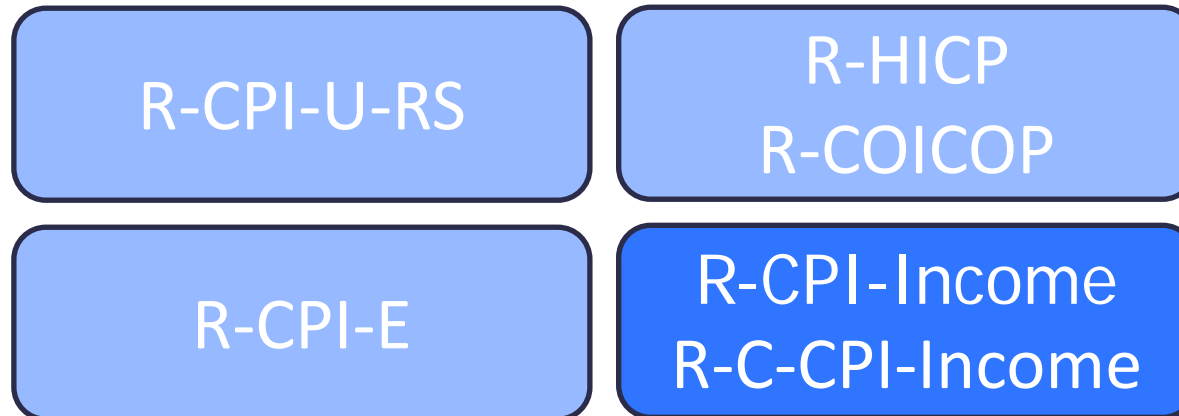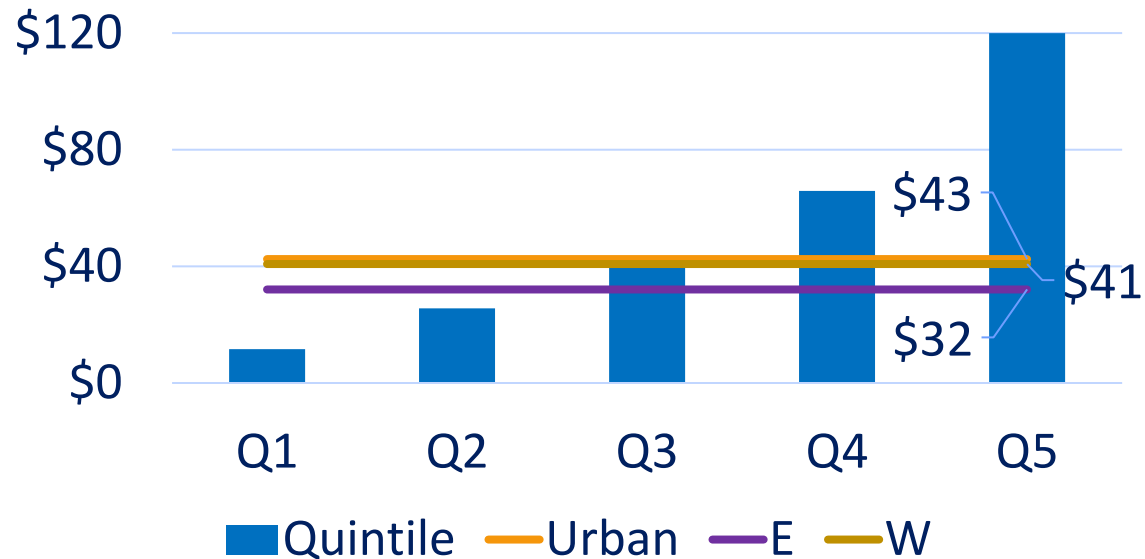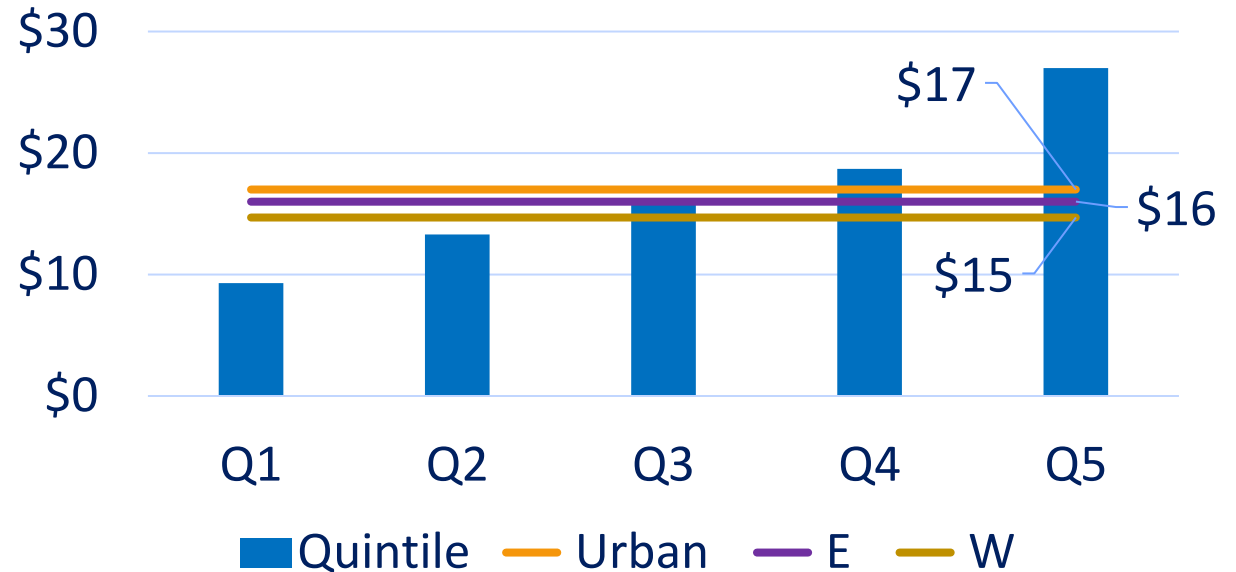
CPI by Income household summary

