



Decomposing the Renter Affordability Gap Across U.S. Metropolitan Areas: Income versus Rent Contributions, 2019–2025

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Abstract. U.S. rental affordability deteriorated sharply after 2019 and partially reversed in some markets after 2022. The Sun Belt rent decline is well documented in industry data; what has not been measured is how much rent versus income each contributes to the metro-level burden change. We apply a log-additive decomposition, $\Delta \log(\text{burden}) \equiv \Delta \log(\text{rent}) - \Delta \log(\text{income})$, to a balanced panel of 14 U.S. metropolitan areas observed annually from 2019 through 2025, with bootstrap, jackknife, and permutation inference. Over the full 2019–2024 window the income side accounts for most of the change in every supply group. In the 2022–2024 post-surge window the rent-side contribution flips sign: positive in supply-constrained coastal metros (+0.036, 95% CI [+0.021, +0.052]) and negative in high-supply Sun Belt metros (−0.025, [−0.046, −0.011]; permutation $p = 0.005$). Even within the Sun Belt the income side is roughly four times larger in magnitude than the rent side (−0.096 vs. −0.025), so rent moderation distinguishes regimes but is not the larger force in either. The reversal appears in CoStar asking rent but not yet in ACS gross rent; cross-correlation places the peak transmission lag at one year (Pearson $r = 0.76$, $p < .001$).

Keywords: housing affordability, rent burden, metropolitan areas, decomposition, supply elasticity

1 Introduction

Housing costs absorb a rising share of household budgets, and renters, unlike homeowners, accumulate no equity to offset that burden. The conventional U.S. benchmark, due in its modern form to HUD, treats a household as cost-burdened when gross rent exceeds 30 percent of income. By that measure rent burden has trended upward for three decades and intensified during the 2021–2022 rent surge, when market rents rose faster than wages across most large metropolitan areas; the National Low Income Housing Coalition ^[7] reports that more than half of all U.S. renter households are now cost-burdened.

The national average hides large regional differences. After 2022 a second pattern is visible: high-supply Sun Belt metros (Austin, Phoenix, Dallas-Fort Worth, Atlanta,

Nashville) saw rent growth slow sharply as 2021–2022 deliveries came online, while supply-constrained coastal metros remained severely burdened. Industry research ^[3, 5] reports the Sun Belt rent decline; the academic literature, which relies on ACS-based measures with longer lags, has not yet incorporated the reversal. Existing affordability research ^[4, 9, 10] describes rent and income separately or regresses burden on metro-level determinants without isolating their relative contributions, and Oaxaca-Blinder decomposition ^[1, 6] has been applied to house-price levels but not, to our knowledge, to the rent-burden ratio across an MSA panel over the post-pandemic window. Our contribution is the attribution exercise rather than the documentation of the reversal. Putting rent and income on the same log scale gives an exact additive accounting, and with bootstrap and permutation inference we show that even where the rent-side contribution flips sign, the income side remains the larger force; rent moderation distinguishes supply regimes but does not drive the overall affordability change.

2 Background and Prior Literature

Three lines of work bear on the analysis. Descriptive typologies of rent burden ^[4, 8] classify metros using ACS indicators; Lin and Dawkins ^[4] find that higher housing values, poverty rates, minority shares, and specialization in education-medicine and information industries predict higher burden. Hierarchical models of housing cost burden ^[9] treat the burden ratio as a continuous outcome with cities nested within metros, which is the appropriate framework for a metro-year panel; the housing-economics literature ^[10] points to supply elasticity as an important driver of price capitalization. Decomposition methods are common in labor economics, Oaxaca-Blinder ^[1, 6] for wage gaps, but are rarely applied to housing affordability; the OECD ^[11] applies the technique to house-price levels rather than to the rent-to-income ratio that defines the affordability measure. We combine these literatures, treating the metro-year burden ratio as the panel outcome and applying a decomposition into rent-side and income-side log contributions, interpreted against the supply-constrained vs. high-supply typology motivated by the industry literature ^[3, 5].

