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Timberland

WHITEPAPER
AUGUST 2020

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In this paper, we provide an overview of timberland investments. Timberland is often categorized as a sector within a natural resources allocation, and it is generally a lower risk, lower returning strategy with the potential to generate stable income and provide uncorrelated performance relative to other asset classes. Harvesting trees remains the primary driver of the income, while tree growth and land values drive appreciation potential. Unique to the asset class is the ability or optionality to defer harvest activities during low price environments and the ability to generate income from alternative sources, such as recreational activities, hunting fees, or conservation easements. An institutional investor has the ability to diversify timberland by forest type, species, geography, and income source. However, investors need to consider the political, regulatory, currency, liquidity, and physical risks to help determine whether the risk and return profile aligns with their portfolio objectives when considering an allocation to timberland.

Investment universe

In the early 2000s, timberland began maturing as an institutional asset class, with an increase in the number of managers and aggregate capital raised as shown in Exhibit 1. According to Preqin, the industry raised a record $3.7 billion, excluding the amounts of undisclosed capital raised for separate accounts, across 10 fund managers in 2008, as institutional investors coveted the reliable income and steady appreciation that the asset class offered at the time.

Following the Global Financial Crisis and the US housing crash, fundraising meaningfully slowed. Income decreased as timber managers elected to delay harvesting and "store on the stump," given low demand from new housing construction and remodeling activities. As a result, timberland investments represent a relatively small percentage of the natural resources opportunity set, accounting for just 2% of aggregate capital raised across natural resources in the from 2015 to 2019[1]. The number of managers has also narrowed with an average of seven funds raised per year.

[1] From 2015 to 2019, $6.4 billion was raised for closed-end timberland funds.

Another contributor to the decreasing number of funds has been increased offerings of evergreen and open-end vehicles to extend portfolio terms and avoid forced selling of timberland properties. The evergreen model has provided some stability to timberland managers, but has changed the investable universe for institutional investors. Hence, timberland remains a meaningful investment opportunity.

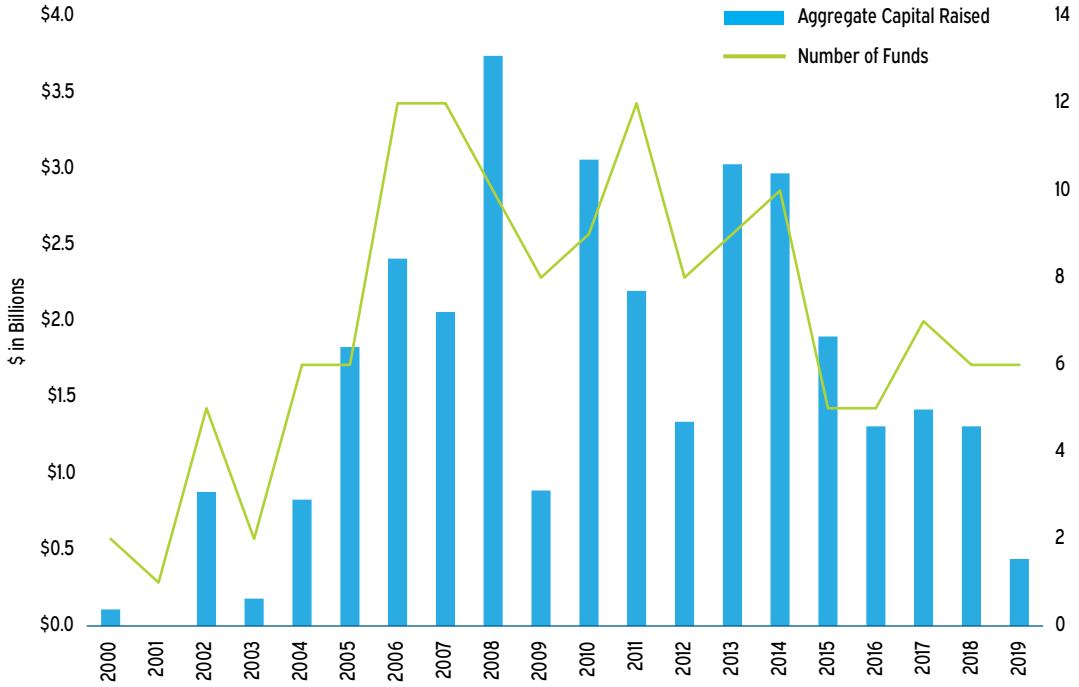

EXHIBIT 1

Timber Close End Fund Capital Raised per Year[2]

[2] Source: Preqin, Represents closed-end funds raised for each vintage year

Timberland as an investment

As in other asset classes, diversified timberland portfolios are key to reducing risk and generating stable returns. It is important to recognize that timberland can be differentiated by forest type, tree species, age and size, geography, and proximity to customers and transportation infrastructure (e.g., saw mills, roads, and ports). If one forest suffers a devastating disease, or one species falls out of favor with furniture makers, the impact on the broader timberland portfolio can be mitigated.

