

# 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 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

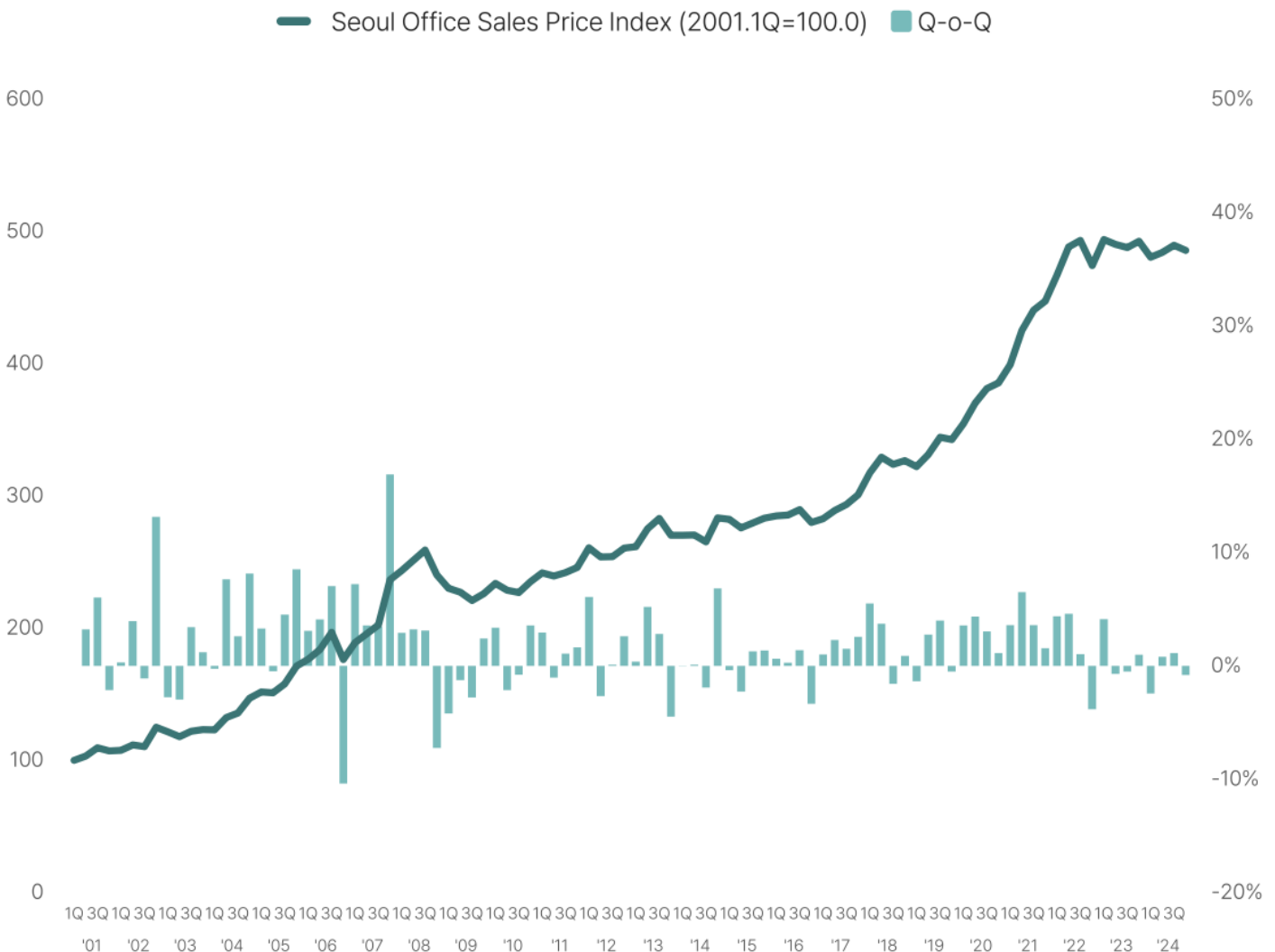
## Misc

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- The sales index and Cap. Rate were calculated using actual transaction data derived from RSQUARE's use of registry documents, among other sources. The following references were used for data collection 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

