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By Christopher Longee
Managing Director
Real Assets
The University of Chicago

By Katrina Carder
Senior Portfolio Manager
Real Assets
The University of Chicago

By Kristin Staffeldt
Portfolio Analyst
Real Assets
The University of Chicago

Examining the Role of Biological Investments in a Natural Resources Portfolio

Natural resources allocations have long been included in diversified endowment and foundation investment portfolios. The asset class is typically intended to provide a hedge against inflation, current cash flow, and diversification benefits that contribute to an institution's expected return targets. Traditionally, natural resources have been thought of as predominantly oil and natural gas investments, and when looking at widely-used natural resources benchmarks, energy and energy-related sectors comprise upwards of 70% of the underlying entities.

The asset class contains more than just energy, though. The investable natural resources universe more broadly encompasses metals and mining, power generation, infrastructure, and other related services. While not as prevalent as energy-based investments, institutional investors frequently have some exposure to these natural resources sub-sectors as well. However, less often found in institutional portfolios are what can be considered biological investments — timber, agriculture, or environmental investments.

Commonly, natural resources are grouped into four categories:

- Energy
- Metals and Mining
- Power Generation and Infrastructure
- Biological Investments

Although these are all in the natural resources universe, each strategy has unique risk, return, and investment horizon characteristics. Evolution of the investable opportunity set and sector attributes may warrant a review of asset allocation policy within institutional natural resources portfolios, with greater consideration given to biological investments.

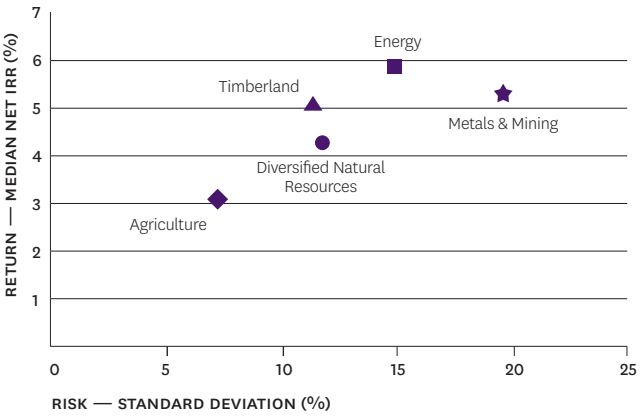
What are Biological Investments?

Biological investments can be defined as investments in assets that have an organic growth factor. This growth factor causes the majority of these resources to increase in physical volume with maturation, typically adding value to a holding. Investments in this space can be classified in three additional subcategories: timber; agriculture; and environmental. Timber and agriculture are relatively well understood, while environmental assets are slightly more esoteric and include investments that capitalize on governmental regulations and legal rights surrounding the natural environment.

Timber: Timberland includes both softwood and hardwood species of trees requiring anywhere from 10 to 15 years for softwoods and 30 to 80 years for hardwoods to reach commercial maturity. Hardwoods are grown in naturally-regenerating forests while softwoods are most frequently grown on managed plantations. Timber managers create value by optimizing planting, growth, and harvesting techniques along with marketing and selling the timber. Additional value creation is possible through land sales for the highest and best use. Institutional investment in timberland increased significantly beginning in the 1990s when forest product companies began divesting from timber holdings in order to deploy capital to higher-yielding projects. Debt is commonly available to managers but tends to be utilized at conservative levels (under 40%) if at all. While returns for timber can vary from year to year, income is largely expected to generate half of returns and capital appreciation of the timberland properties the remaining half.

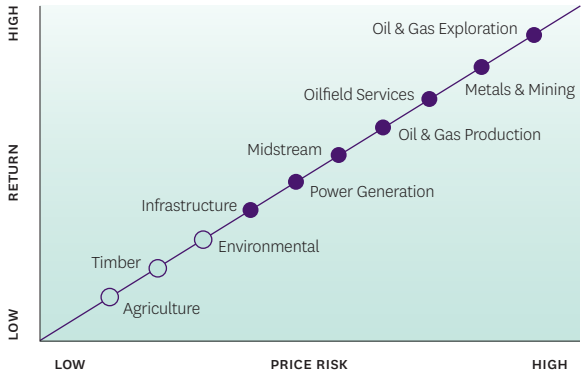
Agriculture: Agriculture is grouped by farming operation and can include seasonally replanted row crops (e.g., corn, soybean, cotton, wheat), permanent crops (such as pitted fruits or nuts), livestock, and farming infrastructure. Clearly the essential need of nourishment for all living beings creates an inelastic demand curve and sustains the strategy. Supporting growth in the sector are expectations for world population expansion along with rising

FIG. 1 Natural Resources Risk/Return by Strategy



Source: Preqin; 2003-2013 vintage funds as of September 30, 2015.

