

# The Treatment of Owner-Occupied Housing in the U.S. CPI

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# Outline

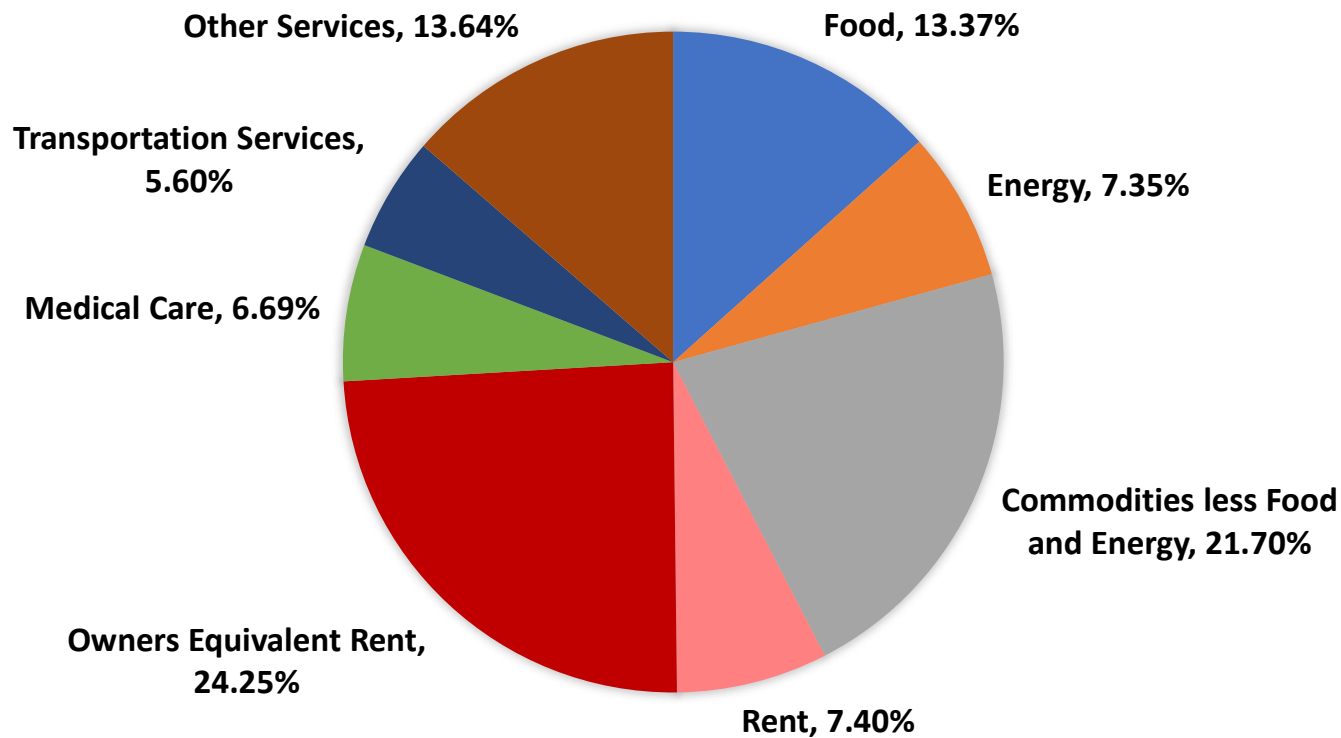
1. Introduction
2. History of BLS OOH Treatment
3. Rental Equivalence
4. Payments