$$\text{Equivalization} = \frac{\text{Income}}{\sqrt{\text{Family size}}}$$

Median Equivalized Income
2021 collection quarter 4
(in terms of Thousands)

Mean expenditure
2021 collection quarter 4
(in terms of Thousands)

CPI by Income expenditure summary

Housing Tenure

2021 collection quarter 4 (percentage)
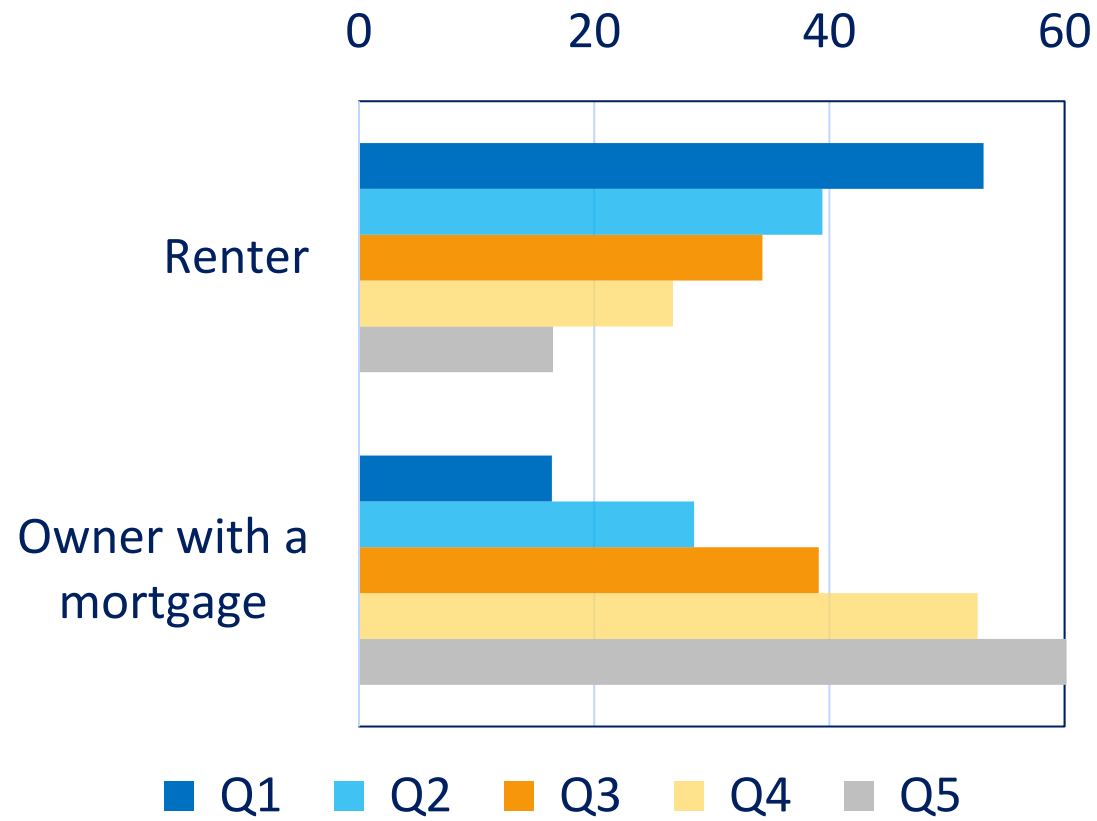
Annual 2021 expenditure share (percentage)
