

Real assets refers to tangible assets for which their intrinsic value is derived from underlying physical attributes. Real assets can be an important component of long-term investment portfolios. Their inclusion in portfolios dominated by publicly traded stocks and bonds offers the potential to provide inflation and market downturn protection, diversification benefits, income generation, and capital appreciation. In this whitepaper, we broadly examine real assets, focusing on private market infrastructure and natural resources.¹

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¹ While real estate is also sometimes included by institutional investors under the umbrella of real assets, it often receives a specific and separate allocation that is beyond the scope of this paper.

Key takeaways

- **Inflation protection** | Real assets, such as infrastructure and natural resources, can provide a hedge against inflation, helping to preserve the purchasing power of a portfolio.
- **Market downturn protection** | Real assets can offer protection during market downturns, as their intrinsic physical qualities often make them less volatile compared to financial assets like stocks and bonds.
- **Diversification benefits** | Including real assets in an investment portfolio can enhance diversification, reducing overall risk and improving the resilience of the portfolio.
- **Income generation and capital appreciation** | Certain types of real asset strategies can generate steady income streams, which can be particularly valuable for long-term investors seeking consistent returns. Other real asset strategies have the potential for capital appreciation, contributing to the overall growth of the investment portfolio.
- **Role of real assets strategies** | There are many different types of real assets strategies that offer varying levels of risk, return potential, and behavior relative to financial assets. Determining the role of real assets in a portfolio will determine which types of strategies an investor should emphasize.

What are real assets?

Real assets are generally defined as long-lived physical assets that are valued for their intrinsic physical qualities. This contrasts with financial assets, such as stocks and bonds, which derive their value from claims on current and future cash flows. The real assets universe encompasses a wide variety of strategies with respect to their level and type of risk, return potential, and behavior relative to financial assets.

Types of real assets

The two asset classes most commonly associated with a real assets allocation are infrastructure and natural resources. Infrastructure is the foundation for the production and delivery of goods and services critical to the global economy. Natural resources assets are raw or processed commodities, including associated production facilities and services, which are critical inputs for energy, food, manufacturing, and construction. Both infrastructure and natural resources can be categorized by their distinct sectors (and sub-sectors), shown in Figure 1.

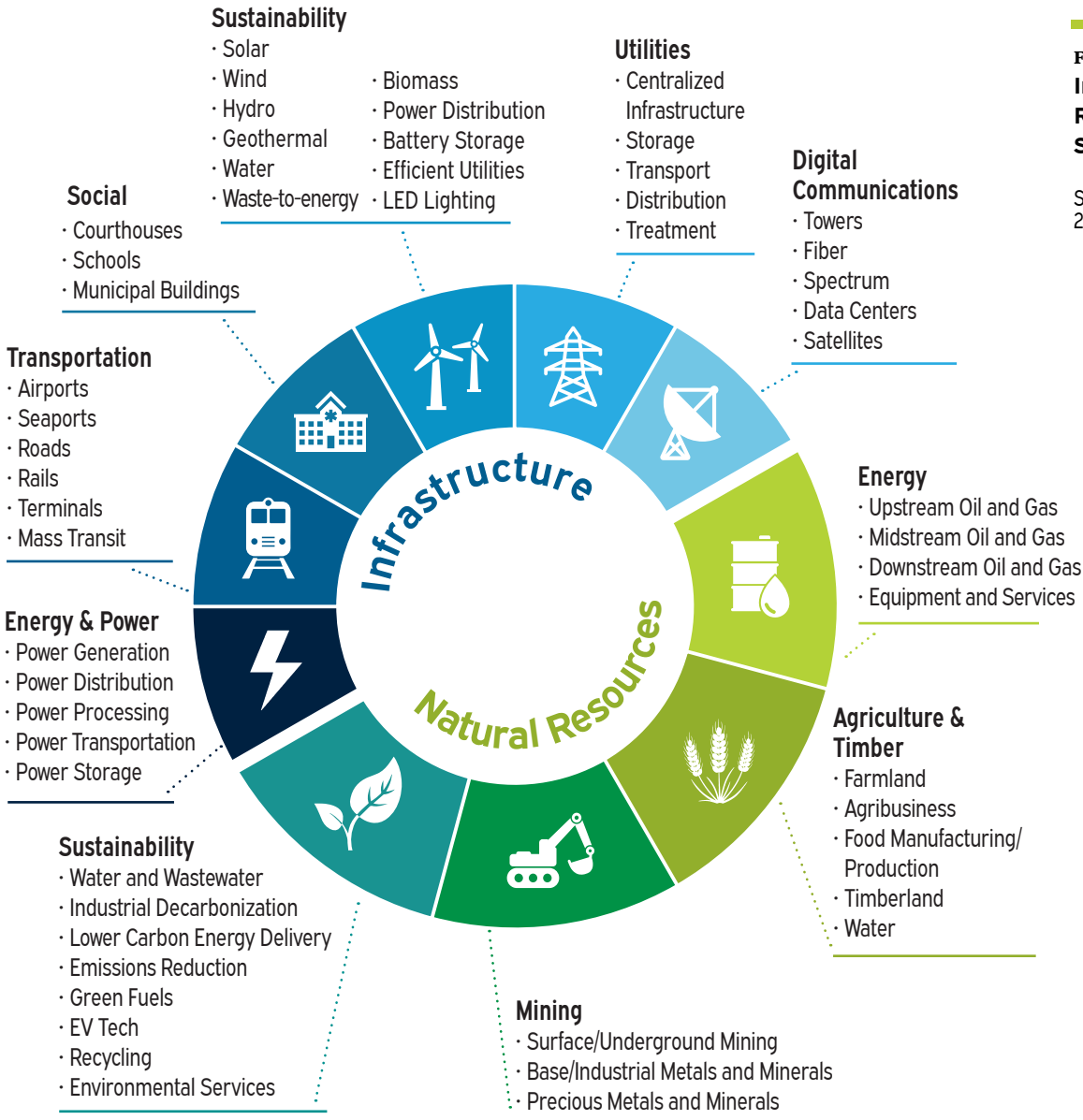


FIGURE 1
Infrastructure & Natural Resource Sectors & Sub-Sectors

Source: Meketa Investment Group, 2024.

While natural resources funds are typically focused on a particular sector (e.g., energy, farmland), infrastructure funds are more commonly classified by their risk and return profiles, spanning from the least risky/lowest expected return of core and core plus to the riskier (and higher expected return) strategy of value add and opportunistic (similar to the way real estate funds are often structured). That said,

there are natural resources funds that invest in multiple sectors, just as there are infrastructure funds that focus on a single sector.

