Deciphering the Recent Decline in AIMI®

Examining the drivers that led to AIMI's largest annual drop on record

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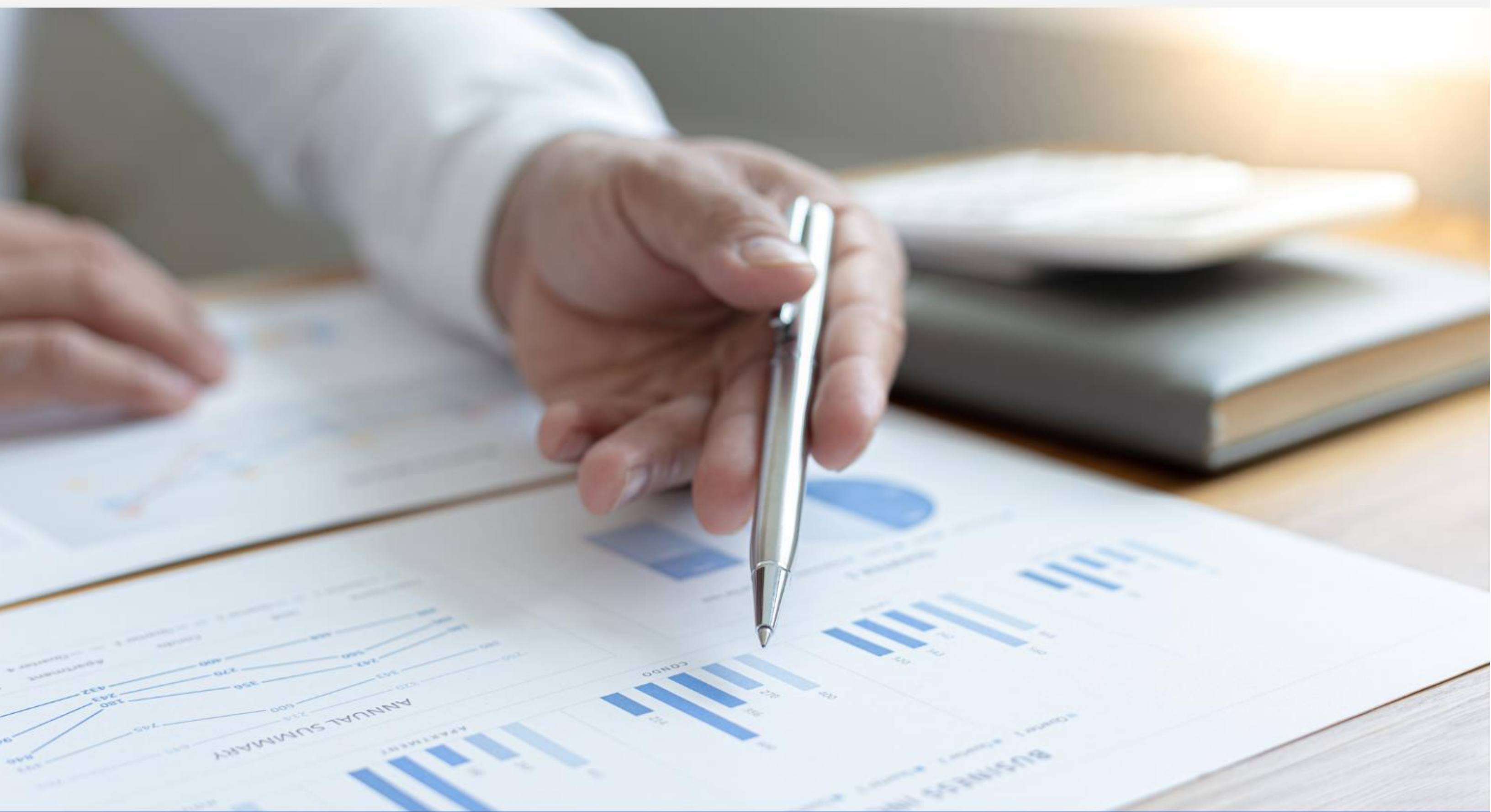
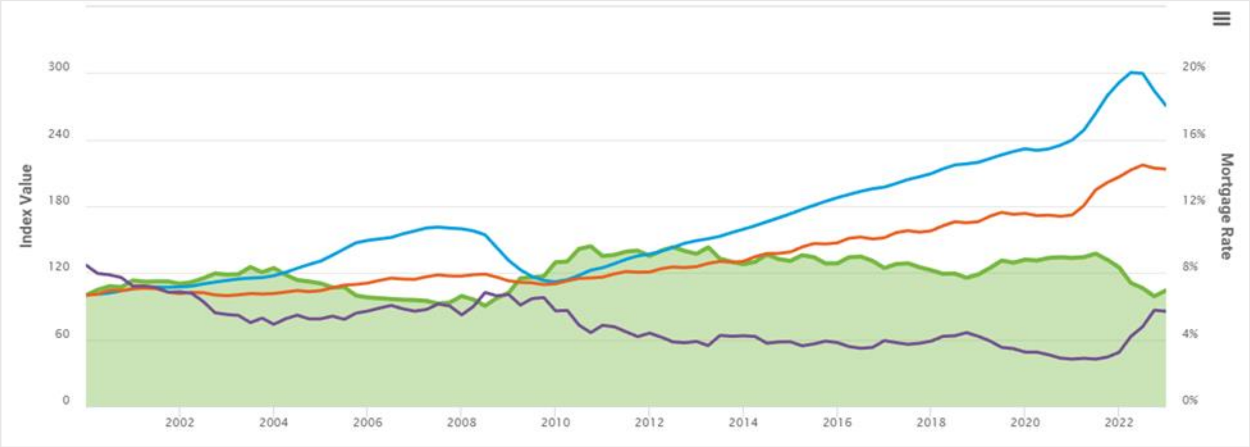


