MEKETA
INVESTMENT GROUP

Core Real Estate

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CONTRIBUTORS
Christy Fields
Lauren Giordano
Frank Benham, CFA, CAIA

"Buy land; they ain't making any more of it." — Will Rogers

Real estate, which combines elements of stocks, bonds, and hard assets, is widely recognized as an institutional-class investment with distinct risk and return factors. As a result, real estate can help diversify an institutional portfolio. This paper provides an overview of core real estate, reviews the case for including it in a portfolio, and discusses its characteristics.

Real estate has the potential to provide the steady income of bonds, the appreciation of stocks, and the inflation-protection of hard assets. Arguably for these reasons, the target allocation to real estate among institutional portfolios has steadily risen since the 1980s.

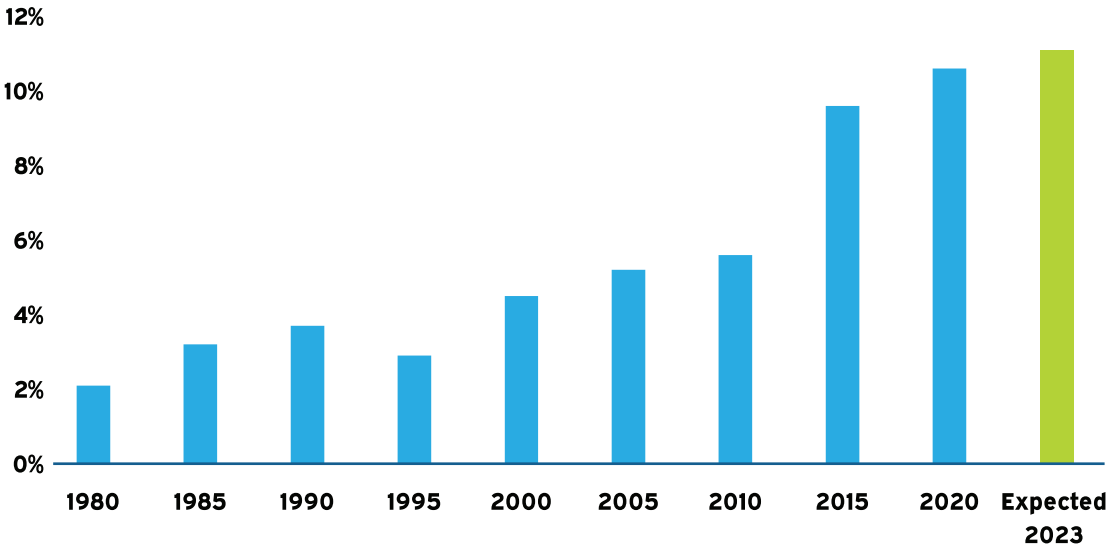

FIGURE 1
Institutional Target Allocations to Real Estate

Source: Hodes Weill & Associates, 2022 Institutional Real Estate Allocations Monitor.

What is "core" real estate?

While definitions of "core" real estate vary, they generally include several common criteria. First, the property must be owned or controlled by one or more institutional investors. Second, it must be a stabilized, high-quality asset (e.g., 80% or more of returns are generated from leases). Third, the property must be well-leased, with at least 60% occupancy, although most are leased at 80% or higher. Fourth, it must have a low level of leverage (usually 30% or less). Finally, it must be located in developed markets, predominantly prime locations in the US.

There are four property types widely considered as core real estate:

1 Offices (central business districts and suburban offices, life science facilities)

2 Industrial (warehouses, distribution centers, data centers, cold storage)

3 Retail (malls, shopping centers)

4 Residential (apartments, single family build-to-rent)

In addition, there are other specialty property types such as hotels, self-storage facilities, and student housing that are commonly held in core real estate portfolios.

Characteristics of real estate

Risk and return

Core real estate's historical returns are higher than bonds but lower than US equities, which is in line with expectations (see Figure 2). Additionally, the maximum drawdown for core real estate is likewise between that of stocks and bonds. Historical volatility of core real estate appears to be lower than both the stock and bond markets. However, real estate's volatility is meaningfully understated by the appraisal-based valuation process. This approach results in estimates of property prices changing slowly, which artificially depresses observed volatility. Hence the returns for core real estate are smoothed out and tend to lag economic cycles.

