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MEKETA INVESTMENT GROUP

MEMORANDUM

TO: Members of the Investment Committee, CalPERS
FROM: Meketa Investment Group
DATE: March 13, 2023
RE: Semi-Annual Real Estate Performance Review as of December 31, 2022

In our role as the Board Real Estate Consultant, Meketa Investment Group ("Meketa") conducted a quarterly performance review of the Real Estate Portfolio ("the Portfolio") based on data provided in Wilshire's California Public Employees' Retirement System ("CalPERS") Real Assets Performance Analysis Review for the period ended December 31, 2022, and selected CalPERS reports.[1] This memorandum provides the Portfolio performance data and information on key policy parameters, along with summary market commentary.

Performance[2]

Portfolio-Level Returns

CalPERS ("the System") assigns the goals of diversification from public securities, current income and inflation protection to its Real Assets portfolios, of which real estate comprises 81.3%. The Portfolio's diversification is serving the System as different property sectors experience varying demand and supply dynamics. Similarly, CalPERS' focus on the highest quality locations and materials that attract credit worthy tenants provides defensive characteristics. Across real estate markets, no property type or geographic region necessarily outperforms over the long-term, so diversification is critical.

This became more apparent during the quarter's results reported for September 30, 2022, which reflected property operations during broader market volatility that followed the COVID pandemic.

CalPERS' Real Estate Portfolio returns underperformed the benchmark for all time periods presented. However, it should be noted that the returns presented for all time periods exceed CalPERS' expectations for the asset class of 5.3% to 5.5%, set by the Capital Market Assumptions for Real Assets for the near- and long-term (five and 20 years).[3] Measured by a percentage of Loan to Value ("LTV"), CalPERS has historically used more leverage than the benchmark (30.7% versus the benchmark of 21.3%). When property values are rising, this accelerates returns. When values decline, this detracts from performance. Measured by the 2.9x multiple of Net Operating Income to debt service, (coverage ratio, or "DSCR"), and the strength of the tenancies, this is nevertheless a prudent level of debt. Both LTV and DSCR are well within policy guidelines of <50% and >1.5, respectively.

[1] Real Assets Program Allocation, Characteristics, and Leverage Reports (pdf) and Datasheets (Excel), Period Ending September 30, 2022, and Real Assets Quarterly Performance Report, Partnership Financial Statements as of September 30, 2022.
[2] Per Wilshire's CalPERS Real Assets Performance Analysis Review for the period ended December 31, 2022 reported with a 1-quarter lag, so effectively as of September 30, 2022.
[3] Approved at the September 13, 2021 Investment Committee.

Net Returns December 31, 2022	1 Year (%)	3 Year (%)	5 Year (%)	10 Year (%)
Real Estate Returns	15.7	10.5	8.3	9.6
Real Estate Policy Benchmark[1]	20.9	11.3	9.2	9.9
Over (under) Performance	-5.2	-0.8	-0.9	-0.3

Performance Attribution

The portfolio continues to generate strong absolute returns with low leverage and a low risk profile. Ten year net returns of 9.6% missed the benchmark by 20 basis points but deliver both strong income and appreciation to the System. Three- and five-year net returns trail the benchmark by 80 and 90 basis points, respectively, largely as a result of somewhat less robust appreciation gains, but the portfolio continues to generate consistent income with which CalPERS can pay its beneficiaries.

The big outlier in performance is the one-year return. For the one-year period, the portfolio posted a positive 15.7% net return, consisting of 3.1% current income and positive appreciation of 12.6%. However, this strong performance trailed the benchmark by more than five percent, primarily because CalPERS' industrial and multifamily holdings, which together comprise roughly 50% of CalPERS' total real estate investments, posted lower returns than the industrial and multifamily components of the benchmark. CalPERS' lower returns in these sectors are attributable to sub sector property type selection (e.g., urban high rise apartments vs. suburban garden style apartments) and market selection.

Meketa notes that the COVID pandemic resulted in a remarkable dispersion of returns across property types and locations, with clear winners and losers. Swiftly rising inflation and interest rates have only magnified this dispersion, as tenants seek to consolidate their space use in the best properties and markets to attract and retain human capital, best serve their customers, and rationalize costs. As a result, institutional investors are scouring data to discern which submarkets and which property attributes are likely to prove most compelling in their ability to attract tenants and provide resilient income streams. Institutional real estate has benefitted from more than a decade of low interest rates and economic growth tailwinds. Slower economic growth and higher interest rates will likely bring a re-pricing to the entire real estate complex in 2023, and relative performance will be challenging to assess until the dust settles on the sector. All this to say that we should expect significant near-term volatility in valuations, and that shorter-term performance should be viewed skeptically.

