Net Returns As of March 31, 2023[1]	NAV ($B)	1 Year (%)	3 Year (%)	5 Year (%)	10 Year (%)
Core	50.9	3.9	8.8	7.6	11.4
Value Add	4.1	-1.3	3.8	3.8	5.7
Opportunistic	1.8	-2.5	0.9	2.1	3.7
Real Estate Policy Benchmark	--	6.4	8.9	7.6	9.1

Key Policy Parameters

The Real Estate Portfolio is compliant with all key parameters related to diversification and other limits applicable at the Portfolio level, as demonstrated in the following table.

Key Portfolio Parameter	Policy Range/Limit	NAV 3/31/23 Exposure[1]
Risk Classification	(%)	(%)[2]
Core	75-100	89.5
Value Add	0-25	6.1
Opportunistic-All Strategies	0-25	3.7
Geographic Region	(%)	(%)[3]
United States	75-100	93.7
International Developed	0-25	3.6
International Developing	0-15	2.7
International Frontier	0-5	0.0
Manager Exposure[4]	(%)	(%)
Largest Partner Relationship	20 max	19.2
Investments with No External Manager	20 max	0.0
Leverage[5]		
Loan to Value	50% max	32.0%
Debt Service Coverage Ratio	1.5x min	2.7x

Implementation

The Real Estate Portfolio had a market value of $56.8 billion at the end of the current reporting period, representing 79.7% of the Real Assets program and 12.5% of the total portfolio. Including Forestland and Infrastructure, the Real Assets program currently comprises 15.7% of the total portfolio against a long-term target allocation of 15%, within the policy range of 8% to 18%. CalPERS has a very small exposure to overseas properties, and almost no exposure to the hospitality industry in its private real estate holdings.

[1] Private Investment data are one quarter lagged, so effectively as of December 31, 2022.
[2] Real Assets Quarterly Performance Report as of December 31, 2022 and Real Assets 2022.12.31 Characteristics Report (PDF), based on asset-level risk.
[3] Real Assets Quarterly Performance Report as of December 31, 2022 and Real Assets 2022.12.31 Characteristics Report (PDF), based on asset-level geography.
[4] CalPERS Real Assets Portfolio Allocation Report (Excel), Period Ending December 31, 2022: calculated based on manager- and account-level NAV. Percent calculated using relevant NAV plus total unfunded commitments for relationships/investments and same for the Real Assets Program ($85.3 billion).
[5] CalPERS Real Assets Portfolio Leverage Report (pdf), Quarter Ending December 31, 2022.

The CalPERS business model for real estate emphasizes control, transparency, alignment and governance. CalPERS' market advantages are its size, scale and ability to hold assets for longer periods. The implementation of this business model is primarily through direct investing with separately managed accounts, in which CalPERS has effectively complete control. Cancellable separate accounts are created with expert, aligned fiduciary managers/partners. These relationships are overseen by Staff with the benefit of independent consultants' prudent person opinions and monitored on behalf of the Trustees by the Board Consultant. This provides a replicable, scalable model that can grow as the Total Fund size grows and invest within the strategic ranges based on market conditions and alternative investments available to the Total Fund. As the System grows and markets evolve, this method of investing helps control risk and reduce costs.

CalPERS continues to be an industry leader in creating and embracing Responsible Contractor Policies and ESG best practices at its properties. Additionally, during the last five years, the Staff has made progress harmonizing several of the private asset classes under the Real Assets Unit. This has improved continuity of research, decision-making, risk mitigation and reporting, as well as providing increased knowledge across INVO. This is consistent with a System wide, Total Fund approach rather than a collection of independent asset "silos."

Real Estate Portfolio Structure

The Portfolio invests via a number of different managers and investment vehicles, currently relying primarily on separate accounts and commingled funds.

Partners	Investment Vehicles	Investments	Countries
17	39	1,153	10+

Investment Vehicle Type	Count	% of NAV	% of NAV + Unfunded
Commingled Funds	6	6.4	5.9
Direct Investments	1	0.0	0.0
Separate Accounts	32	93.6	94.1
Total	**39**	**100.0%**	**100.0%**

Real Assets Program Staffing Update

The Real Assets Program is led by its Managing Investment Director ("MID"), along with three Investment Directors, who together oversee 40 other Staff positions, as of December 31, 2022. In 2023 CalPERS, hired a Deputy Chief Investment Officer ("DCIO") for Private Markets and adjusted the delegated authority to include the DCIO and provide the DCIO with a distinct delegated authority between the MID and the CIO.