	Core Real Estate (%)	Core Bonds (%)	US Stocks (%)
Annualized Return	8.6	6.8	11.6
Annual Standard Deviation	4.1	5.6	14.7
Maximum Drawdown	-23.9	-17.2	-45.5

FIGURE 2
Historical Performance (1980 - 2022)

Sources: Annual Quarterly Returns from Q1 1980 to Q4 2022, as of January 2023. Returns sourced from Bloomberg. Indices used: NCREIF Property Index, Bloomberg Aggregate Bond Index, Russell 3000 index.

Note: Real Estate in this presentation is represented by the NCREIF Property Index (NPI), a composite of core real estate properties totaling more than $933B in Total Market Value.

It is crucial to note that the income portion of returns historically has extremely low volatility (see Figure 3). Instead, the vast majority of the volatility has come from capital appreciation/depreciation (i.e., price changes).[1] The logical conclusion is that the underlying fundamentals for core real estate have been remarkably consistent, and it is the market's variable appetite for real estate that creates volatility. Thus, core real estate should be significantly less volatile than stocks.

[1] The annual standard deviation of NPI Income Returns was 0.74% and the standard deviation of NPI: Capital Appreciation Returns was 4.1% for the period 1980 - Q4 2022.

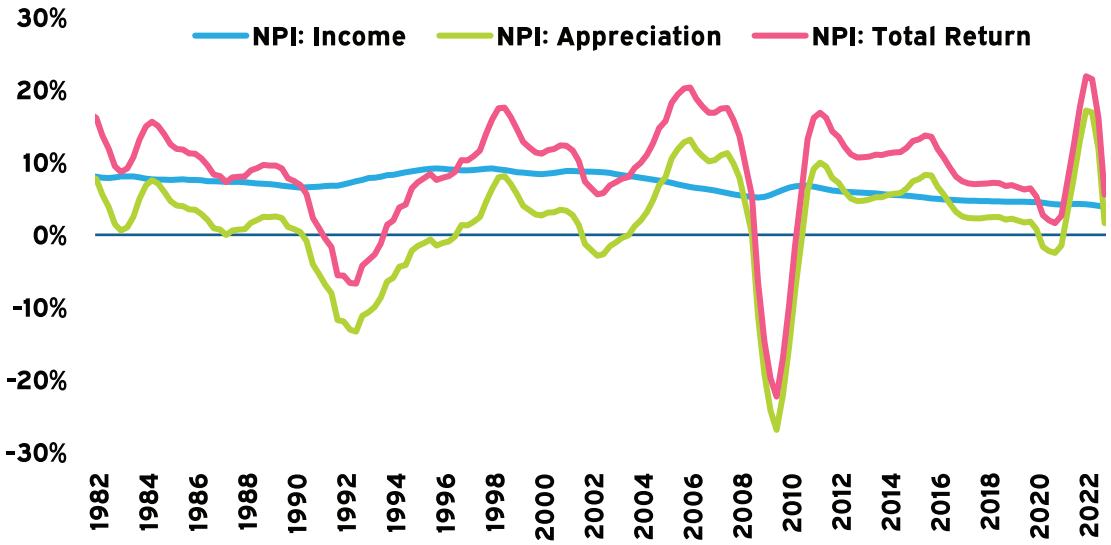

FIGURE 3
NPI Breakdown: Rolling 1-Year Returns

Source: NCREIF Property Index (NPI) Q4 2022 Trends Report, as of January 2023.

Diversification

Core real estate returns have historically exhibited generally low correlation with stocks and bonds. This is again influenced by the smoothing effects of appraisal-based valuation. However, looking at 5-year rolling returns can somewhat lessen the effects of smoothing, since properties are sold and returns are realized. Correlations have tended to hover between +0.5 and -0.5, while averaging near zero.

