

# Sales Index Report

## **Methodology**

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## **Office Index**

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## **Knowledge Industry Center Index**

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## **Transaction Volume**

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## **Index Comparison 1**

### **: Office vs Knowledge Industry Center**

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## **Index Comparison 2**

### **: Macro vs Office**

## Sales Index

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- The office sales index was formulated using the repeat sales model, which is also applied in calculating the Case/Shiller Home Price Index in the United States.
- The repeat sales model tracks the price changes of properties that have been sold at least twice, dividing the appreciation rates appropriately over different time periods.
- To supplement the limited availability of data, the MIT Center for Real Estate's (MIT/CRE) two-stage estimation method is also utilized in the calculation.

## Cap. Rate

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- The cap rate has limitations as a stable indicator due to the small number of transactions, particularly in cases involving corporate headquarters or development projects, where there may not be any rental income. Even when using quarterly averages, creating a reliable index is challenging.
- To address this, the cap rate index was calculated using a Bayesian model, which has recently been employed for developing stable indicators. The model assumes that the difference between the previous quarter and the current quarter follows a normal distribution under a random walk hypothesis.

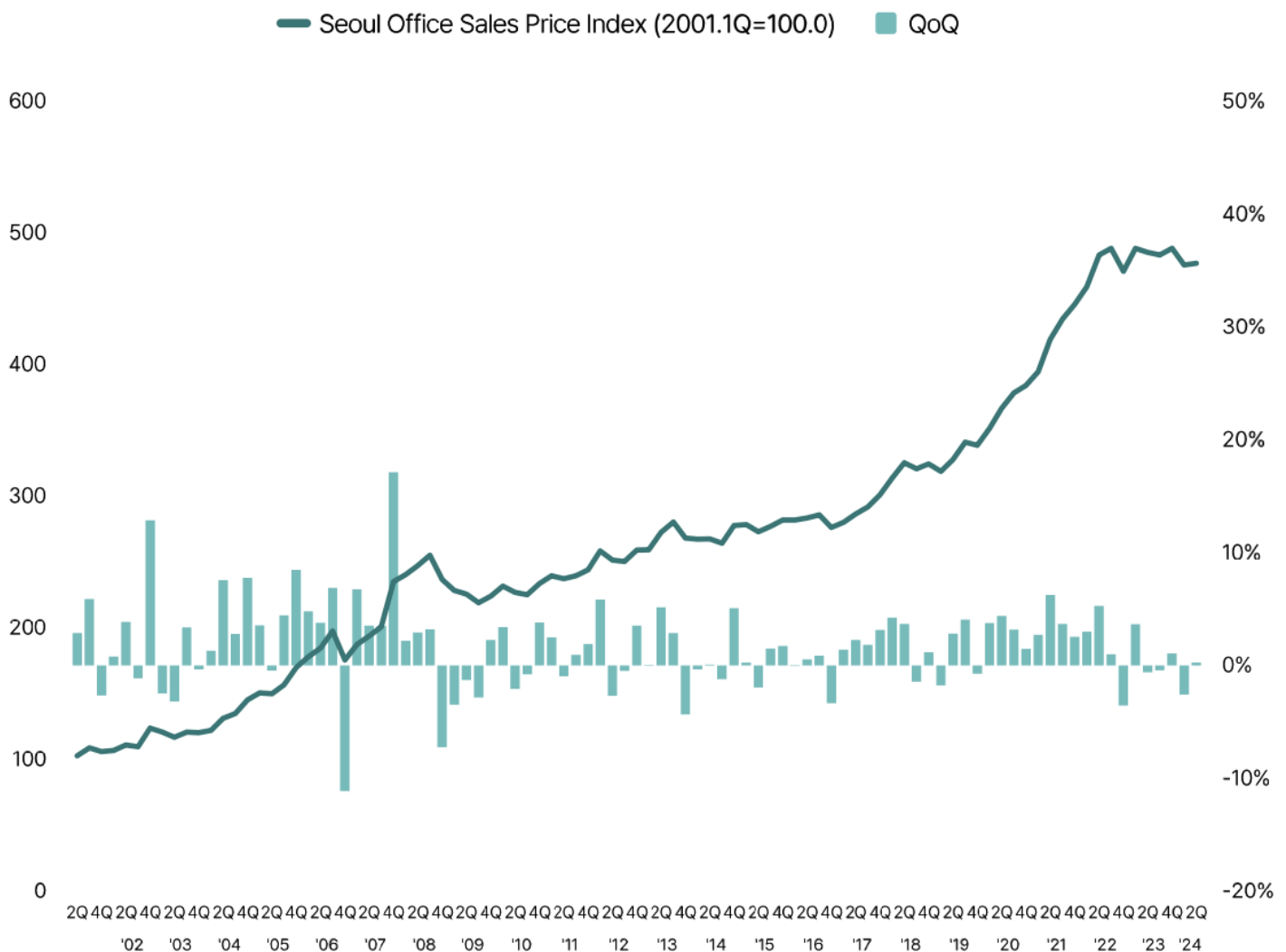
## Misc.