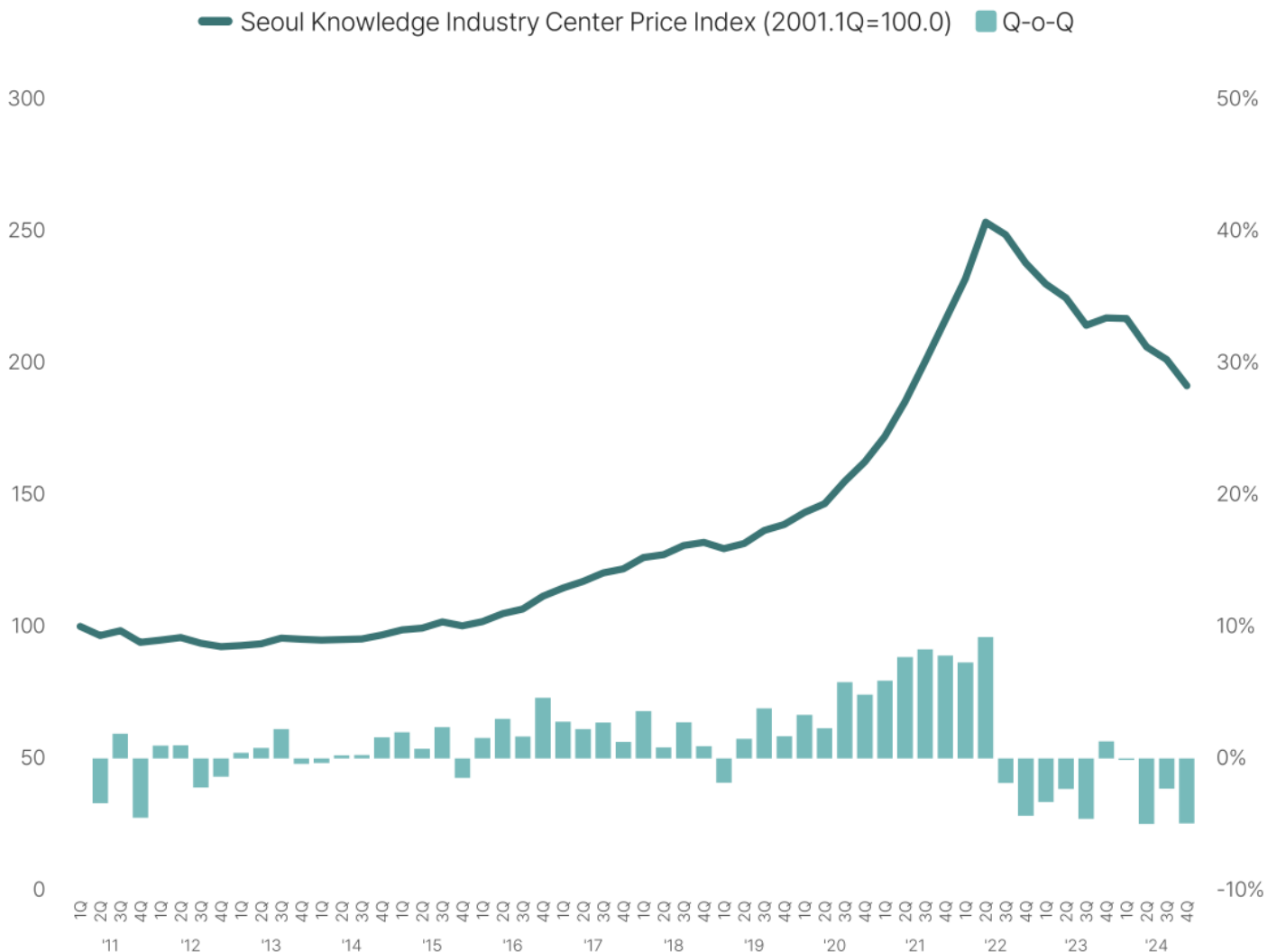
# Office Index

- As of Q4 2024, the sales index stood at 485.5 points, reflecting a 4.86x increase from Q1 2001. This represents a 0.8% decline from the previous quarter (Q3 2024) and a 1.4% decline compared to the same quarter last year (Q4 2023).
- The Seoul office sales index showed strong annual growth rate of over 13% from 2001 to Q3 2008, but following the global financial crisis, it dropped by 12% in the Q3 2009 compared to the peak in the Q3 2008. 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 since then, the situation has remained stagnant.
- 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 rents, 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.
- Compared to the previous quarter, prices have slightly declined, but overall, prices have remained stagnant since Q2 2023. However, with recent increases in rents and interest rate reductions, the Cap. Rate Spread has widened, signaling a potential normalization of transactions. It is anticipated that prices may break out of this prolonged stagnation and begin to rise as early as this year.