Among core holdings, industrial buildings, multifamily properties, and life science buildings continued to generate strong performance during the one-year time period. CalPERS' industrial portfolio, representing 31.7% of the core portfolio, posted returns for the one-year time period of 33.0%. CalPERS' multifamily portfolio, representing 25.6% of the core portfolio, posted returns for the one-year time period of 21.2%.. While industrial buildings are benefitting from increased demand during COVID, as a

[1] CalPERS Real Estate Policy Benchmark, with historical composition as follows: As of July 1, 2018 is the MSCI/PREA US ACOE Quarterly Property Fund Index (Unfrozen), Net of Fees. From July 1, 2011 through June 30, 2018, the Policy Benchmark was the NCREIF Fund Index Open-End Diversified Core Equity, Net of Fees. The. Policy Benchmark results are shown on a blended basis during the relevant trailing periods.

result of greater e-commerce volume and work from-home conditions, multifamily properties are benefitting due to higher mortgage rates and improving property level fundamentals. However, growth in rents is slowing even among these strong sectors, and we expect to see returns moderate from prior atmospheric levels.

While slightly underperforming the benchmark on an absolute basis, life science buildings outperformed on a relative basis during the one-year time period. Life science buildings are benefitting from an aging population driving the demand for health care spending. CalPERS' life science portfolio, representing 2.1% of the core portfolio, posted returns for the one-year time period of 19.0%.

Mall retail property investments, to which CalPERS has had a material overweight compared to the benchmark, and which account for 10.3% of the core portfolio, posted performance of 7.3% for the one year time period. These investments have produced an 8.3% total net return since inception. While malls were hit particularly hard during the pandemic, sales have rebounded dramatically and are now at all-time highs. The dispersion of returns between higher and lower quality properties is particularly observable in the mall sector, with Class A+ properties dramatically outperforming everything else.

The other portion of CalPERS' retail holdings, grocery anchored shopping centers, which amount to 9.5% of the core portfolio, posted performance of 9.5% for the one-year time period. The grocery-anchored shopping centers were impacted during COVID by the temporary closure of the small businesses, including restaurants, which lease in-line stores, but have since experienced strong tailwinds with the shift in consumer habits to shopping closer to home. Shorter average lease terms, relative to big box retailers, and little new development have given owners of grocery anchored shopping centers the ability to more proactively push rents, especially given historically low vacancy within the sector.

As of this reporting period, the core risk portfolio, comprised of completed, leased and cash flowing assets, and representing 90.5% of the Real Estate Portfolio, produced strong longer-term returns of 9.2% for the five-year return, which was in-line with the MSCI/PREA benchmark returns of 9.2%. Ten-year returns of 12.1% handily exceeded the 9.9% benchmark return. Virtually all core properties are held directly in lower cost separate accounts (as opposed to investing in open-end commingled pools). These long-term strategic partnerships anchor the Portfolio, and efforts continue to transition the Portfolio away from legacy, non-strategic risks towards higher quality, stabilized assets that serve the role of the asset class.

Net Returns As of December 31, 2022[1]	NAV ($B)	1 Year (%)	3 Year (%)	5 Year (%)	10 Year (%)
Core	53.3	18.5	11.8	9.2	12.1
Value Add	4.2	0.9	5.4	3.9	5.7
Opportunistic	1.9	9.8	3.1	4.1	4.6
Real Estate Policy Benchmark	--	20.9	11.3	9.2	9.9

[1] Private Investment data are one quarter lagged, so effectively as of September 30, 2022.

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 12/31/22 Exposure[1]
Risk Classification	(%)	(%)[1]
Core	75-100	90.5
Value Add	0-25	5.9
Opportunistic-All Strategies	0-25	3.6
Geographic Region	(%)	(%)[2]
United States	75-100	94.0
International Developed	0-25	3.3
International Developing	0-15	2.6
International Frontier	0-5	0.0
Manager Exposure[3]	(%)	(%)
Largest Partner Relationship	20 max	19.7
Investments with No External Manager	20 max	0.0
Leverage[4]		
Loan to Value	50% max	30.7%
Debt Service Coverage Ratio	1.5x min	2.9x

Implementation

The Real Estate Portfolio had a market value of $60.0 billion at the end of the current reporting period, representing 81.3% of the Real Assets program and 13.6% of the total portfolio. Including Forestland and Infrastructure, the Real Assets program currently comprises 16.7% 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.

