MEKETA

Private Natural Resources

WHITEPAPER
MARCH 2024

CONTRIBUTORS
ADAM TOCZYLOWSKI, CFA
GERALD CHEW, CAIA
LAUREN GIORDANO
LUKE RIELA, CFA
FRANK BENHAM, CFA, CAIA

Key takeaways

- Natural resources are real assets that are valued for their physical qualities and are essential for various industries and sectors. They include energy, mining, agriculture/timberland, and sustainability.
- Natural resources have produced equity-like returns over the long term, but they have also experienced cycles of high and low performance, influenced by commodity prices, exchange rates, and economic conditions.
- Natural resources can offer diversification benefits for institutional investors, given their exposure to different economic drivers. They may also provide inflation protection in certain environments.
- Natural resources have the potential for manager alpha, as returns indicate that fund and manager selection can make a significant difference in performance outcomes.
- Natural resources share implementation considerations with other private market asset classes, which investors should be aware of. These include fund structure and investment vehicles, J-curve, vintage year diversification, capital deployment, and fees.

Introduction

Natural resources fall into the category of real assets, which are generally defined as long-lived physical assets valued for their intrinsic physical qualities. They are the critical inputs for energy, food, manufacturing, and construction. Natural resources are fundamentally products of the earth that have value, either in a relatively unmodified form, such as gold or diamonds, or as a key input to manufactured goods, such as iron ore into steel and cherry wood into cabinets.

In this paper, we delve into the private natural resources asset class. We outline the various sectors of natural resources, the investable market, and the factors driving returns. Additionally, we assess the historical risk and return profile of this asset class, its benefits for portfolio diversification, and its capability to hedge against inflation.

Natural resource sectors

Natural resources as an asset class includes many different types of investable physical assets. While previously categorized as either "harvested" or "extracted," the natural resources asset class has recently evolved such that these definitions do not cover all of the new opportunities in the space. Instead, we categorize natural resources by four primary sectors: energy, mining, agriculture/timberland, and sustainability.

Energy

The energy sector includes oil and gas activities across the value chain from upstream to midstream and downstream, as well as production, equipment, and services operations.

- **Upstream:** Exploration and production ("E&P") usually involves leasing or obtaining rights to promising tracts of land, exploratory drilling, and extracting one or more forms of fossil fuel. E&P tends to have high exposure to commodity prices – specifically oil and natural gas – which can be partially offset with hedges and derivative contracts. A higher risk and return profile should be expected for earlier-stage strategies relative to later-stage strategies that are producing or near production.
- **Midstream (transport) and Downstream (refining):** Includes gathering lines for oil and gas wells, short- and long-haul pipelines, hydrocarbon processing and compression stations, storage silos, and liquefied natural gas export terminals. These investments may include greenfield development projects, improvements to brownfield facilities, or repurposing existing assets. They generally have a lower risk and return profile relative to E&P due to lower commodity price dependency. Some investments are structured with price-certain contracts (e.g., take-or-pay, volumetric commitments, offtakes) while others have indirect commodity exposure through long-term acreage dedications and joint ventures with commodity producers.

The energy sector is diverse and includes various risk and return profiles. Each sub-sector has different risk profiles including exploration exposure, commodity exposure, operational exposure, and leverage. Within the oil and natural gas segment, there are firms that specialize in exploration and production, drilling services, rig equipment manufacturing and services, transportation of material, and others that refine the products into end-user fuels. Furthermore, some companies may engage in one or more of the above activities to capture more of the value chain by becoming vertically integrated.

Mining

Mining (also known as "metals and mining") investments are found globally and are often in difficult-to-access areas. The timeline to advance a project from exploration to production includes permitting, engineering, and infrastructure and mine construction. Mining projects are subject to a number of risks including commodity price exposure, quality of mined product, geographic exposure, government regulations, resource nationalism, local infrastructure, large capital

expenditure requirements, and debt covenants for levered projects. The main two types of mining projects are surface mining and underground mining.

- **Surface mining** is a method of extracting minerals near the surface of the Earth by removing the soil and rock overlying the mineral deposit. There are different types of surface mining, such as open-pit mining, strip mining, and quarrying.
- **Underground mining** extracts minerals or ores from beneath the earth's surface. It involves digging tunnels or shafts to reach the deposits and using various techniques to break and transport the material. Underground mining can be more labor and capital intensive as it seeks to reach deeper deposits that usually have higher value products.

Mines are typically described by their primary commodity, though in reality a mine will often contain several metals with varying grades of quality. The quality is not known for certain until after completion, although test drilling can provide estimates. There are two main classifications of metals:

- **Precious Metals:** Classified as precious due to their scarcity and/or higher prices, the premium received for these metals is driven by high demand and short supply. The most well-known precious metals are gold and silver (i.e., coinage metals), as well as palladium and platinum, which are used in many electronic devices.
- **Industrial/Base Metals:** In wider supply and lower price than precious metals, the most common base metals are the industrial, non-ferrous metals copper, zinc, lead, and nickel. These metals are essential for various fields and industries. Given the lower price point of these commodities, the cost and quality of the resource becomes critical to determine the feasibility of extraction.

Due to the risk associated with exploration, permitting, and construction, mining projects may be funded through equity or other securities rather than debt. Projects typically take three to seven years (or longer) to bring to production, with typically no income generation until after the mine is completed and producing. Due to the need for equity funding early in development, small cap (i.e., "junior") mining companies tend to list on public exchanges earlier than companies in many other sectors. These small mining companies are typically centered on one project, so the public stock price will reflect concentration risk in valuations and the level of volatility. Many natural resources funds will make private placement equity or debt investments in these companies.

Agriculture and Timberland

While agriculture and timberland target different assets, they are often grouped together due to their similar nature, functionality, and characteristics.

