# Sticky Continuing Tenant Rents

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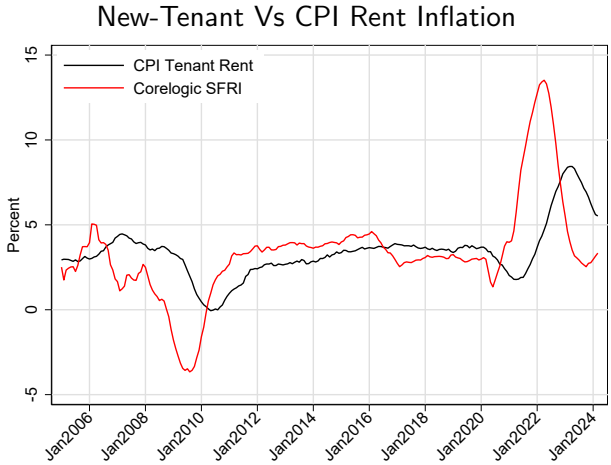
# Notes

**Disclaimer:**
These notes reflect the views of the authors and don't necessarily reflect the official positions of the Federal Reserve Bank of Cleveland, the Federal Reserve Board, or the Federal Reserve System.

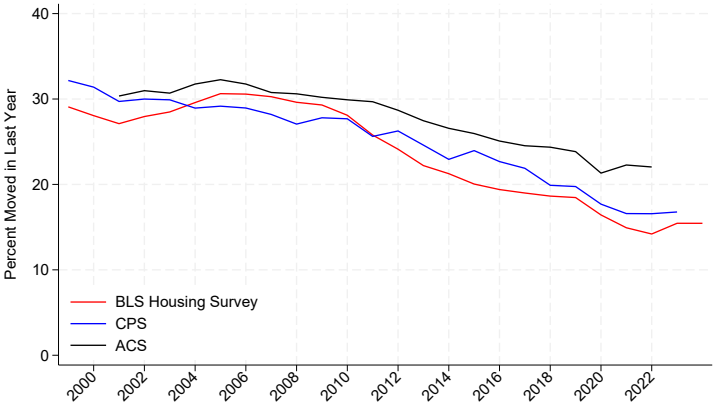
**Disclaimer:**
This presentation provides a summary of research results. The information is being released for statistical purposes, to inform interested parties, and to encourage discussion of work in progress. The presentation does not represent an existing, or a forthcoming new, official BLS statistical data product or production series.

# Understanding Rent Inflation




- Rent growth determines over 30 percent of CPI (rent and OER).
- Some people move (new tenants), but others remain in their unit (continuing tenants).
- New tenant rent inflation has declined, but CPI tenant rent remains high.
- What is happening with continuing tenant rent inflation?

# Mobility in the BLS Housing Survey



# This Paper

- This paper uses the BLS Housing Survey to analyze continuing tenant rents
- **Concept**: Posted rents for new tenants are flexible, but continuing tenant rents are sticky

Contributions

- Document decline in renter mobility and increasing significance of continuing tenant rents in inflation
- Investigate determinants of rent changes and study tenure lengths for continuing tenants
- Calculate "rent gap" measure: the differences between continuing tenant rent and new tenant rent for a unit

# An Incomplete List of Related Literature

Contribute to the literature in at least two areas:

- Micro pricing facts and implications: Bils and Klenow (2004); Baharad and Eden (2004); Alvarez et al. (2006); Dhyne et al. (2006); Nakamura and Steinsson (2008); Maćkowiak and Wiederholt (2009); Campbell and Eden (2014); Vavra (2014); Eichenbaum et al. (2014); Gilchrist et al. (2017); Alvarez et al. (2019); Bonomo et al. (2020)
- Rent rigidity: Kimura and Ueda (2001); Genesove (2003); Hoffmann and Kurz-Kim (2006); Gallin and Verbrugge (2019); Tsai (2021); Suzuki et al. (2021)

# BLS Housing Survey

- ≈40,000 rental units surveyed every 6 months
- Data from 1999–present, with some changes in the survey design.
- Units are divided into 6-month panels (January-July, February-August, ...)
- Rental units selected within sampled Census Block Groups ("neighborhoods"), within each sampled metro areas
- Mostly continuing tenants, 18% are new tenants
- Data include:
  1. Tenant move-in date
  2. Unit information, such as structure type (single family detached, single family attached, apartment, other)
  3. Indicator for whether unit is rent controlled.
  4. Weights used in CPI
  5. Contract rents and "economic rents"
- Additional data sources: CoreLogic SFRI, QCEW, county-level population and unemployment rates, vacancy rates from CoStar, PSU-level CPI indices.