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

[1] Real Assets Quarterly Performance Report as of September 30, 2022 and Real Assets 2022.9.30 Characteristics Report (PDF), based on asset-level risk.
[2] Real Assets Quarterly Performance Report as of September 30, 2022 and Real Assets 2022.9.30 Characteristics Report (PDF), based on asset-level geography.
[3] CalPERS Real Assets Portfolio Allocation Report (Excel), Period Ending September 30, 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 ($88.5 billion).
[4] CalPERS Real Assets Portfolio Leverage Report (pdf), Quarter Ending September 30, 2022.

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 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 gradually had a widespread and negative impact on commercial real estate during 2022.

While many properties experienced full recoveries in occupancy, 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. 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. As 2022 progressed, rent growth slowed dramatically across property types and locations but overall fundamentals, such as occupancy, remained 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. 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.

Inflation continues to be a material market phenomenon. 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. Rising inflation is driving dramatically increased debt costs, which is particularly pertinent to the capital intensive private real estate industry. Debt costs for all types of commercial real estate have nearly doubled, and 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. While the likelihood of distress is increasing, it is not yet expected to be widespread. Some investors who have flexibility in their investment mandates are pivoting to originating credit.

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. 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 33.5% in 2020 to 23.1% today, due to increased disposition activity within the office sector and redeployment of capital into the residential and industrial sectors.

There remains significant dry powder equity capital (nearly $375 billion) raised and sitting on the sidelines ready to invest, although the amount raised for new closed-end funds decreased throughout 2022. 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, 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.

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.

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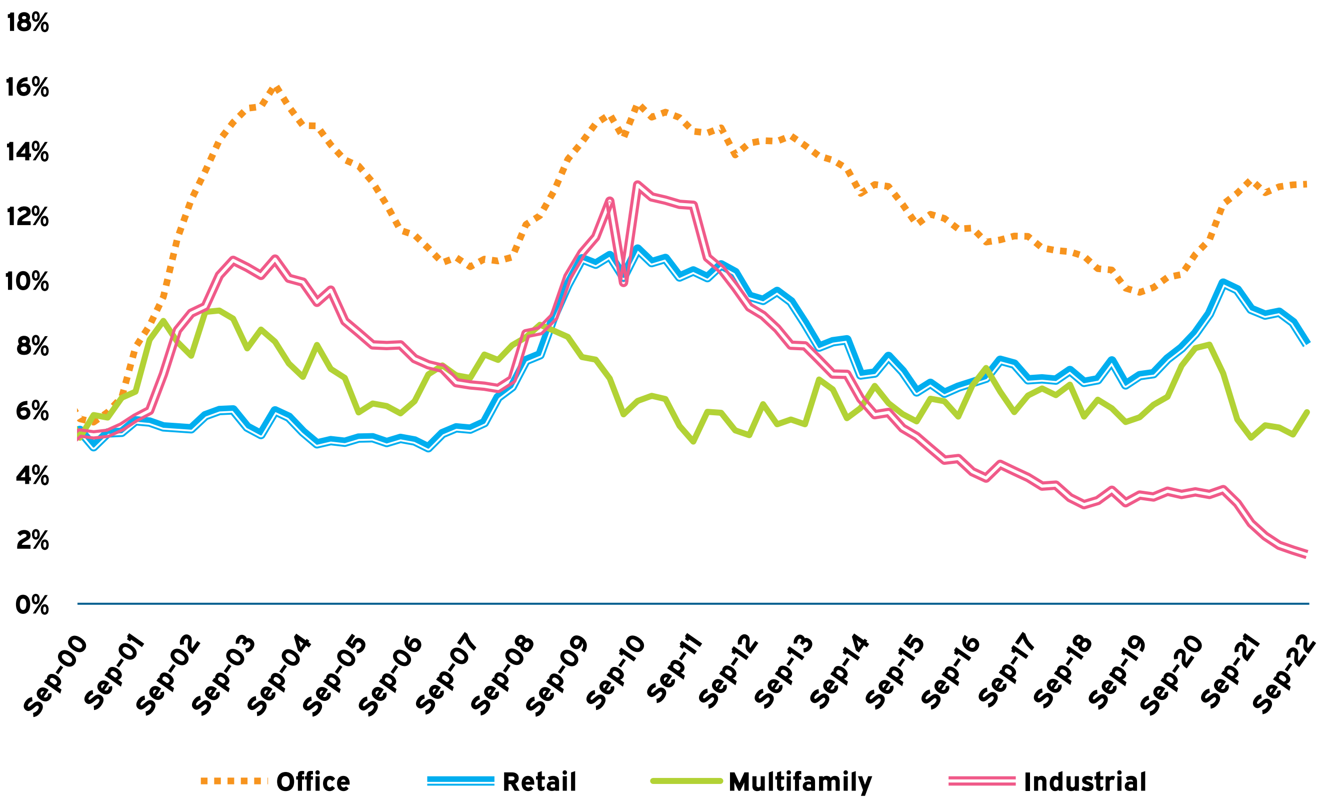
Attachment