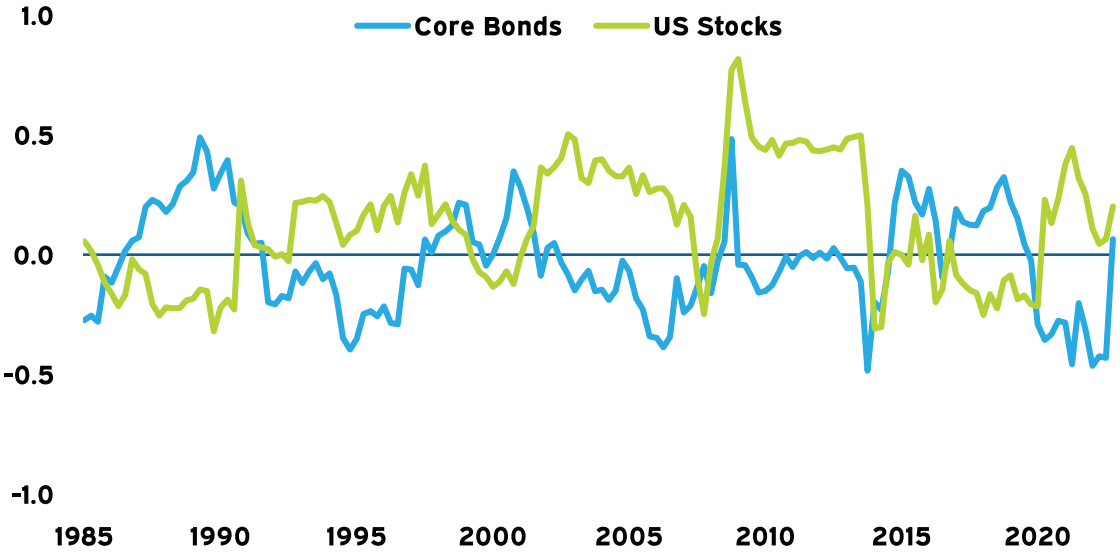

FIGURE 4
Rolling 5-Year Correlation with Core Real Estate

Sources: Quarterly Returns from Q1 1980 to Q4 2022, as of January 2023. Returns sourced from Bloomberg. Indices used: NCREIF Property Index, Bloomberg Aggregate Bond Index, Russell 3000 index.

Another way to view the diversification effect is to compare how core real estate performed during times of economic downturns (see Figure 5). Since 1980, core real estate has tended to exhibit flat or positive returns during the worst drawdowns for US Stocks. The exception was the Global Financial Crisis ("GFC"), during which core real estate also suffered double-digit declines. Note that the drawdown for core real estate was lagged by 1-2 quarters during the GFC.

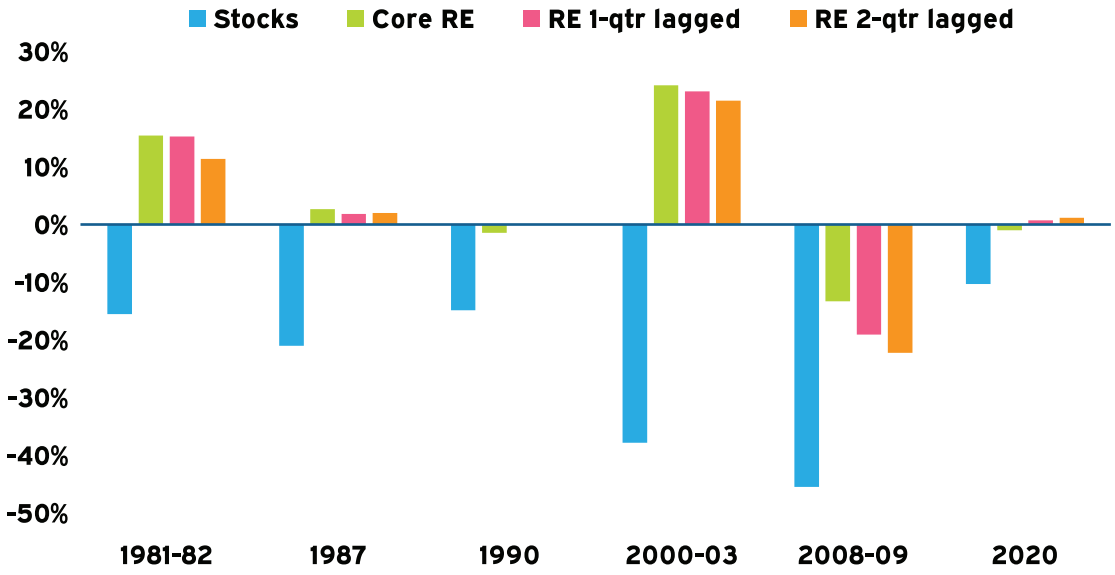

FIGURE 5
Performance During Equity Drawdowns

Source: Bloomberg. Indices used: NCREIF Property Index, Russell 3000.

Note: Represents cumulative performance based on quarterly returns.

An inflation hedge?