Throughout this paper, we show infrastructure returns as two distinct categories, core (which includes core and core plus) and non-core (which includes value add and opportunistic). This is due to both the availability of data and to help showcase the different characteristics of the strategies. Due to a lack of sufficient data for the individual sectors, natural resources returns are shown as one aggregate value, proxied by the Cambridge Associates Natural Resources Composite.²

² With the exception of the energy sector, the number of funds for which there is strategy-specific natural resource return data from year to year is insufficient to draw meaningful conclusions about each sector. Note that the NCREIF timberland and farmland indices are often used as benchmarks in those sectors.

Characteristics of real assets

Real asset investments vary with respect to their economic sector and positioning within an economy. Infrastructure and natural resources investments have different and complementary relationships to economic risk factors, some of which are summarized in Figure 2 below. For example, natural resources investments are closely related to commodity prices and can benefit from high demand during short supply or suffer from cycles of lower demand when the market is oversupplied. The infrastructure sector has a lower sensitivity to commodity prices or swings in demand and tends to be less affected by supply/demand cycles. Because of the physical nature of the assets, both categories are highly capital intensive.



FIGURE 2
Economic Risk Factors

Source: Meketa Investment Group, 2024.

How big is the real assets universe?

Real assets represent roughly 12% of the global private markets’ assets under management (“AUM”) as of year-end 2023 (see Figure 3). Real Assets’ share of the private markets’ universe has been generally trending upward since 2000. Notably, the composition of real assets has shifted. In the early 2000’s, natural resources represented just over half of real assets’ AUM; however, this switched in 2004 when infrastructure AUM surpassed natural resources. Since that inflection point, infrastructure has gained an even larger share of the real assets universe. Infrastructure’s rise has been due to both heightened growth within the asset class as well as lower overall growth in natural resources’ AUM and annual fundraising relative to other private markets assets (see Figure 4).

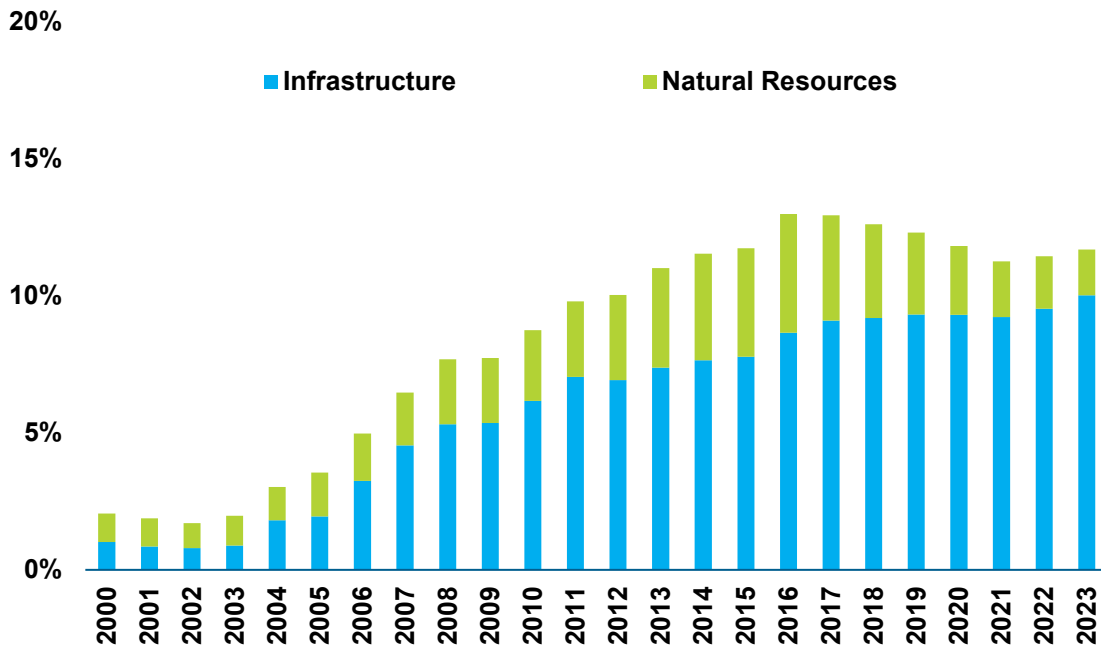


FIGURE 3
Real Assets as a Percentage of Global Private Markets Assets Under Management

Source: Preqin, as of December 31, 2023. To avoid double counting, fund of funds and secondaries are excluded.

Global historical fundraising for the investable private infrastructure universe first became a noteworthy part of the private market landscape in the mid-2000's and has grown more robust ever since. Private natural resource fundraising has been somewhat cyclical over the past 20 years. However, aggregate capital raised and number of funds has been generally declining since their respective peaks in 2015 and 2018, respectively. These recent declines in private natural resources' aggregate capital and number of funds may be explained by both a trend of divestment from traditional energy as well as overall lower returns in the asset class.

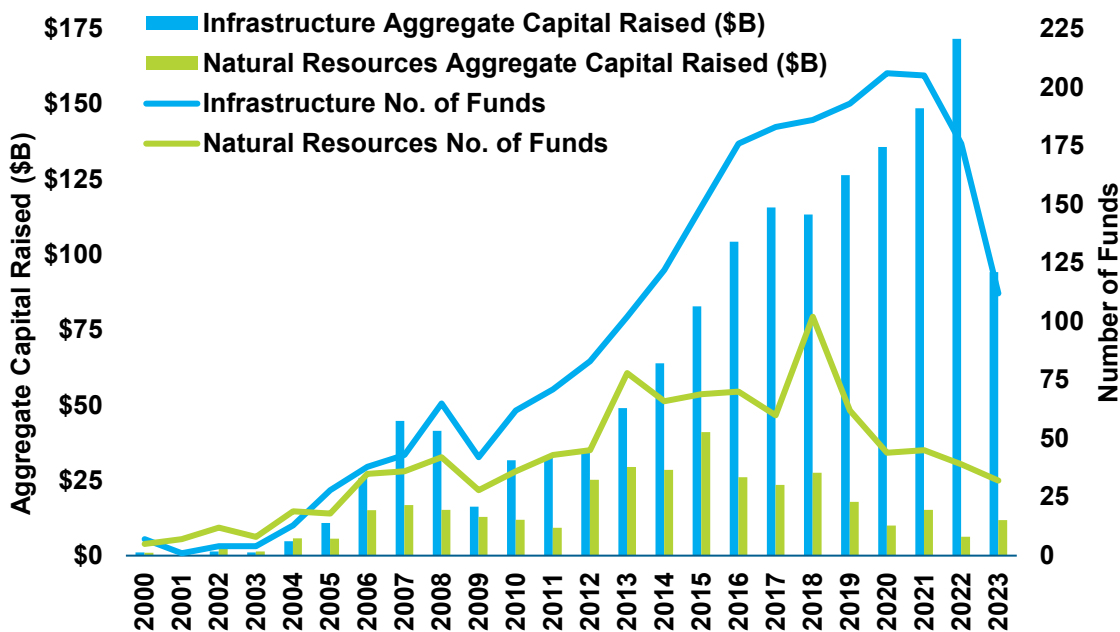


FIGURE 4
Global Historical Fundraising

Source: Preqin, as of December 31, 2023.