Q3 Real Estate Market Views

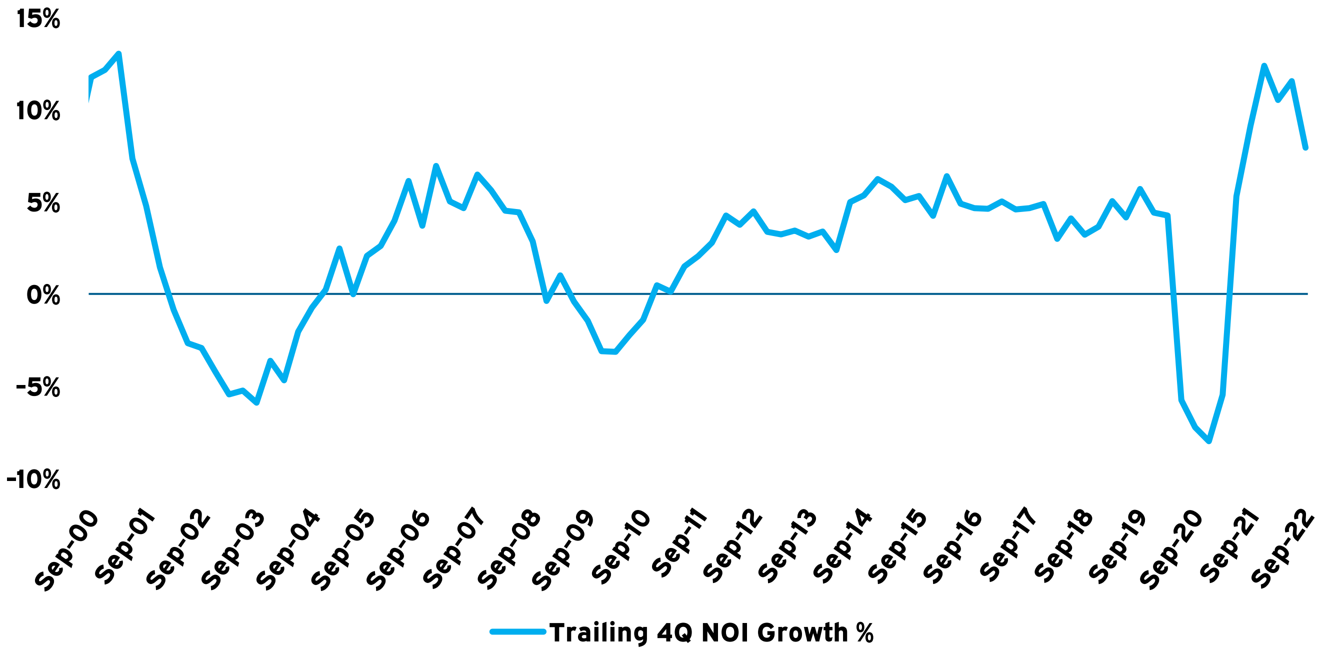
Vacancy by Property Type[1]



In the third quarter of 2022, vacancy rates increased slightly for multifamily, while vacancy rates for retail and industrial decreased. Office vacancy remained flat quarter-over-quarter. Retail saw the largest decrease in vacancy rates, moving down 68 basis points in Q3. Multifamily vacancies increased 69 basis points in Q3 2022, and industrial vacancies fell another 14 basis points to set a new all-time low at 1.5%. Office vacancies increased slightly by 2 basis points in Q3 2022 to remain at 13.0%. Compared to one year ago, vacancy rates in industrial decreased 97 basis points, retail decreased 109 basis points, multifamily increased 79 basis points., and office decreased 13 basis points. Overall, the vacancy rate across all property types decreased 65 basis point from Q3 2021.