As the level of activity in infrastructure has increased over the last several years, and infrastructure investment has begun to scale in a meaningful way, Real Assets' staff have begun to specialize in either real estate or infrastructure activities. Additionally, whereas there used to be a separation of new

investment underwriting from ongoing portfolio management, most team members currently work across all phases of the investment program, including sourcing and diligencing new investments, as well as managing existing investments and manager relationships.

The Program is recruiting a Investment Officer ("IO") III specifically for real estate. Staffing movements among professionals supporting the Real Estate Portfolio over the prior fiscal year are as follows: one Investment Manager ("IM") retirement, one IO III promotion to Associate Investment Manager ("AIM") infrastructure, and one new hire for an IO I position.

Overall, we have observed the Real Assets team as stable, engaged, and collaboratively working together in a rigorous investment sourcing, diligencing, decision-making, and post-commitment and post-acquisition management process. Their rigor and focus has been important to increasing the infrastructure portfolio's scale and diversification in a thoughtful, strategic, and prudent manner.

Real Estate Market Commentary

While the core NCREIF ODCE Fund universe produced historically high returns in 2021 and the first part of 2022, decades-high inflation, and the corresponding monetary policy actions of the Federal Reserve, have had a widespread and negative impact on commercial real estate. The collapse of two regional banks and concurrent collapse and sale of a third regional bank, has caused further economic uncertainty and volatility in the banking industry and capital markets. As commercial real estate assets re-price amid greatly reduced transaction volume, and some asset owners with maturing debt struggle to refinance or sell their asset(s), we anticipate some continued volatility.

While inflation slowly began to moderate in 2023, it continues to be a material market phenomenon. The multiple interest rate increases by the Federal Reserve during 2022 and year-to-date 2023, aimed at reducing inflation, have caused rent growth to slow dramatically across property types and locations, and for debt costs to more than double. For the first time in more than a decade, market conditions are resulting in "negative" or non-accretive leverage, meaning the cost of new debt financing exceeds the going-in-yield of the real estate acquisition. Rising interest rates have also been the impetus for three high profile regional bank failures which induced turmoil and a great deal of uncertainty across the banking industry. As a result, lenders are becoming more conservative with their underwriting and willingness to make loans and highly leveraged buyers are less likely to compete as underwriting tightens. While "hard assets" such as real estate offer protection from inflation over the mid to longer term because of their ability to raise rents, the timing and amount of correlation vary depending on the individual rent roll (weighted average lease terms), market supply and demand for competing space (also affected by changing usage needs), legislation, and other factors. While the likelihood of distress is increasing, it is not anticipated to be widespread.

Those with upcoming loan maturities, expiring interest rate caps, and other situations requiring a re-financing of current debt could have difficulty obtaining financing and be forced to sell their commercial real estate asset(s). Those holding office, hotel and retail property types will have more difficulty getting new financing than those holding industrial and/or multifamily assets. While this situation could create

buying opportunities for well capitalized, low leverage investors, the current economic uncertainty coupled with thin transaction volumes (and therefore comparable sales) makes finding reasonable price and return expectations challenging.

While many properties experienced full recoveries during 2021 and 2022, and in some cases have exceeded pre-pandemic levels, COVID's impact varied greatly by market and property type. Increased e-commerce utilization, high multifamily and single-family home renter-ship, and an aging population fueled increasing rents, high occupancy and increased valuations, for industrial buildings, residential properties, and life science buildings. A cloud-computing and technology reliant population is driving investments in data centers. Lower utilization of office buildings, decreased travel, and the impact of e-commerce caused office buildings, hospitality assets, and mall retail properties to experience weaker fundamentals and therefore valuations. Core returns were record setting during calendar 2021 and the first half of 2022, with the NCREIF ODCE Fund index recording a net 21.0% return for calendar year 2021 and a net one-year return of 28.3% as of June 30, 2022. However, the second half of 2022 saw flat to negative returns with the 2022 calendar year ending with a net 6.6% one-year return. During the second half of 2022 and year-to-date 2023, rent growth has slowed dramatically across property types and locations but overall fundamentals, such as occupancy, remain healthy. While retail properties have generally stabilized, office assets are struggling primarily due to hybrid office working models. However, newer office assets that are well located, highly amenitized, and focused on tenant well-being are markedly outperforming older assets with dated designs and fewer amenities. It is anticipated that different locations and property types' experience will continue to vary considerably, even in the same generally accepted statistical metro areas.

