

Expanding the family of US Consumer Price Indexes

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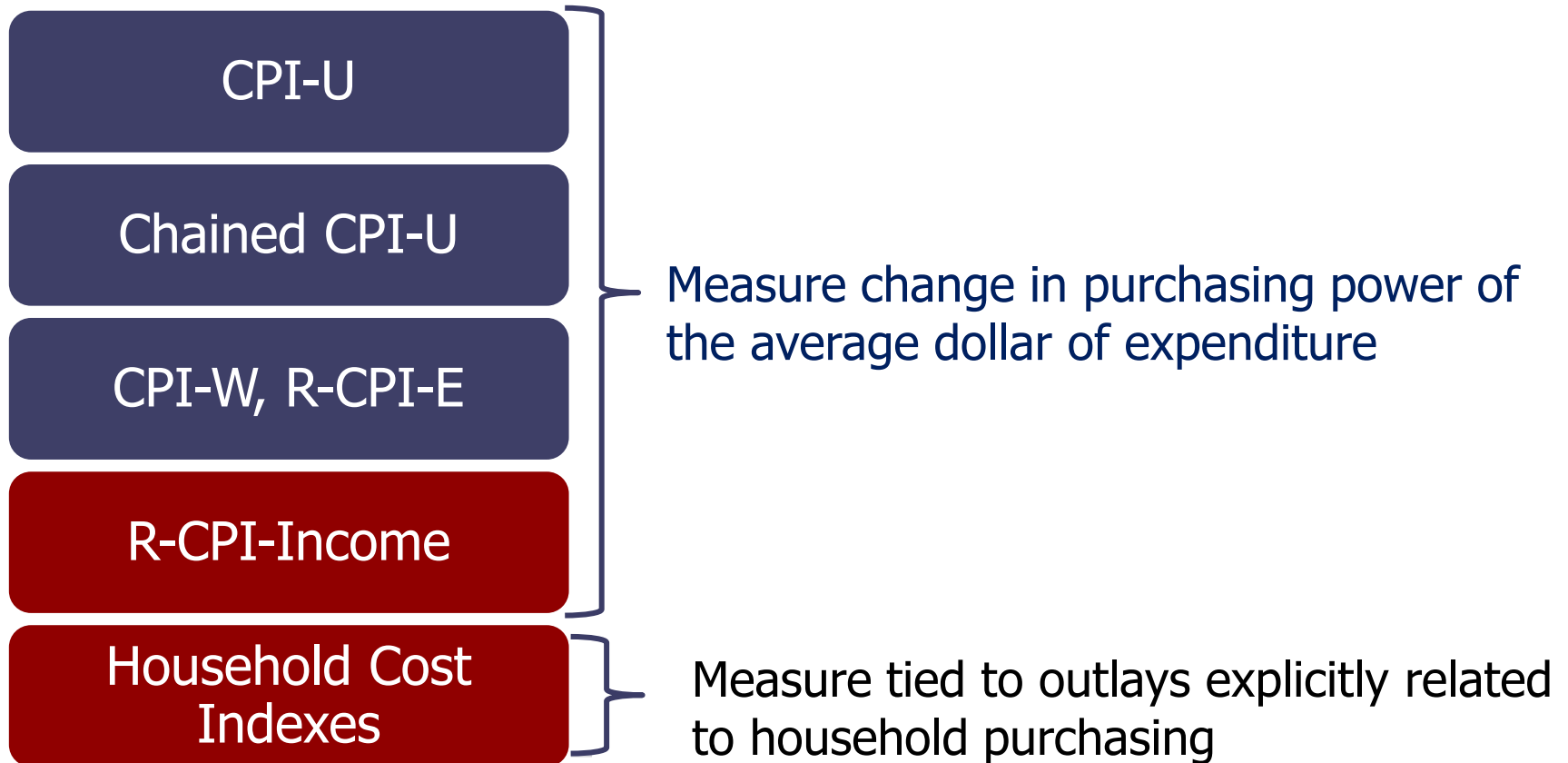
Bureau of Labor Statistics