[1] Source: NCREIF.

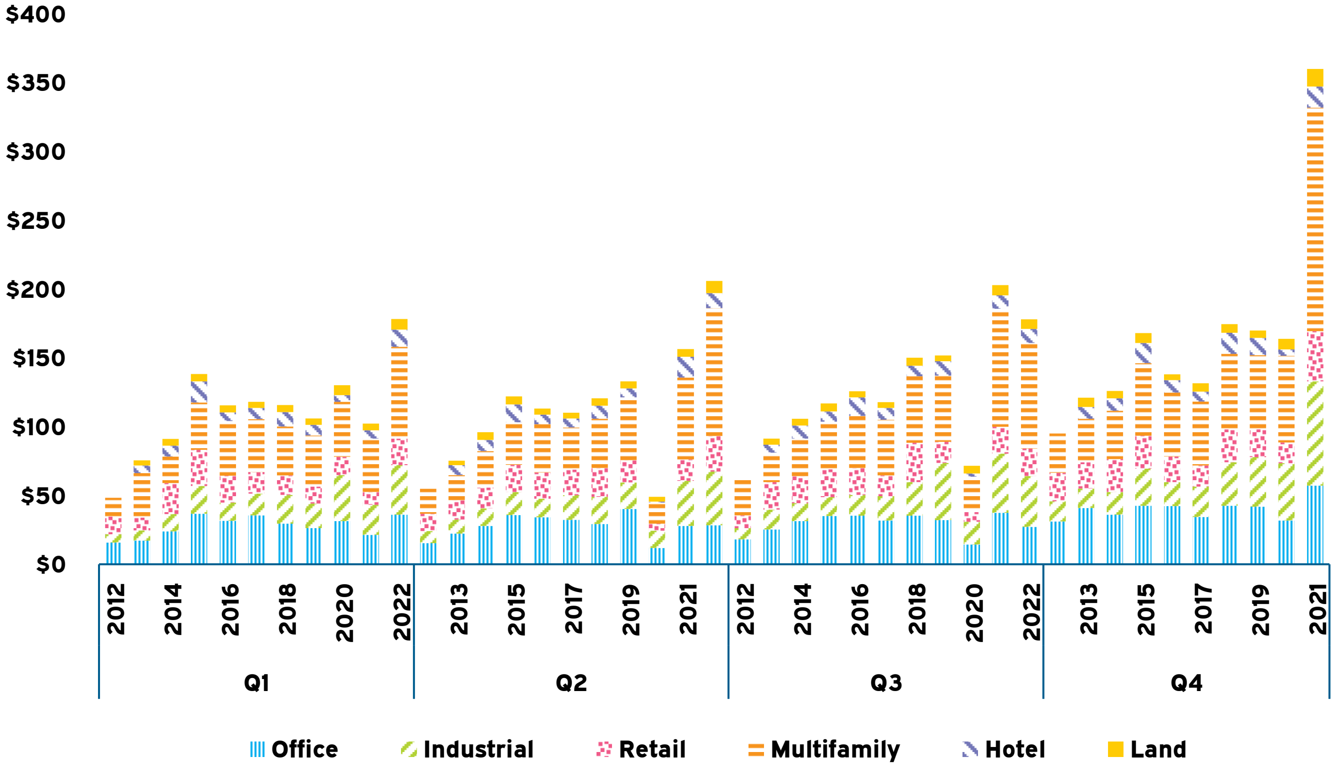
NOI Growth[1]



The trailing twelve-month rate of NOI growth decreased in Q3 2022 to 7.9%. Resilient demand and near immediate take-up of new supply in the industrial sector underpinned the continued NOI growth. Industrial NOI growth is trending at 13.6% for the trailing year ending Q3 2022. Office NOI growth has moved back to negative territory to -0.8% year-over-year, and Apartment NOI (a sector with "gross" rents, compared to "net" rents in other property types) experienced positive NOI growth at 17.6% year-over-year as occupancy levels and rental rate growth remained strong. Retail NOI growth moderated, now at 4.1% year-over-year.