Real estate derives a significant portion of its returns from income, an attractive feature for two reasons. First, the stability of income generated by long-term leases lowers volatility and helps support returns during down markets. Second, unlike many fixed income instruments, real estate's income stream is more likely to keep pace with inflation as rental properties typically produce increasing rental rates during inflationary periods. This has been borne out during periods of high and unexpected inflation (see Figure 6).

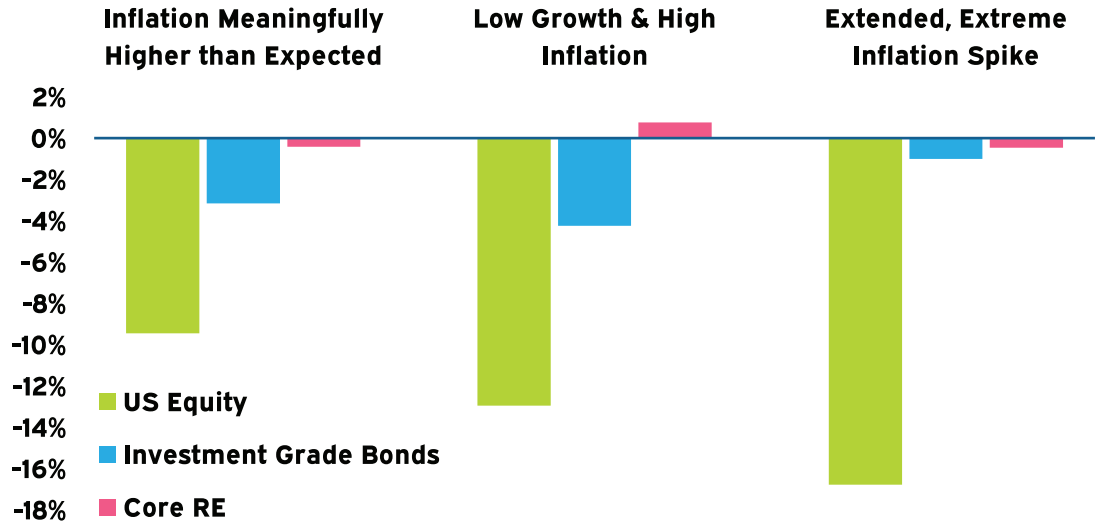

FIGURE 6
Core RE's Performance during Periods of High Inflation

Source: Meketa's scenario analysis based on data from Bloomberg, FRED. See the appendix for more details on and descriptions of the inflationary periods included in Meketa's scenario analysis.

A surprisingly efficient market

As a private-market asset with little public information, it could be argued that skillful managers should be able to add value. Hence, real estate managers should theoretically be able to add value through both prudent property and market selection and skillful property management.

However, the historical evidence for this is mixed. For the five-year period ending Q2 2022, there was only a 1.7% difference between the top quartile core real estate manager and the third quartile manager, compared to a 3.5% difference for US large cap equity managers and a 0.4% difference for investment grade bond managers (see Figure 7). Thus, the evidence suggests that core real estate markets may be fairly efficient. Differences in returns among core real estate managers appears to be driven primarily by their relative geographic or property type concentrations, or the extent to which they use leverage.