Timberland properties can be classified under two types of forest: plantations and managed sustainable forests. Plantations are artificially created, often on bare or repurposed ground, and intensively managed with rows of densely planted trees to create a forest intended to be harvested once the trees have reached the desired size and then replanted in a similar manner. Managed sustainable forests are naturally growing forests that may have multiple uses; managers often seek to harvest a small portion each year to allow other trees within the forest to continue to grow and new trees to sprout.

Silvicultural techniques are essential to successfully manage a plantation forest throughout the life cycle of a tree. The science of site preparation, seed planting, thinning and pruning, and prescribed burning helps ensure optimal growth and other characteristics to maximize value. Active silviculture management has the potential to lessen both economically-driven and physical risks. For example, removing unhealthy trees or the less desirable species from a tract encourages the growth of healthier and more favorable and valuable trees. Tree plantation managers often section forest tracts into different age classes and will actively harvest a section while allowing the rest of the plantation to mature.

Other differentiations of timberland investments are the type of tree (e.g., hardwood, softwood), country (e.g., domestic, international), and region or sub-region (e.g., West, Northeast). These categories are not usually independent because species are often land- and region-dependent. For example, the US Pacific Northwest is populated by forests of Douglas fir, hemlock, cedar, and alder trees, while the US South is more suited to loblolly pine species. Typical dominant species harvested by select regions include:

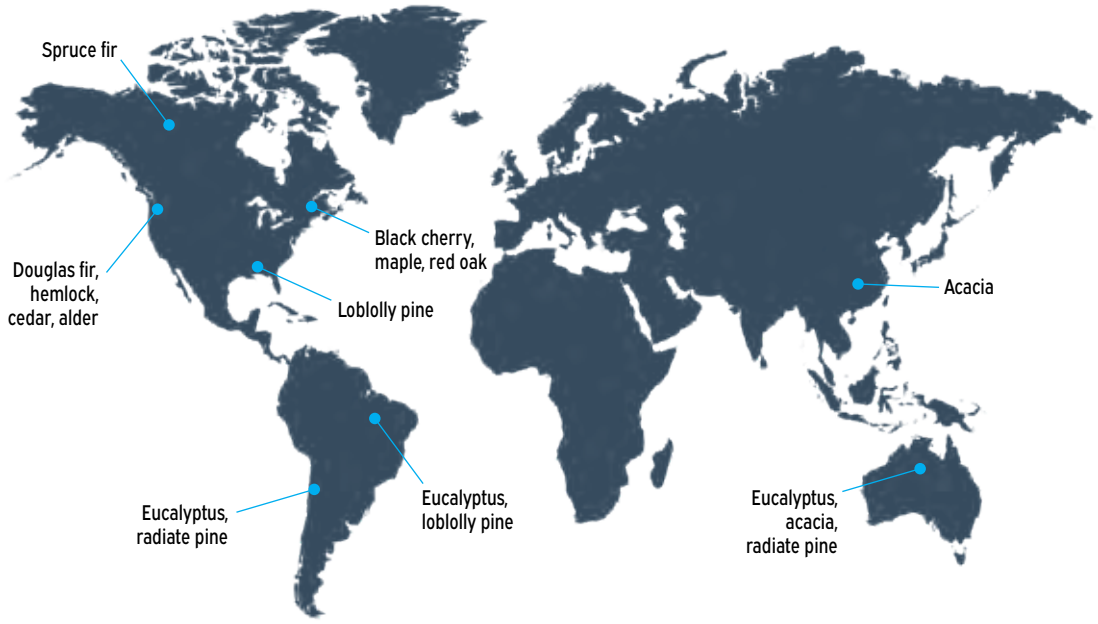

EXHIBIT 2
Dominant Species by Regions

Each timber category has distinct product markets and risks that call for specifically-tailored investment strategies. Hardwoods are generally directed toward higher value "niche" markets such as furniture or flooring, while softwoods are grown for commodity products such as structural lumber, plywood, and pulp. Plantation forest owners often focus on genetically selected pines or eucalyptus trees due to their fast-growing characteristics and inexpensive costs to harvest. Prices vary by species and product, so managers must consider the risk and reward of allowing trees to grow into a more valuable product versus harvesting at an earlier age and replanting. Exhibit 3 displays the variation in historical timber prices within the US South market.