Why use real assets?

Real assets can serve many purposes within an investor's portfolio. The two primary reasons behind adding a real assets allocation - diversification benefits and inflation protection - are described in the following sections.³ Other benefits of real assets (dependent upon the strategy) include the potential for manager alpha as well as capital appreciation and income generation. For example, certain subsectors within real assets can provide stable yields to a portfolio while also providing downside protection during a bear market for public equities. The stable and long-term revenue streams provided by some real assets may offer investors attractive yields relative to high-quality fixed income securities while still offering the potential for capital appreciation. Additionally, real assets have the benefit of an expected return that more closely resembles stocks than bonds.

Inflation protection

A common theme among real assets is inflation protection benefits. These benefits are important when considering an allocation to real assets in a portfolio with significant holdings of traditional assets like stocks and (nominal) bonds. Periods of unexpected inflation or inflation that was accompanied by low growth have historically been more damaging to stocks and bonds than to real assets. Stocks and bonds' fundamental values are based on discounted streams of future cash flows. Unexpected inflation or inflation together with little to no growth can cause nominal costs to increase faster than nominal revenues, or it can cause the real dollar value of the cash flows to decline. Both scenarios typically cause a decrease in the value of traditional financial assets. Real assets derive their value from their physical properties, which are expected to maintain or increase in value during times of unexpected inflation.

The inflation protection benefits of private real assets are illustrated in Figures 5 and 6 below, as they generated returns that were higher than US stocks in each of the inflationary scenarios analyzed. Note that the natural resources and infrastructure returns analyzed below are all strictly private assets. Public market real assets tend not to perform as well during inflationary periods and even have lower returns than US equities in some scenarios.⁴ This is primarily because public real assets' valuations are inherently linked to the volatility of the stock market and because they represent financial assets whose earnings are more susceptible to changes in inflation.⁵

³ The following sections depict private natural resource and infrastructure performance and characteristics only (not public). Non-core infrastructure is composed of 50% value add and 50% opportunistic. This 50/50 split was chosen based on historical average fund counts.

⁴ There are some obvious exceptions, such as the performance of energy stocks during an inflationary period that is caused by a supply shock in the energy market.

⁵ Note that the diversification benefits and lower volatility of real assets, like most other private markets assets, may be potentially overstated due to the fact that private assets are only valued on a quarterly basis as determined by managers/auditors.

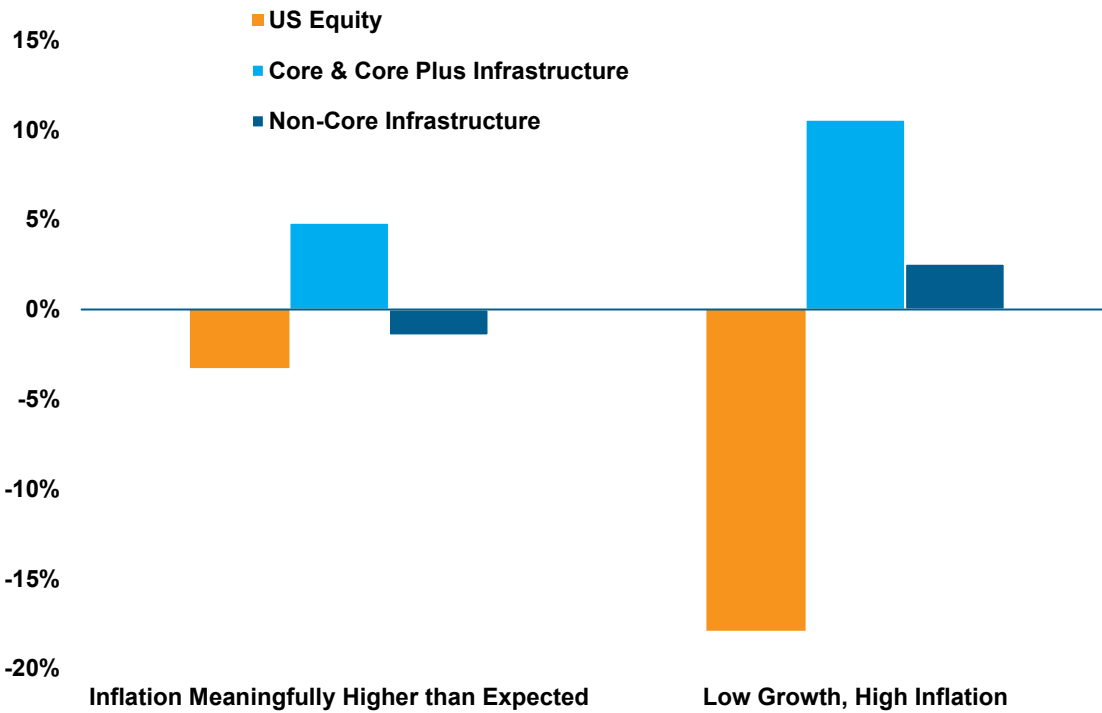


FIGURE 5
Infrastructure Returns
During Historical Periods
of High Inflation

Source: Reflects average, annualized asset class returns. These figures are from Meketa's scenario analysis based on data from Cambridge Associates via IHS Markit, Bloomberg, and FRED from 4/1/2003 to 12/31/2022. See the appendix for more details on and descriptions of the inflationary periods included in Meketa's scenario analysis.

Note: The infrastructure inflationary scenarios analyzed were over the period 4/1/2003 to 12/31/2022 as this was the earliest data available for core/core plus private infrastructure and provided the largest time period to analyze inflationary periods over. Note that fund count from 4/1/2003 to 10/1/2007 is low, with less than 8 funds per strategy.