Rent Definitions

# Summary Statistics

| Structure Type | Obs. (#) | Share (%) | Mean Rent ($) | Median Rent ($) | Mean Tenure Length (months) | Median Tenure Length (months) | Mean Rent Spell Length (months) | Median Rent Spell Length (months) |
|---|---|---|---|---|---|---|---|---|
| Single Family Detached | 275,326 | 22 | 1120 | 900 | 41 | 26 | 17 | 12 |
| Single Family Attached | 203,433 | 16 | 894 | 750 | 36 | 22 | 15 | 12 |
| Apartment | 759,704 | 60 | 983 | 829 | 33 | 20 | 13 | 12 |
| All | 1,271,757 | 100 | 991 | 815 | 34 | 21 | 14 | 12 |

- Tenure: how long a tenant lives in a housing unit before moving out
- Rent spell: how long is contract rent unchanged
- Covers observations from January 1999-June 2024

# Tenant Weight Setup

**Q: How significant are continuing tenants?**
Two approaches

1. **Weight:** Sum sampling weights on continuing and new tenants separately. Let $i$ be housing unit, $c$ denote city. Let $M_{c,t}$ denote the set of continuing tenants at time $t$.

$$W_{continuing,t} = \frac{\sum_c w_{c,t}^{city} \sum_{i \in c} w_{i,t} 1[(i,t) \in M_{c,t}]}{\sum_c w_{c,t}^{city} \sum_{i \in c} w_{i,t}}$$

# Tenant Weight Setup

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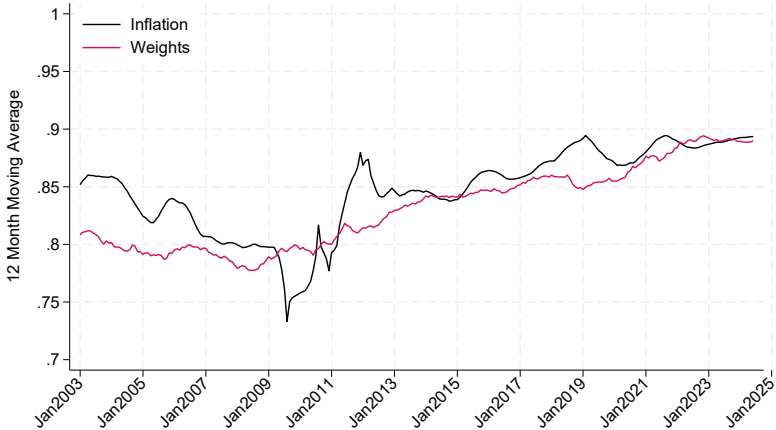
2. **Inflation:** Relationship of rent inflation for new, continuing, and all tenants.

$$\pi_t = W_{continuing,t} \pi_{continuing,t} + (1 - W_{continuing,t}) \pi_{new,t}$$

# Continuing Tenant Weights



# Estimating Contributions of Increase/Decreases to Inflation

- Use **contract** rents to flag rent increases and decreases
- Use **economic** rents to calculate inflation rates

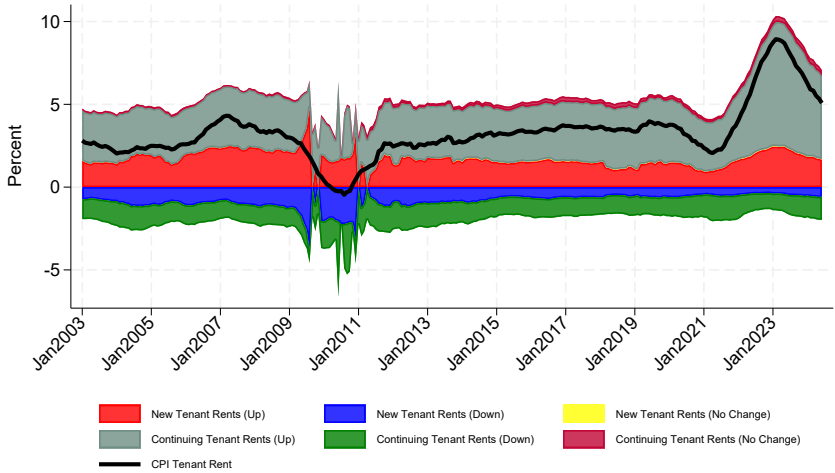
Expand on inflation weight approach by rent increase/decrease/no change