Core investors have been actively rebalancing their portfolios in light of increasing interest rates and declining commercial real estate values. In addition, the broad decline in public equities and the resulting denominator effect is causing some investors to be over-allocated to real estate. The redemption queues at many large open-end funds increased in the second half of 2022 and into 2023. While some funds satisfy redemption requests on a first-come first-serve basis, some will distribute redemption proceeds on a pro-rata basis. Due to decreased new fund commitments and market-wide lower transaction volume, it is unclear how long it will take to satisfy the redemption requests. The funds within the core NCREIF ODCE Fund universe have also been rebalancing among property types. Office investments have decreased as a proportion of total investments from 32.9% in 2020 to 20.8% today, due to increased disposition activity within the office sector, declines in values, and redeployment of capital into the residential and industrial sectors. Office valuations overall have noticeably decreased over the past three years and many expect values to decline further.

There remains significant dry powder equity capital (nearly $300 billion) raised and sitting on the sidelines ready to invest, although the amount raised for new closed-end funds decreased throughout 2022 and into 2023. As institutional capital adapts to the re-pricing that is currently occurring in the private real estate market, investors are becoming more selective when committing to additional funds and preparing for an economic slowdown and uncertain commercial real estate environment.

Increasing interest rates, lack of construction financing, rising input costs (labor and materials) and a slowing economy are causing a reduction in construction starts and, therefore, new supply. While supply chain disruptions have improved there are still some shortages affecting construction and delivery of new inventory. This represents an opportunity for investors like CalPERS with high-quality, well-located assets to maintain long-term resilient income streams, and also for those with quality development projects far enough along in the development pipeline with certainty around execution pricing and timing. Meketa believes that CalPERS' strategic, long-term tilt to the historic centers of population and employment growth continues to be sound.

As the overall economy slows and the prospects of the US entering a recession in 2023 seem more likely, we expect rent growth to continue to slow and values to decrease across property types and locations. The actions of the Federal Reserve aimed at lowering inflation have resulted in near frozen debt capital markets, greatly reduced transaction volume, and price opacity.

Conclusion

CalPERS' continued discipline, long-term investment horizon in this illiquid asset class, and focus on the role of the asset class should continue to serve the needs of the System. Adhering to the Strategic Plan, particularly in times of market uncertainty and disruption, will ensure the real estate program continues to scale in an appropriate manner and contribute to the Investment Office Mission.