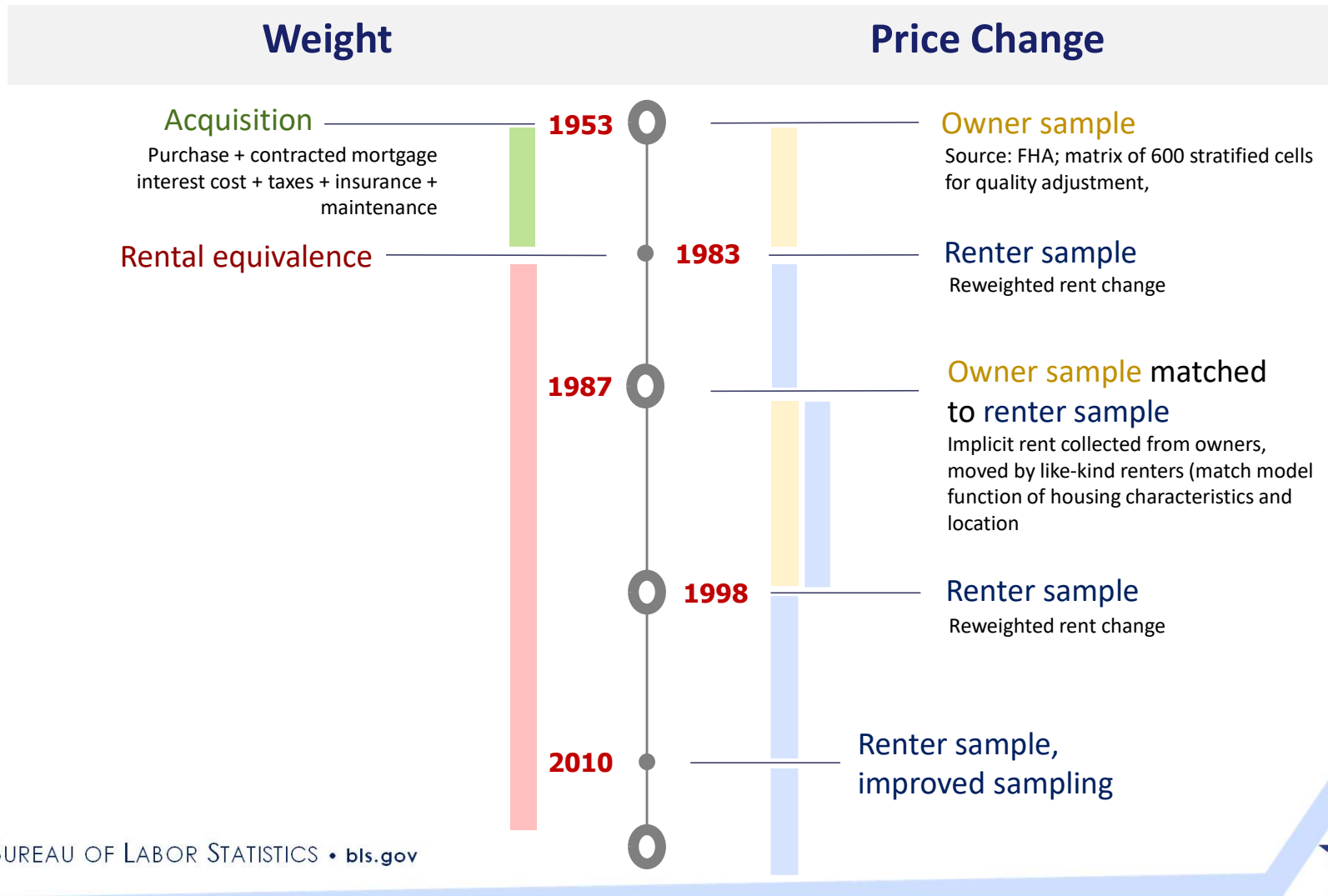
# Price Index Timing

- Acquisition of, use or consumption of, and payment for a good or service may occur in different periods.
- Examples: Owner-occupied housing (OOH), storable or durable goods, advance purchases
- Three approaches to answering “when” and “how much”.
  - ▶ Acquisitions
  - ▶ Use (rental equivalence, user cost)
  - ▶ Payments

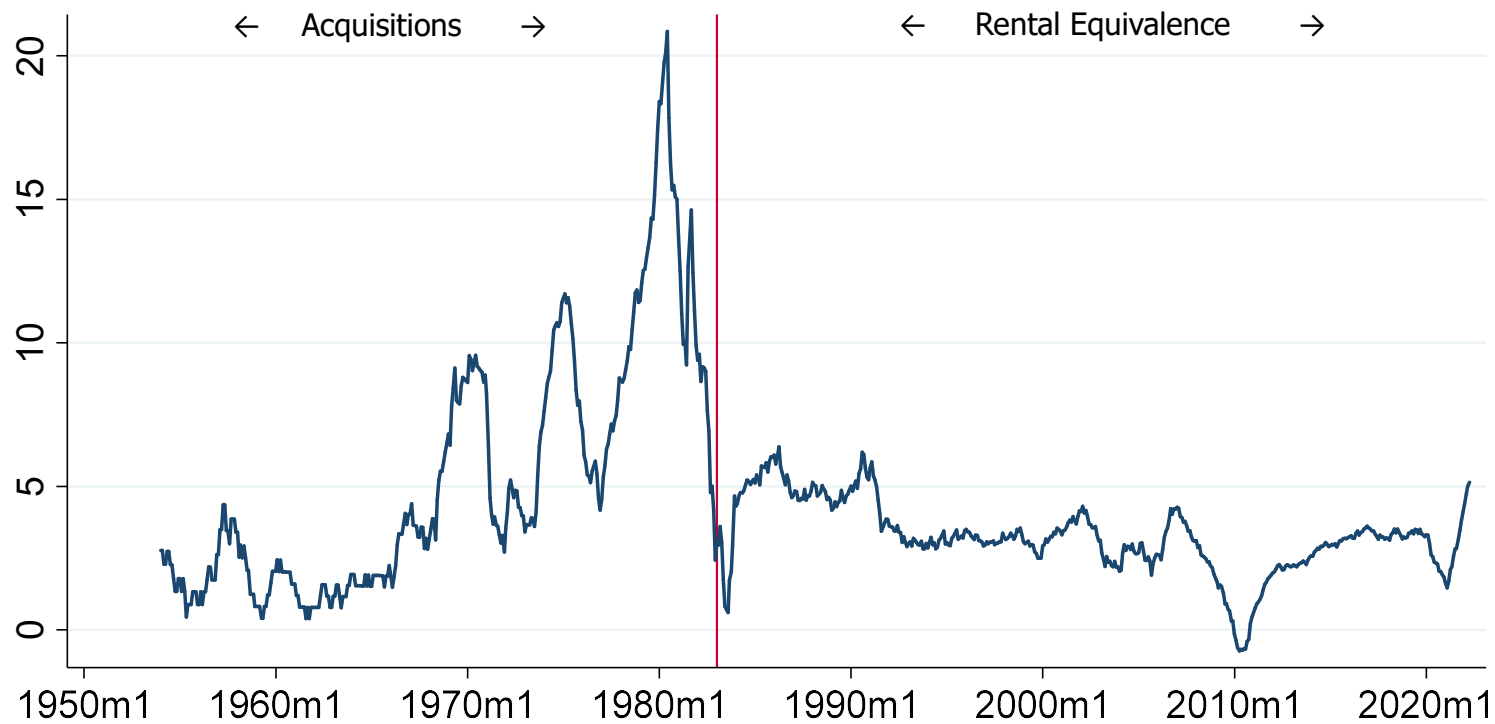
# CPI-U Relative Importance, Dec. 2021



# History of OOH treatment in US CPI



# Acquisitions to Rental Equivalence



CPI: Shelter (12-month Percent Change)