Meeting of the Group of Experts on CPIs

June 8, 2023



CPI Family of Indexes - Concepts



Outline



Motivation



Income-based indexes



Household Cost Indexes



Next steps

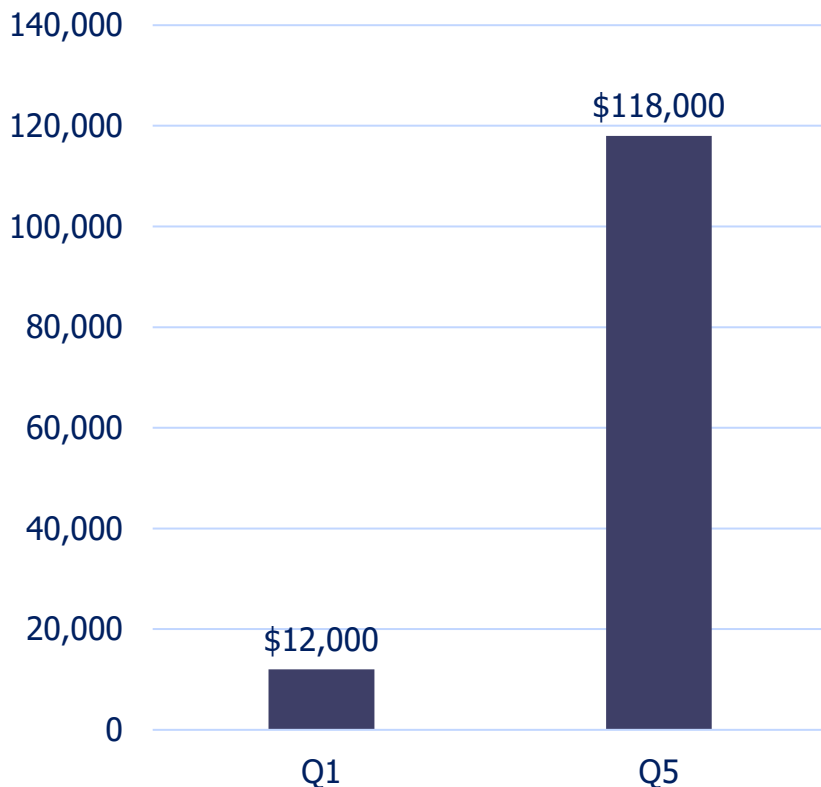
Motivation – Increased need for data granularity

- Committee on National Statistics recommendation
- Federal Reserve Bank interest
- Office of Management and Budget, Bureau of Economic Analysis, and other government interest
- General user interest (major media)
- Publications: [Initial working paper](#), [Spotlight on Statistics](#)



CPI by Income Methodology

Median Equivalized Income
(Interview Survey - 2021)