Agriculture investments can range from greenfield conversions to brownfield income-producing properties. Greenfield projects convert a property into workable farmland or plant new long-term crops on farmland that will take several years to mature and

produce. Brownfield projects are already producing and generating income when purchased, which makes the investment more reliant on income generation rather than development value-add. The two main types of crops targeted are:

- **Row Crops** are planted in rows that can be easily grown and harvested once or twice a year. Common row crops include corn, wheat, cotton, and soybeans. Based on climate, soil quality, and current market prices, farms can determine the appropriate type of crop(s) to grow each season. Agriculture managers typically purchase the land, but may not operate or own the crops. Income could be derived by leases negotiated with land tenants (farmers) that can be fixed or variable payments. Fixed leases are the most common and provide a steady income that avoids direct commodity exposure. Variable leases offer less constant income but the potential for higher payouts based on sales.

- **Permanent Crops** refers to perennial plants (i.e., trees, bushes, vines) that are maintained but not replanted each year. Plants are expected to be harvested for several, or many, consecutive years. Examples include grapes, apples, cranberries, and walnuts. It is typical to own both the land and operate the growing of the crops. Income is typically subject to fluctuations in commodity prices. Owners bear the risk of damage to crops, which may affect the harvest and value.

There are also opportunities to invest in agribusiness operations and vertically integrated agriculture companies beyond traditional farmland and farming.

Timberland properties may be either plantations or naturally managed forests. Unlike agriculture, where managers must harvest their crops each year, timberland can choose to harvest or let the trees grow and thereby "store on the stump" in anticipation of higher future prices. Higher future prices can result from a combination of market timing and the fact that larger trees are generally worth more than smaller trees.

Tree farms are planted in spaced-out rows in tracts of land and continually replanted after harvest, while non-plantation forests are allowed to regenerate and regrow through natural processes. Hardwoods (e.g., cherry, maple, oak) are generally used in higher value "niche" markets such as furniture or flooring, while softwoods (e.g., fir, pine) are grown for commodity products such as structural lumber, plywood, and pulp.

Sustainability

Sustainability is a relatively new sector that has come into greater focus over the last decade. Net zero aspirations, climate change considerations, and greater awareness among consumers, companies, and governments have been driving growth and investment in this sector. The investable opportunity set includes the products, services, and processes that focus on de-carbonization, energy efficiency,

emissions, and low-carbon and alternative fuels. Examples of subsector investments include water and wastewater for oil/gas and agriculture, industrial and petrochemical de-carbonization, lower carbon energy delivery and management, emissions reduction, green fuels, electric vehicle technology, chemical and materials recycling, and environmental services. Because the sustainability sector includes such a wide variety of possible investments, risk and return profiles vary depending on the underlying assets targeted.

Investable universe

Private natural resource fundraising has been somewhat cyclical over the past 20 years. However, aggregate capital raised has been generally declining since its peak in 2015. The number of funds in the market each year has likewise decreased from its peak. These recent declines in 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.

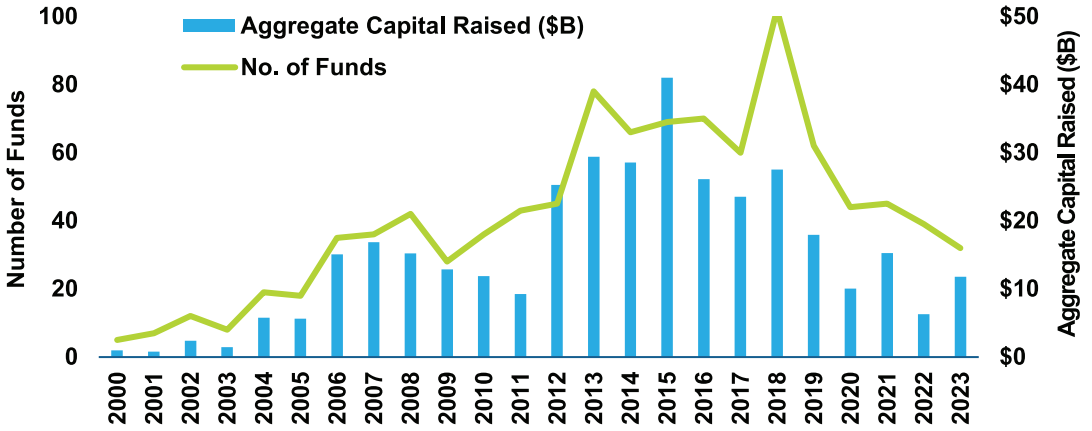

FIGURE 1
Global Historical Fundraising

Source: Preqin, as of December 31, 2023. Data is for private market fundraising.

Natural resources represent the smallest segment of the major private markets' asset classes.[1] Over the last ten years, natural resources account for approximately 3.1% of the private markets' universe on average, as measured by total assets under management ("AUM").

[1] Private markets asset classes include private equity, real estate, infrastructure, private debt, and natural resources.

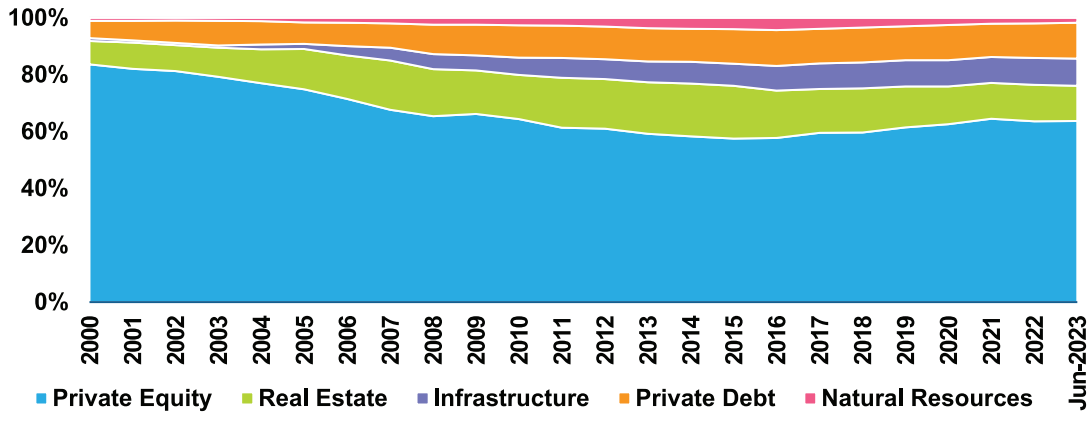

FIGURE 2
Global Assets Under Management by Private Markets Asset Class

Source: Preqin, data as of June 2023. Natural Resources includes Natural Resources and Timberland fund types only to avoid double counting. To avoid double counting of available capital and unrealized value, fund of funds and secondaries are excluded.