# Rental Equivalence

- Consumer Expenditure Survey (CE) questionnaire:

*“If someone were to rent this (including part of the property currently being used for business, farming, or rented/home today) how much do you think it would rent for monthly, unfurnished and without utilities?”*

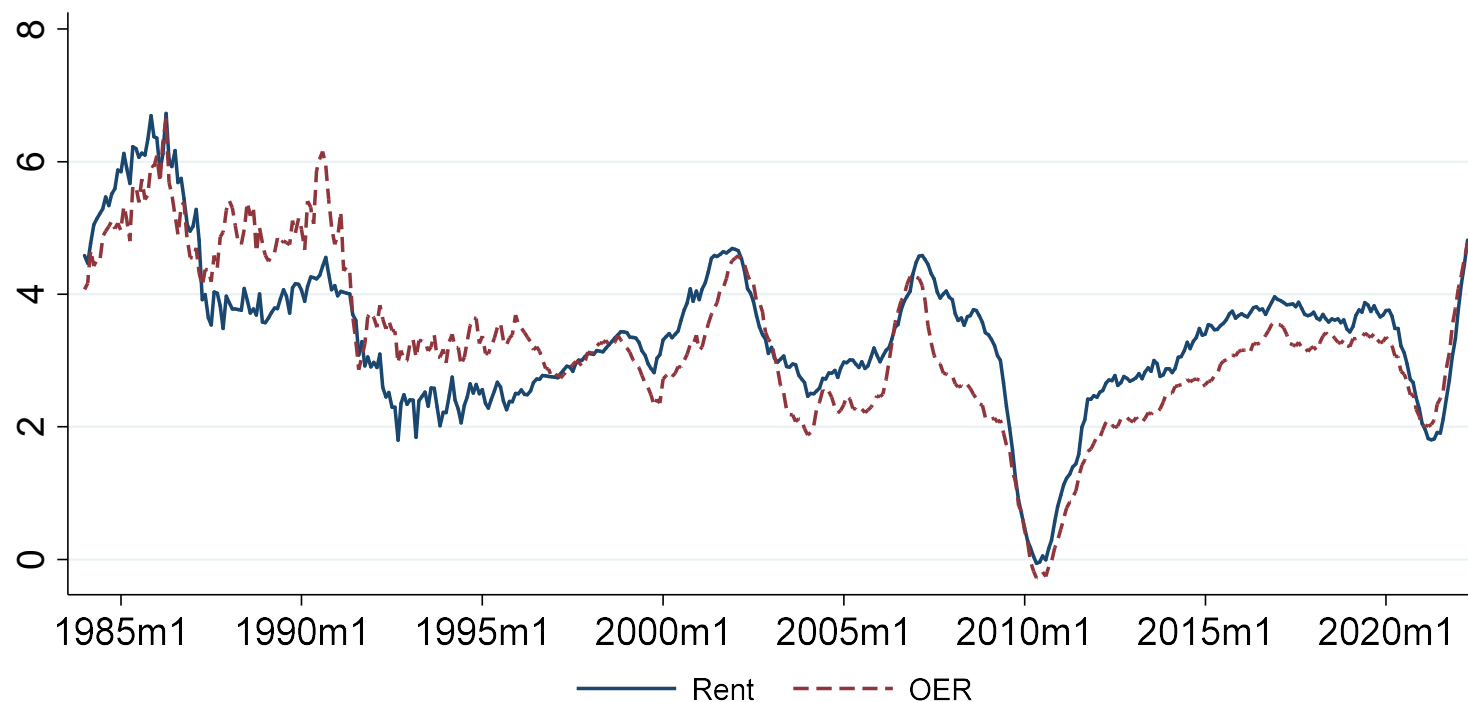
# BLS Owner Equivalent Rent (OER) Methodology

- **Sampling** – Target sample of 43,000 renters using probability proportional to size for primary sampling units, neighborhoods, and housing units
- **Collection** – Divide sample into six balanced panels and price each panel every six months ( $t$  and  $t - 6$ )
- **Review** – Trigger units based on rent, spec, and message changes to ensure constant quality
- **Estimation** – Produce 32 basic area indexes and aggregates monthly by taking sixth roots of six month rent changes