Expenditure weights

Group CE respondents into weighted ranking of equivalized income quintiles

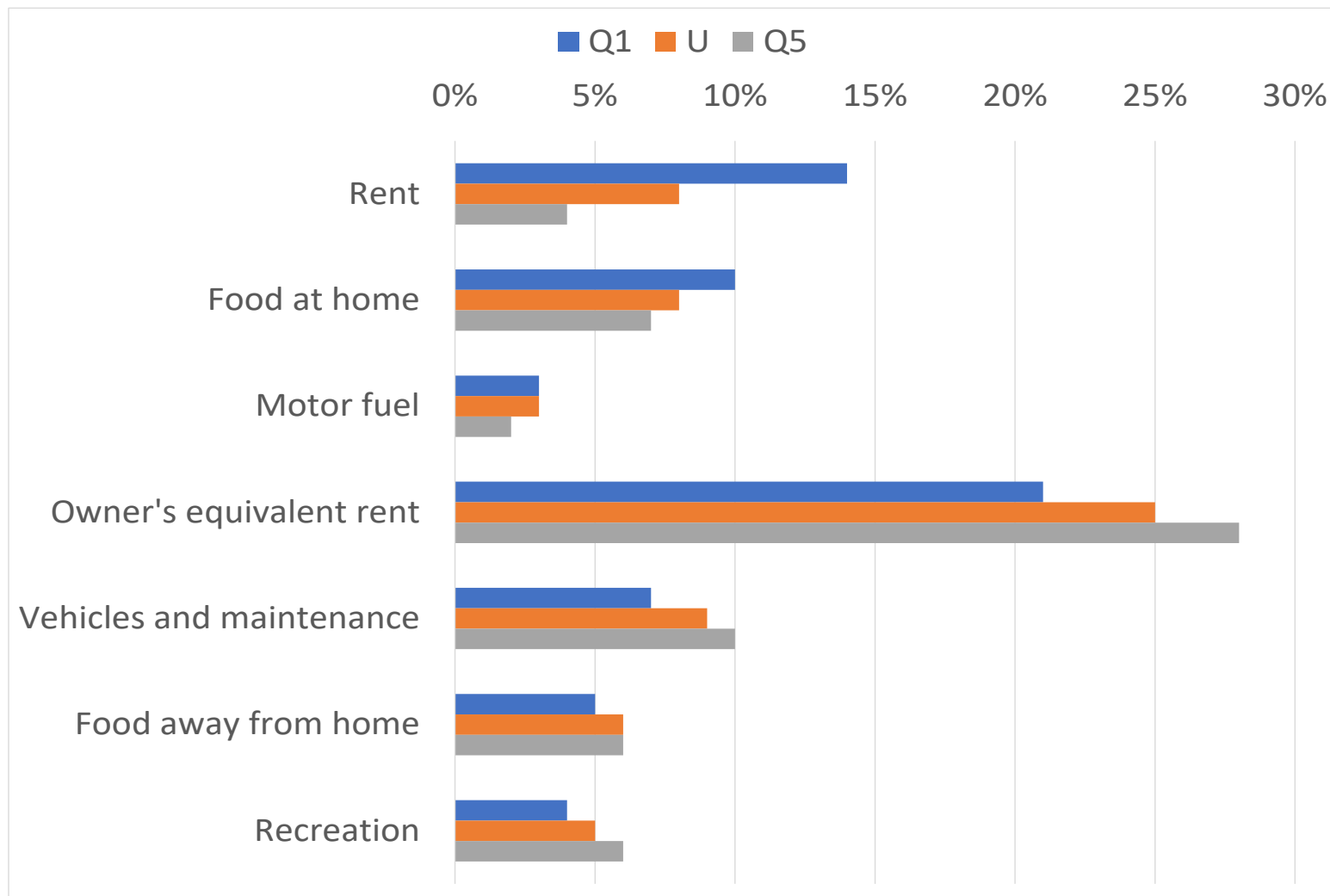
Prices/rents

All lower-level data the same (prices, outlets, rents)