3 Data and Method

The sample consists of 14 metropolitan areas selected by an explicit rule: one or two representatives from each of the nine U.S. Census divisions, spanning the affordability range (Table 1). The supply-group classification follows the industry-consensus Sun Belt vs. coastal naming ^[3, 5] combined with observed 2021–2024 CoStar inventory growth shown in Table 1: high-supply metros have growth 12.3–26.6% (median 15.4%), mixed 4.7–13.2%, supply-constrained 2.9–9.6%. Under a strict numeric rule of inventory growth alone ($>12\%$ = high-supply), Minneapolis and Miami would join the high-supply group; we show below that the headline rent-side sign-flip survives this reclassification. For New York, Los Angeles, and Miami, CoStar reports at the Census Metro Division level, and we pull ACS at the matched MD geography to keep rent and income aligned. The rent-burden ratio for MSA i in year t is $b = (12 \cdot R)/Y$, where R is

monthly median rent and Y is median renter household income. b is a ratio of medians, not a median of household-level burdens; it summarizes the market-level affordability of the median rental to the median renter, not the experience of any particular household. We use two definitions of R : CoStar's 2-bedroom market asking rent (apartment-stock-weighted asking price at lease turnover) and ACS Table B25064 gross rent (stock-weighted average across all renter-occupied units, inclusive of utilities); they differ in the speed at which they reflect new-lease market signals.

Table 1. Sample of 14 metropolitan areas by supply group, with CoStar multifamily inventory growth 2021 to 2024 shown after each metro name.

Group	Metros (with 2021→2024 inventory growth)
Supply-constrained (n=4)	Boston 8.6%; Los Angeles 2.9%; New York 5.4%; Seattle 9.6%
Mixed (n=4)	Chicago 4.7%; Miami 12.8%; Minneapolis 13.2%; Washington DC 8.0%
High-supply Sun Belt (n=6)	Atlanta 13.0%; Austin 26.6%; Dallas-Fort Worth 12.3%; Denver 13.7%; Nashville 23.4%; Phoenix 17.0%

Because $b = R/Y$, the change in $\log b$ decomposes additively with no remainder:

$$\Delta \log b = \Delta \log R - \Delta \log Y \tag{1}$$

Signed contributions are $\Delta \log R$ (rent side) and $-\Delta \log Y$ (income side); a positive value pushes burden upward. We report the decomposition for three windows: full window (2019 → 2024, real ACS endpoints), rent-surge (2019 → 2022), and post-surge (2022 → 2024). A complementary level shift-share derived from a first-order Taylor expansion of b is reported in burden-percentage-point units. Group means use 95% confidence intervals from 2,000 metro-resampled bootstrap iterations.

We complement the decomposition with: (a) a repeated-measures ANOVA with year as within factor; (b) a linear mixed model with MSA random intercepts and a supply $\times$ year interaction; (c) a GEE under exchangeable and AR(1) working correlations; (d) a LightGBM model on supply-side covariates (vacancy, deliveries, inventory, permits) with rent and income excluded as features, exposing residual supply-side signal. CoStar provides quarterly multifamily metrics (Q4 each year); ACS 1-year supplies median renter income (B25119_003E) and gross rent (B25064_001E)^[2]. ACS 1-year 2020 was not released; we interpolate between 2019 and 2021. The 2020 cell is not used as an endpoint in any of the three reported windows, so no headline number depends on the interpolation. ACS 1-year 2025 is expected September 2026. The Census Building Permits Survey provides annual CBSA-level permits.

4 Results

Figure 1 shows the burden-ratio trajectory for each metro from 2019 through 2025, colored by supply group, with panels separated by rent measure. Under the CoStar 2BR measure (panel a), burden ratios in supply-constrained metros remain elevated throughout (New York at 0.74–0.82, Boston and Los Angeles at 0.47–0.55), while Sun Belt

burden ratios cluster around 0.30–0.41 and decline materially after 2022. Under the ACS gross-rent measure (panel b), absolute levels are lower and the post-2022 decline visible in panel (a) does not appear: ACS burden ratios continue rising or plateau in all metros through 2024. We examine the cross-measure divergence separately below.