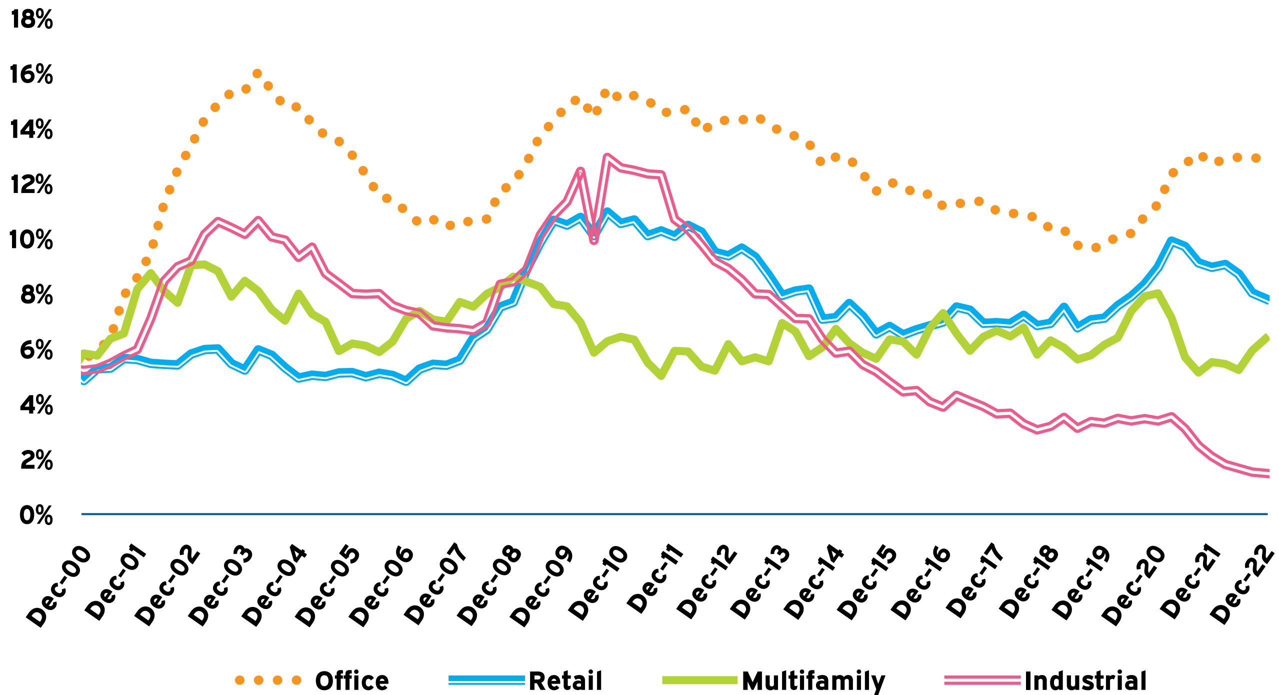
Please do not hesitate to contact us if you have questions or require additional information.

CF/KR/SPM/LB/jls

Attachment

Q4 Real Estate Market Views

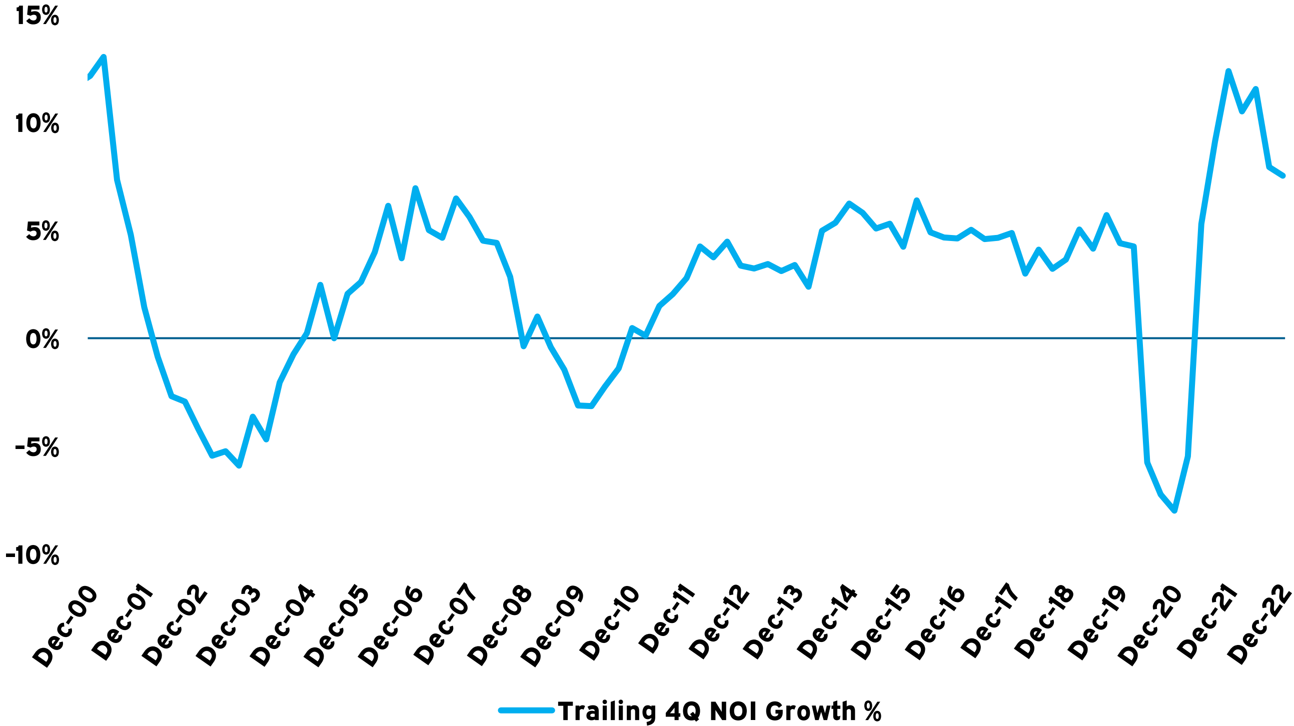
Vacancy by Property Type[1]