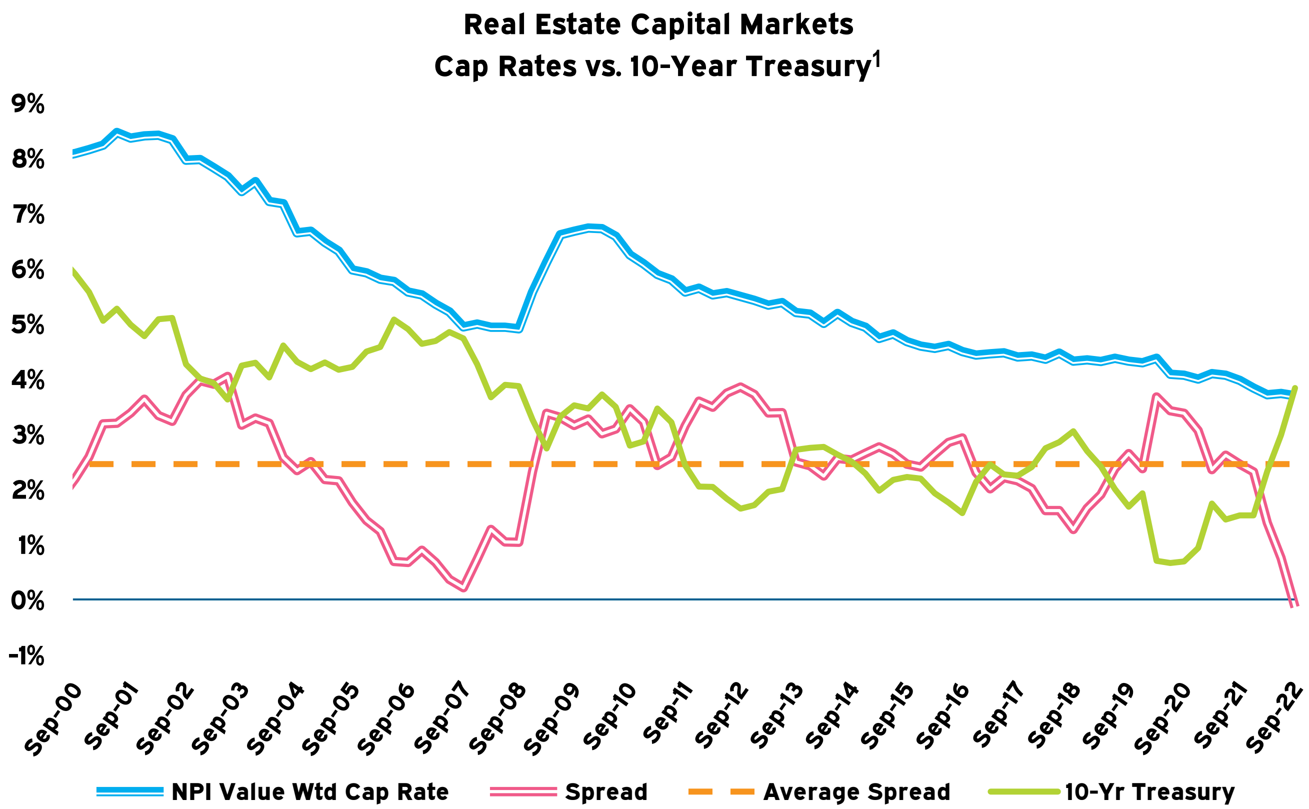
[1] Source: NCREIF.

Transaction Volume ($B)[1]



Private real estate transaction volume for properties valued over $2.5 million for Q3 2022 was down from Q3 2021 to $178 billion. Compared to a year ago, most property types saw decreases in transaction volume: office (-28%), multifamily (+10%), land (+9%), and industrial (+14%). Retail transaction volume increased slightly by 2%, and hotel transaction volume was up 6%. Multifamily and industrial properties made up the largest percentages of total transaction volume during the quarter, at 43% and 21%, respectively.

[1] Source: PREA.



The NPI Value Weighted Cap Rate was unchanged in Q3 2022 at 3.7%. The 10-year Treasury yield increased by 85 basis points in Q3 2022 to 3.8%. The spread between cap rates and treasury yields (-14 basis points) is now negative for the first time since 1991 and is well below the long-term average spread of 249 basis points.