1. $\pi_t = W_{cont,t}\pi_{cont,t} + (1 - W_{cont,t})\pi_{new,t}$
2. $\pi_{cont,t} = W_{change,cont,t}\pi_{change,cont,t} + (1 - W_{change,cont,t})\pi_{nochange,cont,t}$
3. $\pi_{change,cont,t} = W_{increase,cont,t}\pi_{increase,cont,t} + (1 - W_{increase,cont,t})\pi_{decrease,cont,t}$

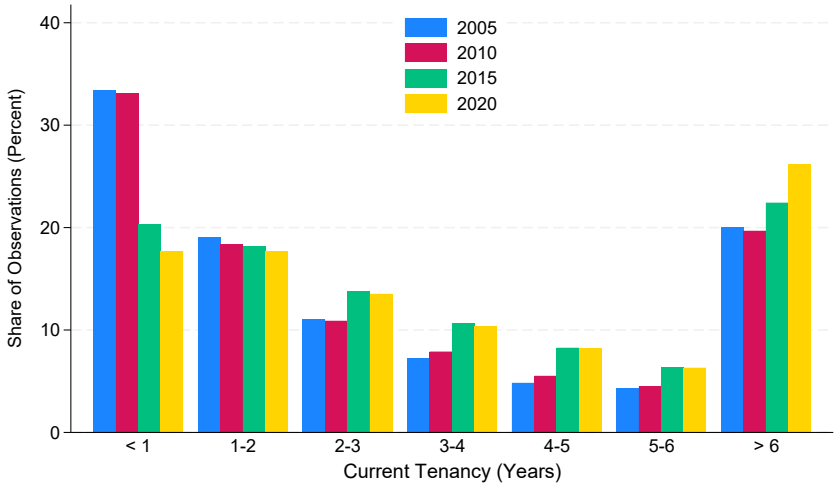
Calculate contribution as

$$Y_{increase,cont,t} = W_{increase,cont,t}\pi_{increase,cont,t}$$

# Contribution to Inflation



# Tenure Over Time

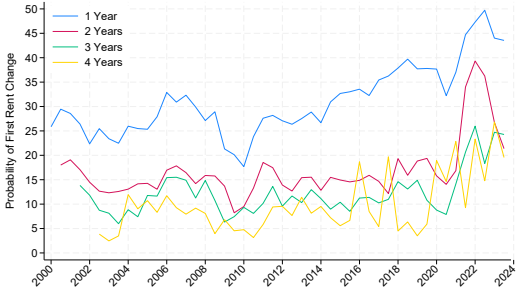


# Continuing Rent Behavior

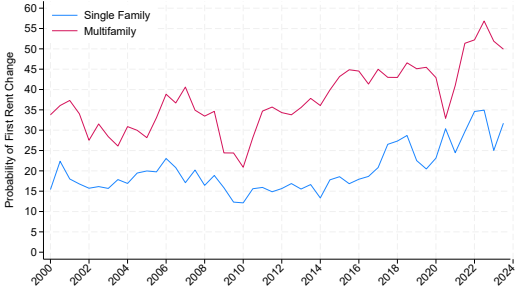
**How do rents for continuing tenants change? How sticky are they?**

- Calculate hazard function for first rent change
- Histogram of continuing and new rent changes
- Frequency and size of rent changes over time
- Does rent-setting have a cyclical component?