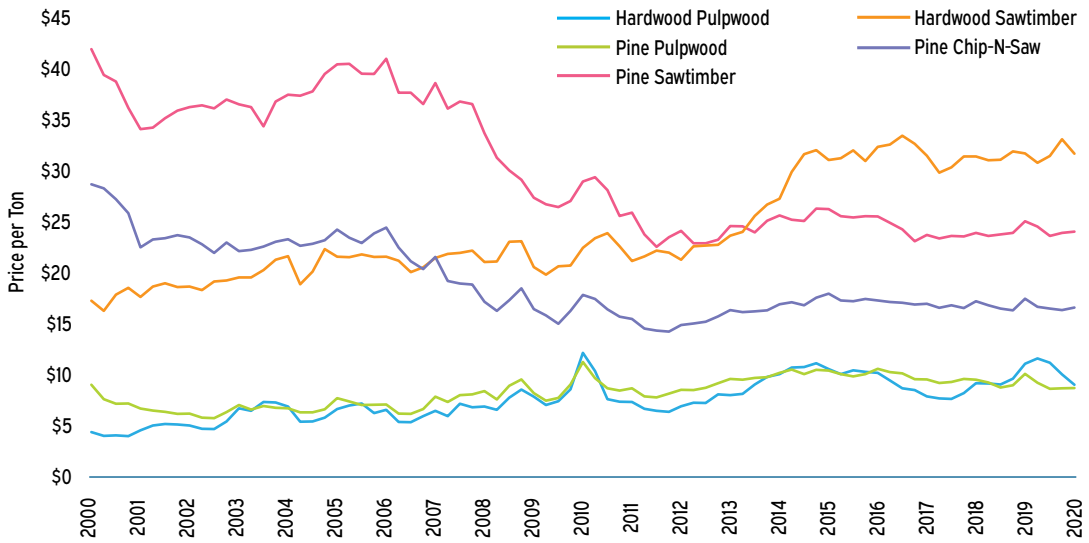

EXHIBIT 3
US Timber Prices[3]

[3] Source: Bloomberg

Lumber can have several different uses that are sold into different markets. Pulpwood are small to medium trees chipped into small fibers primarily for conversion into paper products. Chip-n-saw are medium size trees used to create pulpwood chips or small lumber and plywood with prices typically between sawtimber and pulpwood. The highest price timber product is sawtimber, which is often cut into lumber or veneers, or used as wood-based posts for electrical or telecommunication wires. As seen in Exhibit 3, prices for pulpwood have been consistently lower than chip-n-saw or sawtimber and have been agnostic as to whether sourced from hardwood or softwood. In the early 2000s, pine sawtimber prices were almost double the price of hardwood sawtimber; however, hardwoods now receive a premium over softwoods.

Return drivers

Timberland returns stem from four distinct sources: biological growth; timber prices; land values; and management strategy. Timber managers have control over biological growth and management strategies, but are also subject to market conditions for timber prices and appraisal values.

Timberland as an asset class is unique in that it experiences biological growth ranging from 2% to 8% per annum. That is, the volume of the timber on a parcel of land grows as the trees grow. Generally, the larger a tree's volume, the more valuable it becomes. Even more importantly, this volume growth can be stored "on the stump" for long periods, which provides timberland owners with the option to wait for better prices in an unfavorable market environment. Biological growth is the main driver of value for timberland investments.

Timber pricing is the most volatile return component, and is influenced by such specific factors as the economic cycle, rainfall patterns, interest rates, currency exchange rates, consumer demand, the environmental/political climate, and various other factors. More broadly speaking, prices are influenced by the twin factors of supply and demand. Demand for timber is a direct function of global economic activity, which is generally expected to increase with world population growth and a global increase in per capita income. In particular, the growing wealth of emerging nations is translating into increased demand for wood-dependent products such as housing, furniture, containerboard, and boxes for shipping. Furthermore, despite secular changes in demand, arising from such factors as increases in paper recycling rates (now close to 50%) and e-commerce activity, demand for paper and pulpwood continues to grow.