Multifamily Research Center

In the fourth quarter of 2022, Freddie Mac's Apartment Investment Market Index® (AIMI) declined -24.9% year over year, the largest decline on record going back to 2000[1]. This drop signifies worsening investment conditions, mostly driven by higher interest rates, which increases the cost of financing substantially. For investors who are active in the multifamily space, this finding comes as no surprise, and is evident in a drop in transaction volume by -68% in the fourth quarter of 2022 compared with one year prior, per Real Capital Analytics.

In the years after the great financial crisis leading up to the pandemic, AIMI benefited greatly from the persistently low interest rates and steady net operating income (NOI) growth, even in the face of rapid property price growth. During the pandemic, mortgage rates plummeted, which sent AIMI higher despite faltering NOI growth. Post-pandemic recovery saw property prices and NOI growth increase substantially, while rates remained low. But starting in 2022, the sharp increase in interest rates reversed this trend and caused the index to tumble to a 14-year low in the fourth quarter.

Exhibit 1: National AIMI Graph as of 2023 Q1



Source: Freddie Mac's AIMI. For more information on the technical details of how AIMI is calculated, please see the About AIMI page or AIMI FAQs.

What is AIMI?

The index provides an overview of market-rate multifamily investment conditions by measuring the change in income produced on a property compared with the mortgage debt service. These metrics capture a broad range of multifamily conditions, including the cost of financing a property along with property income performance.

There are three inputs into AIMI: NOI, property price growth and mortgage rates. AIMI uses rental income, which incorporates rent growth and occupancy change, as a proxy for NOI changes. We assume that the rate of expense growth on average matches that of rental revenue and thus the share remains constant

[1] This rate of decline is different from the rate originally reported in the fourth quarter version of AIMI. This is because AIMI values change with each update, and the data in this paper is as of the first quarter of 2023.

over time[2]. Debt service is calculated using the mortgage rate along with the property value, assuming a 75% loan-to-value ratio (LTV). These inputs are combined into a single index that tracks the investment environment at the national level and across several metro areas.

An increase in AIMI indicates a more favorable environment for multifamily investing compared with the prior period, while a decrease in AIMI indicates a less favorable environment. AIMI increases when NOI growth outpaces debt service growth, implying higher property income relative to debt service, in comparison with the prior year. AIMI decreases when debt service growth outpaces NOI growth, implying higher debt service relative to property income. Exhibit 2 shows the relationship of each variable on AIMI independently. NOI has a positive relationship with AIMI, while property prices and mortgage rate have a negative relationship. Each variable also has a different magnitude of impact on AIMI, with property price being the smallest and mortgage rates being the greatest.