In the fourth quarter of 2022, vacancy rates increased for multifamily properties, while vacancy rates for industrial, office, and retail assets all decreased. Multifamily vacancies increased 43 basis points in Q4 2022. Industrial vacancies declined 4 basis points in Q4, bringing vacancies to an all-time low of 1.48% after hitting its previous historical low of 1.52% in Q3. Office vacancies dropped by 12 basis points in Q4, while retail vacancy rates declined 20 basis points. Compared to one year ago, vacancy rates in multifamily increased 85 basis points, industrial vacancies decreased 61 basis points, office vacancy rates increased 10 basis points, and retail vacancies decreased 113 bps. Overall, the vacancy rate across all property types decreased 43 basis points from Q4 2021.

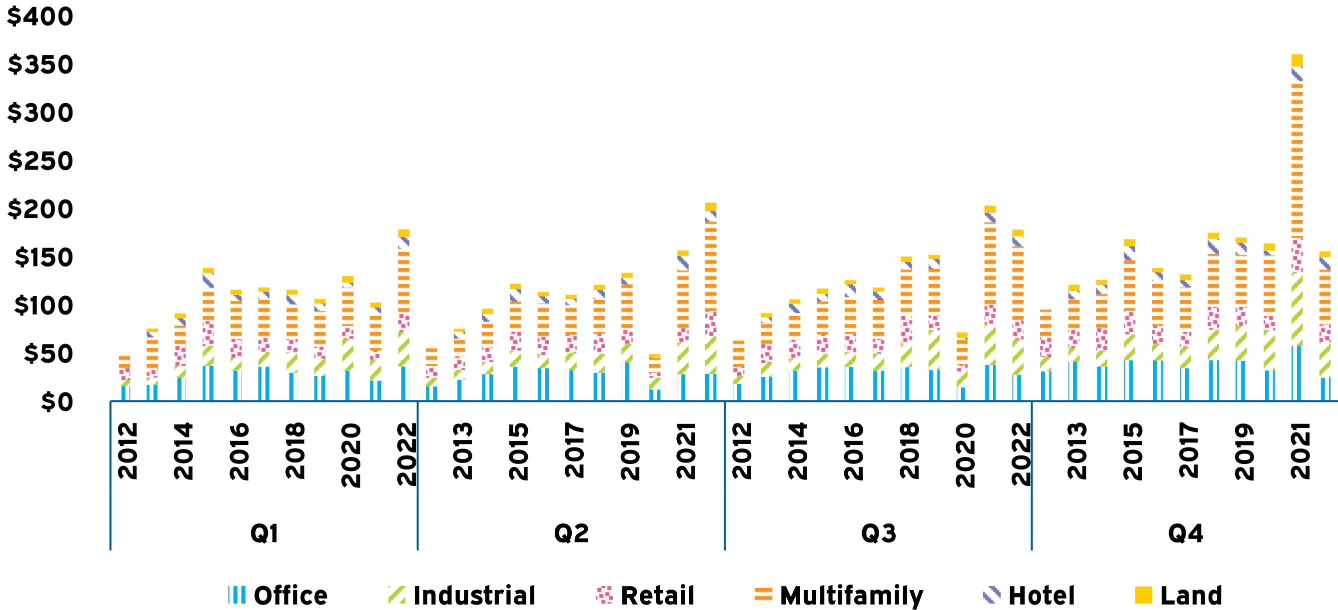
[1] Source: NCREIF.

