Disentangling Rent Index Differences: Data, Methods, and Scope

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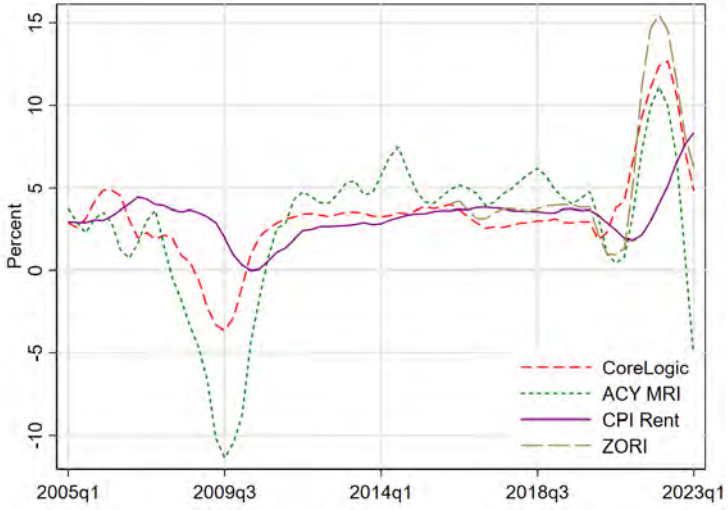
Rent Indices Differ



Why do these indices differ so much?

Hypotheses:

1. Different data sources
   - Perhaps representative of different parts of the rental market
   - Perhaps some are not representative of anything
   - Recent change in weights for the CPI Owners' Equivalent Rent because of different rent movements by structure type
2. Different methods and scope
   - Balanced panel, repeat rents on unbalanced panel, or rescaling of other measures
   - Timing: leasing date, listing date, move-in date, reporting date
   - Objective: rent for new leases or rent for all leases (including renewals)

Investigating the Hypotheses

- Construct repeat rent indices with BLS Housing Survey data
  - all leases
  - only new tenants
- Compare indices that use same methods and scope, different data
- Compare indices that use same data, different methods
- Compare BLS repeat rent indices to outside indices
  - timing
  - scaling

BLS Data

- ∼43,000 rental units surveyed every 6 months
- Units divided into 6-month panels (January-July, February-August, ...)
- Rental units selected from dozens of Census block groups selected from specific metro areas
- Mostly continuing leases, 18% new leases
- Unit characteristics
  - Tenant move-in date
  - Structure characteristics, field notes
  - Other variables
- Several rent measures: contract, "pure", "economic"

Repeat Rent Indices with BLS Data

- Regress rent change between periods $s < t$ for the same unit on positive indicator for month t and a negative indicator for month s

$$\ln rent_{it} - \ln rent_{is} = \gamma_1 D_{i1} + \gamma_2 D_{i2} + ... + \gamma_T D_{iT} + u_{ist}$$

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- Construct two repeat rent indices
  - With all observations (ATRR)
  - Only observations with a new tenant (NTRR)

Rent CPI

- Price changes calculated from $\sqrt[6]{rent_t / rent_{t-6}}$
- Age, vacancy adjustments applied
- Adjustments for remodels and structural changes

Timing Adjustment

- Rent change for a unit may have first occurred at any point between housing survey observations
- To construct our repeat rent indices, backdate the last rent quote to move-in date or latest n*6-month
- BLS is researching how to incorporate rent changes into the CPI more promptly
  - Survey started collecting leasing duration data
  - Corporate and admin data sources may allow more frequent observations of some markets