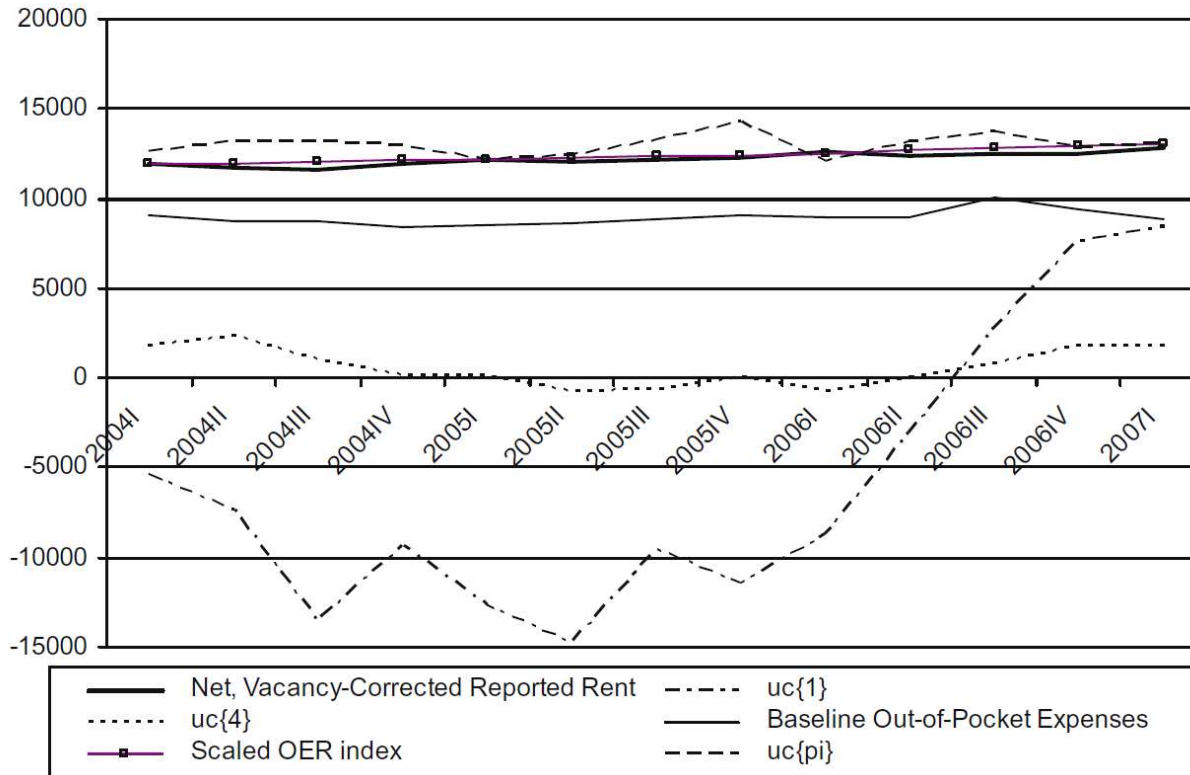
# Rent and Owner Equivalent Rent Comparison



CPI: Rent and Owner Equivalent Rent (12-month Percent Change)



# Rents vs. User Costs (1-yr.) Over Time



- User Cost (UC)
- = interest
- + depreciation
- + property taxes
- + insurance
- + expected appreciation or depreciation

Source: Garner and Verbrugge (2008). Fig. 7. Alternative Shelter Costs over Time - National



# Rental Equivalence: Challenges and Issues

- Using rents to impute OOH – no observed prices
- Comparisons to home values or new tenant indexes
- Lagged rent changes due to  $rent_{it}/rent_{i,t-6}$  construction
- Structure-type composition