Index aggregation

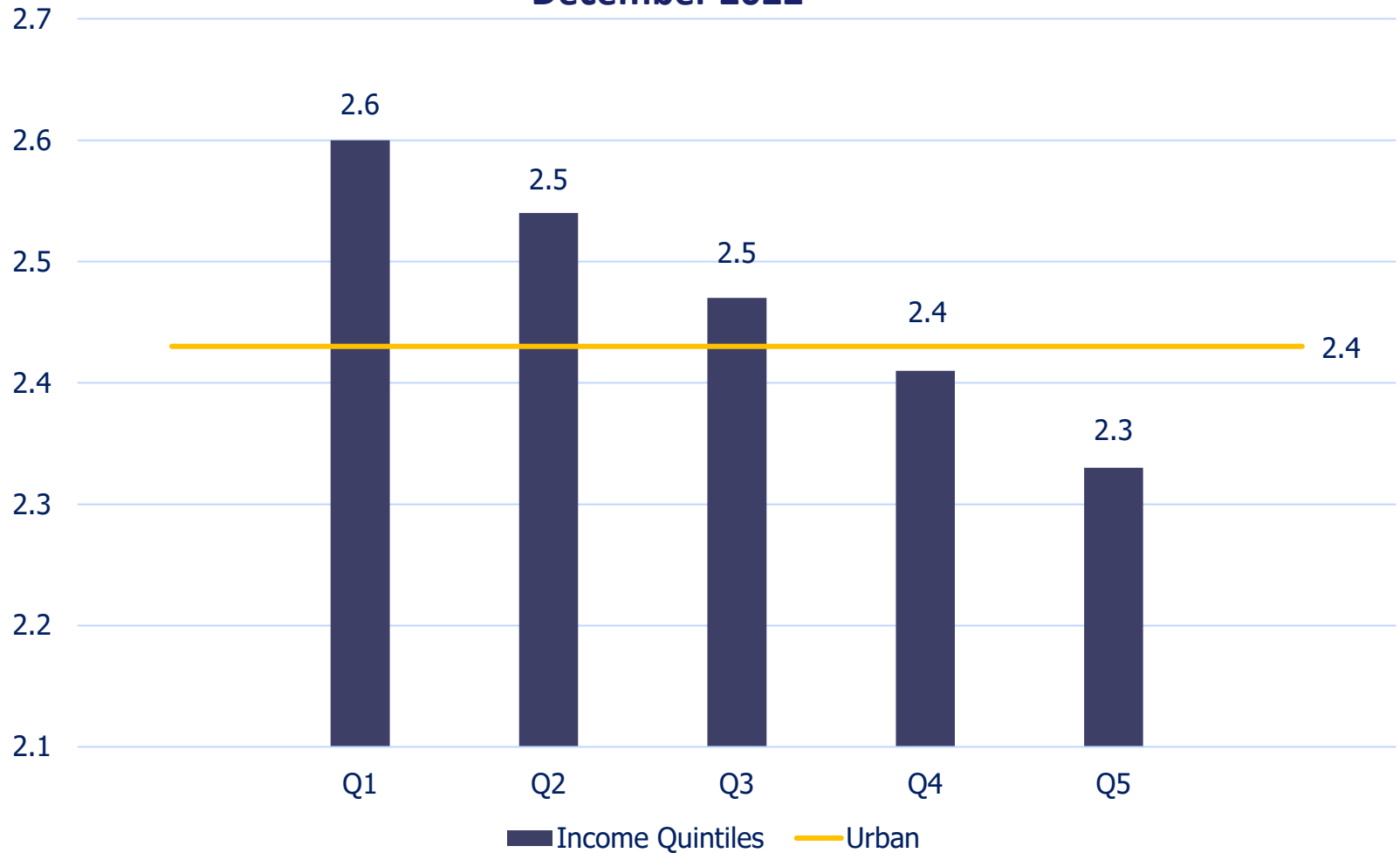
Lowe, Tornqvist aggregation from lowest-level basic indexes

Snapshot of spending weights by population, 2019-2020 biennial expenditure weight share, equivalized income