AUM breakdown by sector

The energy sector historically dominated the natural resources universe, comprising roughly two thirds of global aggregate capital raised over the past ten years.[2] However, reviewing the fundraising of the past few years, this may be changing.

[2] Source: Preqin, as of December 31, 2023.

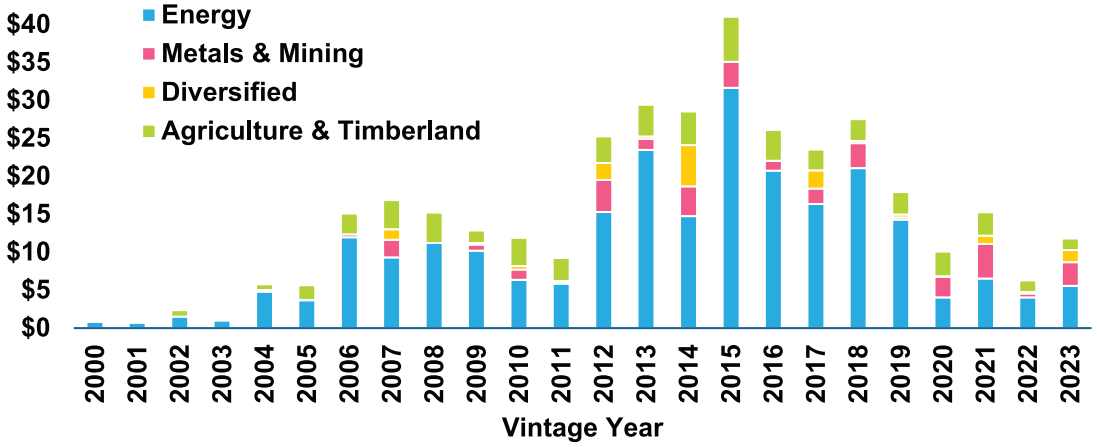

FIGURE 3
Global Aggregate Capital Raised by Sector ($B)

Source: Preqin, as of December 31, 2023. The Diversified category is a general classification that could be a blend of any of the following natural resources sectors: agriculture/farmland, energy, metals & mining, timberland and water. The Agriculture & Timberland category includes Water.

Returns by sector

While these various sectors are all grouped under the umbrella of natural resources, they each exhibit very different risk and return characteristics. For example, timberland has historically had steadier returns and less volatility than energy over the long term. Figure 4 shows the rolling three-year returns of several natural resource sectors.

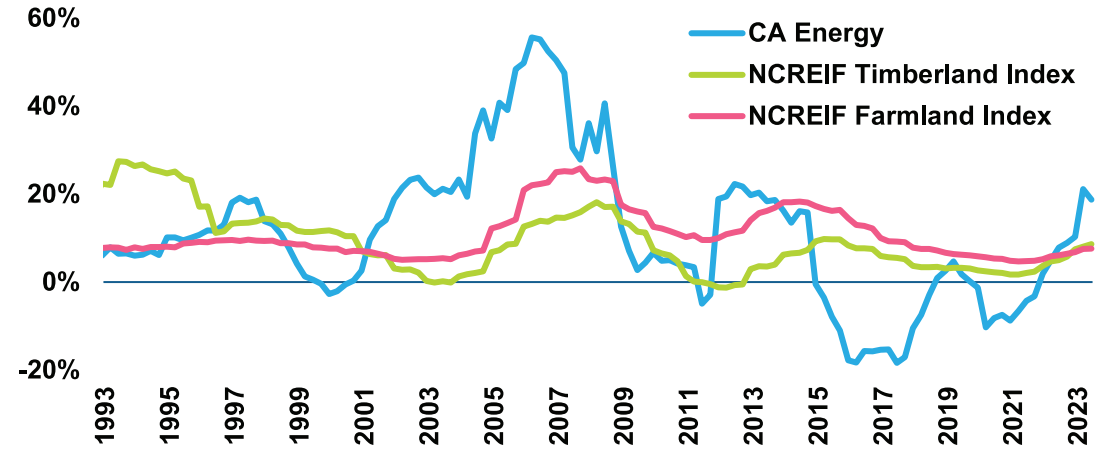

FIGURE 4
Rolling 3-Year Annualized Return by Sector

Source: NCREIF annualized quarterly returns and Cambridge Associates via IHS Markit annualized quarterly Pooled IRR, as of June 2023 (pulled in January 2024). Indices: Cambridge Upstream Energy & Royalties Composite, NCREIF Farmland Index, NCREIF Timberland Index.

Historical performance

Performance data for private natural resources is less robust than that for private equity and real estate. While there are fewer funds in natural resources, the data does go back to the early 1990s, thus providing an extended history.[3]

[3] Throughout this paper, Cambridge Associates' Global Natural Resources Composite is used to represent private natural resource returns. Cambridge Associates' Global Natural Resource Composite was chosen because it has very similar returns to Cambridge Associates' US Natural Resources Composite and provides a higher average fund count.

Returns

Over the long term, natural resources have produced attractive returns. Since 1990, natural resources' 11.2% annualized return was higher than public US equity's 10.1% and lower than private equity's 15.0%.[4,5] However, natural resources' long-term returns are largely amplified by their performance from 2004 to 2008 (see Figure 5). This period was a boom for the commodities market, driven by high economic growth, particularly for developing markets, and an expansionary macroeconomic environment.[6]

Looking at the past ten years, natural resources have not performed nearly as well. Since 2013, natural resources had an annualized return of 3.2%, well below private equity's 15.2% and public US equity's 12.3%.[7] One of the contributing reasons for natural resources' underperformance during this period was, again, the commodities market. Oil prices dropped rapidly in 2015 and remained low, relative to prior decade prices.[8] 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 rise in natural resources' returns over the same period.