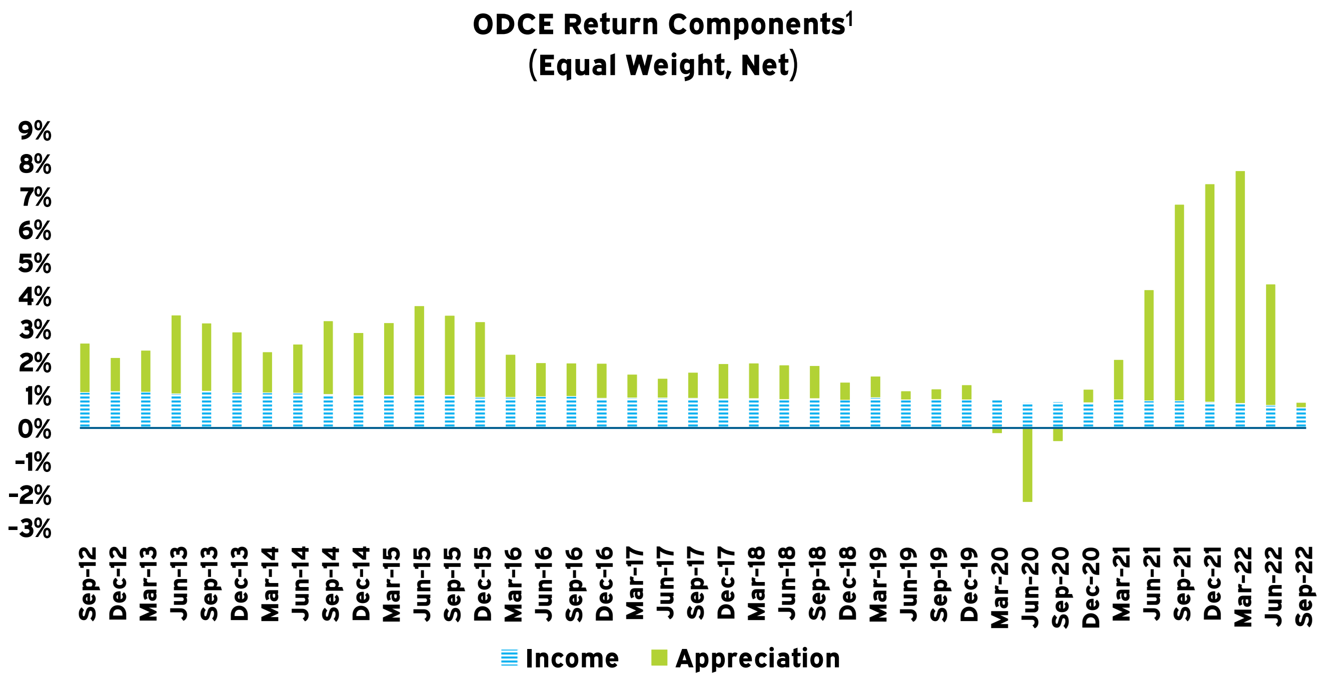
[1] Source: NCREIF and US Department of the Treasury.

Trailing Period Returns[1]

As of September 30, 2022	1 Year (%)	3 Years (%)	5 Years (%)	10 Years (%)
NFI-ODCE (EW, net)	21.7	12.1	9.9	10.3
NFI-ODCE (VW, net)	21.0	11.4	9.3	9.9
NCREIF Property Index	16.1	9.9	8.6	9.5
NAREIT Equity REIT Index	-16.3	-1.1	4.0	7.0

Private real estate indices were slightly positive in Q3 2022 and continue to be positive over the 1-year, 3-year, 5-year, and 10-year time horizons. The NFI ODCE Equal Weight Index posted a weaker return in Q3 2022 of 0.8%, however private core real estate continues 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 -10.8% in Q3 2022, after posting a 16.2% return in Q4 2021.

[1] Source: NCREIF.



The NFI-ODCE Equal Weight return in Q3 2022 moderated significantly, producing a 0.8% net return for the quarter. This represents a significant decrease from Q1 2022's record setting return of 7.8%. Small upward adjustments to the discount rate, used in valuations to reflect increasing interest rates and the cost of debt financing, chipped away at the appreciation component of returns. The income component of the quarterly return has slowly decreased over time, now at 0.6% for Q3 2022.

[1] Source: NCREIF.