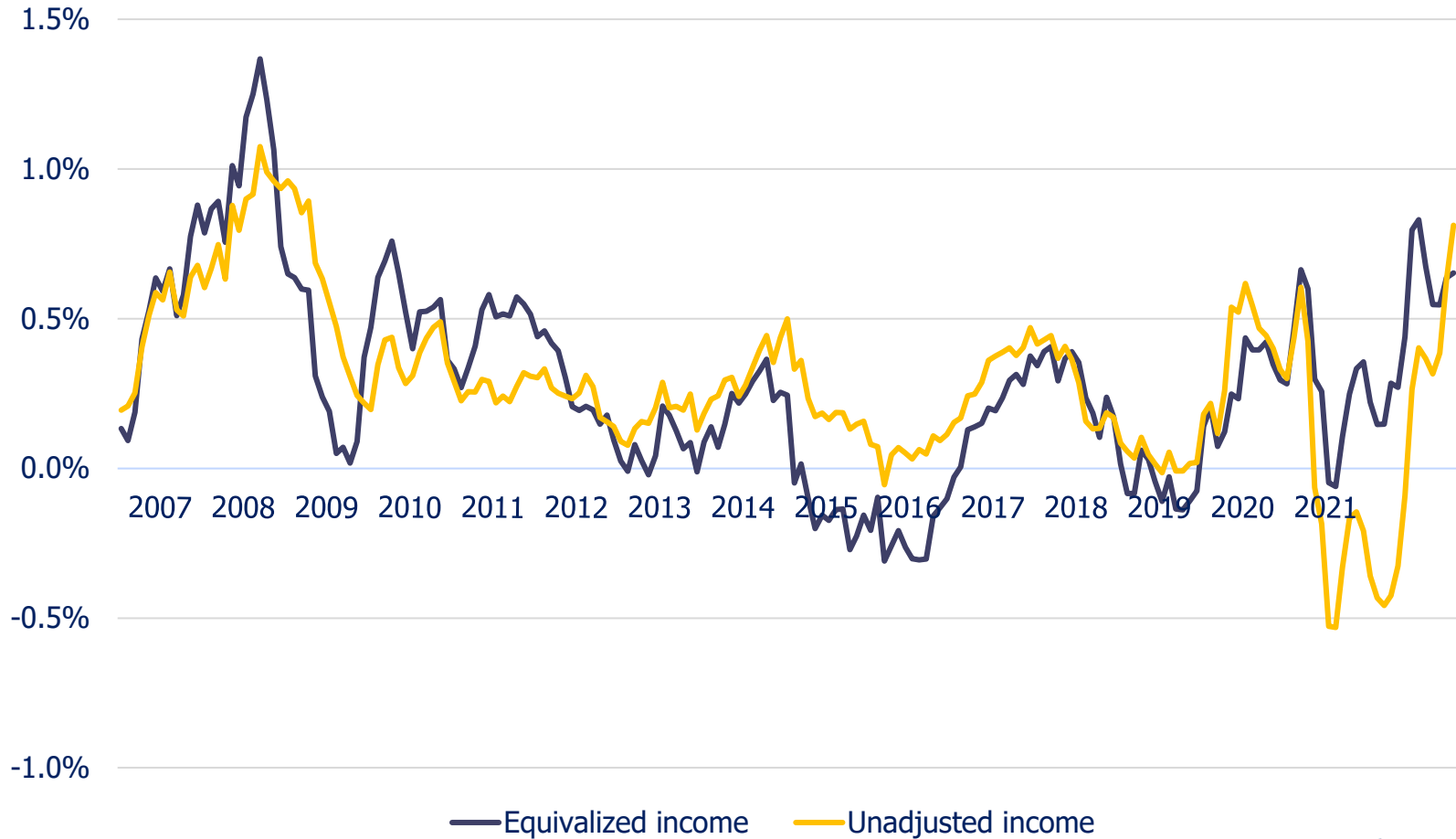
Annualized Inflation Gap

Annualized inflation rate, CPI by income quintile, Lowe Formula, December 2005 - December 2022