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- The sales index and cap rate were calculated using actual transaction data derived from RSQUARE's use of registry records, among other sources. The following references were used for data construction and modeling:
- Hwang, Kyuwan & Son, Jaeyoung (2017). "A Study on the Calculation of the Seoul Office Price Index Using the MIT/CRE Two-Stage Estimation Method," *Housing Studies*, 25(1), 151-175.
- Ryu, Kangmin & Song, Kiuk (2020). "Development and Pilot Application of the Benchmark Price Index for Seoul Offices Using the Repeat Sales Model," *LHI Journal*, 11(2), 33-46.
- Ryu, Kangmin & Song, Kiuk (2023). "Development of the Knowledge Industry Center Price Index and Analysis of Macroeconomic Factors in Seoul," *Real Estate Analysis*, 9(1), 253-270.
- Kwon, Minseong; Choi, Woohyun; Song, Youngsun; & Lee, Changmoo (2022). "Development of Apartment Complex Price Indices Based on Actual Transaction Data Using Hierarchical Bayesian Inference," *Real Estate Studies*, 28(4), 39-54.

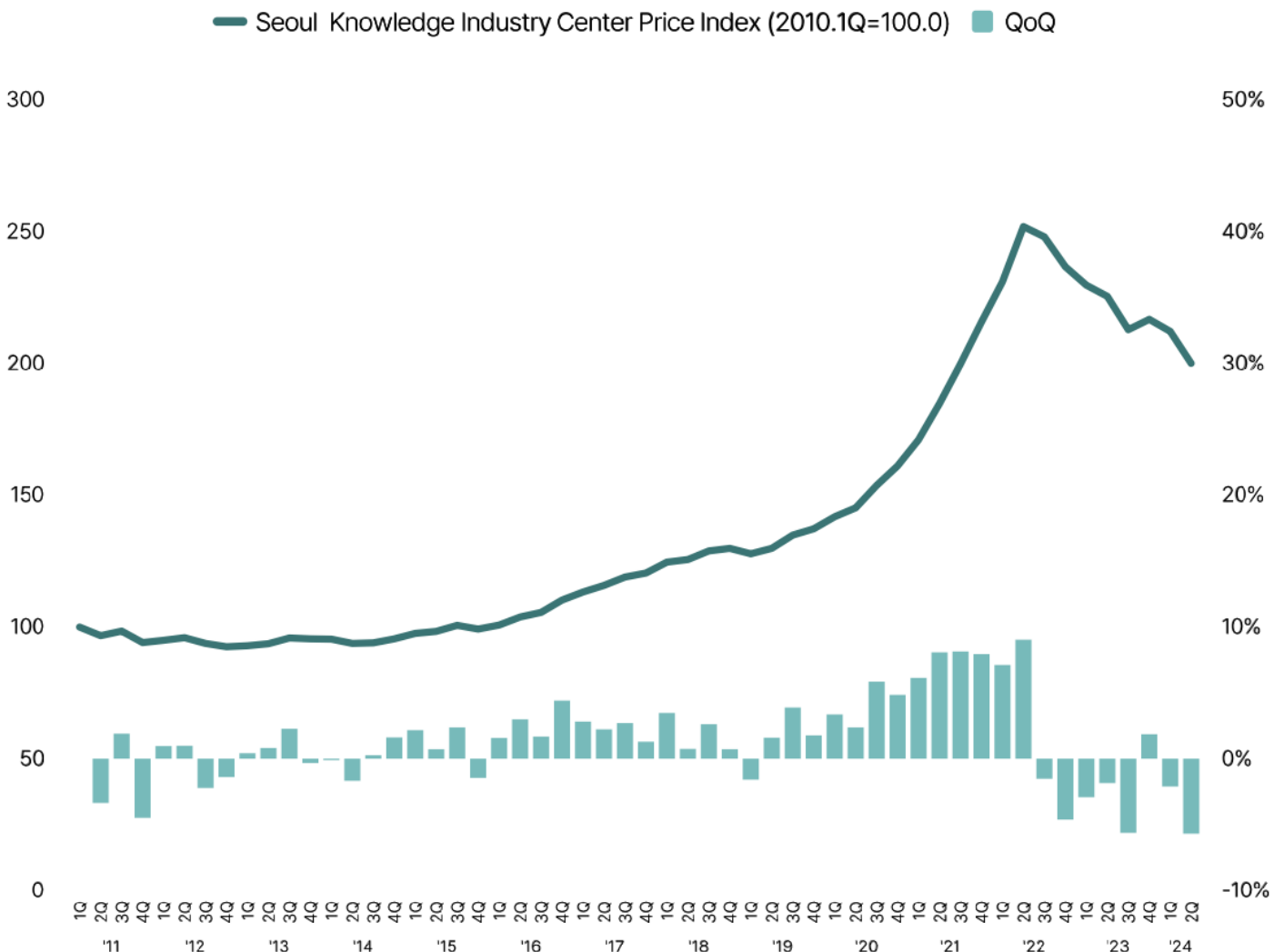
# Office Index

- As of Q2 2024, the sales index stood at 477.1 points, reflecting a 4.77x increase from Q1 2001. This represents a 0.3% rise from the previous quarter (Q1 2024) and a 1.7% decrease compared to the same quarter last year (Q2 2023)
- The Seoul office sales index showed strong growth with annual increases of over 13% from 2001 to Q3 2008, followed by a 12% drop post-global financial crisis in Q3 2009. From 2010 to 2017, the index saw steady growth of around 3% annually. From 2018 to Q3 2022, the index surged by over 10% annually but has since stagnated.