[4] Source: Cambridge Associates via IHS Markit, annualized quarterly Pooled IRR as of June 2023 (pulled in January 2024). Monthly returns sourced from Bloomberg as of June 2023 and converted to quarterly. Indices: Cambridge Natural Resources Composite, Cambridge Private Equity Composite, Russell 3000. For the period Q1 1990 to Q2 2023. Returns are net of fees.

[5] Note: For purposes of return comparison, throughout this document we linked quarterly IRRs of Natural Resources and Private Equity as reported by Cambridge Associates. This is because time-weighted 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.

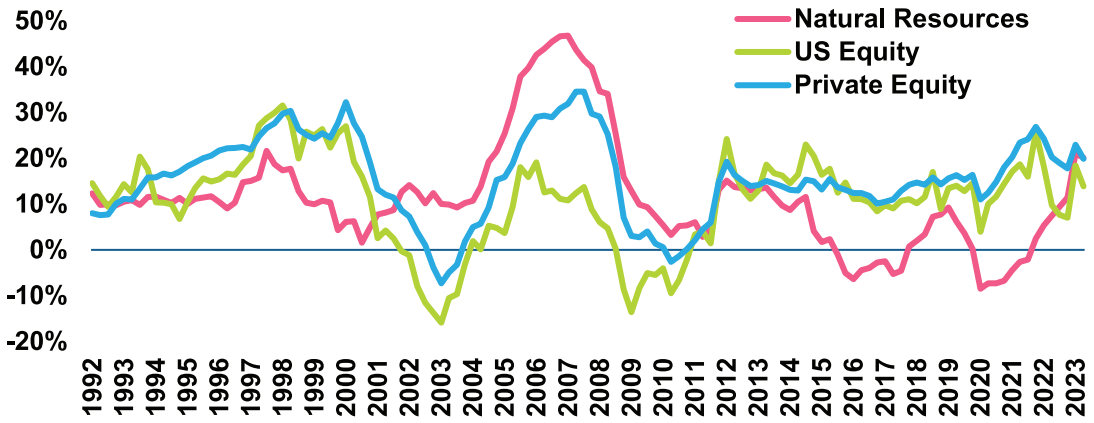

FIGURE 5
Rolling 3-Year Returns

Source: Cambridge Associates via IHS Markit, annualized quarterly Pooled IRR as of June 2023 (pulled in January 2024). Monthly returns sourced from Bloomberg as of June 2023 and converted to quarterly. Indices: Cambridge Natural Resources Composite, Cambridge Private Equity Composite, Russell 3000. Returns are net of fees.

Volatility

Natural resources have exhibited a similar level of volatility as private equity and lower volatility than US equity (see Figure 6). Since 1990, natural resources' volatility has been 11.4%, compared to US equity's 16.7% and private equity's 10.3%.[4] However, it is worth noting that the smoothed nature of private markets returns may contribute to the lower perceived volatility of natural resources (and private equity) relative to public equities.

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

[7] Source: Cambridge Associates via IHS Markit, annualized quarterly Pooled IRR as of June 2023 (pulled in January 2024). Monthly returns sourced from Bloomberg as of June 2023 and converted to quarterly. Indices: Cambridge Natural Resources Composite, Cambridge Private Equity Composite, Russell 3000. For the period Q3 2013 to Q2 2023. Returns are net of fees.

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

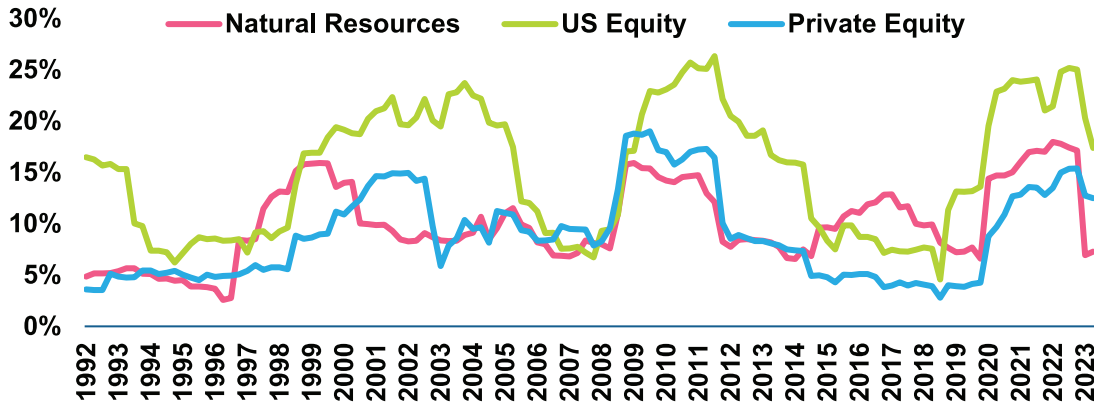

FIGURE 6
Rolling 3-Year Volatility

Source: Cambridge Associates via IHS Markit, annualized quarterly Pooled IRR as of June 2023 (pulled in January 2024). Monthly returns sourced from Bloomberg as of June 2023 and converted to quarterly. Indices: Cambridge Natural Resources Composite, Cambridge Private Equity Composite, Russell 3000.

Manager alpha

Interquartile spreads can be interpreted as how much potential value lies in selecting superior active managers within each asset class. For years 2010 to 2019, natural resources had an interquartile spread of 12.9%, substantially higher than US large cap equity, but slightly lower than private equity.[9] This implies that the natural resources asset class may have more potential to generate alpha than public equities, and slightly less than private equity.

[9] Source: Cambridge Associates via IHS Markit, annual Pooled IRR quartiles by vintage year, and eVestment data pulled in January 2024. Private asset funds raised Vintage Year 2010 to 2019. US equity data for the trailing 10 years as of December 31, 2019. Indices: Cambridge Natural Resources Composite, Cambridge Private Equity Composite, eVestment US Large Cap Equity Universe. For more information on US equity's alpha calculation, see Meketa's Manager Alpha Whitepaper. 2019 was chosen as it is the most recent vintage year with available natural resource data.