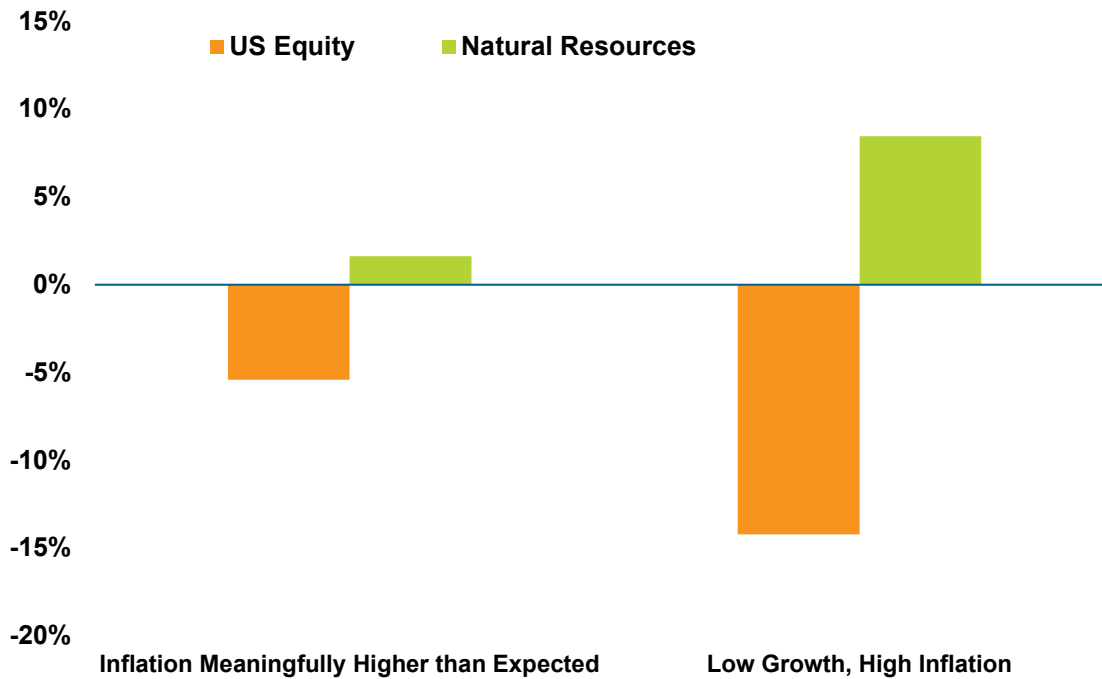


FIGURE 6
Natural Resources Returns
During Historical Periods
of High Inflation

Source: Reflects average, annualized asset class returns. These figures are from Meketa's scenario analysis based on data from Cambridge Associates via IHS Markit, Bloomberg, and FRED from 4/1/1989 to 3/31/2023. See the appendix for more details on and descriptions of the inflationary periods included in Meketa's scenario analysis.

⁶ Natural resource's success during this high inflation period comes after a longer period of disappointing low returns for the asset class.

Sources: FRED, Cambridge Associates via IHS Markit, quarterly Pooled IRR pulled in November 2023 and January 2024. Monthly returns sourced from Bloomberg converted to quarterly. Q4 2020 is \$1 USD. Represents the period from Q1 2021 through Q4 2022. Indices: Russell 3000, Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite, Cambridge Natural Resources Composite, CPI-U (% Change).

As an example, during the recent period of damaging, unexpected inflation beginning in Q1 2021 and going through Q4 2022, real assets outperformed US equities (see Figure 7). While the returns for the equity market were relatively flat for the two-year period, the cumulative gains for real assets ranged from +17% for core infrastructure to +59% for natural resources.⁶

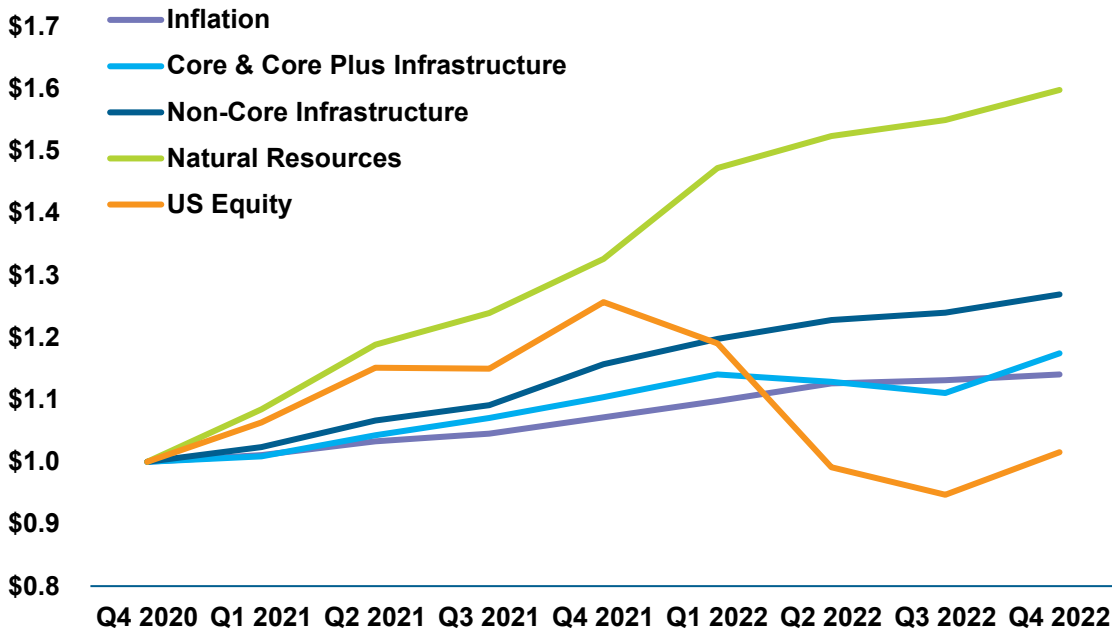


FIGURE 7
Growth of a Dollar

Sources: FRED, Cambridge Associates via IHS Markit, quarterly Pooled IRR pulled in November 2023 and January 2024. Monthly returns sourced from Bloomberg converted to quarterly. Q4 2020 is \$1 USD. Represents the period from Q1 2021 through Q4 2022. Indices: Russell 3000, Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite, Cambridge Natural Resources Composite, CPI-U (% Change).

Diversification from major assets

Real assets may have the potential to enhance a portfolio's diversification and lower overall volatility, thus stabilizing return expectations. These benefits arise, in part, because the correlation of real assets with bonds has typically been negative and the correlation with stocks, while varying considerably, has typically been low.⁷ Since 2003, core and non-core infrastructure have exhibited an average -0.08 and -0.06 correlation to US bonds, and a 0.33 and 0.49 average correlation to US equities, respectively (see Figure 8).⁸ This suggests that private infrastructure is somewhat correlated to equities, which seems intuitive as, in the long run, returns for both infrastructure and equities are likely to be driven by economic growth.

⁷ Public infrastructure and natural resources typically have higher correlations to bonds and equity than private infrastructure and natural resources.

⁸ Quarterly returns sourced from Bloomberg and Cambridge Associates via IHS Markit as of March 2023 (pulled in November 2023). Indices: Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite, Russell 3000, Bloomberg US Aggregate Bond Index. Period is Q2 2003 to Q1 2023.