FIG. 2 Natural Resources Risk/Return Spectrum



Note: For Illustrative purposes only and not to scale

The availability of high quality managers in the space is limited, though it has improved greatly in recent years.

incomes in developing countries, historically proven to drive increased meat consumption. Given the finite supply of arable land, innovation will be required to increase efficiency and productivity, creating potential investment opportunity in agricultural infrastructure. Similar to timber, financing is available to managers although if used is most frequently under 40% LTV. Return contributors are a combination of operating income from the sale of crops or output as well as capital appreciation of land over time.

Environmental: Beginning in the 1970s and continuing today, a growing number of federal, state, and local environmental laws require that unavoidable ecological impacts be offset by restoring comparable land that has been previously degraded or threatened by degradation, resulting in "No Net Loss" of protected natural resources. The most well-known of these regulations, The Clean Water Act and The Endangered Species Act, promoted the creation of investable Land-Based Environmental Offset credits, which resulted in mitigation banks as the preferred solution for offsetting impacts. The most established offset markets include wetland, stream, and endangered species mitigation banking. Investable water rights and carbon credits are also environmental investments. Due to the earlier stage of market development, environmental strategies are typically unlevered. Returns are generated predominantly from the sale of offset credits with some residual value earned by selling the mitigation bank acreage.

Benefits of Biological Investments

Biological investments share the same positive attributes that other natural resources strategies have, including providing current cash flow and protection from inflation. Beyond the advantages classically sought from natural resources investments, there are several additional constructive characteristics of biological investments, including lower depletion than, lower price risk than, and lower correlation to many other asset classes.

One key benefit of biological investments is that they are only marginally tied to the capital markets. Biological development occurs independent of market and economic cycles in that regardless of near-term market fluctuations, trees, vegetation, wildlife, and harvests will continue to mature. While some agricultural crops are seasonal and must be harvested at specific times, the vast majority of biological investments gain in value with development over longer hold periods such that harvesting can be timed to avoid unfavorable pricing. The lack of resource exhaustion and, more accurately, increasing resource value combined with the ability to choose the pricing environment in which income is generated creates a differentiated, less cyclical income stream. This contrasts starkly with the inherent depleting and strongly pro-cyclical traits of other natural resources sub-sectors, namely energy, power generation, and metals and mining. Of course, over long time horizons some level of economic growth is required for biological investments to produce positive returns, so a certain degree of correlation to global markets as a whole does exist. However, performance from biological investments provides stability to natural resources portfolio returns that routinely are dominated by strategies quite susceptible to capital market oscillation.

As with all investments, there is a risk versus return spectrum in natural resources strategies. Figure 1 shows the risk/return tradeoff for a representative set of natural resources strategies. The data clearly indicates that biological investments experience less price sensitivity than other sub-sectors within the universe. In addition to reasons already cited, the lower standard deviations result from fundamental demand for harvested biological produce. Human need for nourishment and shelter underpins agriculture, livestock, water, and ecosystems to create a floor in price and fairly well understood supply and demand relationships.

With Figure 2, natural resources strategies are broken down even further in a simplified illustration of the relative expected return and risk. The interplay of return and risk is unmistakably more nuanced and somewhat difficult to quantify given a limited data set in many subsectors due to nascent investable structures and markets as well as long fund lifecycles. Nevertheless, the continuum of variation in risk and targeted return across sub-strategies is intended to be captured. For the purpose of this discussion, risk can be thought of as standard deviation, although theoretically the likelihood of permanent loss of capital is also represented. Conceptually, the chart aids in understanding the counterbalancing effects adding biological investments has to a typical natural resources portfolio that is heavily weighted to strategies in the top right corner.

FIG. 3 Correlation Matrix

	Agriculture	Timber	Energy	Midstream	Metals & Mining	Power Generation	Global Equities
Agriculture	1.00						
Timber	0.64	1.00					
Energy	0.19	0.08	1.00				
Midstream	-0.11	-0.22	0.51	1.00			
Metals & Mining	0.04	-0.10	0.48	0.45	1.00		
Power Generation	0.10	0.10	0.28	0.38	0.25	1.00	
Global Equities	0.16	0.06	0.36	0.36	0.58	0.33	1.00

Based on quarterly returns from 3/31/1996-3/31/2016; Agriculture, Timber and Energy data are private fund indices, respectively: NCREIF Farmland, NCREIF Timberland, Cambridge Upstream Royalties and Private Equity Energy; remaining asset classes are public indices, respectively: Alerian MLP, HSBC Global Mining, S&P 500 Electric Utilities, MSCI ACWI.

Correlation between natural resources sub-asset classes and the broader equity market are presented in Figure 3. As shown in the matrix, natural resources strategies have been weakly correlated to global equities. Correlation strength within the sub-sectors varies with the more traditional strategies demonstrating higher correlations to equities and amongst each other. When looking at agriculture and timber, the low correlation coefficients are quite pronounced. Due to the more recent development of environmental investments there is no investable proxy, preventing separate inclusion in the analysis. For this purpose, timber is the best representation given the land-based fundamentals of environmental investments. Because of their weak relationship to equities and to other natural resources investments, biological investments provide strong diversification benefits to a portfolio. Inclusion of biological investments in a portfolio should be expected to mute downside risk and lower overall volatility of returns.