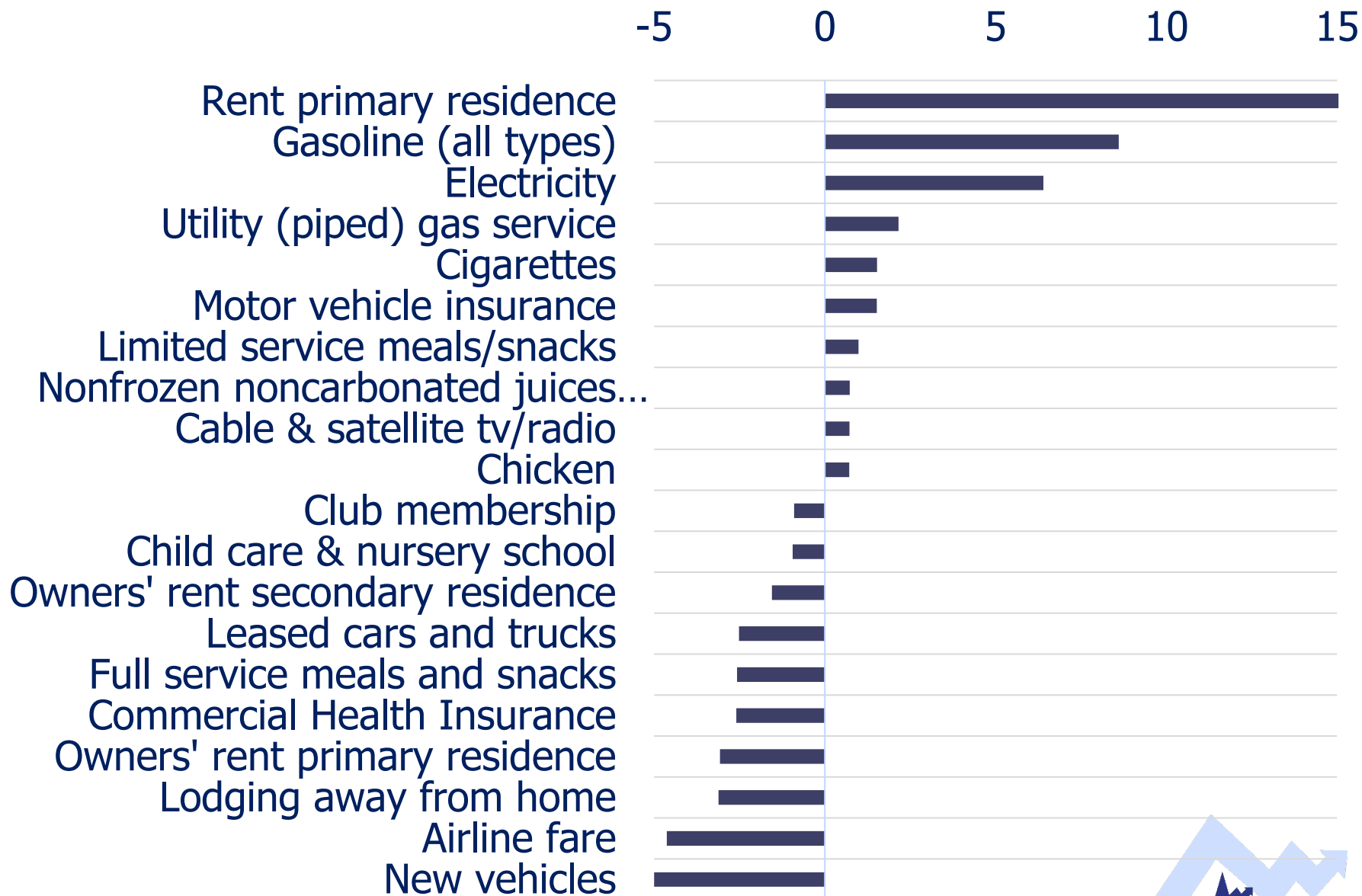


Inflation Gap Variation

Lowest income quintile – Highest income quintile
Annual 12-month percent change
December 2006 – December 2022



2022 Year over year inflation gap (Q1-Q5) CPI contributions to All-Items (percentage)



Limitations and Future Improvements

- Lower-level price heterogeneity
 - ▶ Re-weighting housing prices shows little impact (Malloy, Larson 2021)
 - ▶ 2/3rd price change in grocery items missed (Jaravel 2019)
- BLS future research
 - ▶ Further investigate housing adjustments
 - ▶ Re-weighting alternative data (gasoline, new vehicles)
 - ▶ Interested in a scanner data program (CNSTAT recommendation), but funding...

Household Cost Index

- Inspired by Office for National Statistics and Statistics New Zealand
- Definition: Measure the change in cash outflows required, on average, for households to access the goods and services they consume
- Methodology:
 - ▶ Household (democratic) aggregation,
 - ▶ Payments-approach to owner-occupied housing
 - ▶ Urban population

Household (Democratic) Aggregation

- Create household-level expenditure shares using Consumer Expenditure Survey data
 - ▶ Eligible expenditures from the Diary survey imputed to the Interview sample using a matching procedure based on Hobijn, et. al. (2009)
- Aggregation across households
 - ▶ Lowe formula with lagged expenditure weights
- Limitations
 - ▶ Infrequent purchases (particularly vehicles) pose a challenge
 - ▶ Limit to household with 4 quarters of expenditures (limits use of data to about a third)

Payments Approach – Mortgage Interest Payment

■ Weights

Consumer Expenditure Survey

■ Prices

Mortgage interest payment index =

Debt index * Interest rate index

Data sources:

- Federal Housing Finance Agency's All Transactions House Price Index
- Freddie Mac Primary Mortgage Market Survey

Payments Approach – Property Tax Payments

- Weights

Consumer Expenditure Survey

- Prices

Property Tax Payment Index =

$$\frac{\text{Total property tax payments}}{\text{Total housing stock value}} * \text{Constant quality home price index}$$