# Knowledge Industry Center Index

- In Q4 2024, the knowledge industry center sales index stood at 191.3 points, marking a 1.91x increase from Q1 2011. However, it showed a 4.9% decrease q-o-q(Q3 2024) and an 11.9% decrease y-o-y(Q4 2023). Unlike recent offices, the price decline due to interest rate hikes has been relatively significant.
- From 2011 to 2019, knowledge industry centers exhibited a stable annual growth rate of around 3.0%. However, from 2020 to Q2 2022, they recorded an annual growth rate over 20%, reflecting 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, continuing until Q3 2023. From Q4 2023 to Q1 2024, prices remained stagnant due to expectations of year-end and interest rate cuts but later resumed their decline. By Q4 2024, prices had dropped by 25% from their peak. Unlike the office sector, weak leasing market conditions make substantial price increases challenging in the near term.

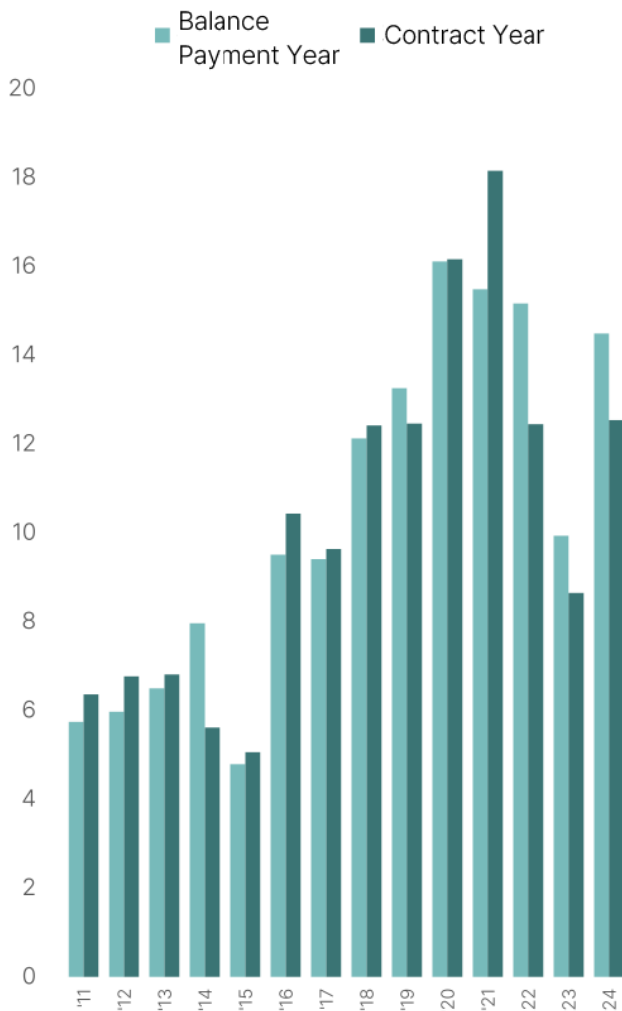


# Office and Knowledge Industry Center Transaction Volume

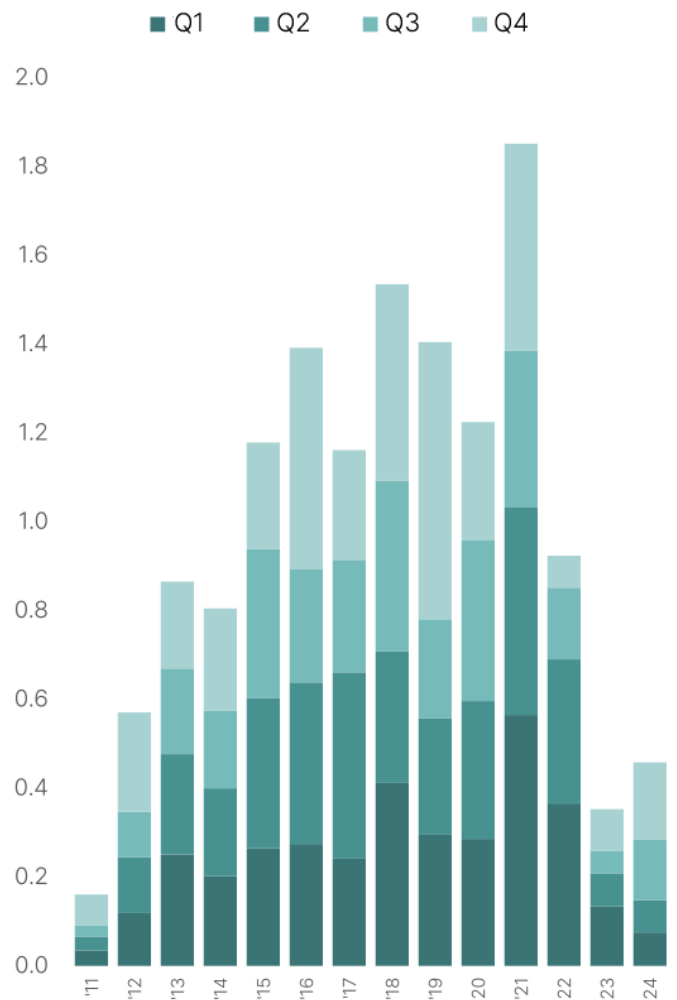
- The transaction volume for Seoul offices, including Bundang, has steadily increased since the global financial crisis, exceeding 10 trillion KRW annually starting from 2016. In 2021, the highest transaction volume was recorded, surpassing 17 trillion KRW.
- However, due to the burden of higher loan costs and declining yields resulting from interest rate hikes, investment in offices has decreased since 2022. In 2023, the transaction volume, based on the year of balance payment, fell below 10 trillion KRW. In 2024, it rebounded, reaching 14.5 trillion KRW, marking a 4.6 trillion KRW increase compared to 2023 (9.9 trillion KRW).
- Since 2015, knowledge industry centers have seen transaction volumes exceeding 1 trillion KRW annually, with 2021 recording the highest at 1.9 trillion KRW. However, similar to the office market, transaction volumes began to decline from 2022 due to the impact of interest rate hikes. As of Q4 2024, transaction volumes remain higher y-o-y, indicating some investment activity, though a full recovery remains uncertain.