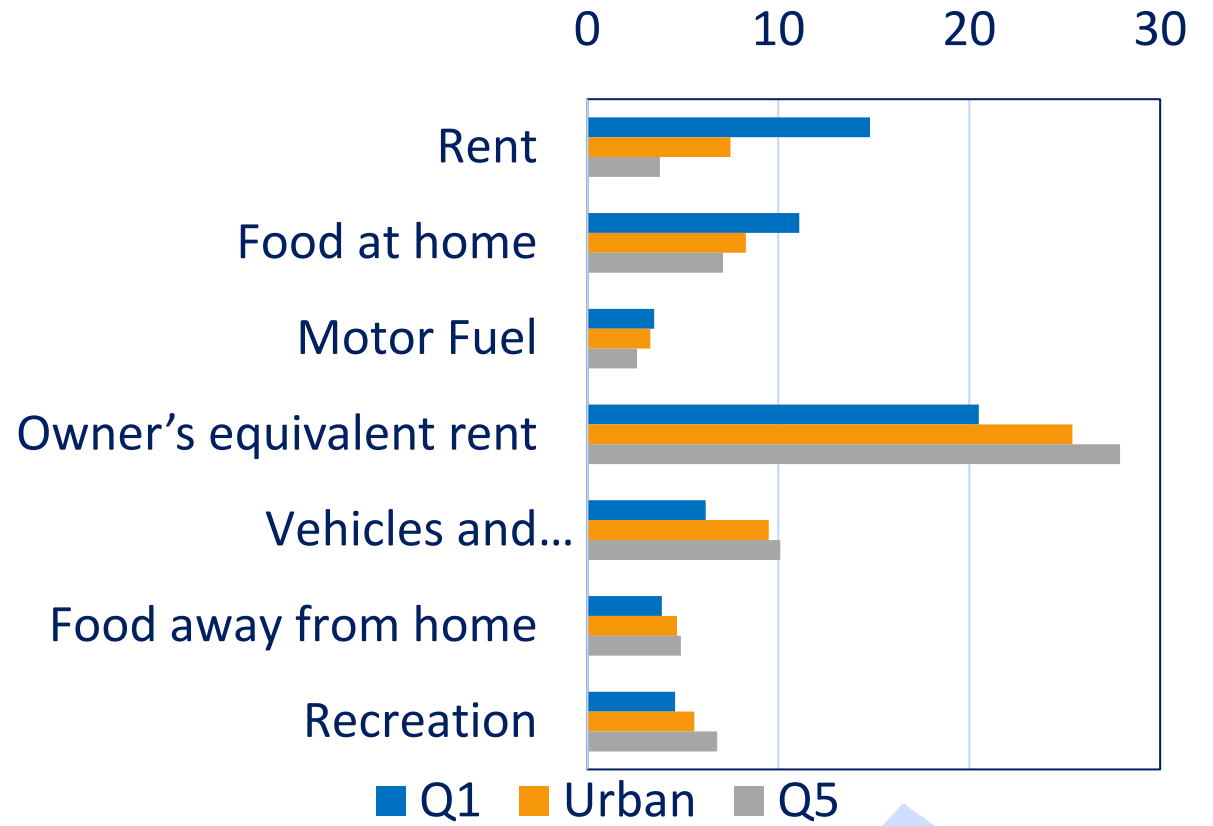
CPI by Income coverage summary item-area cells less than $1
(# Items, percentage of 211 X 32 = 7,776)

	Collected				Smoothed			
	# Items	U	Q1	Q5	# Items	U	Q1	Q5
Overall	209	4	20	10	225	0	0	0
Non-sampled	26	25	63	48	26	4	4	4
Priced	183	1	14	5	199	0	0	0

Annualized Inflation Rate Gap, by equivalized income quintile:

CPI Lowe Formula, December 2005 – June 2023

	Q1	Q2	Q3	Q4	Q5
Annualized inflation rate	2.69	2.63	2.56	2.51	2.42

Urban: 2.52
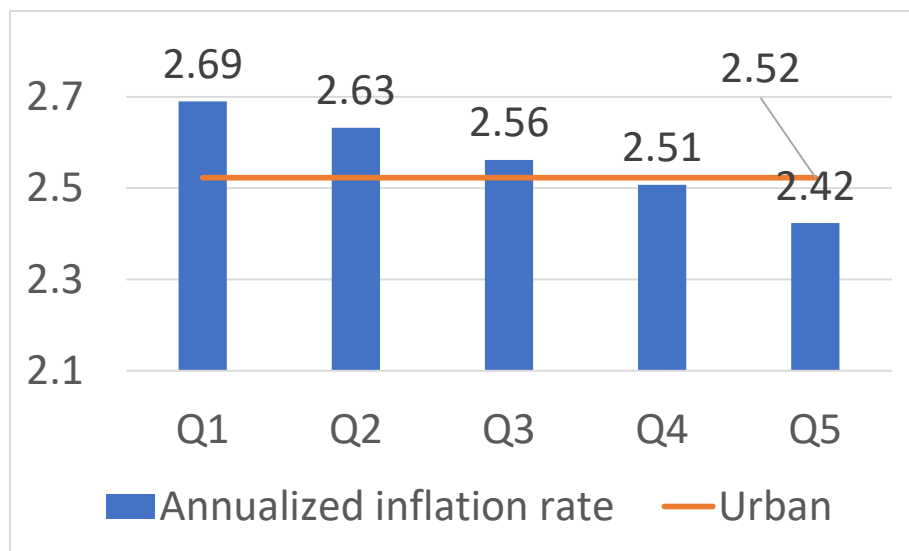
Chained-CPI Tornqvist Formula, December 2005 – June 2022

	Q1	Q2	Q3	Q4	Q5
Annualized inflation rate	2.53	2.39	2.29	2.22	2.14

Urban: 2.27
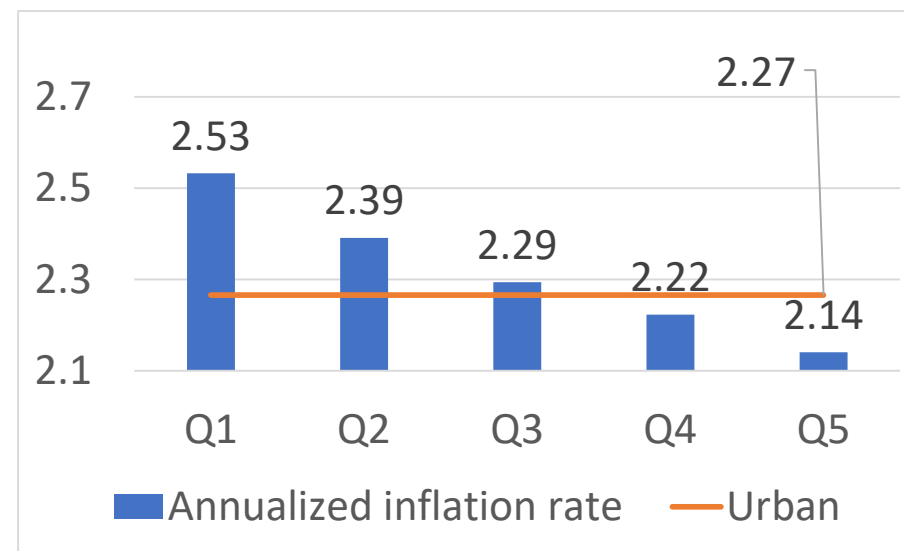
Inflation Gap Variation
Lowest income quintile – Highest income quintile
Annual 12-month percent change December 2006 – June 2023

Items contributing to inflation gap (2022)

	-10	-5	0	5	10	15	20

Rent primary residence(HA01)
Gasoline (all types)(TB01)
Electricity(HF01)
Utility (piped) gas service(HF02)
Cigarettes(GA01)
Motor vehicle insurance(TE01)
Limited service meals/snacks(FV02)
Juices and drinks(FN03)
Cable & satellite tv/radio(RA02)
Chicken(FF01)

Q1 > Q5

Club membership (RB02)
Child care & nursery school(EB03)
Owners' rent secondary res.(HC09)
Leased cars and trucks(TA03)
Full service meals and snacks(FV01)
Commercial Health Insurance(ME01)
Owners' rent primary residence(HC01)
Lodging away from home(HB02)
Airline fare(TG01)
New vehicles(TA01)

Q1 < Q5

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Limitations

- **Upper-level weighted measures of price change:**
  - „ Lower-level price change represents urban population