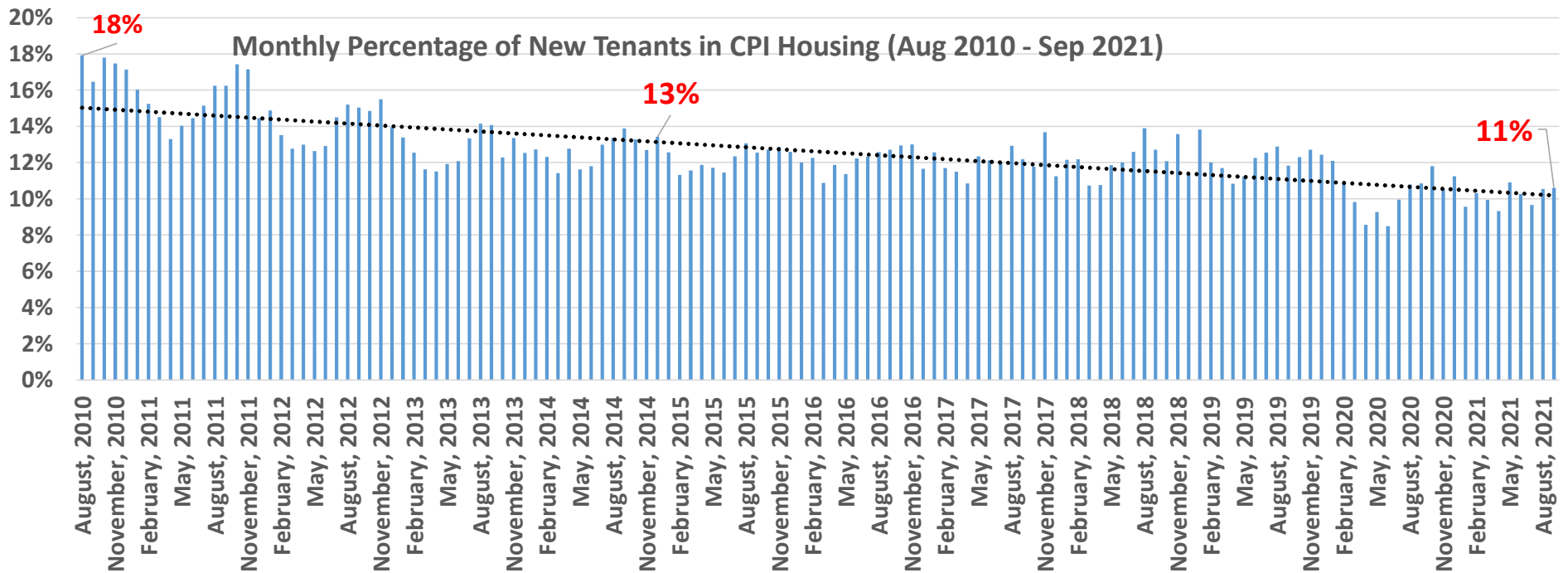
# Consumption vs. Investment



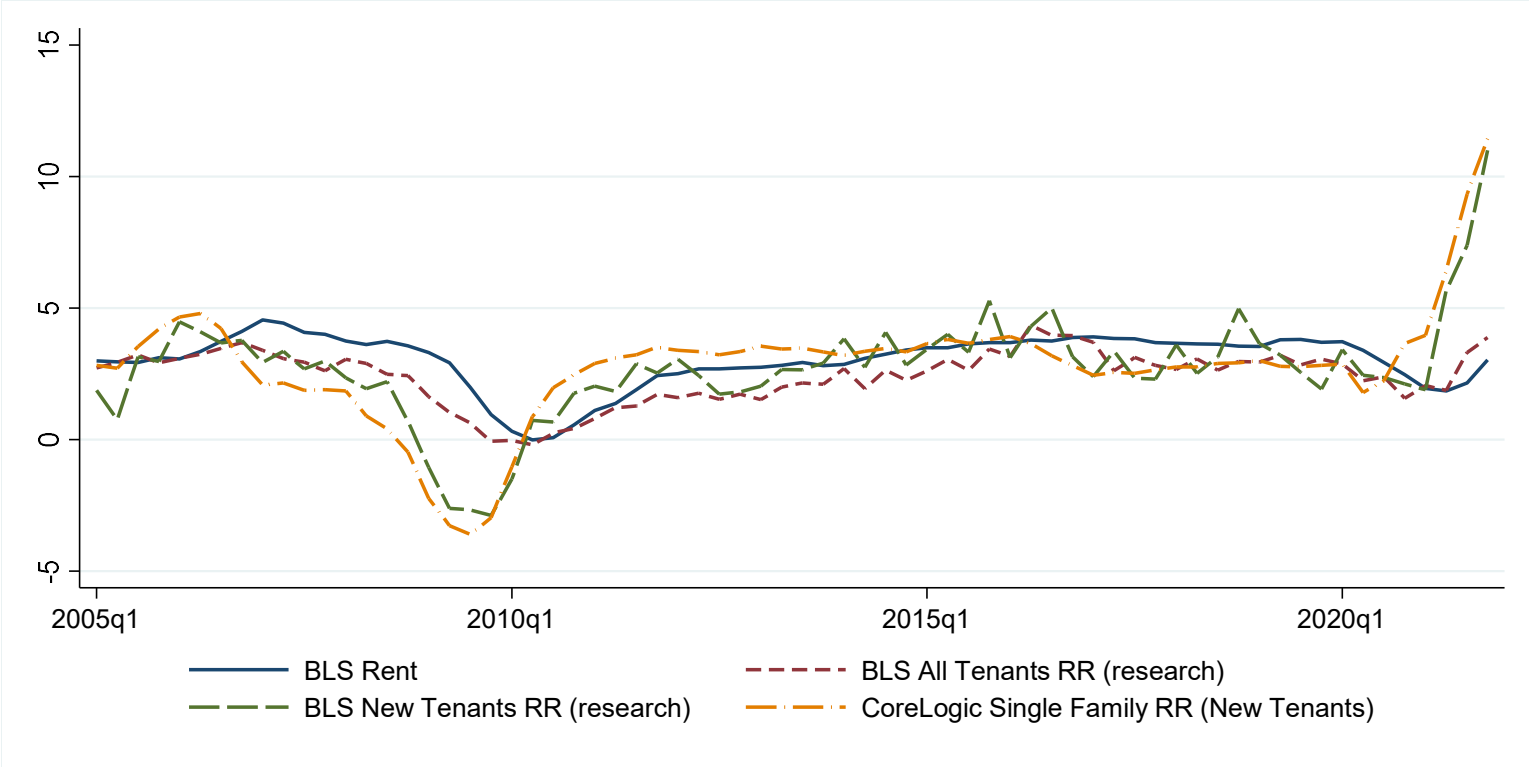
Growth in Different Housing Price Concepts (1991m1=100)



# New vs. Same Tenants



# BLS Rent Index vs. Alternative Methods



Comparing rent index methods (four quarter percent changes)



# Structure-Type Composition

- Adams and Verbrugge (2020) show that the CPI housing rent sample underrepresents single family houses in its OER estimator
  - ▶ 33.6% vs. 86.6%
- Estimated contribution to OER mismeasurement  $\approx 0.34\%$  per year from 2013-16
- Using a type-of-structure re-weighting solution could account for the mis-measurement



# CNSTAT Recommendations

- Continue to use REQ as primary approach for housing services
- Seek new data sources for single-family homes
- Make use of characteristics in tax data
- Consider a supplementary series with repeat sales approach
- Research user cost and opp. cost approaches as comparisons
- Use same methodology for subgroup cost-of-living indexes





# Payments Research

- The Use approach (rental equivalence or user cost) is appropriate for measuring implicit prices of housing services for a consumer price index or cost-of-living index.
- The Payments approach measures the change in explicit expenditures required for the household to access (pay for) housing services.
- Payments captures different aspects of the household experience, particularly for certain subpopulations.