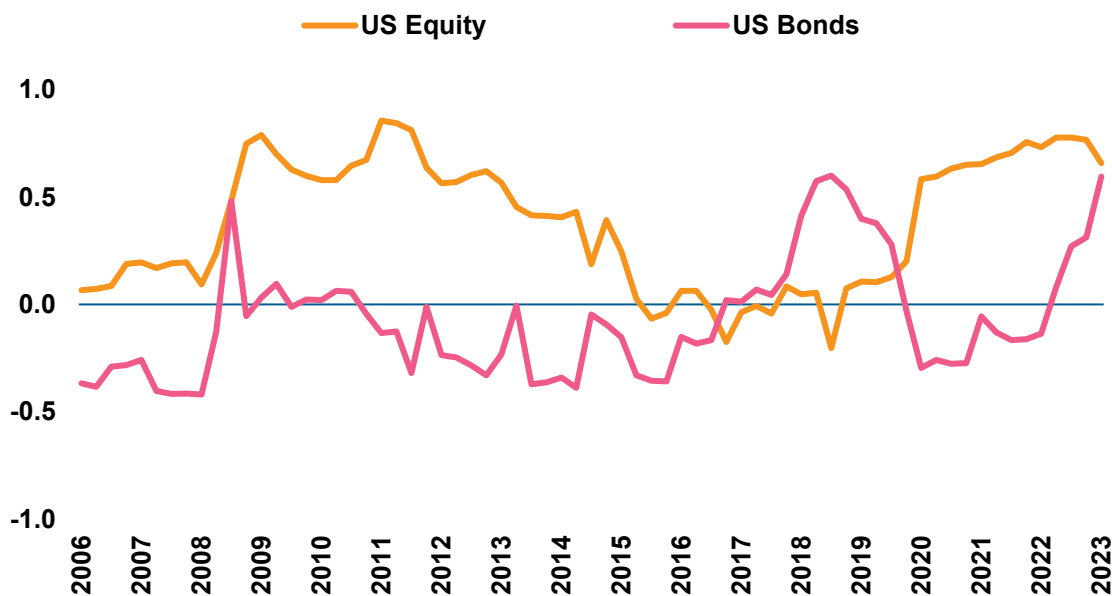


FIGURE 8
Rolling 3-Year Correlation to Core Infrastructure

Source: Quarterly returns sourced from Bloomberg and Cambridge Associates via IHS Markit as of March 2023 (pulled in November 2023). Indices: Cambridge Core & Core Plus Infrastructure Composite, Russell 3000, Bloomberg US Aggregate Bond Index.

Since 1990, natural resources have had a -0.21 average correlation to US bonds and a 0.34 average correlation to US equity (see Figure 9).⁹ This positive correlation to US equities is not strong enough nor is it consistent enough to be considered substantial. Like infrastructure, natural resources' correlation to US bonds and equities have varied considerably over time.

⁹ Quarterly returns sourced from Bloomberg and Cambridge Associates via IHS Markit as of June 2023 (pulled in January 2024). Indices: Cambridge Natural Resources Composite, Russell 3000, Bloomberg US Aggregate Bond Index. For the period Q1 1990 to Q2 2023.

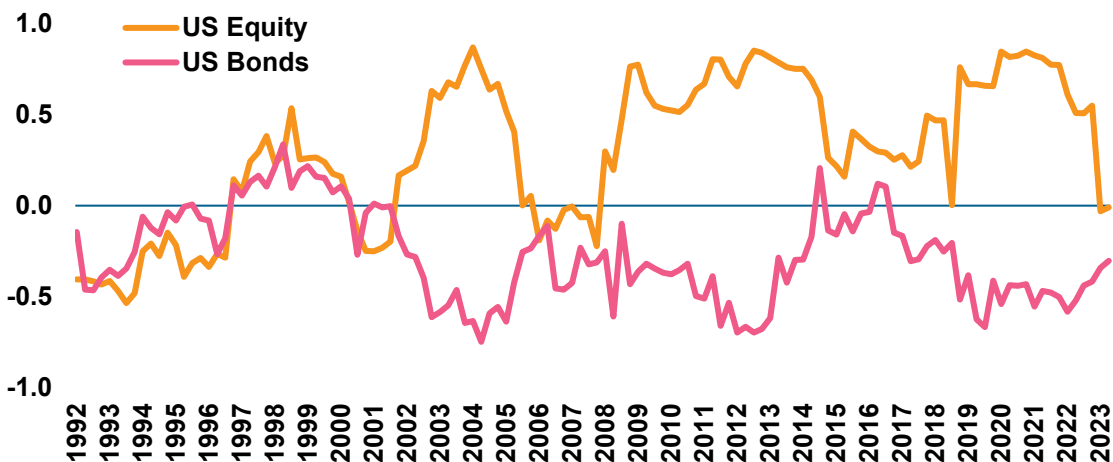


FIGURE 9
Rolling 3-Year Correlation to Natural Resources

Source: Quarterly returns sourced from Bloomberg and Cambridge Associates via IHS Markit as of June 2023 (pulled in January 2024). Indices: Cambridge Natural Resources Composite, Russell 3000, Bloomberg US Aggregate Bond Index.

It is worth noting that private real assets are not marked to market on a daily basis like public stocks and bonds. As such, they will tend to exhibit lower volatility than is observed in public markets. The smoothed nature of private real assets' returns may also contribute to the lower observed correlation with public stocks and bonds.

Diversification during market downturns

Another way to evaluate real assets' diversification benefits is to evaluate how they performed during historical market downturns. Figure 10 depicts the return performance of US stocks and real assets during recent bear markets for stocks. As expected, real assets performed better than traditional US equity in each of the scenarios. The performance of real assets during the post-COVID rate hikes is particularly noteworthy, as both stocks and bonds produced double-digit losses during this period while real assets produced gains.