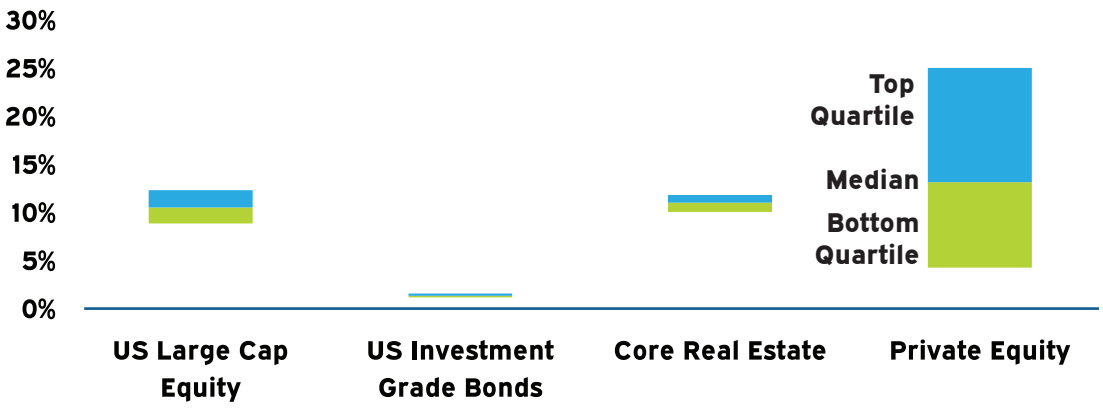

FIGURE 7
Quartile Analysis, Trailing 5-Year Returns

Sources: Cambridge Associates via IHS Markit, eVestment Alliance, and NCREIF-ODCE. Data for US PE funds raised 2017 through December 2021 (328 funds). Equity, Fixed Income, and Real Estate Trailing 5-Year Returns beginning June 2022 (1182 US Large Cap Equity and 229 US Core Fixed Income funds). Data as of September 2022.

Disadvantages of real estate

There are a few disadvantages to real estate. First, investing in real estate involves risk, as property may decline in value and there is no guarantee of a return of principal. Real property is illiquid, although the type of vehicle one chooses can mitigate the illiquidity to some extent. Also, the use of appraisal-based valuations can lead to realized returns that differ from the carrying value of an investment once a property is sold. There is no ideal benchmark for real estate, as the most commonly used indexes have several features that make comparison to established real estate portfolios difficult. Furthermore, real estate has historically exhibited extended bear market cycles that may coincide with downturns in the broader economy. Finally, private real estate portfolios often require more oversight (and charge higher fees) than portfolios of stocks or bonds.

Illiquidity and pricing

While stocks and bonds are traded continuously each day, the sale of an office building or shopping center is a complex transaction that can take many months or years to execute and settle. Open-end commingled real estate funds usually offer quarterly liquidity to their investors. However, a withdrawal "queue" often develops during cyclical downturns, as liquidity in the underlying market can all but disappear and net redemption requests pile up. However, liquidity is not normally an overriding concern for a well-diversified investor with a long-term investment horizon.

Another common concern with real estate is the use of appraisal-based valuation (as opposed to the transaction-based pricing of stocks and bonds). The (typically annual) appraisal process relies on comparisons to properties that are similar but rarely identical to the property being appraised. Thus, values tend to change only gradually over time rather than sharply as with stocks and bonds. This creates two distinct problems: volatility is artificially low and carrying value may differ from the value realized when properties are sold.

Cyclicality

While real estate returns are intrinsically less volatile than stocks, they are still cyclical. Real estate cycles tend to be linked to the performance of the broad economy. As Figure 8 illustrates, the troughs and peaks can persist for extended time periods (i.e., several or more years). This implies that real estate could take longer to decline in value as well as longer to recover from a down market.