NOI Growth[1]



The trailing twelve-month rate of NOI growth decelerated in Q4 2022 to 7.5%, as compared to 7.9% in Q3. Resilient demand and a historically high industrial occupancy rate underpinned the continued NOI growth in industrial, which was 12% for the trailing twelve months ending Q4 2022. Multifamily NOI growth was also strong, with 10.4% growth over the trailing twelve months. Office NOI growth moved back into positive territory at 3.7% in Q4 after detracting from overall growth at -0.8% year-over-year in Q3. Retail NOI growth accelerated from Q3, and reached 4.6% year-over-year in Q4.

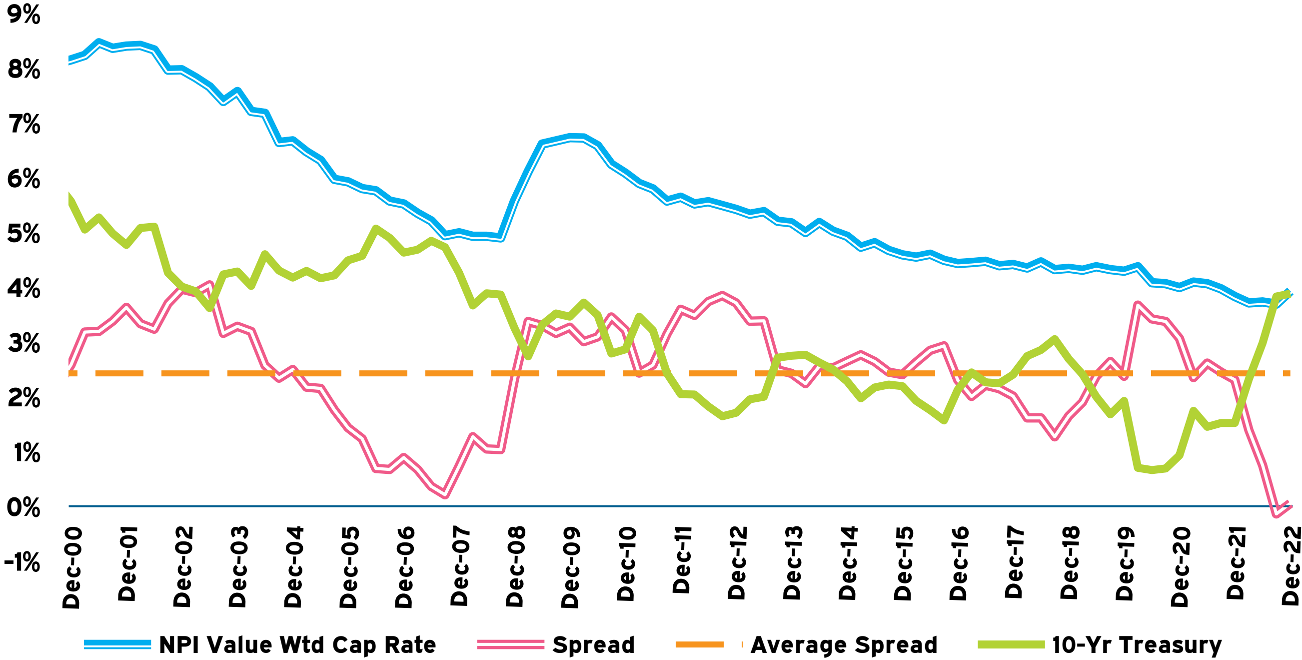
[1] Source: NCREIF.



Private real estate transaction volume for properties valued over $2.5 million was down in 4Q 2022 versus 3Q 2022. It was the slowest 4Q since 2017. Nevertheless, annual transaction volume remained healthy at $731 billion after a record 2021 that saw $842 billion of transactions. Compared to 2021, most property types saw decreases in transaction volume. Retail and hotel transactions increased in 2022 versus 2021. As was true in 2021, multifamily and industrial properties made up the largest share (62%) of the year's transactional volume.

