Abstract

Rental markets around the country have recently spiked causing significant issues in terms of affordability, availability, and even prompting talk of nationwide rent controls. The drivers of this recent phenomenon will, almost certainly, be parsed out in future research. However, there is a critical and pressing need for timely information on recent rent movements in the nation’s rental markets and their affordability. This brief provides information (projected rents, degree of over- or under-pricing relative to historic trends, year over year rent change, and affordability of the average rental unit) for 100 U.S. residential rental markets. A sample of the April 2023 Miami metro market is provided in this brief to deliver guidance on these estimations. Monthly reports are currently provided in the Waller, Weeks, and Johnson Rental Index. The goal of the index is to facilitate more informed decision making by consumers, real estate professionals, and policy makers.

Introduction

This research departs from most other peer-reviewed research in that it seeks to outline a repeatable process that will be deliverable on a monthly basis to consumers, real estate professionals, and policy makers. The modeling and calculations are straightforward and may be viewed by many as rudimentary. However, it is the timeliness of the data and results that provides the value of this ongoing project. Put simply, straight forward, available, and immediately useful sometimes outweighs in-depth and untimely analysis.

This work develops a simple methodology to estimate the premium or discount being paid for an average residential rental transaction in defined metropolitan markets that is repeatable on a monthly basis. Additionally, year-over-year rent change estimations and an affordability measure are provided. With monthly estimates in hand, consumers, real estate professionals, and policy makers can better understand current market conditions as opposed to making critical rental decisions with minimal evidence.

Sections on methodology and data, sample analysis, and concluding remarks follow.
Methodology and Data

Open-source rental data from ZORI (Zillow Observed Rental Index) are employed to develop a simple Rental Index ($RI_t$) time trend:

$$RI_t = \beta_0 + \beta_1 x_t + \varepsilon_t$$  \hspace{1cm} (I)

Here the numeric time trend is represented by $t$ with $t = 1$ representing the initial month of the data. The time trend code is $x_t$ and $\varepsilon$ is $N(0,1)$.

This work employs a smoothed ZORI measure of observed market rent per metropolitan area as defined by the U.S. census bureau. ZORI is simply a repeat-rent index -- a process familiar to most housing experts. Average rents for metros that fall between the 40th and 60th percentile of all homes and apartments are collected for the top 100 metros by size and availability of data. $RI$ is the observed ZORI score. It represents the average (not median) rent of the average unit in the market. For those interested, additional details are available in ZORI Methodology.

$RI$ is the dependent variable and regressed against time. This model is very powerful because rents, like housing prices, are mean reverting making trend analysis an appropriate modeling technique.

A long-term rental trend can be developed for each market by estimating:

$$E(RI_t) = \beta_0 + \beta_1 x_t$$  \hspace{1cm} (II)

Here $E(RI_t)$ is the expected $RI$ score depicted as a linear trend in a particular metro market.

The degree of over- or under-pricing relative to a long-term rental trend in a particular market can be measured. The calculation is:

$$Premium_t = \frac{RI_t - E(RI_t)}{E(RI_t)}$$  \hspace{1cm} (III)

Equation III is depicted as the measure of a premium (aka: degree of over-pricing) for a particular market. For premiums, $RI_t > E(RI_t)$.

The degree of under-pricing or discount for the same market, accordingly, is:

$$Discount_t = \frac{RI_t - E(RI_t)}{E(RI_t)}$$  \hspace{1cm} (IV)
Equation IV is depicted as the measure of a discount (aka: degree of under-pricing) for a particular market. For discounts, $R_{t} < E(R_{t})$.

The reader will note that these calculations are just the percentage difference between the estimated rents from Equation II and actual average rents provided from ZORI. Thus, a premium score for a particular $t$ can be interpreted as the percentage above that market’s long-term rental trend. Conversely, a discount score for a particular $t$ can be interpreted as the percentage below that market’s long-term rental trend.

In addition to premium and discount estimations by period and metropolitan area, year-over-year (YOY) changes in rents are estimated as well:

$$YOY\ Change = \frac{ZORI_{t} - ZORI_{t-12}}{ZORI_{t-12}}$$  \hspace{1cm} (V)

Here $ZORI_{t}$ represents the last month’s average rent for a particular rental market and $ZORI_{t-12}$ represent the average rent in that market 12 months prior.