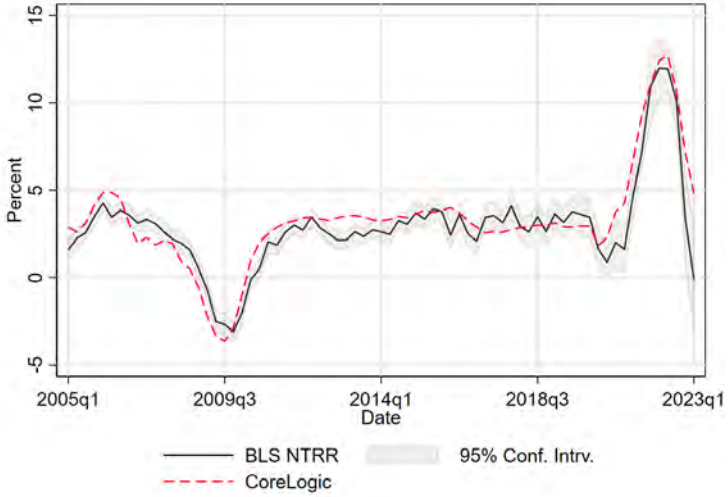
Other Repeat Rent Adjustments

- Vacancy: drop all observations for a housing unit after last new tenant moves in
- Remodels: drop where unit characteristics change, "remodel" keyword
- Heteroskedasticity: perform three-stage procedure to estimate GLS equation
- Outliers: the top and bottom 1% annualized rent changes are dropped each period
- Confidence intervals: bootstrap housing units within each PSU, aggregate
- Frequency: quarterly, so NTRR confidence intervals are narrower

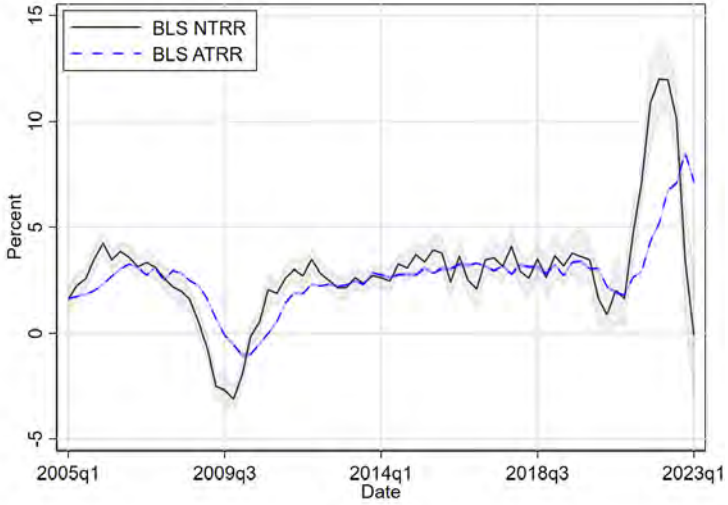
Other Rent Indices

- CoreLogic compiles data from Multiple Listing Services maintained by realtors
  - Coverage varies by time and geography
  - Mostly single detached houses, which it uses for SFRI calculations
  - Contract rents
- Zillow ZORI - repeat rent index from Zillow database, MLS listings
- ACY Marginal Rent Index (ACY MRI) - scaled projections revenue of apartment buildings sold in RCA data