[1] Source: PREA.

June 20, 2023



The NPI Value Weighted Cap Rate increased from 3.7% in Q3 to 3.9% in Q4. The 10-year Treasury yield increased by 8 basis points in Q4 2022 to approximately 3.9%. The spread between cap rates and treasury yields at the end of Q4 was essentially zero, and well below the long-term average spread of 249 basis points.

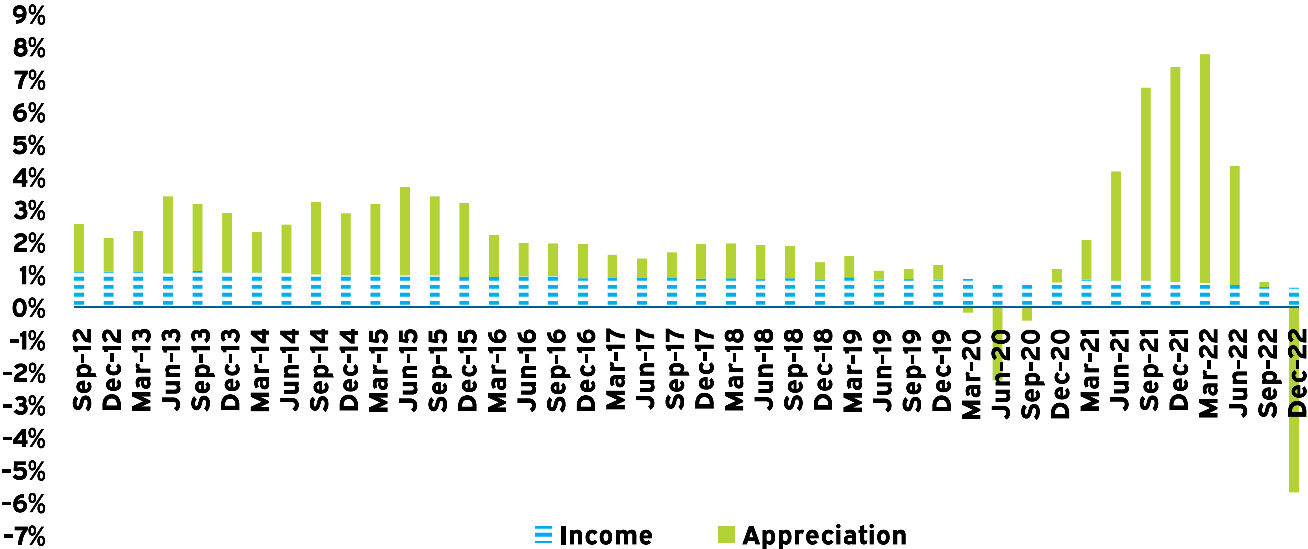
[1] Source: NCREIF and US Department of the Treasury.

Trailing Period Returns[1]

As of December 31, 2022	1 Year (%)	3 Years (%)	5 Years (%)	10 Years (%)
NFI-ODCE (EW, net)	7.6	9.7	8.3	9.5
NFI-ODCE (VW, net)	6.6	9.0	7.7	9.1
NCREIF Property Index	5.5	8.1	7.5	8.8
NAREIT Equity REIT Index	-25.0	0.2	4.4	7.1

Private real estate indices were negative in Q4 2022, but were positive over the 1-year, 3-year, 5-year, and 10-year time horizons. The NFI ODCE Equal Weight Index posted a return in Q4 2022 of -5.1%, however private core real estate continued to vastly outperform the public index over the trailing one-year period. Indeed, private core real estate has outperformed the public index for all periods presented. Public real estate performance continues to be volatile, returning -25% for 2022, after posting a 16.2% return in Q4 2021.

[1] Source: NCREIF.



The NFI-ODCE Equal Weight return in Q4 2022 turned negative after several quarters of continuous growth, producing a -5.1% net return for the quarter. This result was driven by a -5.7% appreciation return for the quarter, which was slightly offset by a 0.6% income return. Upward adjustments to the discount rate, used in valuations to reflect increasing interest rates and the cost of debt financing, negatively impacted the appreciation component of returns.

[1] Source: NCREIF.