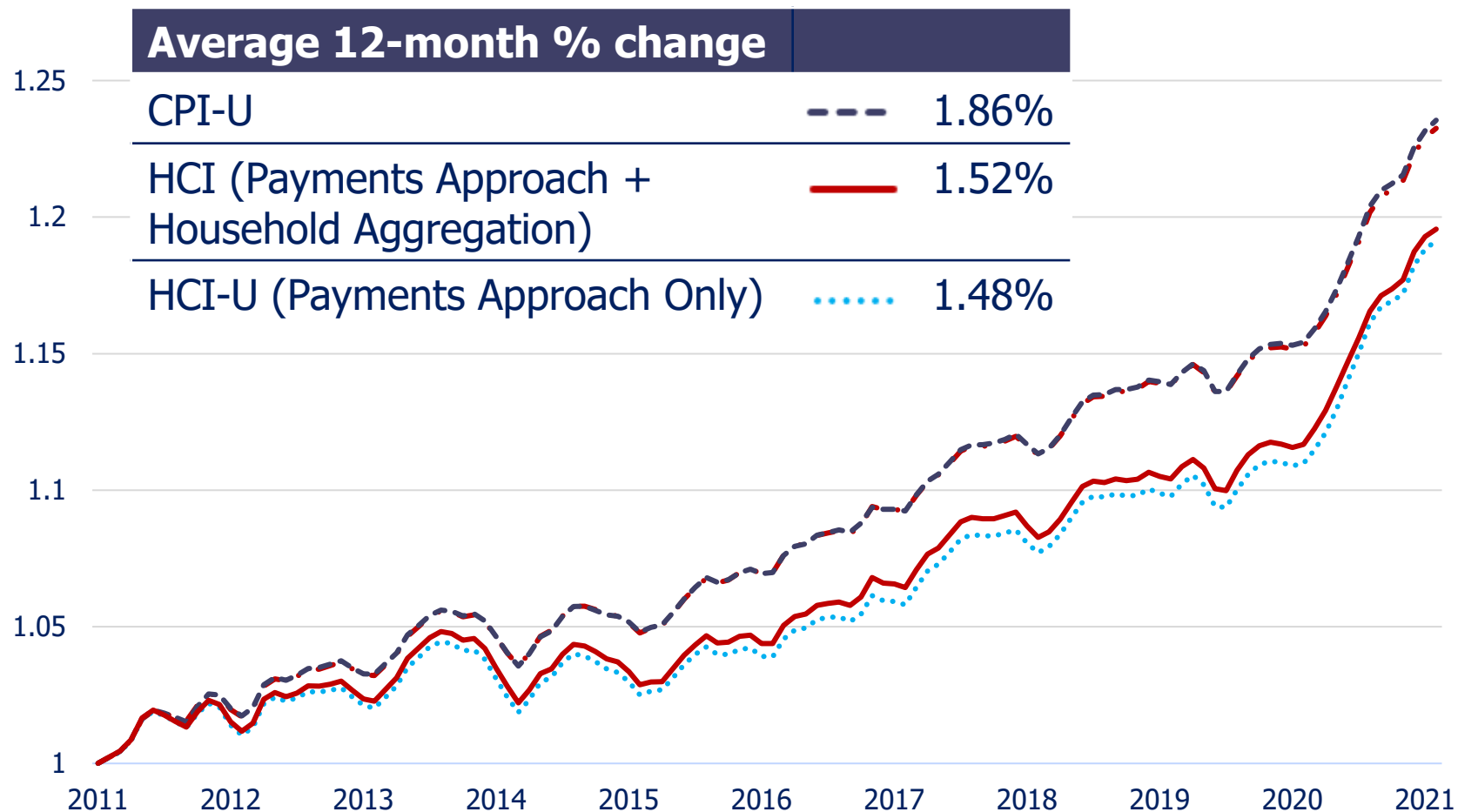
Data source: CE

HCI – Relative Importance

Major Group	CPI-U	HCI-U
Food and Beverages	15.2	20.1
Housing	42.4	34.3
Apparel	2.7	3.1
Transportation	15.2	14.3
Medical	8.9	11.1
Recreation	5.8	6.6
Education and Comm.	6.8	6.7
Other	3.2	3.7
Reference Period	2017-18	2019
CE Sample	Full	4-quarter



HCI – Index Results



Limitations - HCI

- Household aggregation
 - ▶ Infrequent purchases (challenge especially with Tornqvist)
 - ▶ Include in HCI given small impact?
- Payments approach
 - ▶ Investigate a microdata approach for mortgage interest index
 - ▶ Investigate including mortgage principal

What's next?



Improve methodology

Income-group specific lower-level indexes

Next step for HCI research?



Stakeholder outreach

Group of Experts
BLS advisory committees
Federal Committee on
Statistical Methodology



Publish regular updates

R-CPI-Income
C-CPI-Income
HCI?

Contact Information

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