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

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



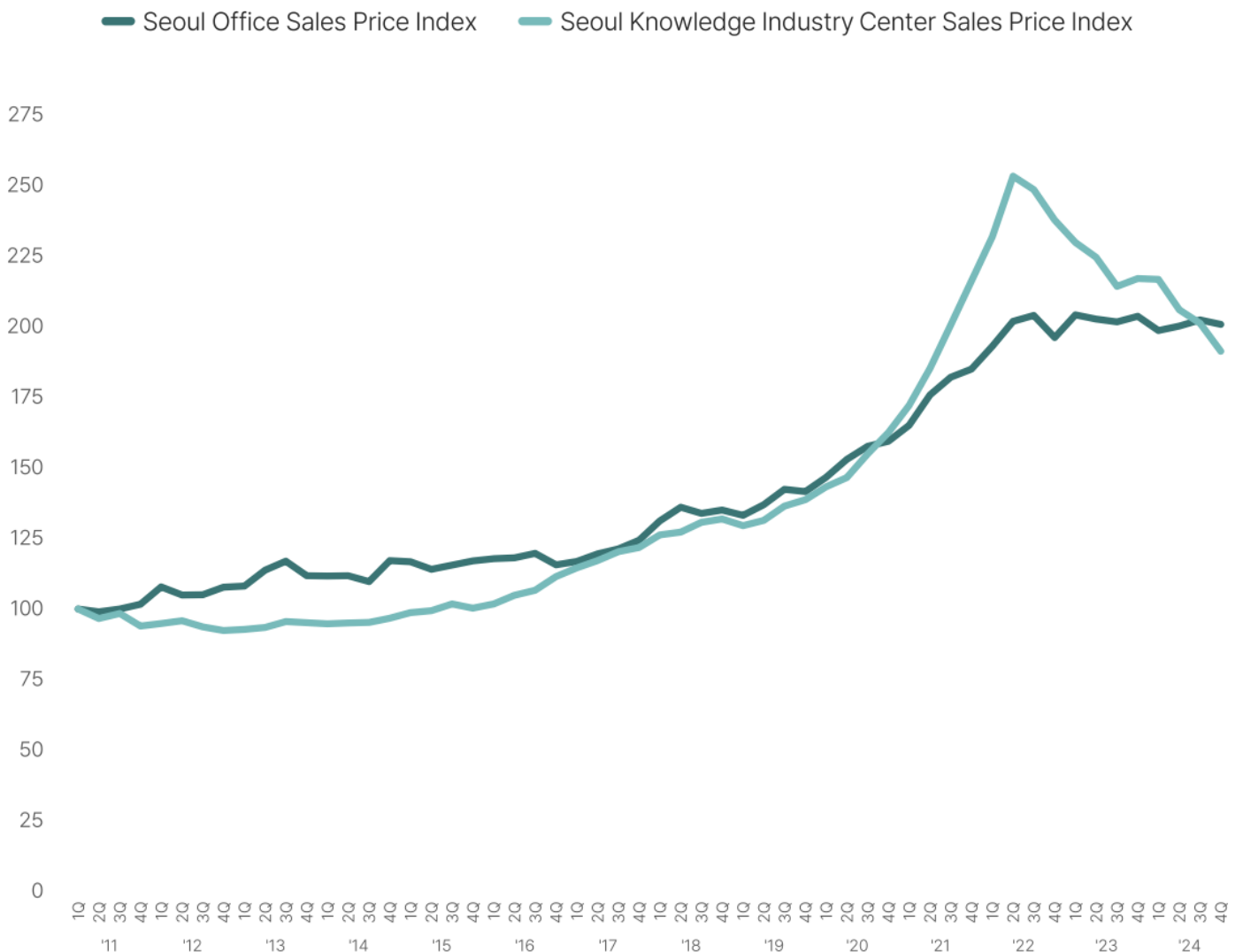
### Seoul Knowledge Industry Center Transaction Volume (Trillion KRW)