Biological investments may also present an option for institutional investors to embrace environmental, social and corporate governance (ESG) investing, although not all biological investments will necessarily meet the standards. Timber and agriculture managers frequently employ sustainable production principles while environmental managers actively restore habitats and reverse damaging ecological impacts. Alternative natural resources strategies, such as biological investments, that address environmental concerns while still meeting expected returns can be a welcome prospect for many institutions.

Considerations and Questions

Despite the numerous benefits of biological investments, some challenges and issues remain when contemplating an allocation to this sub-sector.

While it is a positive that biological investments are relatively lower in risk that also means they tend to be lower in return than other natural resources investments. As shown earlier in Figure 1, returns from all natural resources have been muted in the last decade while volatility has remained high in the non-biological sectors. Ramifications from the Global Financial Crisis and recent commodity price declines certainly have played a role. The compressed spread between nominal and real returns driven by the lack of inflation over this specific timeframe is also a factor. While on an individual basis biological strategies might not seem appealing, in the broader context of a portfolio, a lower returning and less volatile fund can be quite helpful. Even if oil and gas and/or metals and mining funds meet their targeted returns at the end of a ten-year fund life, those funds may also produce interim years of sharply negative returns. The dampening effect of stable, largely uncorrelated returns from biological investments should be quite appreciated in those years.

Although farming and forestry have been around for centuries, institutional asset management of biological investments is a relatively new endeavor. The availability of high quality managers in the space is limited, though it has improved greatly in recent years. Timber was the first of the biological investments to become institutionalized such that there are quite a few established timberland investment management firms. More recently, there has been an increase in the number of managers providing access to agriculture and environmental investments. However, even with the growth in number of managers, the total capital invested in the sub-sector is still small. According to Preqin data, over the last 10 years (2006-2015), for every dollar raised institutionally for timber funds, there was $1.25 raised for agricultural funds and over $19 raised for energy funds. Not surprisingly, given the low level of institutional allocation to biological investments, the weighting is equally low in most commonly used natural resources benchmarks. Thus, investing in the sector requires taking benchmark risk. The impact of an out-of-benchmark holding will vary based on each institution's asset allocation policy and will likely influence desirability for and weighting to biological strategies. Degree of illiquidity is an additional feature that needs assessing. Due to lengthy organic growth lifecycles of biological assets, investing in the sector tends to require longer hold periods. Fund life needs to be sufficient for the manager to fully implement their stated business plan, which can often be longer than the conventional ten-year private fund. Separately managed accounts and private funds allow for reduced asset/liability mismatch and are likely better vehicles for long-term institutional investors to gain exposure to the strategies. Partially offsetting the heightened illiquidity is the income generation potential that biological assets provide. Given the greater level of illiquidity, biological investments should be appropriately sized in an institution's portfolio.

A variation of the illiquidity discussion is, "Can access to biological investments be gained via public markets rather than private markets?" Unfortunately, there are fairly limited marketable options to get pure exposure to timber, agriculture, and environmental assets. Though timber REITs and agriculture-related equities (e.g., fertilizer and seed companies) provide access to some biological investments, these listed entities tend to be diversified businesses producing only partial access to the desired resources. Similarly, environmental public equities are most readily available in the water sector, where the securities are often only tangentially related to water rights, instead often having utility business models. Water stocks then are grouped in with power and electric utilities creating unwanted cross-correlations. Private market vehicles allow investors to specifically access biological assets, more closely corresponding to the ideal hold period and providing superior flexibility for value-additive active management.

A final point to be weighed is the effect of current valuations on an investor. The post-Global Financial Crisis low interest rate regime globally has led to concerns of asset inflation in nearly every asset class. Have biological investments been immune to, less susceptible to, or equally impacted by this phenomenon? One could argue that timber experienced a period of overvaluation in the early 2000s when institutional ownership became widespread, although values have since come back to more reasonable levels. Likewise, when sentiment regarding Emerging Market growth and the rising middle class share of global population themes were at a peak in the mid-2000s, agriculture valuations appeared high but diminished expectations of growth in recent years has led to flat pricing for farmland and stable to lower crop values. Environmental investing and offset credit markets are at an embryonic stage, making relative and absolute valuation judgements difficult. Likely the most prudent approach is to stage into new biological investments over a number of years in order to mitigate vintage year and valuation risks.

Conclusion

A fundamental tenet of portfolio management is to continually reassess the available opportunities and appropriate allocations both to and within each asset class. The natural resources asset class has long been thought of as nearly synonymous with energy, possibly with a smattering of the other more traditional strategies. Similarly, biological investments, if included at all, have been largely synonymous with timber. The evolution of strategies and markets, breadth and depth of available managers, and greater appreciation for lower correlation investments should lead institutional investors to assess increasing commitments to biological investments and broadening to strategies beyond timber.