Exhibit 2: Component Effect on AIMI

Input	Contribution
Net Operating Income (NOI)	↑ NOI ↑ AIMI
Property Price (PP)	↑ PP ↓ AIMI
Mortgage Rate (MR)	↑ MR ↓ AIMI

Source: Freddie Mac's AIMI

How Much Does Each AIMI Component Impact the Index?

NOI

NOI growth has a direct, linear relationship with AIMI and moves at a 1:1 ratio. For every 1% increase (decrease) in NOI, AIMI will increase (decrease) by 1%, holding property prices and mortgage rates constant. The long-run average quarterly growth rate of NOI is 0.9% but the rate varies widely by quarter due to seasonality. Second quarter growth is normally the strongest with a long-run average of 2.1%, whereas NOI normally contracts in the fourth quarter, at a rate of -0.7% on average going back to 2000.

Property Prices

Property prices have a negative relationship with AIMI. Holding NOI and mortgage rates constant, an increase (decrease) in property prices will decrease (increase) AIMI. The relationship is nonlinear but is close to a 1:1 ratio and can be thought of this way for small price movements. Most accurately, the function is as follows:

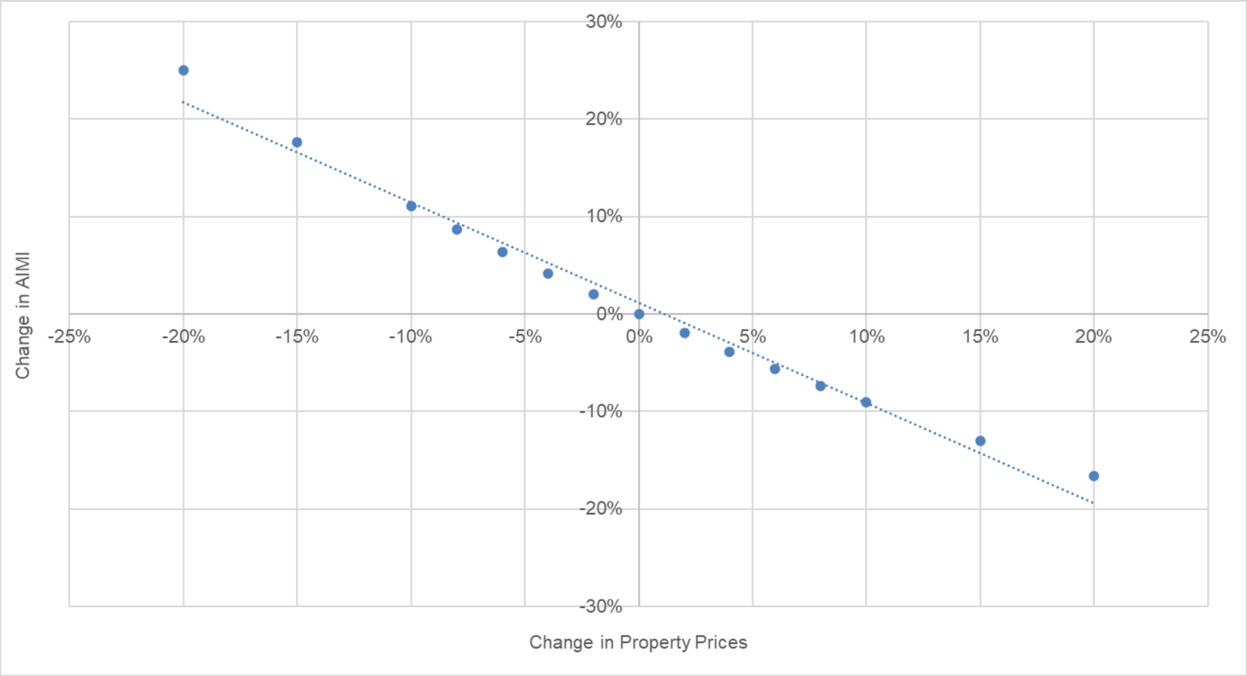
$$\Delta AIMI\ \% = -\left(\frac{\Delta PP\ \%}{1 + \Delta PP\ \%}\right)$$

[2] According to RealPage, the expense ratio has averaged roughly 40% since the first quarter of 2009 and does not exhibit much variation from year to year. RealPage's expense ratio estimate only considers market-rate multifamily units, just like AIMI.