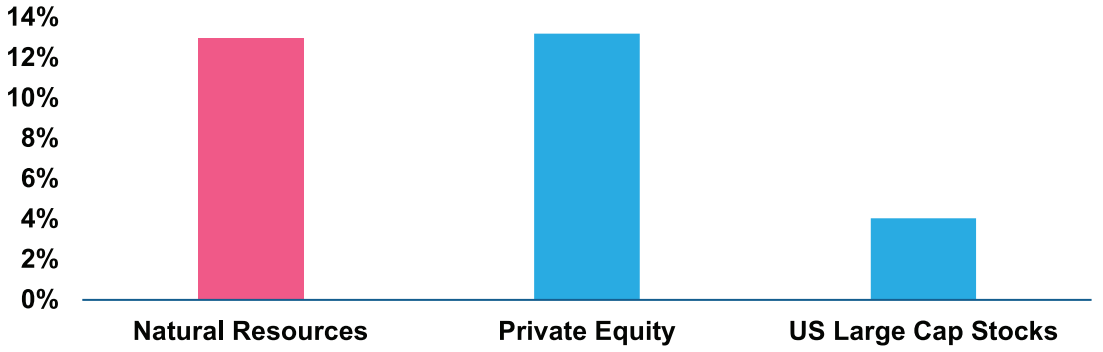

FIGURE 7
Trailing 10-Year Interquartile Spread

Source: Cambridge Associates via IHS Markit, annual Pooled IRR quartiles by vintage year, and eVestment data pulled in January 2024. Private asset funds raised Vintage Year 2010 to 2019. US equity data for the trailing 10 years as of December 31, 2019. Indices: Cambridge Natural Resources Composite, Cambridge Private Equity Composite, eVestment US Large Cap Equity Universe. Average fund count is 23 for natural resources, 104 for private equity, and 416 for US equity. For more information on US equity's alpha calculation, see Meketa's Manager Alpha Whitepaper.

What drives natural resource returns?

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. Two macro factors in particular – commodity prices and exchange rates – will impact performance and are often linked to the cyclicality of returns in the asset class.

Natural resources' underlying assets are - at their core - commodities, and thus there is a logical link between commodity prices and returns for natural resources. However, this link is not straightforward, and it may depend on the time horizon being evaluated. Correlations between both private energy and private timberland returns and their commodity prices have been positive but low over the long term.[10] However, Figure 8 below shows private energy returns moved in the same direction as oil

[10] Correlations are low for both quarterly and annual data. Correlations remain low even when private data is lagged one and two quarters and one year.

price changes in 27 of the 35 analyzed years.[11] Similarly, Figure 9 shows that private timberland returns moved in the same direction as timberland price changes in 21 of the 31 analyzed years. Additionally, both energy and timberland show elements of cyclicality in their returns and price changes.

[11] From the standpoint of a company in this industry, an increase in the price of the commodity that is being extracted/produced will increase the profitability of a company until either their cost structure (eg, labor) adjusts to this new, higher price or prices come back down.

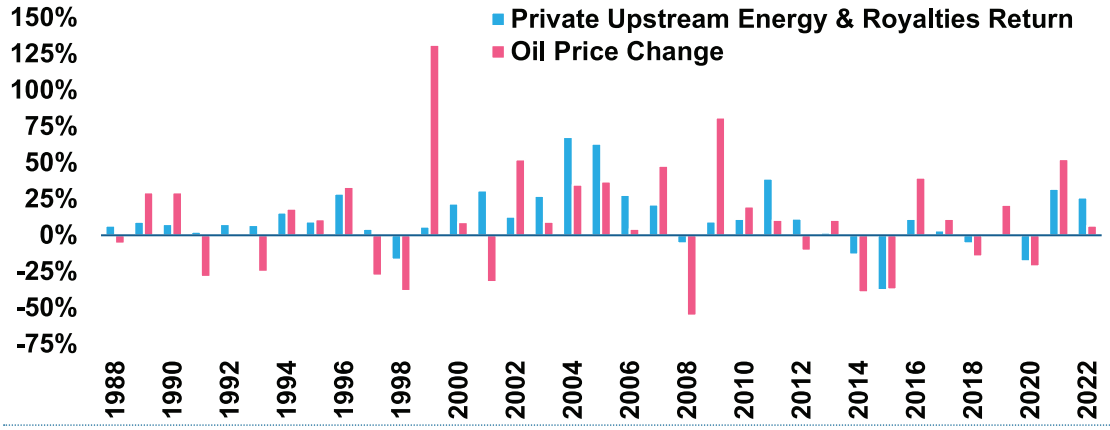

FIGURE 8
Calendar Year Private Energy Returns and Oil Price Change

Source: Cambridge Associates via IHS Markit, annual calendar year Pooled IRR as of December 2022 (pulled in October 2023). Source for oil price is FRED. Indices: Cambridge Upstream Energy & Royalties Composite, Spot Crude Oil Price: West Texas Intermediate ("WTI"), Dollars per Barrel, Not Seasonally Adjusted.

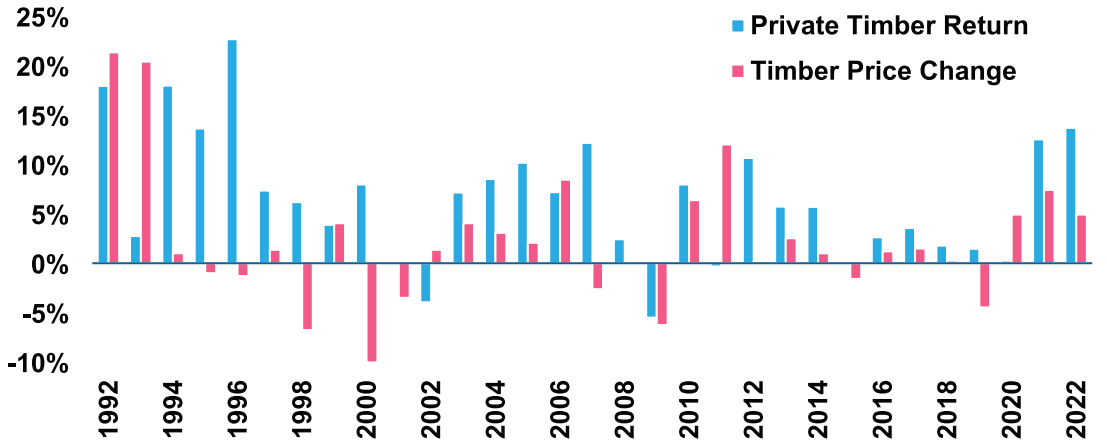

FIGURE 9
Calendar Year Private Timberland Returns and Producer Price Change

Source: Cambridge Associates via IHS Markit, annual calendar year Pooled IRR as of December 2022 (pulled in October 2023). Source for timber price is FRED. Indices: Cambridge Timber Composite, Producer Price Index by Commodity: Lumber and Wood Products: Logs, Bolts, Timber, Pulpwood and Wood Chips, Index 1982=100, Not Seasonally Adjusted.