# Hazard Function for First Rent Change

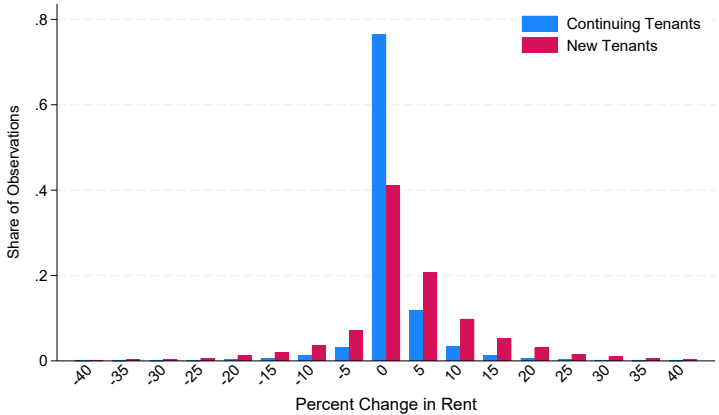



Hazard after first year

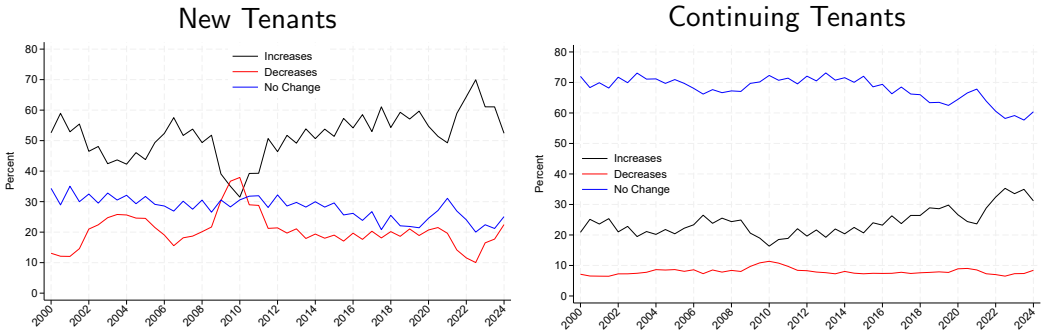



$$\text{Hazard} = \frac{\#\text{ of People With First Rent Change}_t}{\#\text{ People With No Rent Change Yet }_{t-1}}$$

# Rent Changes By Tenancy

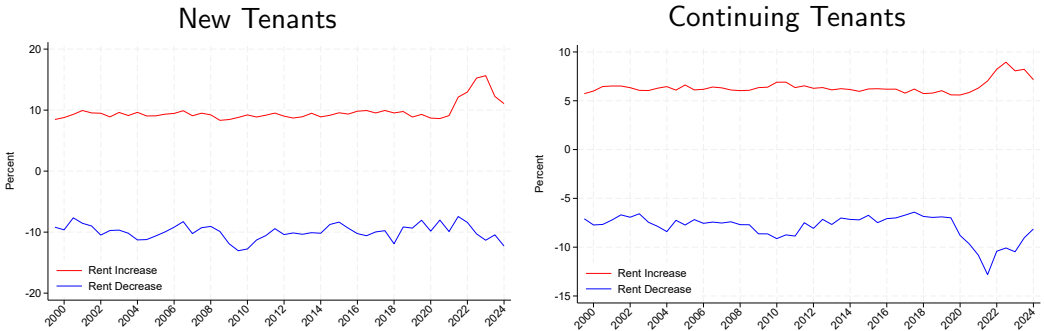


# Frequency of Rent Changes




Percent of rents changed every half-year.

# Size of Rent Changes




Size of rent change conditional on change.

# Rent Gap

**Q: Do rents for continuing tenants keep up with new tenant rents?**

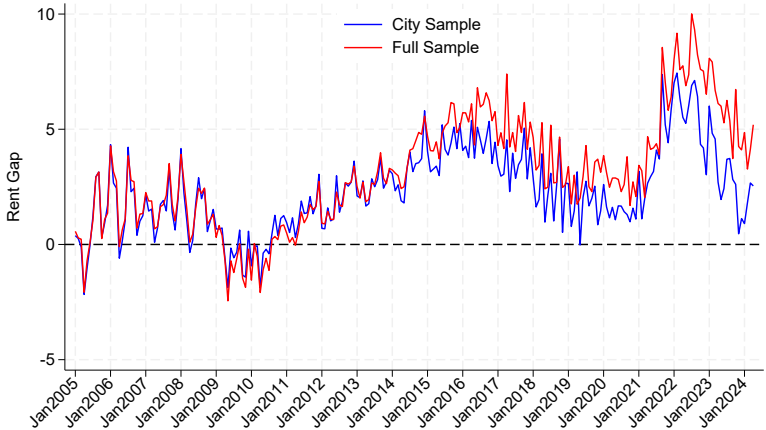
- Let $R_{i,c,t}$ denote the rent for tenant $i$ in structure type $j$ at time $t$ in geographic area $c$
- The move-in date for tenant $i$ is $tm$
- Denote the initial move-in rent for tenant $i$ as $R_{i,j,c,tm}$
  - We impute missing rent gaps by PSU, structure type, and tenure length
- Let $L_{j,c,t}$ denote the structure-specific PSU-level rent index at date $t$
  - We use CoreLogic SFRI for single-family units
  - We use CoStar for multi-family units
  - For areas without local CoreLogic index, we can use the national CoreLogic SFRI