For example, a 5% increase in property prices decreases AIMI by -4.8%.

$$\Delta AIMI\ \% = -\left(\frac{5\%}{1+5\%}\right) = -\frac{5\%}{1.05\%} = -4.8\%$$

Exhibit 3: Change in AIMI vs. Change in Property Prices



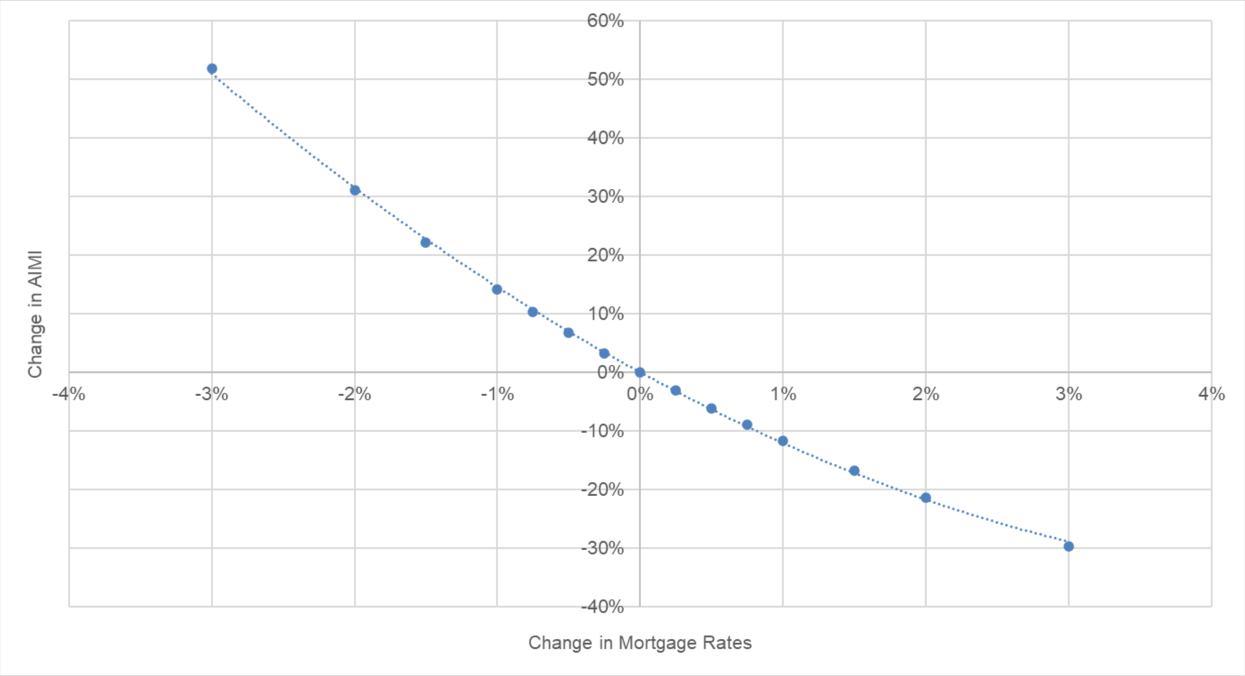
Source: Freddie Mac's AIMI

Mortgage Rates

Mortgage rates, like property prices, have a negative relationship when the other two variables are held constant. But the mortgage rates' impact on AIMI is not linear since it is a value instead of a growth figure. For small increases in mortgage rates, up to 200 basis points (bps), we found that multiplying the mortgage rate by -12 will approximate the change in AIMI[3]. For example, if mortgage rates increase by 50 bps while NOI and property prices are held constant, AIMI decreases by -610 bps, which is very close to a -12 factor difference (-610 bps/50 bps = 12.2). Whereas, for downward movements in mortgage rate, down at most 200 bps, the multiplier is greater at +14.

[3] Mortgage rates movements of greater than 200 bps in a year happen very rarely. The relationship between mortgage rates and AIMI (keeping NOI and property prices constant) can be roughly approximated with a polynomial but using a rule of thumb is adequate for explanatory purposes.

Exhibit 4: Change in AIMI vs. Change in Mortgage Rates



Source: Freddie Mac's AIMI

How Has Each AIMI Component Impacted the Index Historically?