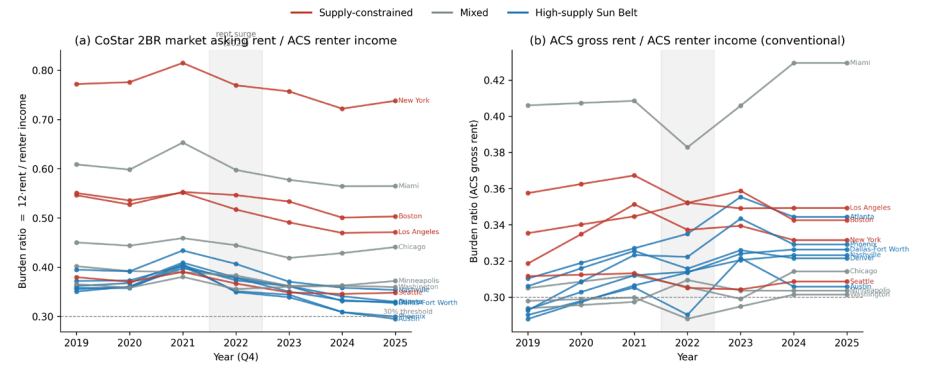


Fig. 1. Rent-burden ratio trajectories 2019–2025 by metropolitan area, colored by supply group. (a) CoStar 2-bedroom market asking rent ÷ ACS renter income. (b) ACS gross rent ÷ ACS renter income (conventional measure). Shaded band marks the 2022 rent surge; reference line at the 30% threshold.

Table 2 reports the group-mean log decomposition of the 2022 → 2024 change in burden. The headline result is the sign of the rent-side contribution: positive in supply-constrained metros (+0.036, 95% CI [+0.021, +0.052]), positive in the mixed group (+0.047), and negative in the high-supply Sun Belt (−0.025, [−0.046, −0.011]). The Sun Belt confidence interval does not cross zero. Income gains are comparable across groups (−0.080 to −0.113 log-points) and provide the bulk of the affordability improvement everywhere; what distinguishes the Sun Belt is the additional rent-side support.

Table 2. Decomposition of $\Delta \log(\text{burden})$ over 2022 → 2024 by supply group, CoStar 2BR rent. Bootstrap 95% CIs from 2,000 metro-resampled draws within group.

Group	n	$\Delta \log(\text{burden})$	95% CI]	Rent-side [95% CI]	Income-side [95% CI]
Supply-constrained	4	−0.077	[−0.092, −0.062]	+0.036	[+0.021, −0.135, −0.097]
Mixed	4	−0.032	[−0.056, 0.000]	+0.047	[+0.032, −0.080, −0.056]
High-supply Sun Belt	6	−0.122	[−0.130, −0.108]	−0.025	[−0.046, −0.096, −0.111, −0.079]

Figure 2 shows the per-metro decomposition. Five Sun Belt metros (Austin, Atlanta, Dallas-Fort Worth, Nashville, Phoenix) show clearly negative rent-side bars; Denver sits essentially on zero (−0.003), the hardest case to classify, and the leave-Denver-out sensitivity reported below is included largely because of it. All four supply-constrained metros show positive rent-side contributions, with no ambiguity at the metro level.

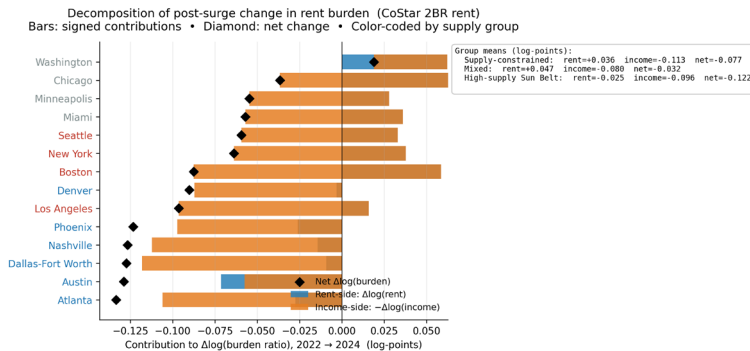


Fig. 2. Decomposition of post-surge $\Delta\log(\text{burden})$ 2022 $\rightarrow$ 2024 by metro. Stacked bars show signed rent-side (blue) and income-side (orange) contributions; diamonds mark the net change. Metro labels color-coded by supply group.

In the rent-surge window 2019 $\rightarrow$ 2022, the Sun Belt had the largest rent-side push on burden (+0.179 log-points, vs. +0.097 in supply-constrained metros), so the group that now provides the largest rent-side relief is also the group that drove the surge. Over the full window 2019 $\rightarrow$ 2024, the income side dominates everywhere; the post-surge reversal appears only when the window is split at 2022. Under the ACS gross-rent measure the rent-side contribution remains positive in every group (+0.103 to +0.128), and the post-surge net $\Delta\log(\text{burden})$ is small and ambiguously signed: ACS averages over existing leases while CoStar's asking rent captures current marginal-lease pricing, so the reversal is a leading-indicator pattern still propagating into ACS.