- Prices surged significantly in 2020 and 2021 due to favorable investment conditions driven by low interest rates despite the COVID-19 pandemic. In 2022, the upward trend continued, supported by strong tenant demand and rising rental rates, even amidst consecutive interest rate hikes, with the market reaching its peak in Q3 2022. However, since Q4 2022, prices have stagnated, and transaction volumes have significantly decreased compared to previous levels.
- This year, the continued stagnation of prices combined with rising rental rates has led to an increase in the cap rate spread. Additionally, if interest rates decrease further, there is potential for price increases.



# Knowledge Industry Center Index

- In Q2 2024, the knowledge industry center sales index stood at 200.1 points, marking a 2.00x increase from Q1 2011. However, it showed a 5.7% decrease compared to the previous quarter (Q1 2024) and an 11.3% decrease compared to the same quarter last year (Q1 2023). Unlike the office market, the impact of interest rate hikes on price declines has been more pronounced.
- From 2011 to 2019, knowledge industry centers showed a stable annual growth rate of around 3.0%. However, from 2020 to Q2 2022, they experienced an annual increase of over 20%, indicating a higher growth rate compared to offices.
- The significant price increase in knowledge industry centers is likely due to the favorable investment environment, where they require less capital compared to offices, making them accessible for individual investors. Additionally, they face fewer restrictions, such as loan regulations, compared to residential properties.
- The knowledge industry centers, which had shown significant price increases until Q2 2022, began to decline from Q3 2022, dropping by up to 20% from their peak by Q2 2024.