# Owner-Occupied Housing

Payments Approach	Rental Equivalence
<ul style="list-style-type: none"><li>• Intended to reflect actual homeownership expenses</li><li>• Includes property taxes, mortgage interest, full value of regular maintenance, etc.</li><li>• Usually excludes mortgage principle, major renovations</li></ul>	<ul style="list-style-type: none"><li>• Intended to capture implicit consumption of housing services</li><li>• Rent as a proxy (OER)</li><li>• Excludes investment</li><li>• For some groups, may differ substantially from actual spending (e.g., owners w/o mortgages)</li></ul>

# CPI-U Expenditure in 2018: Payments vs. REQ

Major Group	Expenditure (bil. \$)		Share of total	
	PAY	REQ	PAY	REQ
Food	1,047	1,047	16.7%	14.8%
Housing	2,127	2,948	34.0%	41.7%
Apparel	216	216	3.5%	3.1%
Transp.	1,145	1,145	18.3%	16.2%
Medical	609	609	9.7%	8.6%
Recreation	408	408	6.5%	5.8%
Education & Communication	484	484	7.7%	6.8%
Other	215	215	3.4%	3.0%
<b>Total</b>	<b>6,251</b>	<b>7,072</b>	<b>100%</b>	<b>100%</b>



# CPI-U Expenditure in 2018: Payments vs. REQ

## Select Items within Housing

OER  
currently {

ITEM	Description	Expend. (bil. \$)		Share of total	
		PAY	REQ	PAY	REQ
HC01	Primary residence expenses	623.5	1,585.4	10.0%	22.4%
HC09	Unsampled secondary residence exp.	22.3	85.0	0.4%	1.2%
HD01	Tenants' and household insurance	59.3	27.4	0.9%	0.4%
HH01	Floor coverings	16.0	4.7	0.3%	0.1%
HK01	Major appliances	27.7	5.4	0.4%	0.1%
HK02	Other appliances	10.6	10.0	0.2%	0.1%
HK09	Unsampled appliances	0.2	0.1	0.0%	0.0%
HM01	Tools, hardware, and supplies	23.9	15.7	0.4%	0.2%
HM09	Unsampled tools, hardware, ...	78.4	13.5	1.3%	0.2%
HP04	Repair of household items	65.1	9.0	1.0%	0.1%
HP09	Unsampled household operations	13.9	5.2	0.2%	0.1%
<b>Sum</b>		<b>940.7</b>	<b>1,761.5</b>	<b>15.0%</b>	<b>24.9%</b>

# CPI-U Expenditure in 2018: Payments vs. REQ

## Payments HC01: Primary Residence Expenses

Sub-Item	2018 Share
Ground Rent	0.10%
<b>Property Tax</b>	<b>4.42%</b>
<b>Mortgage Interest</b>	<b>5.33%</b>
Parking	0.02%
Property Management	0.11%



# Preliminary Price Analysis: Data

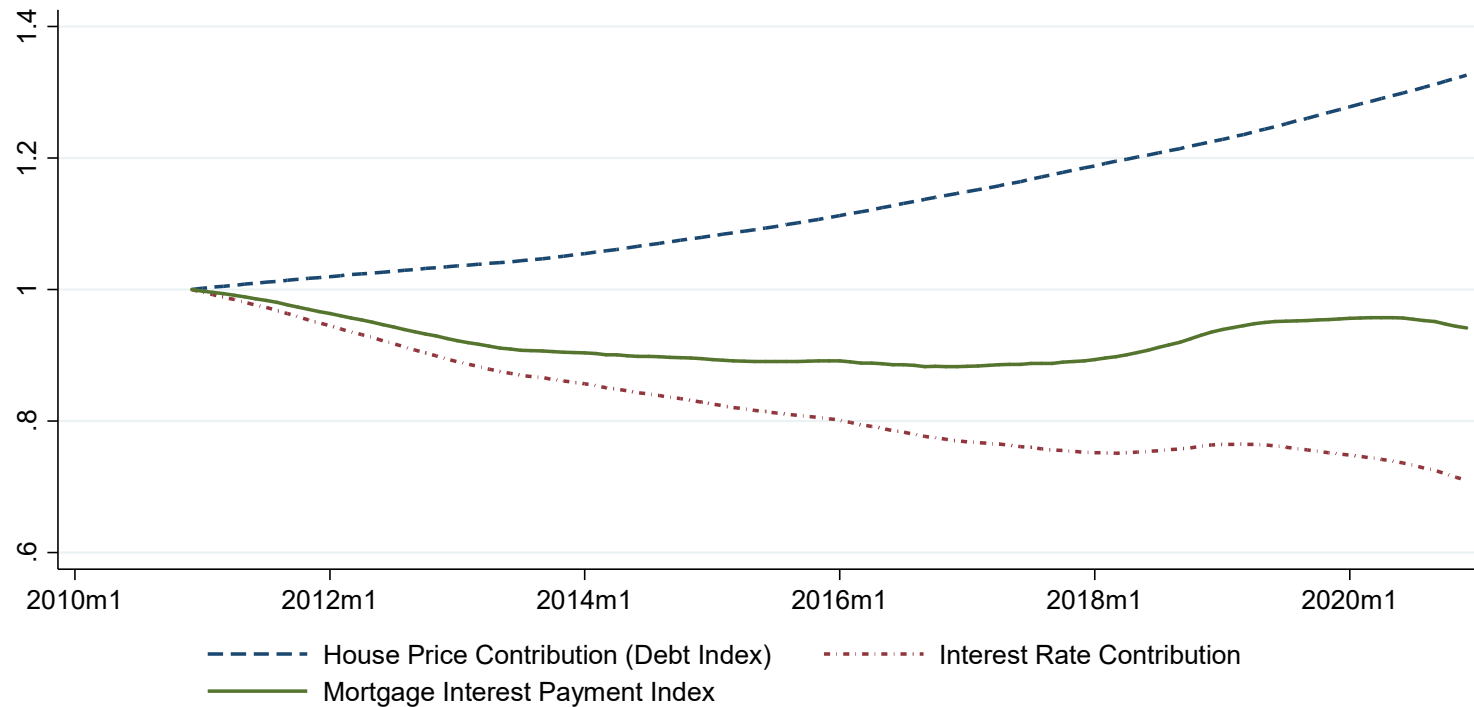
- Repurposing existing datasets
- Consumer Expenditure Survey
  - ▶ Property tax expenditures, Property values
  - ▶ Mortgage loan information (restricted to 30-year fixed rate)
- Federal Housing Finance Agency House Price Index
- Freddie Mac Primary Mortgage Market Survey