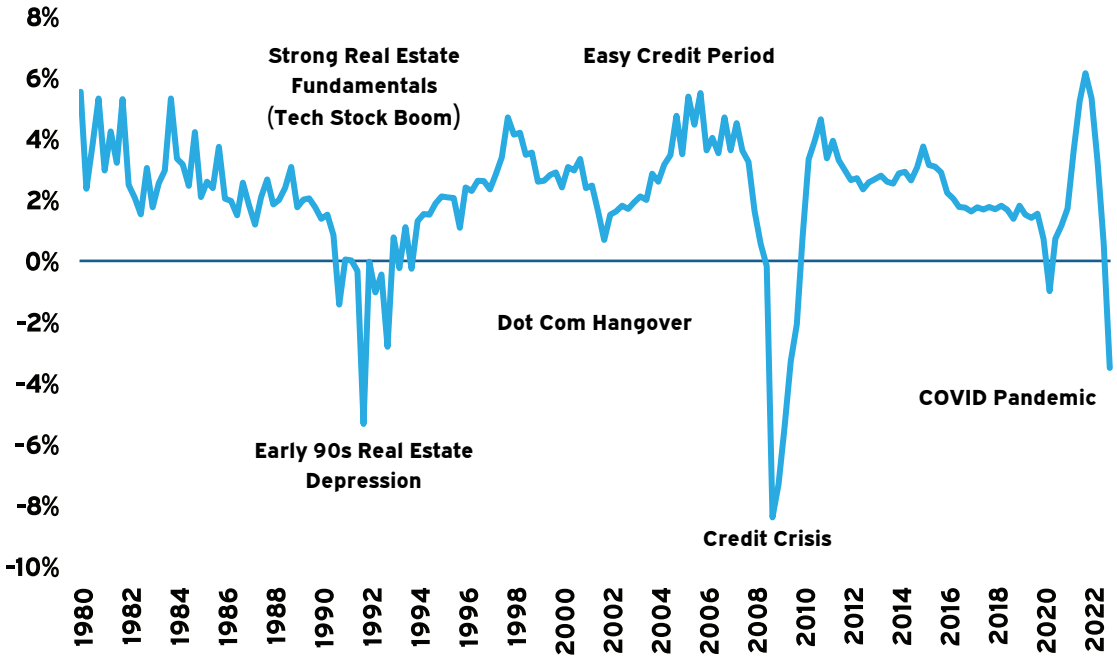

FIGURE 8
NPI Quarterly Returns - Institutional Grade Real Estate

Source: NCREIF Property Index (NPI) Q4 2022 Trends Report, as of January 2023.

Oversight

Evaluating core real estate managers may require more due diligence than evaluating public market managers. While there exists extensive public information on most stock and bond issues, the information on real estate deals is largely inaccessible to the investing public. Real estate market dynamics are highly localized; what is valuable and desirable in one part of a metropolitan area may be worth much less in another. Furthermore, there is a high degree of correlation among seemingly disparate markets. For example, one might expect that owning office properties in Boston and San Francisco would provide diversification benefits, when, in fact, the two markets might be highly correlated.

Fees

Core real estate managers are generally paid a management fee of around 1.0%. On occasion there are incentive fees, calculated as a percentage of total return above a predetermined benchmark (such as consumer price inflation). Often, core real estate managers will step down their management fee if their cash balance exceeds a certain threshold or on the indebted portion of the properties. Some managers will charge fees for acquisitions as well.

Capitalization rates and expected returns

Capitalization rates ("cap rates") are a real estate valuation metric that represents expected profitability of a particular property at the time of the purchase. A higher capitalization rate indicates a higher expected (or required) return on investment, and vice versa. These cap rates are significantly affected by general market conditions and vary by property type and by market, indicating differences in risk/reward ratios. As with any investment, the price paid for future cash flow has a meaningful effect on long-term returns. However, shorter-term returns can be affected by events such as the GFC and COVID pandemic. Figure 9 depicts how capitalization rates influence real estate's 5-year future returns.

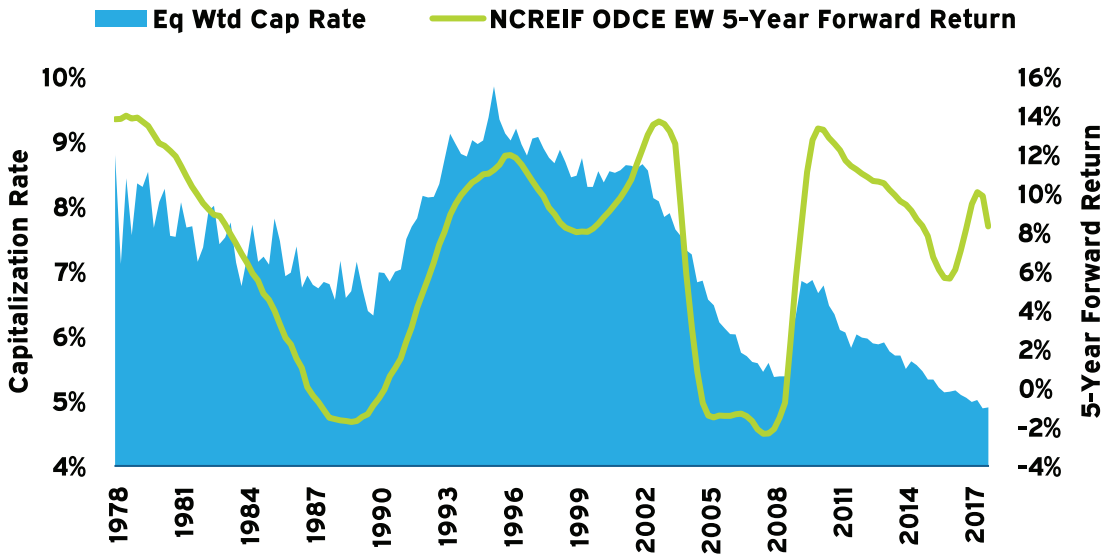

FIGURE 9
Impact of ODCE Cap Rates on Future Returns

Source: NCREIF as of January 2023.