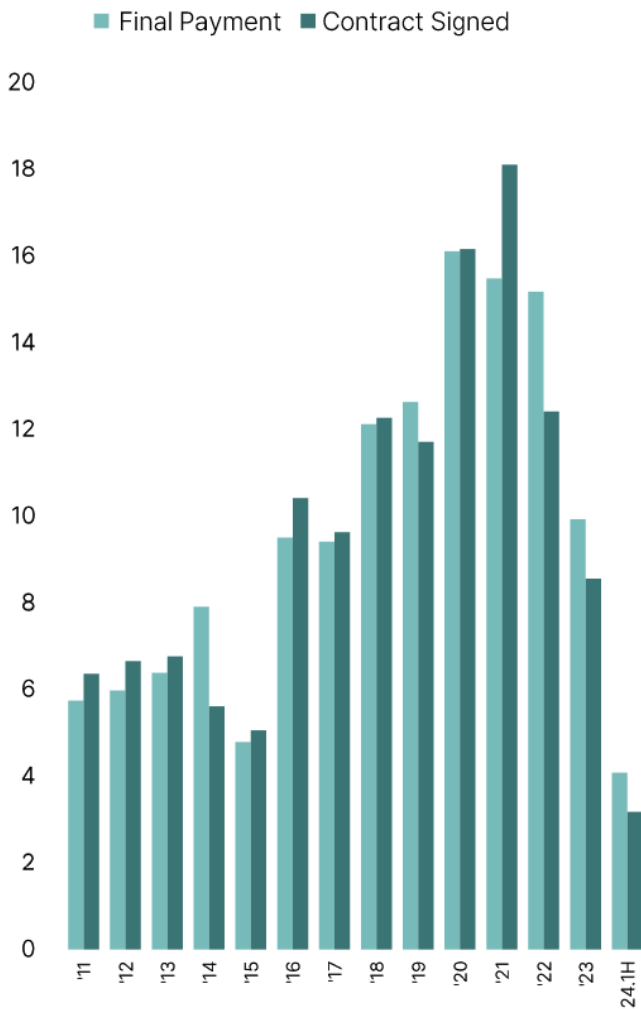


# Office and Knowledge Industry Center Transaction Volume

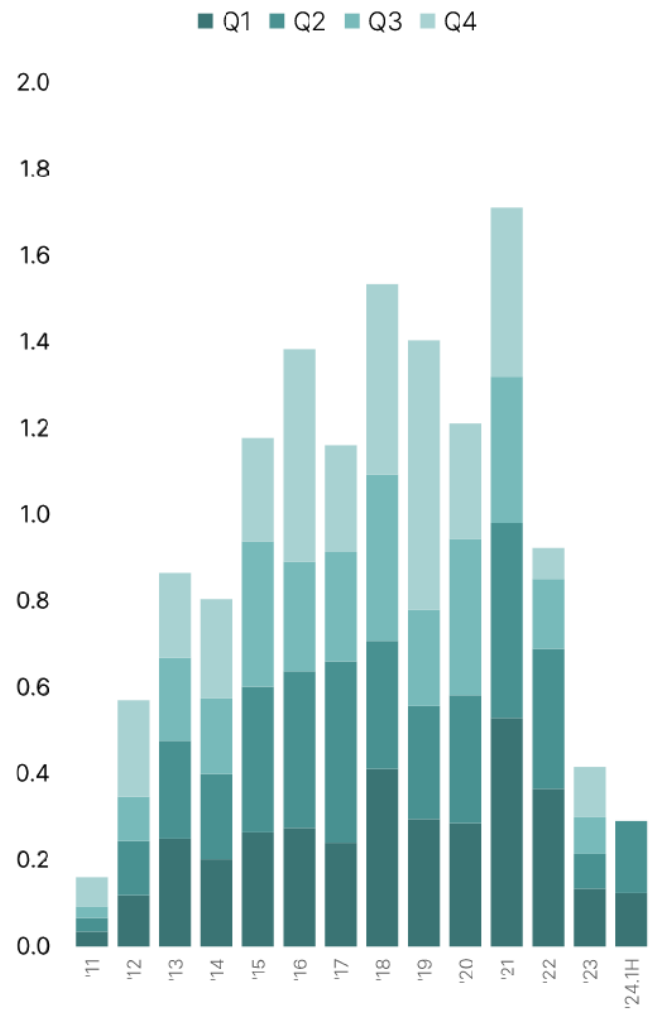
- The transaction volume for Seoul offices, including Bundang, has steadily increased since the global financial crisis, exceeding 10 trillion KRW annually starting from 2016. In 2021, the highest transaction volume was recorded, surpassing 17 trillion KRW.
- However, due to the burden of higher loan costs and declining yields resulting from interest rate hikes, investment in offices has decreased since 2022. In the first half of 2024, the transaction volume, based on the year of final payment, stood at 4.1 trillion KRW, indicating a decrease compared to the same period last year, and a continued decline in transactions.
- Since 2015, knowledge industry centers have seen transaction volumes exceeding 1 trillion KRW annually, with 2021 recording the highest at 1.7 trillion KRW. However, similar to the office market, transaction volumes began to decline from 2022 due to the impact of interest rate hikes. In the first half of this year, transaction volumes have increased compared to the same period last year, likely due to a higher number of sales resulting from price reductions.