Supplementary models corroborate the picture measure-conditionally. The linear mixed model gives ICC = 0.946 under CoStar, showing that most of the variance in log burden sits between metros, not within them. The supply $\times$ year interaction yields year slopes of -0.019 , -0.011 , -0.027 log-points/year (supply-constrained, mixed, Sun Belt) under CoStar, but -0.001 , $+0.005$, $+0.016$ under ACS, reversing sign for the Sun Belt. The headline therefore rests on the CoStar measure, with ACS as a lagged confirmatory series. GEE under exchangeable and AR(1) correlations reproduces the CoStar signs. LightGBM on supply-side covariates (with rent and income excluded from the feature set) identifies the CoStar vacancy rate as the strongest residual predictor (permutation importance 0.193, twice the next feature). The Sun Belt rent-side contribution is stable under fragility checks: jackknife means lie in $[-0.030, -0.016]$, and a permutation test of the Sun Belt vs. supply-constrained group difference yields $p = 0.005$ (10,000 draws). At the metro level the split is binary, with all six Sun Belt metros showing negative rent-side contributions and all eight other metros positive, so the sign-flip survives the strict-inventory-growth reclassification described in §3.

5 Discussion

Read at five-year horizon, the decomposition is essentially a story about income: median renter income grew faster than rent in every supply group between 2019 and 2024,

and net burden fell across all 14 metros. The interesting split appears only when the window is broken at 2022, where the rent-side contribution turns negative in the Sun Belt (-0.025) but stays positive in supply-constrained coastal metros ($+0.036$), and the reversal — visible in CoStar asking rent — is still propagating into ACS gross rent. Pooled cross-correlation of year-over-year log changes places the peak CoStar-to-ACS lead at one year (Pearson $r = 0.76$, $p < .001$), with a still-significant two-year lead ($r = 0.49$, $p < .001$) and no signal at three years, which means policy work using ACS-vintage data is reading rent dynamics with a one-to-two year delay. The metros that received the largest new supply (Austin, Phoenix, Atlanta) are also the ones where the rent-side contribution turned negative; metros that delivered little new supply continued to show positive rent-side contributions, with affordability improvements coming from income growth alone. The pattern is straightforward in its direction even if it is not the dominant force: rent relief seems to follow supply, at least within this single pandemic-era cycle.

Four limitations bound the inference. The sample is fourteen metros, so bootstrap CIs are conditional on the realized panel, though jackknife and permutation results above limit the role of any single MSA. CoStar coverage emphasizes professionally managed multifamily. ACS median renter income can shift for compositional reasons; Sun Belt in-migration changed who is renting, so 'income gains' partly reflect renter-population composition rather than wage gains for incumbent renters. The decomposition is descriptive; a follow-up using supply-instrument variation or rent-regulation natural experiments^[12] would tighten the causal interpretation.

6 Conclusions

This study decomposed the change in metropolitan rent burden into rent-side and income-side log contributions across a balanced panel of 14 U.S. metropolitan areas observed annually from 2019 through 2025. Three findings stand out. First, over the full 2019–2024 window the income side accounts for most of the burden change in every supply group: median renter income grew faster than rent, and net burden fell across all 14 metros. Second, when the window is split at 2022 the rent-side contribution flips sign — positive in supply-constrained coastal metros ($+0.036$) and negative in high-supply Sun Belt metros (-0.025) — yet even within the Sun Belt the income side remains roughly four times larger in magnitude (-0.096 vs. -0.025), so rent moderation distinguishes supply regimes without being the dominant force in either. Third, the reversal is visible in CoStar asking rent but not yet in ACS gross rent, with pooled cross-correlation placing peak transmission at a one-year lead (Pearson $r = 0.76$); affordability analysis built on ACS-vintage data therefore reads post-surge rent dynamics with a one-to-two-year delay.

For policy and research these results imply that new supply is associated with rent-side relief within a single pandemic-era cycle, but that income growth — and, in part, compositional change in the renting population — drives the larger share of measured affordability improvement. Because the findings are descriptive and conditional on the realized panel of fourteen metros, future work using supply-instrument variation or

rent-regulation natural experiments, together with a longer panel once the ACS 1-year 2025 estimates are released, would sharpen the causal interpretation and establish whether the post-2022 rent-side reversal persists.

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