# Index Comparison

## 1: Office vs Knowledge Industry Center

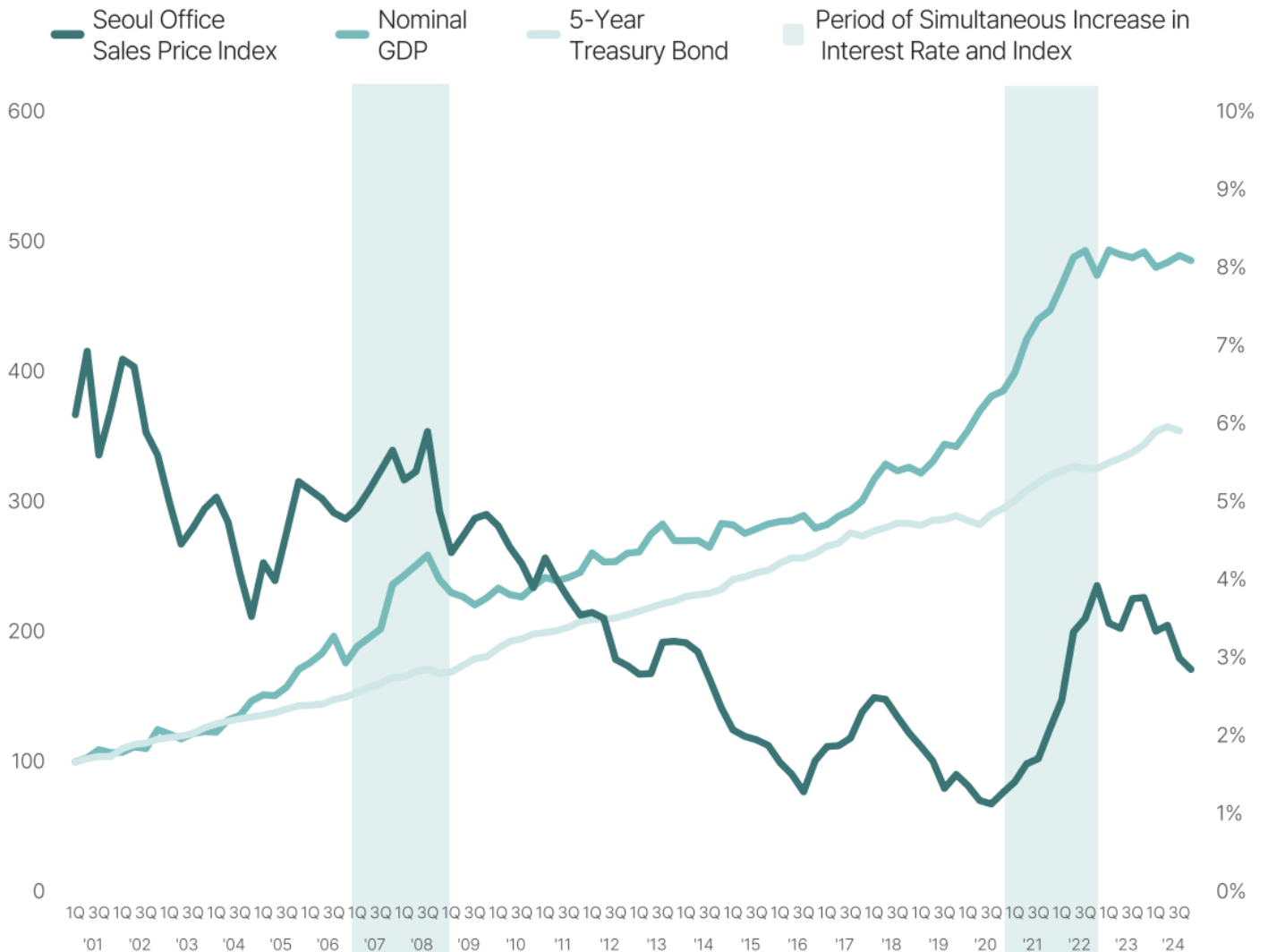
- Knowledge industry center market is complementary to offices due to several factors: 1) Affordable rent 2) Ability to be used as office spaces 3) Location in surrounding areas such as Gasan, Guro, Magok, Songpa, Yeongdeungpo, and Seongsu, rather than in the three core business districts.
- The price 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. However, from 2020 to Q2 2022, knowledge industry centers showed higher sales price increases compared to 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. It also had the advantage of not being subject to housing regulations.
- As a result, knowledge industry centers saw a record-breaking annual price increase of over 20% from 2020 to Q2 2022. However, recently, prices have dropped by up to 25% from their peak. The higher price volatility of knowledge industry centers compared to offices can largely be attributed to investment-driven transactions focused on capital gains rather than leasing-based demand.



# 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 leasing 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 show 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 growth rate in the office index exceeded the growth rate in GDP. This is considered to be due to the positive effect of low interest rates on investment sentiment, despite GDP stagnation from COVID-19.
- From 2001 to Q4 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 a trend was also observed before the global financial crisis.