\* Contract date reflects the point when new investments occur, offering a better alternative to final payment date in understanding the new investment trend.

**Seoul/Bundang Office Transaction Volume (Trillion KRW)**



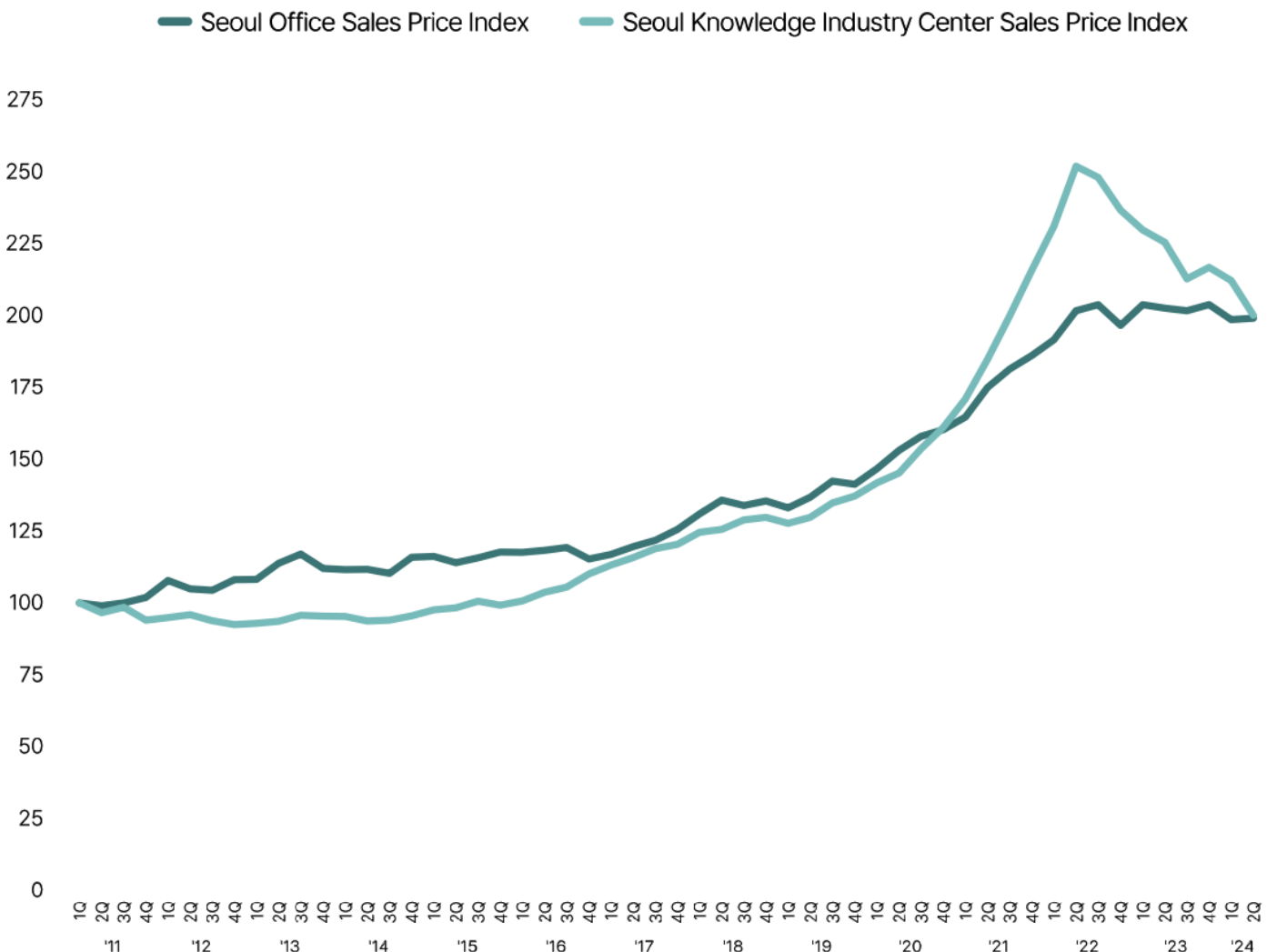
**Seoul Knowledge Industry Center Transaction Volume (Trillion KRW)**