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At the same time that demand for timber products is expected to increase, the supply of timberland is expected to stagnate. In some areas of the US, the amount of forestland being lost to suburban sprawl has significantly exceeded the amount of agricultural land reclaimed for forestry uses. Nevertheless, the global harvestable amount of timber has remained fairly constant over the last 50 years, due primarily to new plantations outside the US and improvements in silviculture techniques.

Similar to timber prices, land values are related to local supply and demand dynamics and can vary by market. However, land prices have been consistent and serve as a buffer to volatility. As seen in Exhibit 4 over the 13 years analyzed, the price per acre on US transacted timber properties has averaged just under $1,500 per acre with two outliers occurring in 2011 and 2013. In 2011, the average transaction price of $761 per acre across 31 transactions was driven by a single large transaction comprising 47% of transacted acres at a relatively low price of $287 per acre. In 2013, the average transaction of approximately $2,500 per acre was driven by one transaction that accounted for one third of the total acres sold that year at over $4,000 per acre in the Pacific Northwest. Excluding this outlying transaction, the other 28 transactions in 2013 averaged $1,650 per acre. Land values themselves typically have the least

impact on timberland returns—with some exceptions. In some cases, land can be managed to acquire "higher and better use" (HBU) advantages, in the sense that the timberland may be made more valuable in some other market segment—primarily involving residential or commercial real estate development. In these cases, land values will contribute more to total returns than is typical.

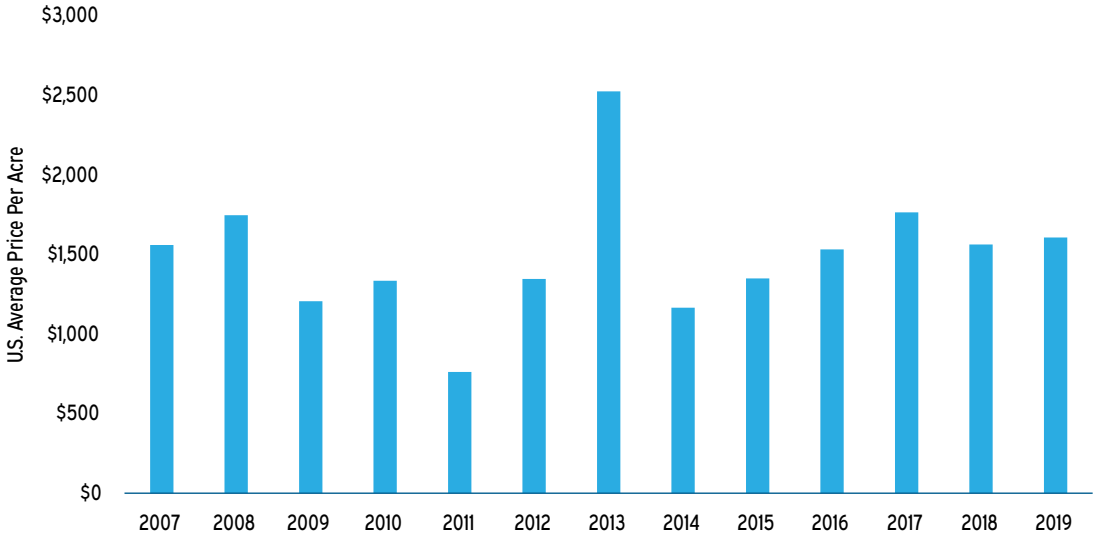

EXHIBIT 4
US Timber Transactions Average Price per Acre[4]

[4] Source: RISI

Management strategy accounts for a small but important differentiator of timberland returns. There are many areas in which proper management can add significant value, including: a well-executed acquisition strategy; the implementation of leading-edge silvicultural techniques; proper region and age class diversification; and an effective exit strategy. Additionally, a skillful operator will add value through managing the sale of its timber by assessing the market and exercising its right to store the trees on the stump during depressed market conditions.

Sources of return

The above drivers result in two primary sources of timberland returns readily observable by investors: income and appreciation. As shown in Exhibit 5, historically income returns have exhibited more stable returns ranging from 2.5% to 4.0%, annually, relative to land values. Timberland investors who favor income over appreciation potential tend to focus their investments toward mature forests that are generating income.