Role in a portfolio

Asset allocation benefits

Adding an allocation to core real estate can result in a more "efficient" portfolio. An investor can use core real estate to achieve a higher expected return for a given level of risk, or to lower risk at a given expected return. Figure 10 illustrates the impact of adding core real estate to a theoretical portfolio. For the purpose of this exercise, we consider three theoretical portfolios: no core real estate, 5% core real estate, and 10% core real estate.

The results support the thesis that adding core real estate can lower risk while maintaining similar target returns, increasing the portfolio Sharpe ratio. Adding a modest real estate allocation to a diversified portfolio can lower the expected standard deviation. For example, the "No Core Real Estate" portfolio's standard deviation is 11.2%; however, after adding a 5% and 10% allocation to core real estate, standard deviation drops to 11.1% and 11.0%, respectively.[2]

[2] Note that Core Real Estate's expected standard deviation in the table does not reflect the actual smoothing effect experienced by investors (similar to that experienced with private equity), hence realized volatility would likely be lower.

Asset Class	No Core Real Estate	5% Core Real Estate	10% Core Real Estate
Public Equities	45	43	41
Private Equity	10	10	10
Investment Grade Bonds	35	32	29
High Yield Bonds	5	5	5
TIPS	5	5	5
Core Real Estate	*0*	*5*	*10*
Expected Return	**7.9**	**7.9**	**7.9**
Expected Standard Deviation	**11.2**	**11.1**	**11.0**
Sharpe Ratio	**0.44**	**0.45**	**0.46**

FIGURE 10
Impact of Adding Core Real Estate

Source: Reflects 20-year horizon and annualized expected return. Based on the 20-year assumptions from Meketa's 2023 Capital Markets Expectations.

Summary

Meketa Investment Group advocates allocating assets to core real estate in portfolios with a long investment horizon and a tolerance for illiquidity. Core real estate can provide diversification that cannot be achieved through public market investments alone. Even smaller investors can take advantage of real estate, as a number of well-diversified core open-end funds are available.

Investors, however, need to understand the nuances of investing in core real estate. While core real estate has some significant advantages, it also has some drawbacks. Understanding the factors involved should allow investors to have a higher level of comfort with their investments in core real estate. A summary list of the advantages and disadvantages of real estate is provided in the following table.

Advantages	Disadvantages
Solid risk-adjusted returns	Limited liquidity
Diversification	Appraisal-based pricing
Inflation hedge	Longer market cycles

FIGURE 11
Advantages and Disadvantages of Core Real Estate

Source: Meketa Investment Group.

Initiating a real estate investment program can seem daunting, but it can be managed. Core real estate returns break down into easy-to-understand factors, and the proliferation of choices makes core real estate accessible to most institutional investors. With its strong risk-adjusted returns, significant income component, and diversification benefits, core real estate is an important asset class that should not be overlooked.

Appendix

Benchmarks

Another drawback to investing in real estate is the lack of an ideal benchmark. Because of the complexity of real estate valuation, few indexes exist to capture the "market" return. Most investors use either the NCREIF NPI or the Open-End Diversified Core ("ODCE") index as a benchmark for core real estate. The NPI is an index of unlevered core property returns as reported by real estate fiduciaries, such as fund managers and institutional property owners. The NPI has over 7,000 constituent properties and is reported on a quarterly basis. The reported property values are based on appraisals and must be re-valued at least annually.

The NPI is not an ideal comparison to real-world conditions, as it is not constituted in a way that makes it directly comparable to most real estate strategies. The most significant drawbacks of the NPI are:

- → It is strictly an aggregation of property-based returns; it does not account for management fees, dead-deal costs, or transaction costs
- → It is not an investable universe; that is, an investor cannot purchase a pro-rata portion of each property in the index
- → It only includes four property types (office, industrial, apartment, and retail), whereas many core managers also invest in other types such as hotels, self-storage, and student housing
- → It relies on data from managers, and thus is not a fully independent measure
- → It does not include all investment grade real estate
- → It is reported on an unlevered basis, while most core managers use leverage to some degree

To combat some of these shortcomings, NCREIF publishes the ODCE. Instead of focusing on the individual properties, the ODCE focuses on 26 active core open-end funds. As such:

- → It includes assorted management and operational fees (ranging between 0.75% to 1.35%)
- → It includes more than the four basic property types
- → It is reported on a levered basis, with fund level leverage usually ranging between 10% and 40%

While the ODCE is still incomplete and un-investable in a practical sense, many investors find that it is an improvement over the NPI for benchmarking purposes. The ODCE is published on both an equal-weighted and a value-weighted basis. Because the performance of the value-weighted index is concentrated among a small number of managers, we recommend using the equal-weighted ODCE index as a peer benchmark.