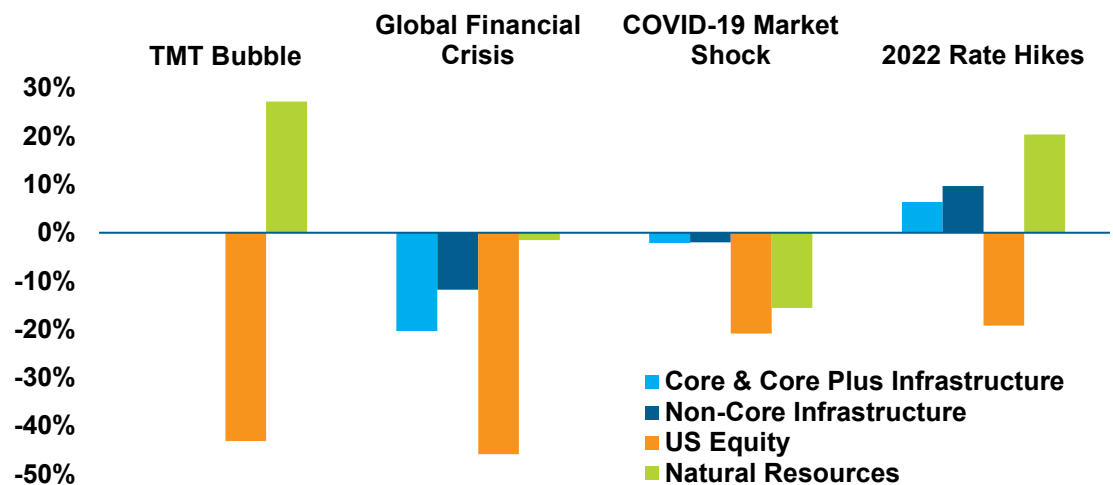


FIGURE 10
Performance During Recent Historical Market Downturns

Source: Meketa's Asset Allocation Tool. Returns are cumulative for the time period over which the scenario occurred. Dates for the four events in order are: Apr 2000 - Sep 2002, Oct 2007 - Mar 2009, Feb 2020 - Mar 2020, Jan - Dec 2022. Data for infrastructure was not available prior to 2003, hence it is excluded from the TMT period.

Expected and historical returns

Another benefit of real assets is that they are, in theory, expected to generate returns that more closely resemble those of equities rather than core bonds (see Figure 11).

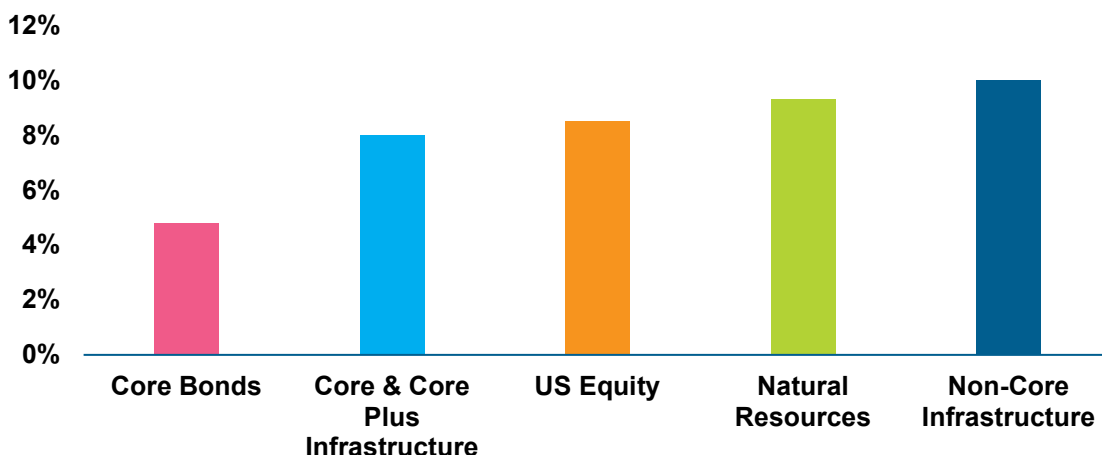


FIGURE 11
Meketa's 20-Year Expected Returns

Source: Meketa's 2024 Capital Markets Expectations. Numbers reflect annualized expected returns.

Over the past 10 years, infrastructure (particularly non-core) has kept pace with and generated similar returns to US equities (see Figure 12). However, over the same period, natural resources has not kept up with US equities. Natural Resources' underperformance was partly due to heavy energy exposure during an unfavorable environment for fossil fuels, as oil prices dropped rapidly in 2015 and remained low relative to prior decade prices.¹⁰ This caused lower energy returns and, by extension, lower natural resource returns. More recently, since 2021, oil prices have risen back to their previous highs, corresponding with a general rise in natural resources' returns. When looking at natural resources' returns over a longer period (the past 20 years), they have been much higher, at roughly 11.7% per annum. However, these long-term returns are largely amplified by natural resources' performance from 2004 to 2008, which was a boom for the commodities market.¹¹ These returns illustrate the cyclical nature that is inherent in the natural resources sector.

¹⁰ Source: Bureau of Labor Statistics, "The 2014 plunge in import petroleum prices," May 2015. IEA, "US Crude Oil First Purchase Price," December 2023.

¹¹ Source: World Bank, "Placing the 2006/08 Commodities Price Boom into Perspective," 2010. IMF, "Commodities in Boom," May 31, 2012.

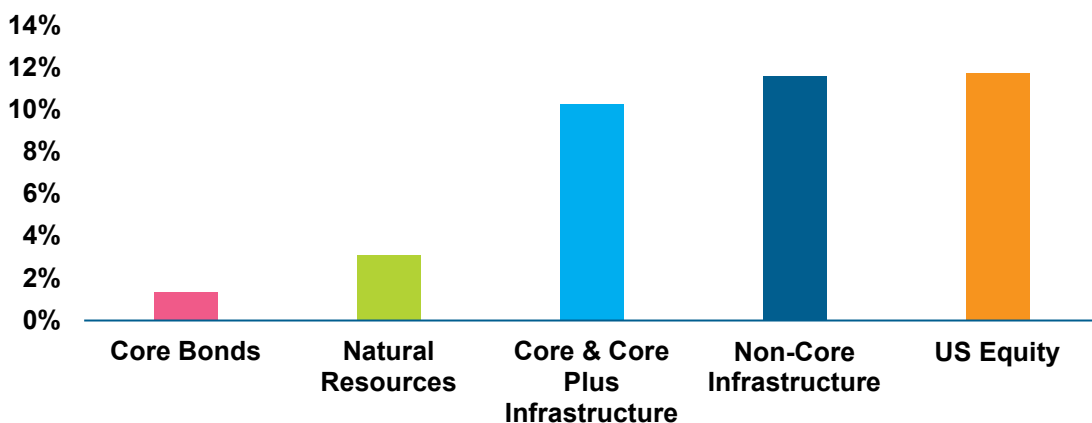


FIGURE 12
Trailing 10-Year Annualized Returns

Source: Quarterly returns sourced from Bloomberg and Cambridge Associates via IHS Markit for the period 4/1/2013 to 3/31/2023 (pulled in November 2023 and January 2024). Indices: Cambridge Core & Core Plus Infrastructure Composite, Cambridge Value Add Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Natural Resources Composite, Russell 3000, Bloomberg US Aggregate Bond Index.