# Preliminary Price Analysis: Methods

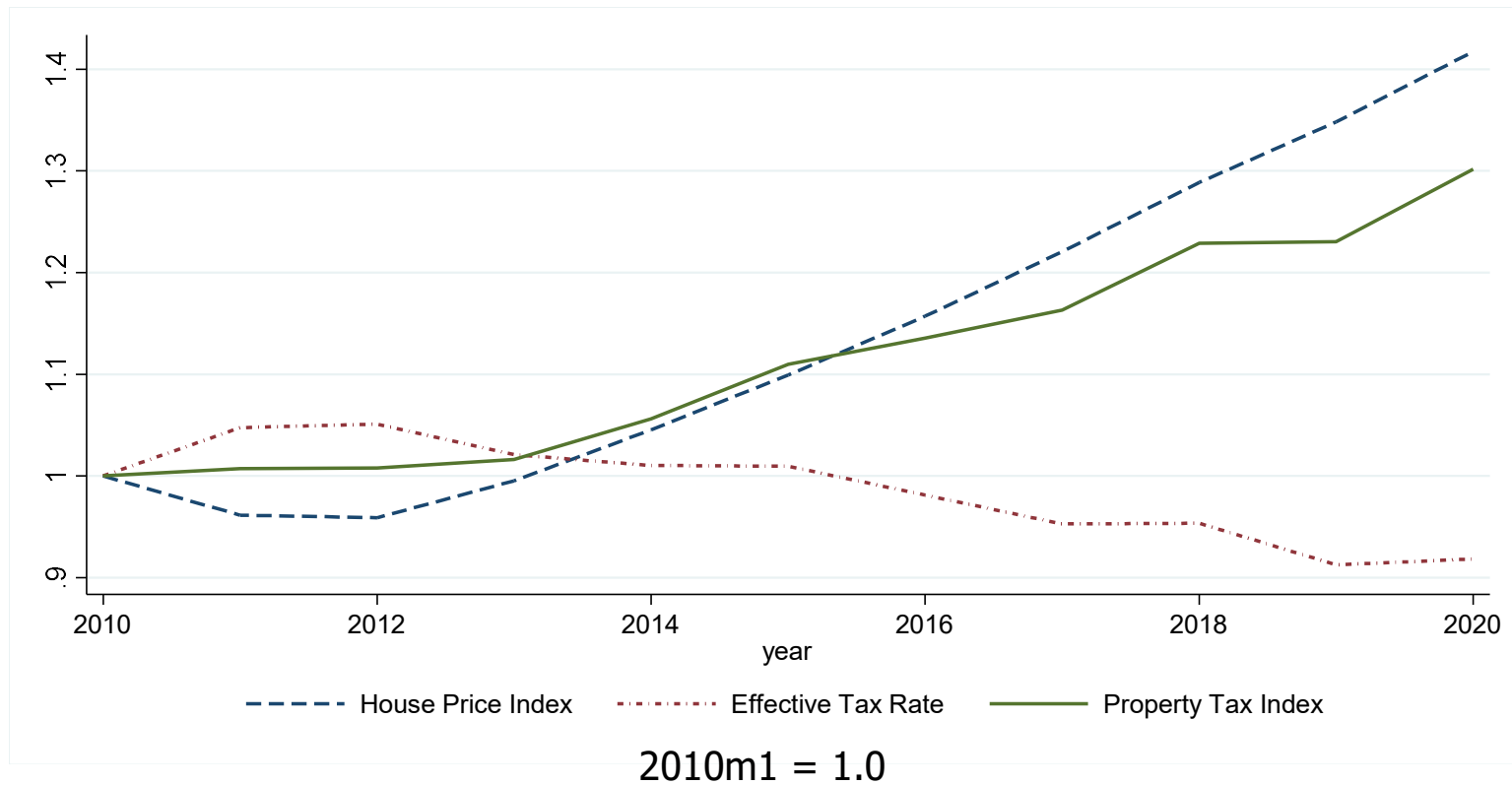
- Following ILO (2004, Ch. 10) recommendations for
  - ▶ Fixed loan-age approach for mortgage interest payment index
    - Requires long timeseries...0 to 360 months prior to index base period
  - ▶ Multiplying percentages (i.e., interest rates or property tax rates) by monetary bases (a debt index or house price index)
- Ongoing discussion: Should a payments index include the impact of home prices when these reflect (potentially unrealized) capital gains or losses to the household?