- **Lower-level item heterogeneity:**
  - „ Degree that cohort specific prices/outlets impact substitution due to price change

- **National rank distribution:**
  - „ Subnational indexes not feasible because the weights are not equivalent across quintiles (within basic areas)

R-CPI-I and R-C-CPI-I Resources

- Publications: [Initial working paper](#), [Spotlight on Statistics](#)
- Home page: https://www.bls.gov/cpi/research-series/r-cpi-i.htm
- **Data**

- R-CPI-I Dec 2005 - June 2023 ([XLSX](#))

- R-C-CPI-I Dec 2005 - June 2022 ([XLSX](#))

- R-CPI-I relative importance, December 2022 ([XLSX](#))

CPI Family of Indexes: research

Official Indexes

CPI-U	Chained CPI-U	CPI-W

Research Indexes

R-CPI-U-RS	R-HICP R-COICOP	Household Cost Index?
R-CPI-E	R-CPI-Income R-C-CPI-Income	New Tenant Rent Index?

Contact Information

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www.bls.gov/cpi

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CPI Research Indexes https://www.bls.gov/cpi/research-series/

Name	Abbreviation	Series type	Description
Classification of Individual Consumption According to Purpose	R-COICOP	Alternative aggregation structure	The Classification of Individual Consumption According to Purpose (R-COICOP) is provided monthly to the Organisation for Economic Cooperation and Development (OECD) to allow for international comparisons of consumer price index statistics. See the R-COICOP homepage for additional information and to access the data.
CPI for Americans 62 years of age and older	R-CPI-E	Alternative population group	The index for the elderly (R-CPI-E) is a research price index for Americans 62 years of age and older which uses different weights than other CPI indexes. The series is predominately used by researchers, news agencies, and some companies, and has several limitations to the data. See the CPI for the elderly homepage for additional information and to access the data.
CPI for equivalized income quintile subpopulations	R-CPI-I and R-C-CPI-I	Alternative population group	These research indexes by equivalized income quintiles, the R-CPI-I and the R-C-CPI-I, paint a fuller picture of inflation than the CPI-U and C-CPI-U for users interested in the state of the economy. See the R-CPI-I and R-C-CPI-I homepage for additional information and to access the data.
CPI using geometric means	R-CPI-U-G	Alternative formula	This index, called the research CPI using geometric means (R-CPI-U-G), uses a geometric mean formula for 100 percent of items to combine individual price quotations at the lower level of aggregation while keeping the Laspeyres arithmetic mean formula for higher level aggregation. This series is predominately used by researchers. See the R-CPI-U-G homepage for additional information and to access the data.
CPI using Laspeyres arithmetic means	R-CPI-U-L	Alternative formula	This index, called the research CPI using Laspeyres arithmetic means (R-CPI-U-L), uses a Laspeyres arithmetic mean formula for all levels of aggregation. This series is predominately used by researchers. See the R-CPI-U-L homepage for additional information and to access the data.
Disease-based price indexes	R-DBPI	Research index for specific categories	Disease-based price indexes are research data constructed by the Bureau as an alternative to current methods of estimating inflation, real medical output, and real consumption. Disease-based price indexes are in their nascent stages and regarded as research indexes as we learn more from the studies that we and others conduct, including most prominently the work of the Bureau of Economic Analysis on a Health Care Satellite Account. See the Disease-Based Price Indexes homepage for additional information and to access the data.
Harmonized Index of Consumer Prices	R-HICP	Alternative aggregation structure	The Harmonized Index of Consumer Prices (R-HICP) is designed for international comparisons of consumer price inflation. The primary users of the U.S. R-HICP indexes are the International Labor Comparisons program, operated by the Conference Board, and Eurostat. See the R-HICP homepage for additional information and to access the data.
New vehicles research index	R-CPI-U-NV	Alternative collection methods	The new vehicles research index (R-CPI-U-NV) was first published from May 2019 to June 2021. This index uses a dataset purchased from J.D. Power of transaction-level new vehicle prices. This index methodology was adopted for use in the official CPI. See the New Vehicles research homepage for additional information, to access the data, and to learn how to provide feedback on the new measures.
Retroactive Series	R-CPI-U-RS	Historical time series based on current methods	The Retroactive Series (R-CPI-U-RS), formerly known as the Research Series, uses current methodology to estimate the CPI-U from 1978 to the present by incorporating most of the improvements made over that time span into the entire series. The series is predominately used by researchers and has some limitations. See the Retroactive Series homepage for additional information and to access the data.