Note: For purposes of return comparison, throughout this document we linked quarterly IRRs of Natural Resources and Infrastructure as reported by Cambridge Associates. This is because timeweighted returns for these series were not available and the quarterly IRRs used should not differ materially from time-weighted quarterly returns. Note that the trailing returns we present by linking the quarterly IRRs are different from the trailing IRRs as the trailing IRRs are running the calculation over a longer period in which the weighting of cash flows has a more substantial impact.

Potential for manager alpha

Real assets, like most private markets assets, may offer increased potential for managers to add (or detract) value in a portfolio relative to public markets assets. Figure 13 measures this potential addition (or subtraction) in value through interquartile spreads. Interquartile spreads can be interpreted as how much potential value lies in selecting superior active managers within an asset class. Compared to each other, private natural resources and infrastructure have nearly identical trailing 10-year interquartile spreads. Compared to public market equity and bond strategies, real assets offer a meaningfully wider interquartile spread. This implies that real assets may offer greater potential to generate alpha through manager/fund selection than is typically available in public markets.

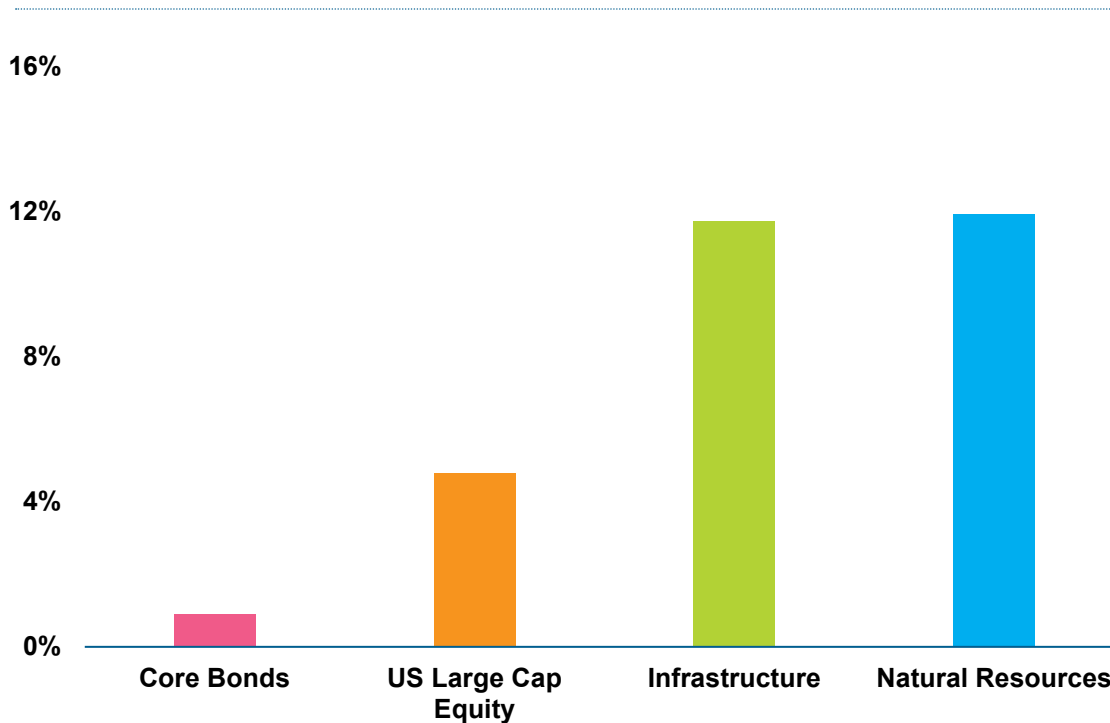


FIGURE 13
Trailing 10-Year
Interquartile Spread

Source: Cambridge Associates via IHS Markit, annual Pooled IRR quartiles by vintage year as of December 31, 2023 with data pulled in May 2024. eVestment data as of December 31, 2023 with data pulled in January 2024. Private markets funds raised Vintage Year 2012 to 2021 (2022 and 2023 are excluded as they are too recent). Note that Natural Resources does not have data for vintage years 2020 and 2021. Public markets data for the trailing 10 years as of December 31, 2023. Indices: Cambridge Infrastructure Composite, Cambridge Natural Resources Composite, eVestment US Large Cap Equity, eVestment Investment Grade Bonds. Private market performance presented in this chart is net of fees, while public market performance is gross of fees. For more information on US equity and Core Bonds' alpha calculation, see Meketa's Manager Alpha White Paper.

Note that due to a lack of available data, Infrastructure is shown as a singular composite in this chart, which may result in an uneven skew of core and non-core strategies.

What risks should investors expect?

As with any asset class, real assets possess unique risks and return drivers that investors must be aware of when considering an allocation. Due to the wide variety of strategies (and sub-strategies) in real assets, some risks are more prominent in certain strategies and less prominent in others.

Most investments in natural resources are equity oriented. That is, they reflect ownership in one or more assets that are involved in the extraction, production, or servicing of natural resources. Hence, like most equity-oriented investments, the long-term returns of the asset class will be linked to economic growth. However, there are other factors that will affect returns.

Some of the most conspicuous risks when investing in natural resources are global demand and commodity prices. Natural resource assets are primarily raw and processed commodities, and thus are heavily influenced by the price of the goods. These prices may change for a number of reasons, the foremost of which being global supply and demand. Shifts in supply and demand may be cyclical or linked to an external world event, including drought, major weather events, and war. Natural resources are also prone to geopolitical and regulatory risks, as foreign (and domestic) political, climate, and other factors may influence the harvest, production, and price of commodities. Similarly, natural resources can also be influenced by changes in exchange rates. Since most commodities are priced in US dollars, commodity imports and exports are influenced by currency swings. As exchange rates fluctuate, commodities prices, and underlying raw resource prices, can shift.¹²

¹² See Meketa's primer on Private Natural Resources for a more detail analysis of the link between performance and commodity prices and exchange rates.

Infrastructure assets also tend to be equity oriented and hence the long-term returns of the asset class will be driven by economic growth. While infrastructure is not usually subject to the same global demand and commodity risks as natural resources, it does have a degree of interest rate risk. Infrastructure typically utilizes a substantial amount of debt to finance its projects. As interest rates change, it can be more (or less) expensive to borrow money to finance projects, which can also influence the number of investable projects in the market.

Infrastructure's high dependency on the building and developing of assets can also make it subject to greater construction risks. To a lesser degree than natural resources, infrastructure can also be influenced by regulatory risks as building codes, permits, and zoning regulations change over time. To help mitigate some of real assets' risks, investments in this space should be diversified across geographies, sectors, and time.