	NPI	ODCE
Valuation Basis	Appraisals	Appraisal & Valuations
Leverage	None	10% - 40%
Fees	None	0.75% - 1.35%
Property Types	Four "Core" (Office, Industrial, Apartment, Retail)	"Core" plus Hotels, Self-Storage, Medical Office
Cash	None	1% - 7%
Data Source	Property Level	Fund Level

FIGURE 12
Comparison of Core Property Benchmarks

Source: Meleta Investment Group.

Tactical considerations

There are many pieces of data that are used to analyze real estate at a macro level. These data are often used to predict near-term returns. While Meketa Investment Group does not recommend attempting to "time" the market, the data may provide an indication of expected returns and may, to some extent, dictate the timing of making certain investments. The key data we discuss are: earnings yields, capitalization rates, capital flows, and capital overhang.

Capitalization rates, or "cap rates," are a measurement of the expected profitability of a particular property at purchase, based on several factors: the price of the property, transaction costs, and projected net operating income. The cap rate calculation does not take into effect growth in net operating income, nor does it consider capital expenditures and their possible effect on property value. Thus, it does not always reflect the true return potential of a property.

The key piece to the cap rate calculation is the purchase price. In fact, most acquisitions are priced using a required IRR, or "dollar-weighted" return. In other words, rather than calculating an IRR based on the purchase price, a manager will base his/her offer on a required rate of return. Thus, cap rates and prices are inversely related. When cap rates are high, prices are relatively low and vice versa. This is the same as the relationship between bond yields and bond prices.

Cap rates and earnings yields are strongly related. Higher cap rates generally lead to higher yields. However, cap rates apply specifically to properties being transacted, at the time of purchase. Earnings yields are based on current net operating income and the historical capital costs of a property. This is a subtle but important difference, although the two are easily confused. As noted above, cap rates do not consider the effects of income growth and capital expenditures. This decreases the accuracy of historical comparisons. In markets where significant income growth is expected, lower cap rates (i.e., higher prices) may be justified as it is anticipated that they will be offset by growth.

As with most asset classes, capital flows affect prices. When there is a surplus of capital to be invested, prices increase and cap rates decrease. When capital is withdrawn

from the real estate market, the opposite occurs. As with stocks and bonds, there are underlying fundamental factors that affect long-term returns (e.g., demand for office space), but capital flows are responsible for much of the short-term volatility.

Because of real estate's illiquidity, cash cannot be deployed as rapidly, and uncommitted capital can accumulate when capital is flowing into the real estate market. The amount of capital that has been committed to real estate but not yet invested is known as capital overhang. Capital overhang can be a significant problem for investors in any illiquid asset class. As uncommitted capital accumulates, cap rates are driven down and managers may be tempted to acquire less desirable properties in order to put money to work.

Meketa scenario analysis: periods of high inflation

- Meketa's Inflation Scenario Analysis is for the period February 1973 - December 2022.
- The Scenario Analysis is based on a generalized linear regression ("GLS") model that estimates the effects of realized and surprise inflation on monthly asset returns, controlling for the economic environment. The GLS model assumes a residuals autocorrelation of 1. Quadratic independent variables are added to the regression model to account for potential non-linearity between an asset class and inflation. Estimated scenario returns at the asset class level are then calculated as the expected value of asset class returns, conditional on the inflation scenario.
- Inflation is the monthly change in CPI from the 3-month rolling average CPI, surprise inflation is the difference between this month and last month's inflation rate, and GDP Growth is the percent change in GDP from the previous quarter. Inflation and GDP data are taken from the St. Louis Federal Reserve Bank's FRED database.
- Inflation meaningfully higher than expected is when surprise inflation is in the 75th percentile of positive, historical surprise inflation.
- Low growth and high inflation is when real GDP growth is in the 25th percentile of historical GDP growth and inflation is in the 75th percentile of historical inflation.
- Extended, extreme inflation spike is when inflation is in the 95th percentile of historical inflation and lasts for 12+ months.
- Indices Used: Russell 3000 Index, Bloomberg US Aggregate Bond Index, and NCREIF Property index.

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