In addition to estimated rents, premium or discount, and YOY change in rent by market and time period, affordability is addressed as well. HUD defines affordable housing as housing cost, inclusive of utilities, being equal to or less than 30% of occupants’ gross income.\(^1\) Households that exceed this 30% limit are referred to as rent burdened. HUD defines severely rent burdened as households with housing costs equal to or greater than 50% of their income.\(^2\)

Unfortunately, monthly utility data is not readily available. But, in the interest of gaining additional insight into the ongoing rent crisis, this work defines a similar measure that is referred to as house poor, which is simply rent burdened less utilities. Given HUD’s definitions for rent burdened and severely rent burdened and $RI$ (observed monthly average rents by market and month), the minimal annual income necessary to avoid being house poor or severely house poor is estimated as follows.

$$Annual\ Income\ to\ House\ Poor = \left(\frac{RI_{M,t}}{0.30}\right) 12$$  \hspace{1cm} (VI)

Here again, $t$ is a monthly placeholder and $M$ indexes different metros.

$$Annual\ Income\ to\ Avoid\ Severly\ House\ Poor = \left(\frac{RI_{M,t}}{0.50}\right) 12$$  \hspace{1cm} (VII)
The reader will notice that by not including utility estimates, actually results in more conservative estimates of the necessary annual incomes to avoid being rent burdened or severely rent burdened in each market.

In order to illustrate these estimations, the next section provides a sample analysis of the Miami metro market for the month of April, 2023.

**Sample Analysis of Miami Metro**

Executing on Equations (I) through (VII), results in the following observations for April 2023 in the Miami metro market. The expected rent for Miami metro in the month of April 2023 was $2,530.22 as compared to a ZORI average rent of $2,804.60. This produced a premium of 10.84%, implying that the average rental unit in Miami metro was priced at 10.84% above what would otherwise be expected based on historical rental prices in the area.

Figure 1 provides a snapshot of the Miami metro rental market as of April 2023. Rental premiums and discounts are depicted through time. It is clear that the runup in rents relative to the long-term rental trend in rents has been most dramatic since mid-2021, resulting in significant rent premiums for the area. Interestingly, rents were actually trading at a discount to their historical trend in the several years prior to 2021.

Figure 1

Year-over-year change in rents came in at 5.27%, implying rent increased, on average, 5.27% between April 2022 and April 2023. Though not depicted, there has been a steady decline in
year-over-year percentage change in average rents for Miami metro. For example, the average annual rent increase for January 2022 to January 2023 was 9.61%, and the average annual rent increase for September 2021 to September 2022 was 18.81%. Clearly, the rent crisis in the area is subsiding, albeit slowly.

While the easing of the rent crisis in Miami is certainly welcome news for tenants, local incomes have not kept pace with the increase in local rents. When considering minimum annual incomes to avoid being house poor or severely house poor, the necessary annual incomes for April 2023 are $112,184 and $67,310, respectively. Thus, the occupant(s) of an average rental unit in Miami metro as of April $2023 will need an annual income of $112,184 or higher to avoid being classified as house poor and an annual income of $67,310 or better to avoid being classified as being severely house poor.

When considering the levels of year-over-year increases in rents and minimum annual income levels to avoid falling into the classifications of house poor or severely house poor, it seems the area is likely entering a prolonged period of unaffordable rental housing. The duration of this situation will hinge on the relative rates of increase of incomes and rents within the Miami metro area. Hopefully the insights drawn from the index will facilitate more informed discussions and decisions by Miami renters, real estate professionals, and policy makers.

**Concluding Remarks**

In general, this brief is inspired by the collection of indices in the Real Estate Initiative at Florida Atlantic University with the goal of helping consumers, real estate professionals, and policy makers make more informed decisions when it comes to renting, property development, and urban policy. In particular, this brief is motivated by Gravatt, Beracha, and Johnson (2022), which outlines a process for timely delivery of estimations concerning housing prices and their movements. Currently, monthly results from executing on Equations (I) through (VII) are available in the Waller, Weeks, and Johnson Rental Index .

Is timely public scholarship a competitor or complement to more traditional static peer-reviewed process? This is an open question, and time will eventually tell. The authors of this piece firmly believe that the two will eventually complement one another as it is necessary for all scholarship to go through a review process. Change, on many levels, is afoot in the academy. It is our hope that this work provides some of the original steps in the transition into availability of public scholarship.

**References:**


**Endnotes**

1. [HUD Glossary of Terms to Affordable Housing](#). See affordable housing definition.
2. [Rental Burdens: Rethinking Affordability Measures](#). See definitions of rent burdened and severely rent burdened.
3 ZORI updates data monthly with both new monthly estimates and changes to data from past months. This work is a moving average or trend analysis. Thus, the trend and resulting statistics are reset each month. Said another way, this work suffers the same critique as all other trend analysis, such as unemployment or GDP.

4 The Waller, Weeks, and Johnson Rental Index is a joint production between the authors herein and their universities – The University of Alabama, Florida Gulf Coast University, and Florida Atlantic University.