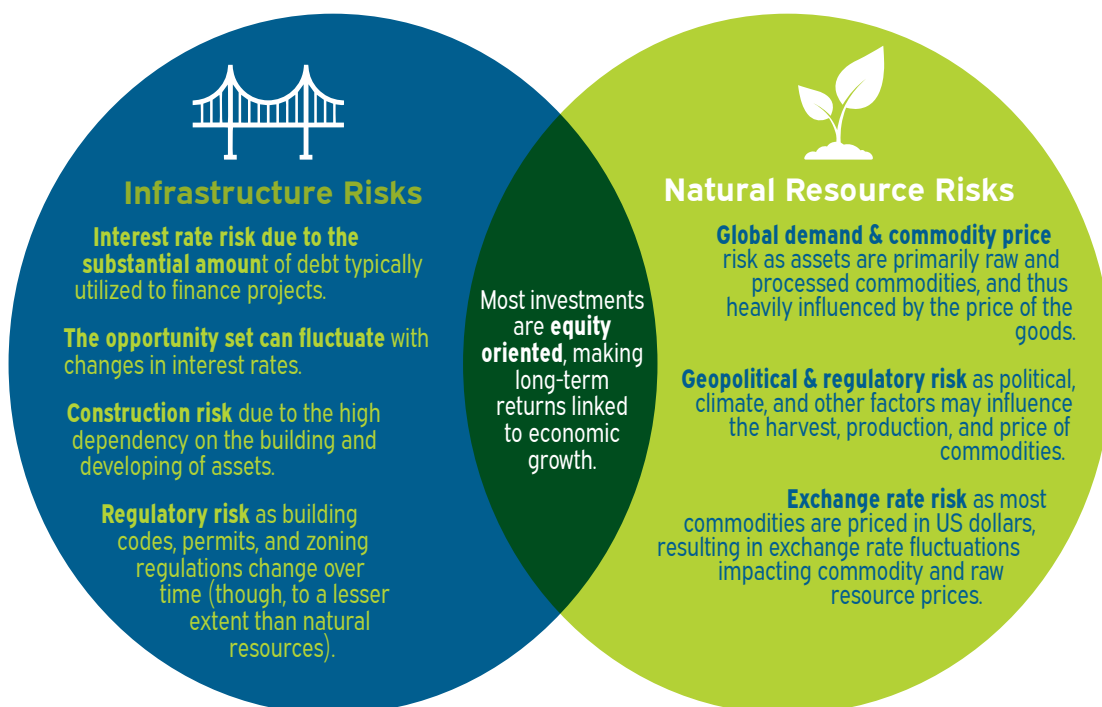


FIGURE 14
Summary of Risks

Source: Meketa Investment Group, 2024. This list is not exhaustive.

See Meketa's primer on [Private Natural Resources](#) for a more detail analysis of the link between performance and commodity prices and exchange rates.

How can investors access real assets?

Investors can access both public and private markets (or a combination of both) to gain exposure to real assets, but it is critical to understand the true drivers of risk and return within each investment type, and how this relates to an investor's time horizon, risk tolerance, capital availability, and liquidity constraints.

Public markets

Investors with short time horizons and/or requiring near-term liquidity may benefit from publicly traded equity in infrastructure- or natural resource-related companies. This exposure can be achieved via sector specific separate accounts, commingled funds, or exchange-traded funds ("ETFs") – and via active or passive approaches.

While liquid, these strategies are subject to much of the same volatility as the broad stock market and represent less of a pure play for the desired characteristics mentioned earlier, such as downturn and inflation protection. The performance of the underlying companies in a stock portfolio may be influenced more by how the operating company is managed and less by the underlying assets, and their stock prices may be heavily influenced by the overall market environment, trends, and investor sentiment. That said, for investors who are in the process of building or increasing a real assets program, public markets real assets tend to serve as the closest proxy for these assets, and thus can serve an interim role until the target allocation is reached.

Private markets

Investors with significant capital, long time horizons, and sufficient ability to tolerate illiquidity would likely benefit from an allocation to private investments in real assets. Commingled funds, direct investments, co-investments, and separately managed accounts can provide exposure to infrastructure and natural resource assets. These investments should exhibit less volatility and represent a more pure approach to gain exposure to the asset class than their public market counterparts. However, constructing and maintaining a private markets portfolio requires significant and dedicated research resources for due diligence and monitoring. The minimum commitment size for most private real assets' investment vehicles (typically \$1 million to \$10 million) can also limit the flexibility for some investors to build a diversified portfolio using only private markets.

Portfolio construction

When constructing a real assets program, investors should give thought to the role they want real assets to play in their overall portfolio, as well as how to best balance the risk-return tradeoffs while meeting their objectives. Consideration should be given to diversification by vintage year, geography, and strategy.

On the strategy side, investors who would prefer to focus their program on income should bias their program toward core infrastructure and farmland/timberland. Strategies such as core infrastructure, farmland, and timberland offer lower returns but higher revenue and cash yield certainty. In contrast, investors who are focused on higher returns (and alpha potential), should emphasize non-core strategies. Non-core infrastructure or energy services strategies may provide the most upside potential along with elevated risks.

Energy and mining strategies may provide a more direct hedge against certain types of commodity or supply-shock driven inflation. However, these strategies are likely to be highly impacted by the energy transition from fossil fuel-based energy systems to renewable energy sources. The energy transition should play an increasingly important role in how investors structure their real assets program. As the investable universe for sectors related to the energy transition (e.g., batteries, renewables, decarbonization, carbon sequestration) evolves, investors may need to revise strategic targets periodically in this dynamic asset class.

Summary

Real assets, such as infrastructure and natural resources, are valued for their intrinsic physical qualities. This is in contrast to financial assets, which derive their value from claims on current and future cash flows. This means that real assets are less affected by the movements of the broader market that impact traditional stocks and bonds. Thus, real assets may provide a portfolio with inflation and market downturn protection, diversification benefits, income generation, and capital appreciation.

There are many different kinds of real assets strategies, and it is important to fully understand them all as well as the purpose they can serve within a portfolio. Investors must also determine how they want to access real assets. Public markets are more liquid but tend to exhibit return behavior and volatility that resembles public stocks, while private markets are illiquid but direct and thus offer “purer” benefits. Investors should consider all of these factors as well as the overall goals of their real assets program when constructing a real assets allocation.

Appendix

Meketa's inflation scenario analysis

- Meketa's Inflation Scenario Analysis for Infrastructure is for the period April 2003 to December 2022.
- Meketa's Inflation Scenario Analysis for Natural Resources is for the period April 1989 to March 2023.
- 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 the 25th percentile of historical GDP growth and inflation is in the 75th percentile of historical inflation.
- Indices Used: Russell 3000 TR, Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite, Cambridge Natural Resources Composite.

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