# Mortgage Interest Payments

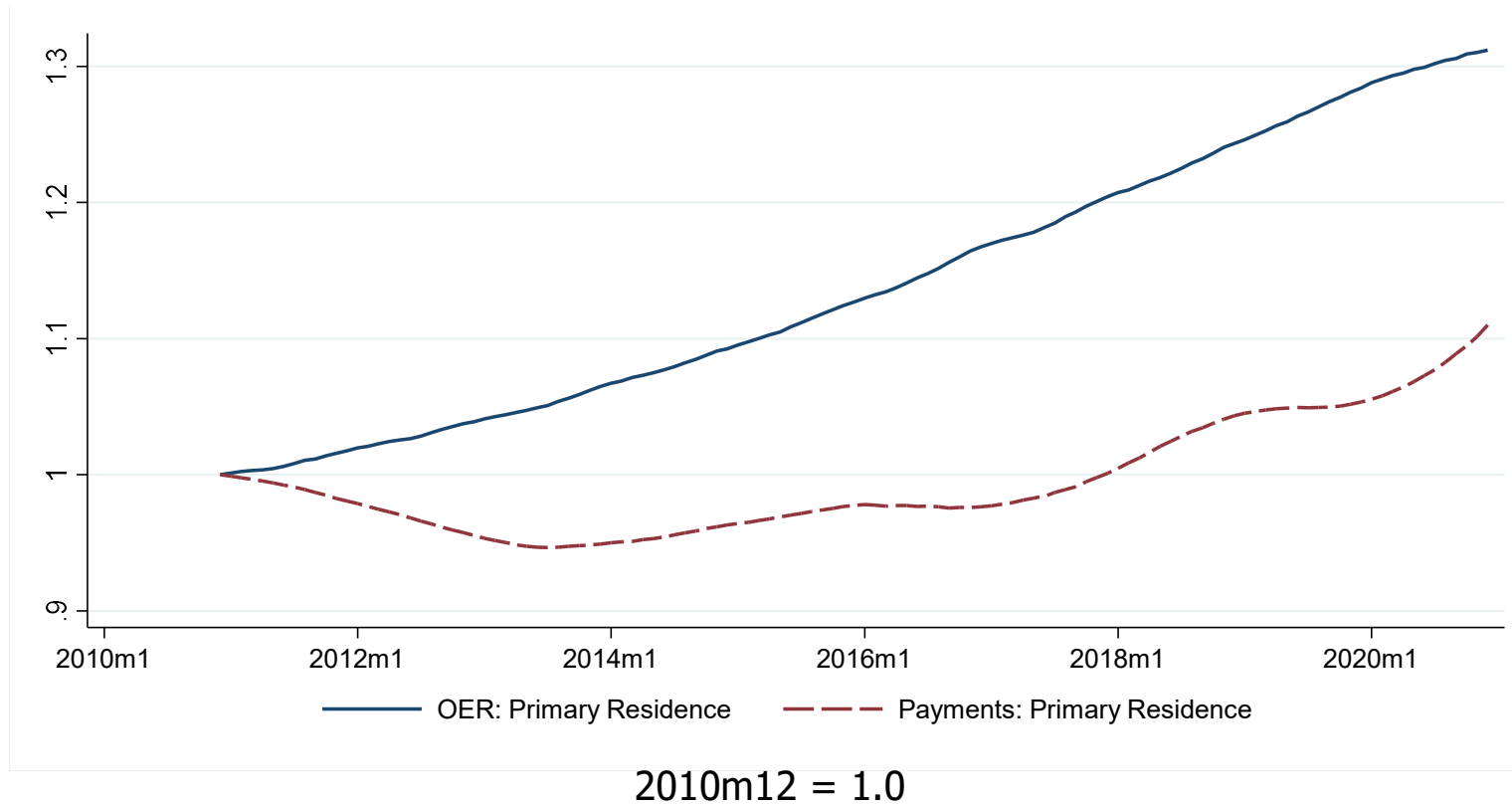




# Property Tax Payments



# Payments Index vs. OER



# Closing Thoughts

- Rental equivalence designed to measure the implicit prices of housing services.
  - ▶ Key considerations include timing, structure type, and quality change.
- The Payments approach aims to measure explicit prices paid to access housing services, which may differ considerably from implicit rents.
  - ▶ Key questions surround eligibility of specific expenditures and sources of price change.
  - ▶ We look forward to learning from the NSOs who use Payments

# Thank you!

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