Let $\tilde{R}_{i,j,c,t}$ denote the "market rent" for tenant $i$. Then

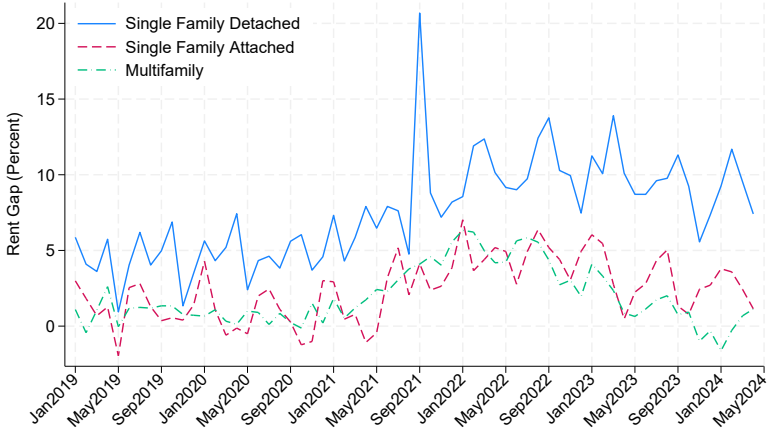
$$\tilde{R}_{i,j,c,t} = R_{i,j,c,tm} \frac{L_{j,c,t}}{L_{j,c,tm}}$$

$$G_{i,j,c,t} = \ln \tilde{R}_{i,j,c,t} - \ln R_{i,j,c,t}$$

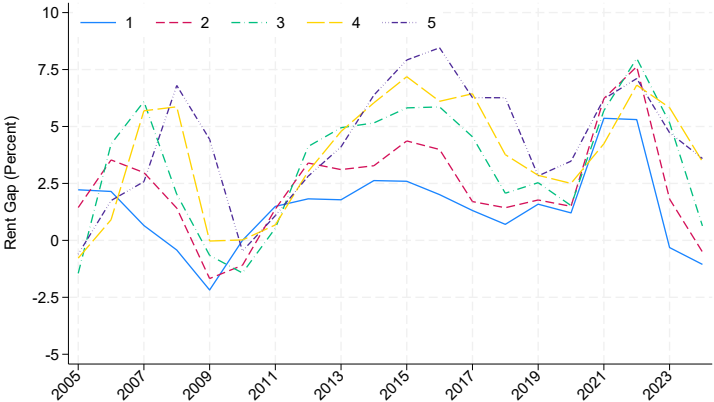
# Rent Gap


City Sample
Full Sample
Rent Gap
10
5
0
-5
Jan2005
Jan2006
Jan2007
Jan2008
Jan2009
Jan2010
Jan2011
Jan2012
Jan2013
Jan2014
Jan2015
Jan2016
Jan2017
Jan2018
Jan2019
Jan2020
Jan2021
Jan2022
Jan2023
Jan2024

# Rent Gap by Structure Type



# Rent Gap By Year Since Move In



# The Rent Gap and Rent Changes

**How does the rent gap affect rents changes?**

- For continuing and new tenants $i$, consider rent change relative to a year ago in city $c$, at time $t$.

$$Y_{i,c,t} = \alpha + \beta \text{Gap}_{c,t-1} + X_{i,c,t} + \gamma_t + \gamma_{p,c} + \varepsilon_{i,c,t}$$

- Let $Y_{i,c,t}$ represent
  - Rent change (binary variable), or
  - Rent increase (binary variable), or
  - Size of rent increase conditional on rent increase
  - Likewise with rent decrease