Another factor that may impact natural resource returns is currency movements, or the relative appreciation and depreciation of the US dollar. Since most commodities are priced in US dollars, commodity imports and exports are influenced by currency swings. Hence, natural resource assets, and their returns, may also be impacted by exchange rates. That said, the correlation between private natural resources and the trade weighted dollar has been very low. This may imply that currency swings have only a small, long-term impact on private natural resource returns.

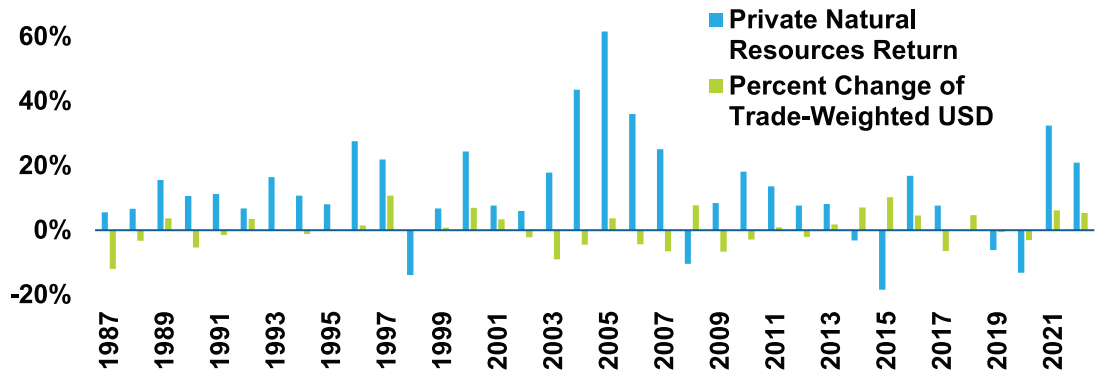

FIGURE 10
Calendar Year Private Natural Resource Returns and Trade Weighted Dollar Price Change

Source: Cambridge Associates via IHS Markit, annual calendar year Pooled IRR as of December 2022 (pulled in October 2023). Source for Trade-Weighted USD is Bloomberg. Indices: Cambridge Natural Resources Composite, Trade-Weighted USD.

Why invest in natural resources?

The private natural resources asset class may offer institutional investors several potential benefits, including equity-like returns, diversification from traditional stocks and bonds, some protection during market downturns, and an inflationary hedge.

Diversification from traditional assets

Since 1990, private natural resources has exhibited a positive correlation with public US equity and private equity of 0.34, and 0.48, respectively. Natural resources have been uncorrelated with US bonds (0.0).[12] Thus, natural resources may provide a portfolio with modest diversification benefits relative to traditional stocks and private equity.

[12] Source: Cambridge Associates via IHS Markit, annualized quarterly Pooled IRR as of June 2023 (pulled in January 2024). Monthly returns sourced from Bloomberg as of June 2023 and converted to quarterly. Indices: Cambridge Natural Resources Composite, Cambridge Private Equity Composite, Russell 3000. For the period Q1 1990 to Q2 2023.

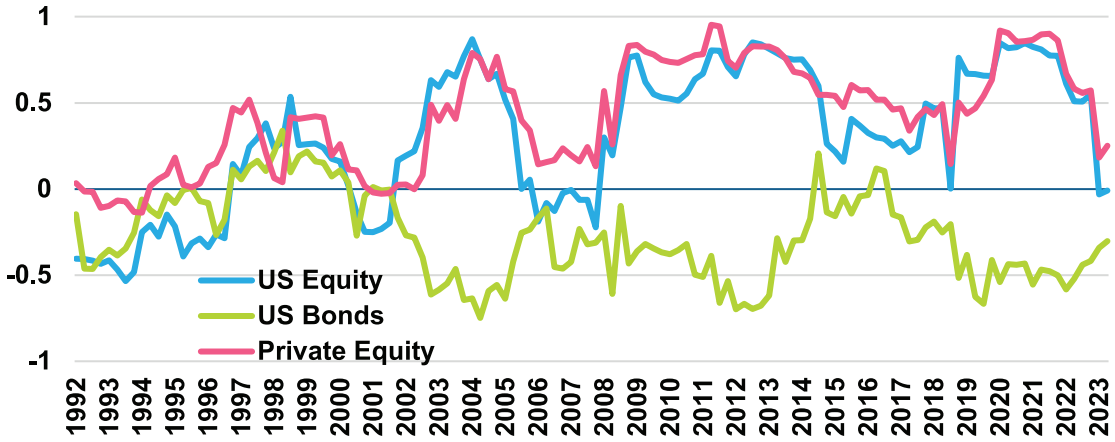

FIGURE 11
Rolling 3-Year Correlation to Natural Resources

Source: Cambridge Associates via IHS Markit, annualized quarterly Pooled IRR as of June 2023 (pulled in January 2024). Monthly returns sourced from Bloomberg as of June 2023 and converted to quarterly. Indices: Cambridge Natural Resources Composite, Cambridge Private Equity Composite, Russell 3000.

Market downturn protection

Private natural resources performed better (or less worse) than US equities in each of the historical market downturn scenarios shown in Figure 12. Note that this could be due in part to the pricing mechanism involved in private markets.