# Index Comparison 1

## : Office vs Knowledge Industry Center

- Knowledge industry center market is complementary to offices due to several factors: 1) lower rental costs, 2) able to be used as office spaces 3) located in surrounding areas such as Gasan, Guro, Magok, Songpa, Yeongdeungpo, and Seongsu, rather than in the three core office districts.
- The price trends of offices and knowledge industry centers have shown similar patterns. Until 2019, the average sales price increase for knowledge industry centers was lower than that of offices. From 2020 to Q2 2022, however, knowledge industry centers saw higher sales price increase compared to that of offices.
- The significant price increase in knowledge industry centers seemed to be affected more by the shift in investment demand for housing, driven by low interest rates and housing regulations, rather than an increase in tenant demand. Unlike offices, which typically require large amounts of capital due to single-ownership, knowledge industry centers allow fractional ownership, making them accessible to individual investors. Staying immune to housing regulations was a plus.
- As a result, knowledge industry centers saw a record-breaking annual price increase of over 20% from 2020 to Q2 2022. However, due to factors such as interest rate hikes, recent price has declined as low as 20% from the peak. The higher price volatility of knowledge industry centers and that of offices is largely due to an investment-centric demand than from tenants.

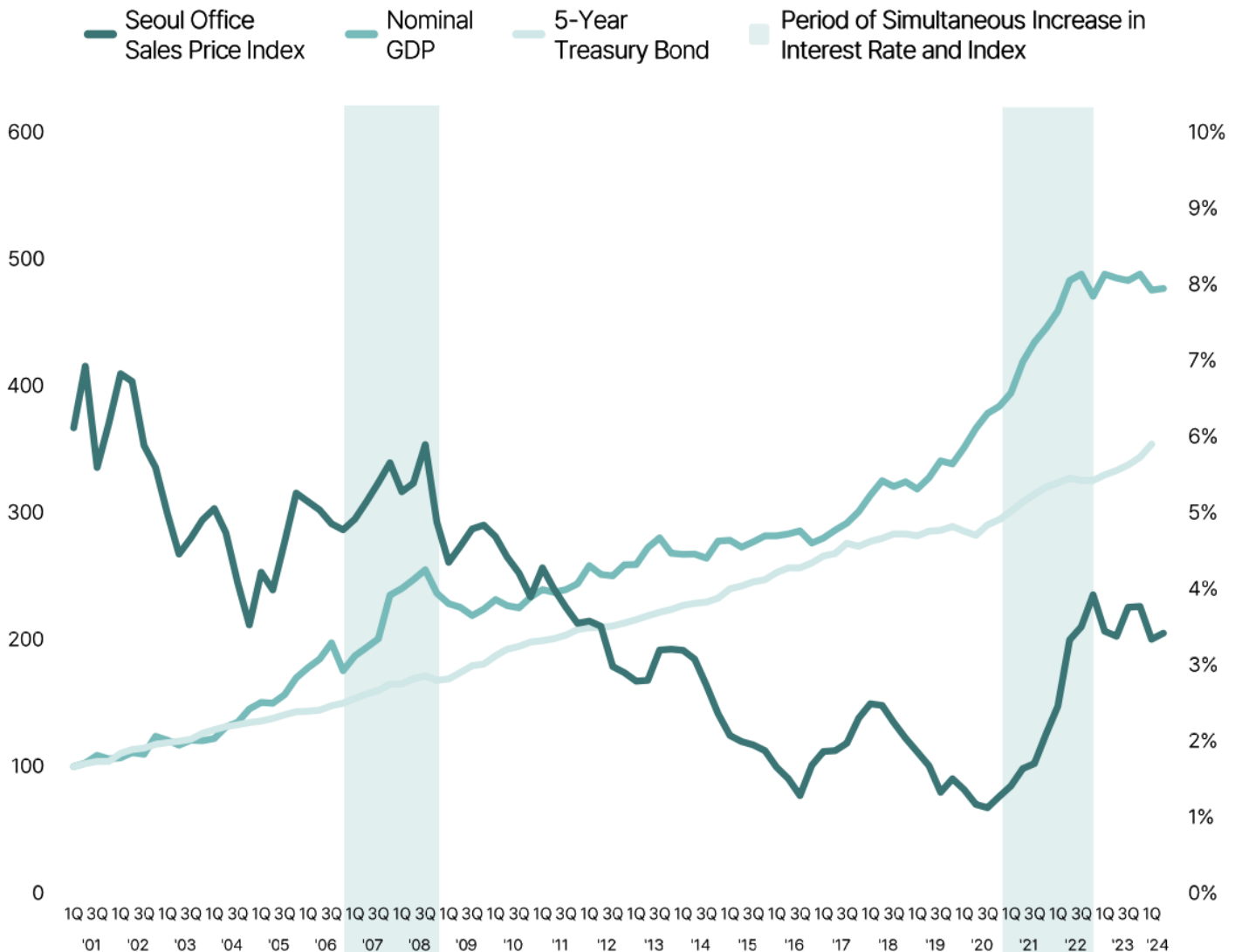


# Index Comparison 2

## : Macro vs Office

### Office Index vs GDP, Interest Rate

- GDP is a productivity indicator for a country and is closely linked to office investment and tenant demand. The scale and production of goods are determined within office spaces, and the resulting profits drive capital investments in facilities.
- When examining the correlation between the office index and GDP, both shows an upward trend; however, the gap is seen notably before the global financial crisis in 2007 and again after 2019.
- In 2020 and 2021, the rate of increase in the office index exceeded the growth in GDP. This is believed to be due to the positive effect of low interest rates on investment sentiment, despite GDP stagnation from COVID-19.
- From 2001 to Q2 2024, the correlation coefficient between interest rates and sales prices was  $-0.63$ , indicating a strong inverse relationship. However, in 2022, despite interest rate hikes, prices continued to rise, imposing a significant burden on investors. Such trend was also observed before the global financial crisis.