Same Scope, Different Data



Same Data and Methods, Different Scope



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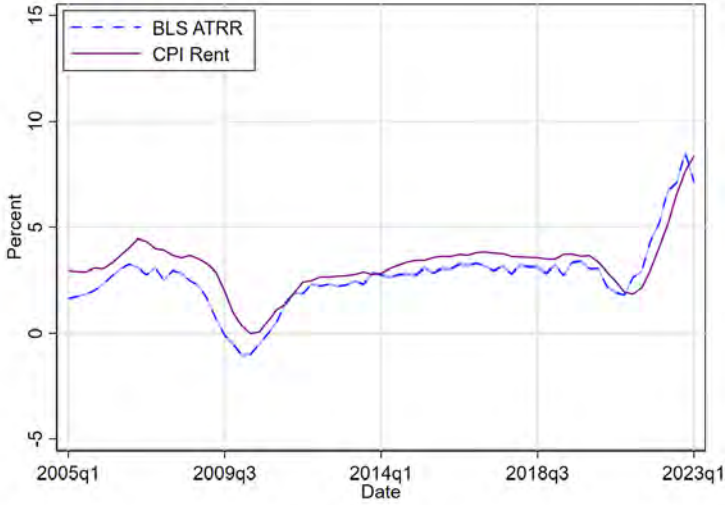
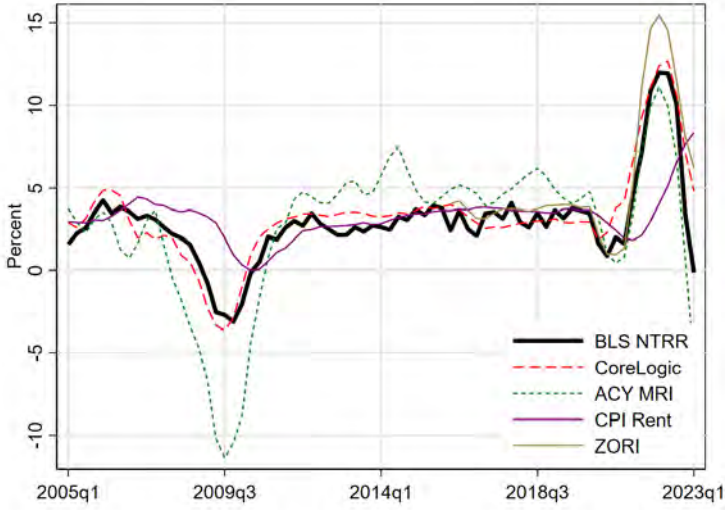
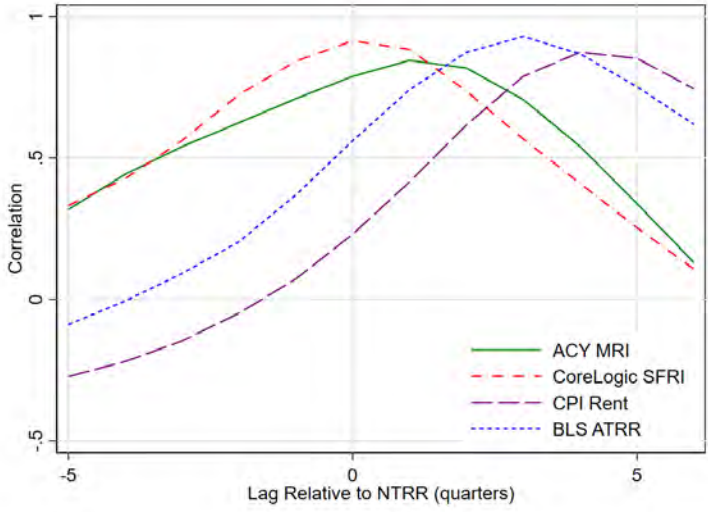


NTRR Compared to Other Indices



New Tenants Leads All Leases by 3 quarters



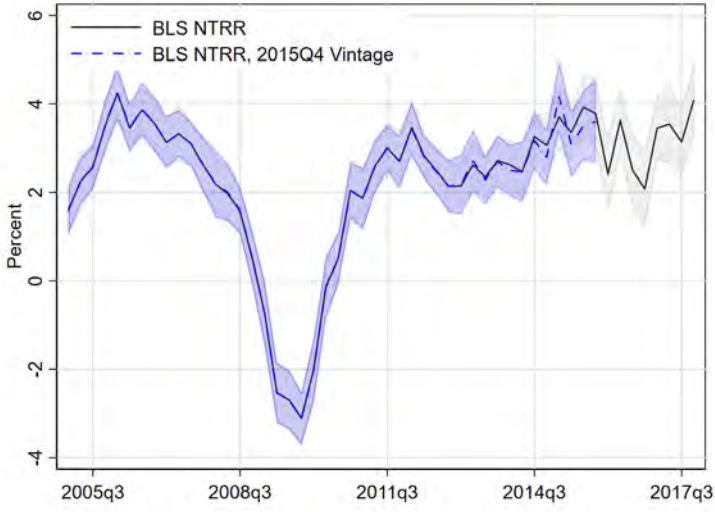
Calculate lead/lag by corr$\{NTRR_t, Y_{t+n}\}$ for positive and negative n

NTRR Revisions

$$\ln P_{it} - \ln P_{is} = \gamma_2 D_{i2} + ... + \gamma_T D_{iT} + u_{ist}$$

- Each observation pair represents a complete tenure for a tenant
- NTRR index will be continually revised as tenants move out

Extra Noise in Last Quarters



Conclusion

- New tenant rent and average rent are different measurement objectives.
- Most of the differences between CoreLogic SFRI and BLS CPI Rent are from scope, not data.
- Our new tenant index is more of a leading indicator, but is more volatile and subject to revisions.