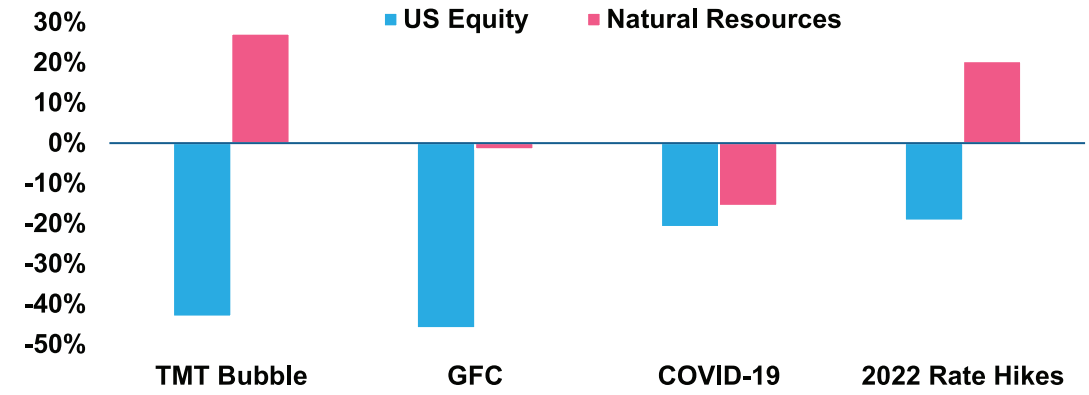

FIGURE 12
Historical Market Downturn Scenarios

Source: Meketa's Asset Allocation Tool. Returns are cumulative for the time period over which the scenario occurred. Dates for the events in order are: Apr 2000 - Sep 2002, Oct 2007 - Mar 2009, Feb 2020 - Mar 2020, Jan 2022 - Dec 2022. The historical downturn scenarios were also run with a one-quarter lag to natural resources; the results remained consistent with the non-lagged analysis.

Inflation protection

Inflation protection is another attribute that attracts investors to private natural resources. In the different kinds of high inflationary periods analyzed in Figure 13, natural resources outperformed US equities in each. Thus, private natural resources may offer inflation hedging properties when added to a traditional portfolio. Note that natural resources tend to perform best during periods that combine high growth with high inflation.

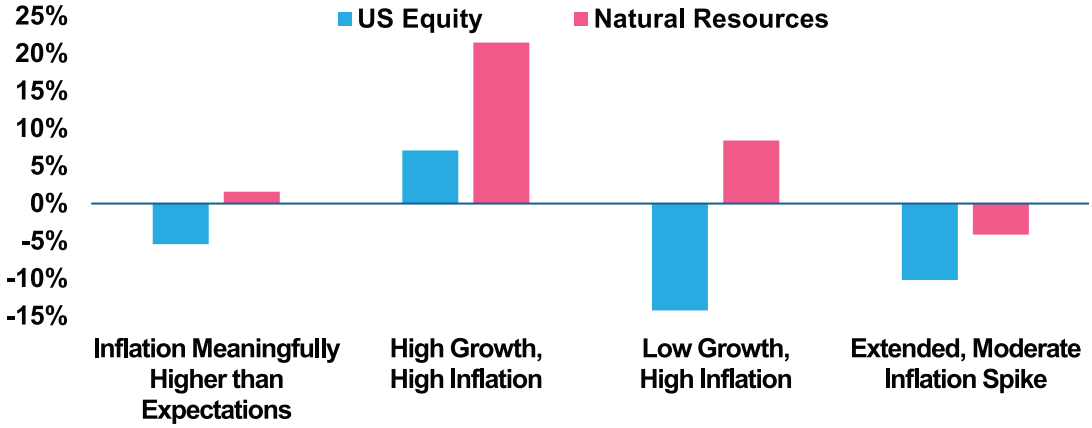

FIGURE 13
Returns during Inflationary Scenarios

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.

Implementation considerations?

There are several implementation considerations that investors should be aware of when allocating to private natural resources, including fund structure & investment vehicles, the J-curve, vintage year diversification, capital deployment, and fees.

Fund structure and investment vehicles

Most of the current universe of private natural resources funds are structured similarly to other types of private market partnerships (i.e., with a General Partner who is responsible for investing and managing the fund and multiple limited partners who provide the capital to be invested). They are closed-end private funds, generally with terms between 10 and 15 years, with the potential for several one-year extensions. They are structured with an investment period of three-to-five years and will usually invest in five to 15 assets or portfolio companies.

Separately managed accounts may be a potentially appealing investment vehicle for larger investors who wish to have a more customizable strategy, often with lower fees. Co-investments or direct joint ventures can provide selective exposure to individual opportunities, typically with low or even no fees, but can increase concentration risks if not sized appropriately relative to an investor's overall portfolio. These alternatives to commingled funds are primarily accessible to larger investors with sufficient in-house or outside resources and specialization to support the extra due diligence and legal analysis these vehicles can involve.

J-curve

A characteristic that many natural resources funds share with private equity partnerships is the J-curve. The J-curve is characterized by small negative returns early in an investment vehicle's life that should turn positive with successful investments, thus making the graph of returns J-shaped. The J-curve occurs in situations where management fees, and perhaps other expenses, are funded early in an investment's hold period and not offset by revenues, profits, and/or capital appreciation until later in the fund's life.

This curve can be mitigated by the income stream generated by many natural resources' assets shortly after their acquisition and dependent on the production profile. Hence, the J-curve is generally less pronounced for natural resources than for private equity strategies.

Vintage year diversification

Vintage year diversification is just as important for natural resources portfolios as for other asset classes. Different vintage years may experience varying economic conditions, market cycles, commodity cycles, or performance trends. There is the potential for poor vintage year timing when structuring a natural resources program, just as in other areas of private markets. Missing out on a particularly good year, or overcommitting to a particularly bad one, will harm performance.

By diversifying across vintage years, investors can often reduce the impact of poor performance in a particular year or economic environment. This helps to mitigate risk and minimize the potential negative effects of a single vintage year's underperformance. Therefore, vintage year diversification is important for a well-rounded natural resources allocation. Using pacing plans, following them, and regularly updating them, is considered a "best practice" for maintaining vintage year diversification.