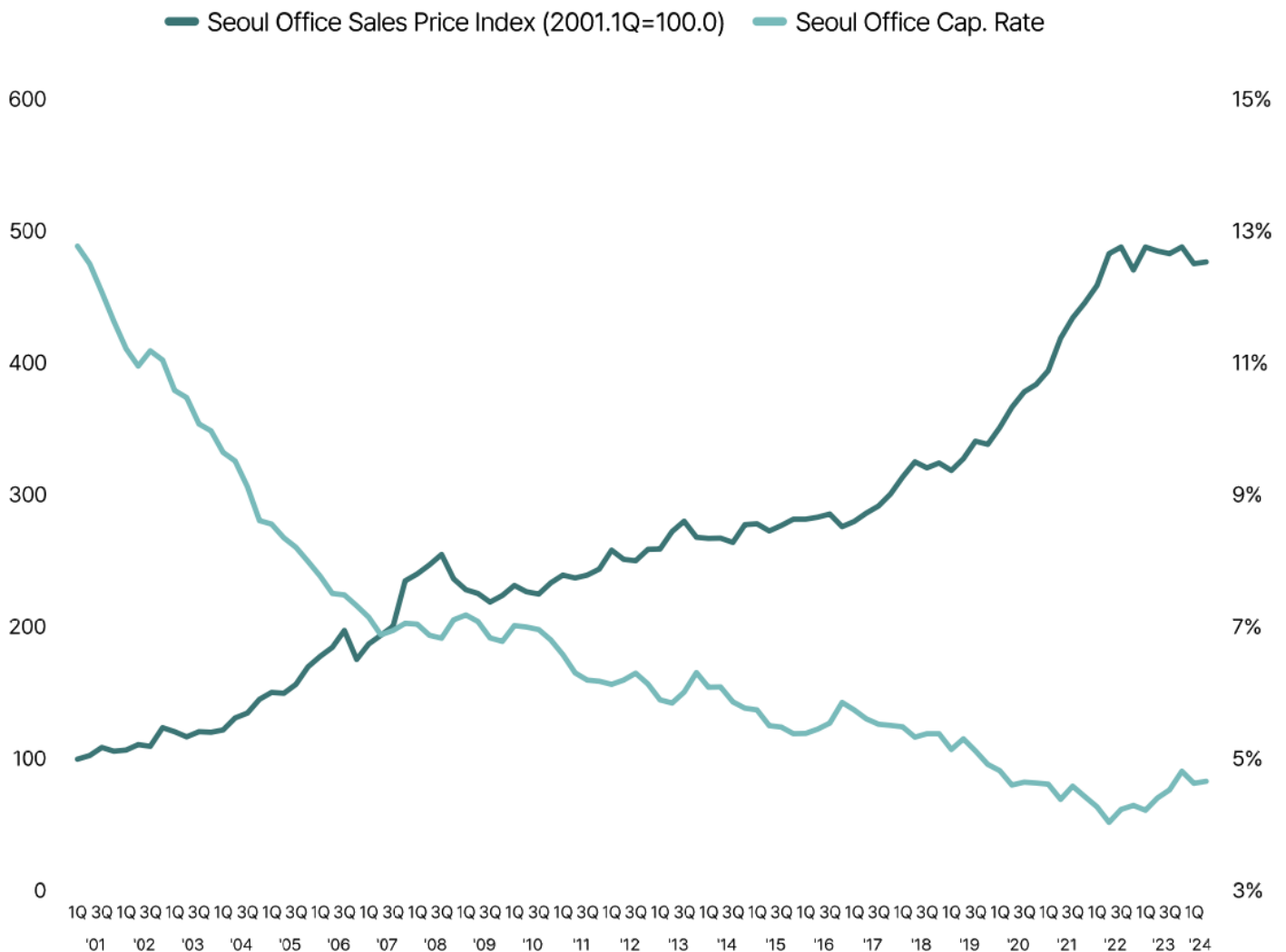


# Index Comparison 2

## : Macro vs Office

### Office Index vs Cap. Rate

- The cap rate, which reflects the relationship between sales prices and rental income, shows an inverse relationship with sales prices. The cap rate decreased from 12.8% in Q1 2001 to 4.7% in Q1 2024, a drop of 8.1 percentage points, while sales prices increased from 100.0 in Q1 2001 to 477.1 in Q2 2024, a 377% rise. It was observed that for every 10% increase in sales prices, the cap rate decreased by 0.22 percentage points.
- The cap rate has been on a continuous downward trend but began to rise in Q4 2022 due to interest rate hikes, coinciding with a decline or stagnation in prices. The cap rate increased from 4.0% in Q4 2022 to 4.7% in Q2 2024.
- Due to the stagnation of prices caused by high interest rates and the continued increase in rental rates driven by a strong rental market, the cap rate is expected to continue rising for some time.
- Additionally, while the cap rate spread has historically ranged between 250 to 300 basis points from 2010 to the recent past, the spread in Q2 2024 was around 120 basis points, indicating that the cap rate is likely to increase further.



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