# Effect of Rent Gap

| | Rent Change (%) | | Rent Up | | Rent Down | | Rent Change (Up) | | Rent Change (Down) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Rent $Gap_{t-1}$ | -0.09*** | 0.01 | 0.10*** | 0.04 | -0.18*** | -0.12*** | 0.06*** | 0.13*** | 0.06*** | -0.04 |
| | (0.03) | (0.06) | (0.03) | (0.04) | (0.02) | (0.02) | (0.01) | (0.02) | (0.01) | (0.08) |
| SF Attached × Rent $Gap_{t-1}$ | | -0.05 | | -0.02 | | -0.01 | | 0.00 | | 0.03 |
| | | (0.08) | | (0.11) | | (0.06) | | (0.05) | | (0.09) |
| Multifamily × Rent $Gap_{t-1}$ | | -0.13** | | 0.08 | | -0.07* | | -0.08*** | | 0.12 |
| | | (0.05) | | (0.05) | | (0.04) | | (0.03) | | (0.08) |
| Δ ln New-Tenant $Rent_{t-1}$ | 0.92*** | 0.91*** | 1.90*** | 1.90*** | -0.84*** | -0.84*** | 0.22*** | 0.22*** | 0.16* | 0.16 |
| | (0.11) | (0.11) | (0.16) | (0.16) | (0.16) | (0.16) | (0.04) | (0.04) | (0.09) | (0.09) |
| Rent Controlled | 5.28*** | 5.27*** | 4.71*** | 4.72*** | -0.37 | -0.37 | -0.42 | -0.43 | 0.31 | 0.32 |
| | (1.19) | (1.19) | (1.67) | (1.67) | (1.00) | (0.99) | (0.53) | (0.53) | (0.84) | (0.85) |
| Δ ln CPI Ex $Shelter_{t-1}$ | -0.15 | -0.15 | 0.15 | 0.15 | -0.22 | -0.22 | -0.04 | -0.03 | 0.07 | 0.07 |
| | (0.19) | (0.19) | (0.24) | (0.24) | (0.16) | (0.16) | (0.05) | (0.05) | (0.06) | (0.06) |
| Δ ln $Population_{t-1}$ | 2.49*** | 2.50*** | 2.52*** | 2.51*** | 0.48 | 0.49 | 0.30** | 0.31** | -0.28 | -0.28 |
| | (0.84) | (0.84) | (0.55) | (0.55) | (0.66) | (0.66) | (0.11) | (0.11) | (0.29) | (0.28) |
| Δ ln $Wage_{t-1}$ | -0.05 | -0.05 | 0.30** | 0.30** | -0.35*** | -0.35*** | 0.08 | 0.08 | 0.07 | 0.06 |
| | (0.06) | (0.06) | (0.14) | (0.14) | (0.10) | (0.10) | (0.05) | (0.05) | (0.05) | (0.05) |
| Vacancy $Rate_{t-1}$ | -0.01*** | -0.01*** | -0.02*** | -0.02*** | 0.01*** | 0.01*** | -0.00 | -0.00 | -0.00*** | -0.00*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Δ$Unemp.\ Rate_{t-1}$ | 0.11 | 0.11 | -1.15** | -1.15** | 1.10*** | 1.10*** | -0.04 | -0.04 | -0.49** | -0.49** |
| | (0.50) | (0.50) | (0.48) | (0.48) | (0.35) | (0.35) | (0.04) | (0.04) | (0.20) | (0.21) |
| Constant | 57.42*** | 57.37*** | 57.89*** | 57.92*** | 9.14*** | 9.11*** | 6.87*** | 6.86*** | -7.04*** | -7.00*** |
| | (1.61) | (1.61) | (2.72) | (2.72) | (2.12) | (2.12) | (0.35) | (0.35) | (0.58) | (0.58) |
| $R^2_a$ | 0.15 | 0.15 | 0.09 | 0.09 | 0.06 | 0.06 | 0.08 | 0.08 | 0.05 | 0.05 |
| Observations | 188,577 | 188,577 | 188,577 | 188,577 | 188,577 | 188,577 | 100,464 | 100,464 | 24,760 | 24,760 |
| Month FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Prop Type FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PSU FEs | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

# Conclusion

- Continuing-tenant rent inflation is an increasingly important part of overall inflation.
- Continuing-tenant rents are sticky! Slightly more flexible recently
  - Continuing tenant rents affected by local market conditions.
  - Hazard of first rent change has increased since early 2010s. Technology?
  - Evidence for downward rigidity for both new and continuing.
  - Stickiness is not that cyclical, except during pandemic.
  - Intensive margin flat.
- Current outstanding "rent gap" is still elevated in our data.
  - Rent gaps vary by structure type and other characteristics.
  - Tenure discounts are length of residency discounts, not sit discounts.

Thank you

# Contract and Economic Rents

Economic rent

- Includes adjustment for
  - Cost of included utilities
  - Aging of housing unit
  - In-kind work (e.g. shoveling the driveway)
- Used in BLS Rent of Primary Residence
- Best representation of cost paid by renter

Contract rent

- No adjustments
- Closer to rent stated on the lease
- "Market Rent" reported by Zillow
- Used in this presentation
- Best representation of price changes by landlord