Capital deployment

Closed-end natural resources funds will typically call most of an investor's commitment over a three- to five-year investment period, similar to other private market strategies. While most managers will be able to give investors periodic estimates of the pace of future capital calls, there will be some lack of predictability in the short term given the rate of deal flow, deal execution and closing, and forward activities.

Furthermore, it is not uncommon to see the pace of deployment slow during economic downturns or periods of uncertainty and accelerate during bull markets. The converse can also be true where some deal flow picks up during times of distress and slows down when prices are richer. These dynamics can create challenges for investors in managing liquidity to fund capital calls as they are received, perhaps even on short notice.

Fees

The fees and additional expenses on private natural resources funds are higher than public market options, and generally include both a management fee and a performance-based fee (a.k.a. "carry") that kicks in above a pre-specified preferred return (a.k.a. "hurdle"), as with many private market investment vehicles. The management fee typically ranges from 1.5% to 2.0% per year, and the performance-based fee often has a 6% to 8% net preferred return, which – if achieved – permits the manager to assess a carried interest of 15% to 20% of profits. Like private equity

partnerships, the management fees on private natural resources funds are on the higher side of private markets (see Figure 14). Investors making large commitments often receive lower fee rates at one or more break levels.

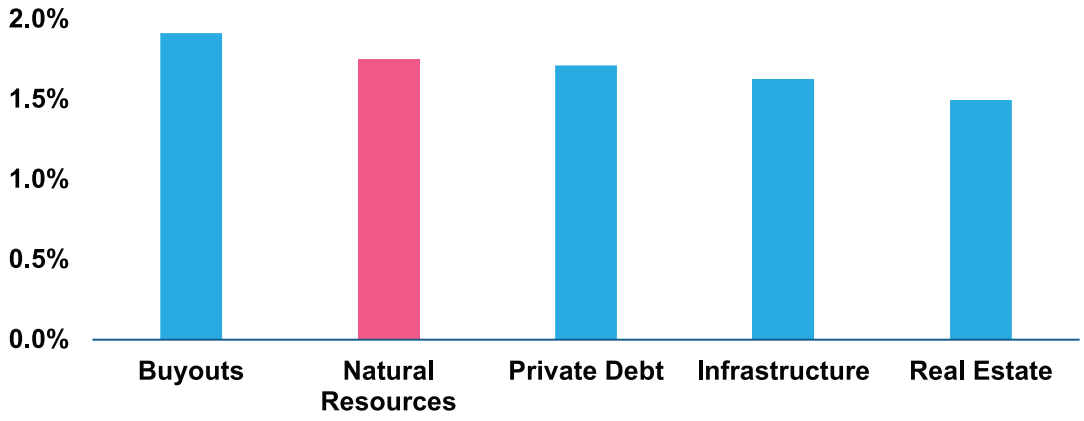

FIGURE 14
Mean Management Fee (average 2005-2023)

Source: Preqin, "2023 Private Capital Fund Terms Advisor," as of October 2023.

Summary

Natural resources are products of the earth that are valued for their intrinsic physical qualities. They provide investors with a wide range of potential investment opportunities through their primary sectors of energy, mining, agriculture/timberland, and sustainability. In each of these sectors, and even within each sector, risk and return profiles can vary from relatively stable to high degrees of variability. Thus, investors should be aware of each sector and sub-sector's unique profile and characteristics when constructing a diversified natural resources portfolio.

Over the long term, natural resources have produced equity-like levels of return. However, the sector has been prone to extended cycles of high and low performance, as natural resources' returns are influenced by commodity prices, exchange rates, and economic cycles.

Investors may find natural resources' diversification benefits appealing, particularly its potential to serve as an inflation hedge and provide market downturn protection. Additionally, natural resources may offer greater potential to generate alpha via fund and manager selection relative to public equities and some private markets. Natural resources has its own unique risks and implementation considerations, some of which are attributable to being a private markets asset class.

Natural resources offer a wide range of investment opportunities with unique characteristics and benefits for institutional investors. As always, investors should conduct careful due diligence to make sure that investments match their objectives and constraints.

Appendix

Meketa's inflation scenario analysis

- Meketa's Inflation Scenario Analysis is for the period 4/1/1989 to 3/31/2023.

- The Scenario Analysis is based on a generalized least squares ("GLS") regression 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. Meketa backdated all asset class returns whose inceptions were after 4/1/1989 with the closest available proxies.

- Inflation meaningfully higher than expected is when surprise inflation is in the 75th percentile of positive, historical surprise inflation.

- High Growth and High Inflation is when real GDP growth is the 75th percentile of historical GDP growth and inflation is in the 75th percentile of historical 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 Natural Resources Composite.

Disclaimers

This document is for general information and educational purposes only, and must not be considered investment advice or a recommendation that the reader is to engage in, or refrain from taking, a particular investment-related course of action. Any such advice or recommendation must be tailored to your situation and objectives. You should consult all available information, investment, legal, tax and accounting professionals, before making or executing any investment strategy. You must exercise your own independent judgment when making any investment decision.

All information contained in this document is provided "as is," without any representations or warranties of any kind. We disclaim all express and implied warranties including those with respect to accuracy, completeness, timeliness, or fitness for a particular purpose. We assume no responsibility for any losses, whether direct, indirect, special or consequential, which arise out of the use of this presentation.

All investments involve risk. There can be no guarantee that the strategies, tactics, and methods discussed in this document will be successful.

Data contained in this document may be obtained from a variety of sources and may be subject to change. We disclaim any and all liability for such data, including without limitation, any express or implied representations or warranties for information or errors contained in, or omissions from, the information. We shall not be liable for any loss or liability suffered by you resulting from the provision to you of such data or your use or reliance in any way thereon.

Nothing in this document should be interpreted to state or imply that past results are an indication of future performance. Investing involves substantial risk. It is highly unlikely that the past will repeat itself. Selecting an advisor, fund, or strategy based solely on past returns is a poor investment strategy. Past performance does not guarantee future results.