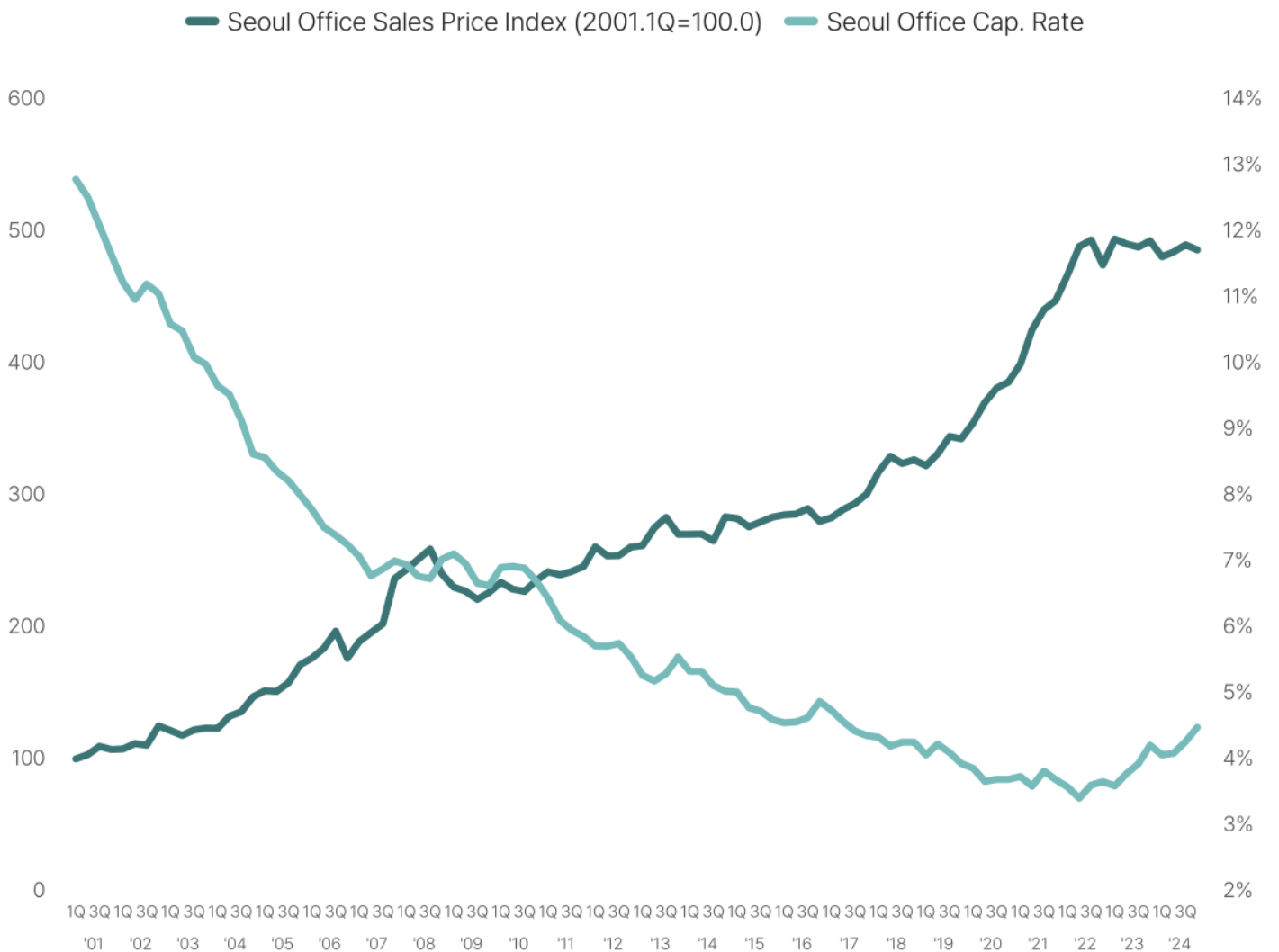


# Index Comparison

## 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 4.5% in Q3 2024, a drop of 8.3%p, while sales prices increased from 100.0 in Q1 2001 to 485.5 in Q4 2024, a 386% rise.
- The Cap. Rate had been on a continuous downward trend until Q2 2022, but began to rise due to consecutive interest rate hikes. (The Cap. Rate increased from 3.4% in Q4 2022 to 4.5% in Q4 2024, with the core business districts around 4.3%.)
- A closer examination of the recent Cap. Rate increase suggests that it is driven more by the rise in Net Operating Income (NOI) due to a strong leasing market rather than by a decline in office prices. As interest rates are expected to decrease and rental growth is likely to slow, the upward trend in Cap. Rates is expected to reverse.
- Additionally, while the Cap. Rate spread has historically ranged between 170 to 330 basis points from 2010 until recently, the spread in Q4 2024 stood at approximately 163 basis points, indicating that the normalization of the office transaction market is nearly complete.



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