Each quarter, the effect of the three inputs depends on how much each one moves relative to the other. In most quarters since 2000, property prices have the strongest effect. However, the trend of strongest effect is highly correlated with macroeconomic conditions. We study these three components from 2000 Q1 to 2023 Q1.

NOI

NOI is rarely the main driver of the AIMI change. This has only happened if property prices and mortgage rates remain relatively constant, which historically back to 2000 has not been the case. An exception was during late 2021 and early 2022, when NOI drove the AIMI change due to massive growth from the pandemic recovery that far exceeded the historical average.

Property Prices

Property prices have been the largest contributor to the change in AIMI in 51 of 89 quarters (57%). In the entire time series, the average annual growth of property prices has been 5.1%. Since the great financial crisis, prices have increased, on average, at a higher rate of 7.7%. Both growth rates are materially higher than those for NOI growth during those same periods (3.5% and 5.4%, respectively).

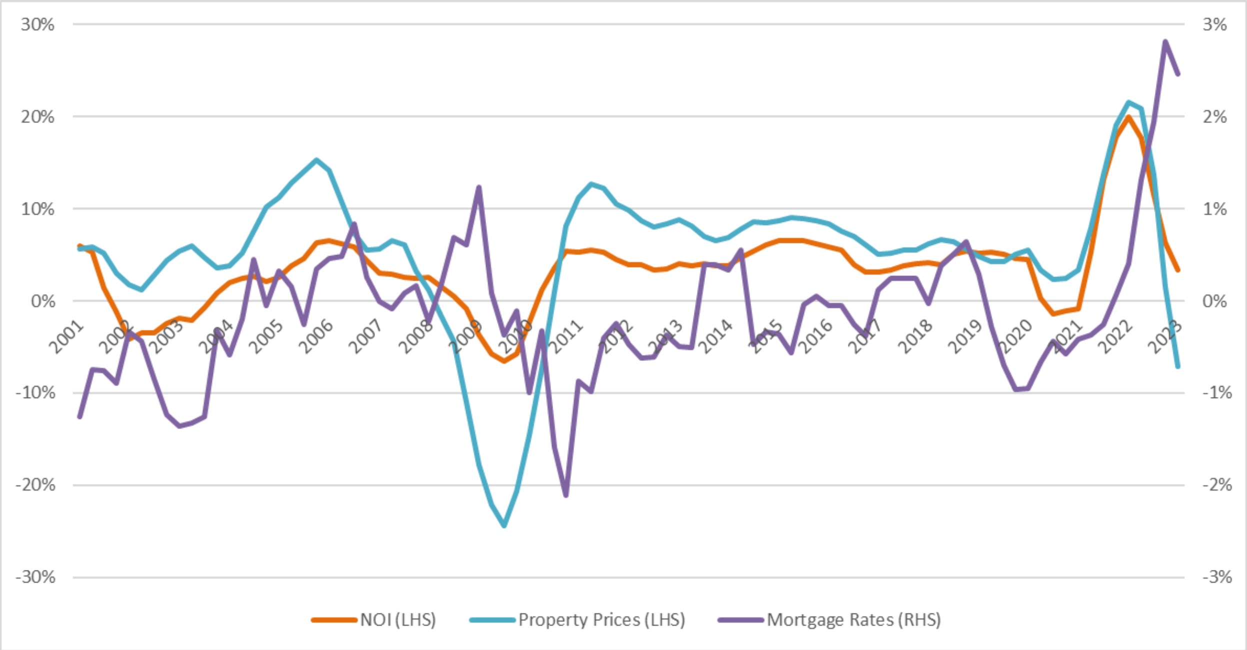
Mortgage Rates

Mortgage rates have historically been the best indicator of which way AIMI will move, and during periods of volatile interest rates, they tend to have the strongest effect on AIMI. In 70 of 89 quarters (79%), the direction that mortgage rates move indicates the direction in which AIMI moves. In other words, the negative relationship between mortgage rates and AIMI is observed 79% of the time. In the other 21% of cases, the effect of NOI and/or property prices was strong enough to offset the effect of mortgage rates. One example was during the great financial crisis when NOI and, especially, property prices dropped precipitously and consequently increased AIMI at a time when mortgage rates were rising. The 79% indication rate for mortgage rates compares with 35% for NOI and 57% for property prices.

Relationship Between Components

We see some correlation among the three input variables into the index. NOI and property prices are strongly correlated. As seen in Exhibit 5, NOI tends to be less volatile than property prices, but the general movements are largely the same. Mortgage rates are somewhat correlated with NOI but the relationship is not particularly strong. However, while mortgage rates and property prices show almost no correlation, the movement of those two variables are not independent of each other. Higher mortgage rates influence property prices by pushing the cost of financing up and thus lowering marginal demand for multifamily investment. When this happens, prices tend to fall. The relationship is not coincidental, as seen by the lack of correlation in Exhibit 5, but instead shows signs of a lagging relationship; higher mortgage rates typically lead to lower prices in two to three quarters. Property prices are a function of many variables, mortgage rates among them, so we cannot conclude direct causality from this.

Exhibit 5: Annual Percent Change in NOI, Property Prices and Mortgage Rates



Source: Freddie Mac's AIMI. NOI and property prices are expressed as annual percentage change whereas mortgage rates are expressed as nominal change.

What Has Happened Recently?

Exhibit 6 breaks out each component's contribution to AIMI before and after the pandemic. Mortgage rates were the primary driver of the change in 2020 and 2022, albeit in different directions. Mortgage rates dropped quickly in 2020 and as a result, AIMI generally increased. In the second quarter of 2020 through the first quarter of 2021, AIMI increased modestly, at which time mortgage rates accounted for about 64.3% of AIMI's upward movement[4]. Similarly, in the last two quarters of 2022, when mortgage rates moved up rapidly causing AIMI to decline, mortgage rates accounted for 47.3% and 78.3% of AIMI's third and fourth quarter decline, respectively.

Meanwhile, NOI and property prices had a greater impact in most of 2021, although offset one another in most quarters. Since the end of 2021, annual AIMI change has been negative, and in the last two quarters of 2022, the decline was mostly driven by increasing mortgage rates. During that time property price appreciation contributed to the decline but not in a major way, while NOI growth counteracted the decline but with only a small effect.

Exhibit 6: Annual Component Contribution to AIMI During and After the Pandemic

Source: Freddie Mac's AIMI

Breaking down the three AIMI components in the fourth quarter of 2022 decline in AIMI, we see:

- **NOI:** Rental revenue grew by 6.4% in 2022. Despite the strong growth in rents, which was more than double the pre-pandemic average, it was not enough to offset the negative effects of mortgage rates and property price growth.

[4] To calculate how much each component contributes to the total movement, we first calculate how much each component would change AIMI if the other two components were held constant over the year. We then sum the absolute value of those three isolated component effects and divide each of the three by this summed value. Then, we standardize each component contribution to percentages. For example, the isolated effect of NOI, property prices and mortgage rates in 2022 Q4 was 6.4%, -1.5% and -28.4%, respectively. The sum of the absolute values is 36.2%. Therefore, the contribution of NOI is 17.6% (6.4% / 36.2%), property prices is 4.1%, and mortgage rates is 78.3%.

- **Property Prices:** In the fourth quarter of 2022, annual property price appreciation was 1.5% which is an abrupt slowdown from the prior four quarters when average appreciation was 18.8%. Despite the slowdown, the positive property price growth puts downward pressure on AIMI, but only modestly given the almost one-to-one relationship.
- **Mortgage Rates:** Mortgage rates increased annually by 282 bps in the fourth quarter 2022, which was a historic high going back to 2000 and was the chief culprit in the drop in AIMI. If NOI and property prices were held constant, this observed change in mortgage rates would have decreased AIMI by -28.4%.

Conclusion

In 2022, the decline in AIMI was mostly driven by mortgage rates, which reflects the increase in the federal funds rate from the Federal Reserve's reaction to combat high inflation. As we saw, higher mortgage rates will result in lower property prices, which would offset the decline in AIMI, but the relationship is lagged. In the first quarter of 2023, Real Capital Analytics reported property prices have declined for eight straight months, down -10.3% annually. The 10-year Treasury rate, which drives mortgage rates, was less volatile in the first quarter compared with the fourth quarter, but at the same time, rental income growth slowed considerably to 3.4% (compared with the prior year's record high of 19.9%). While the multifamily market is expected to see modest growth by the end of 2023, the continued economic uncertainty could result in mixed AIMI changes throughout the year.

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