Investing in natural forests can create multiple avenues of revenue to provide income over the holding period. Harvesting trees is the primary source of income from natural forests, and may be conducted with an eye toward thinning the forest or converting a section to HBU. Thinning a forest consists of the removal of selected trees in order to enhance growth, health, and quality of the remaining trees.

HBU would often take the form of converting the land so that it would be attractive for a real estate developer (e.g., for residences, golf courses). By limiting the harvest, a sustainable wood supply can be developed while preserving native vegetation and wildlife habitat and encouraging natural regrowth.

After the housing market downturn in 2008, timberland managers turned to alternative revenue sources to supplement harvesting income from residential activities. In a challenging market environment, timber managers can reduce or suspend harvesting, depending on minimum harvesting contract obligations, and let the trees continue to grow. The trees will gain additional value as larger trees can be sold at a premium price. Natural forests can generate some income through recreational and hunting leases that allow clubs or organizations use of the forest. Additionally, conservation-related uses can create revenue early in the investment period or when managers delay harvesting. The supplemental income sources help in maintaining consistent revenue when operators elect to store on the stump in low commodity price environments. In years such as 2008 and 2009 when new housing starts decreased from 1.5 million to 0.5 million and remodeling activity slowed, income remained at 1.5% to 2.0% primarily from these alternative sources.

Capital appreciation/depreciation of timberland consists of the change in value of both the underlying land and inventory of trees. Timberland valuations are based on discounted future cash flows, which themselves are based on projections for biological growth, cash flows from harvest, and interest rates.

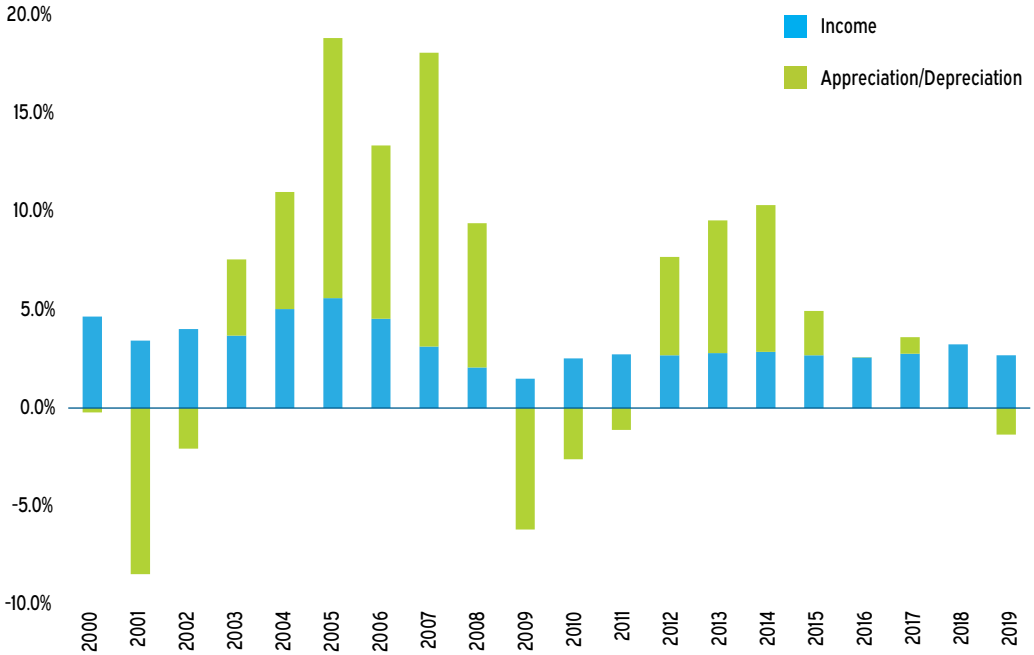

EXHIBIT 5
Timberland Return Components[5]

[5] Source: NCREIF. The NCREIF Timberland Index is a composite of non-levered quarterly performance data of U.S. institutional private market timber properties acquired for investment purposes only.

Risk/return

Exhibit 6 shows that timber investments consistently realized harvesting income at approximately 5% per year until 2007. The financial crisis and subsequent housing market downturn negatively affected timber revenue, as foresters exercised their option to suspend harvesting activities. Housing starts have since increased above one million new starts per year on a seasonally-adjusted basis. However, income rates have not experienced the same steady increase and, hence, remain below the levels of the early 2000s.

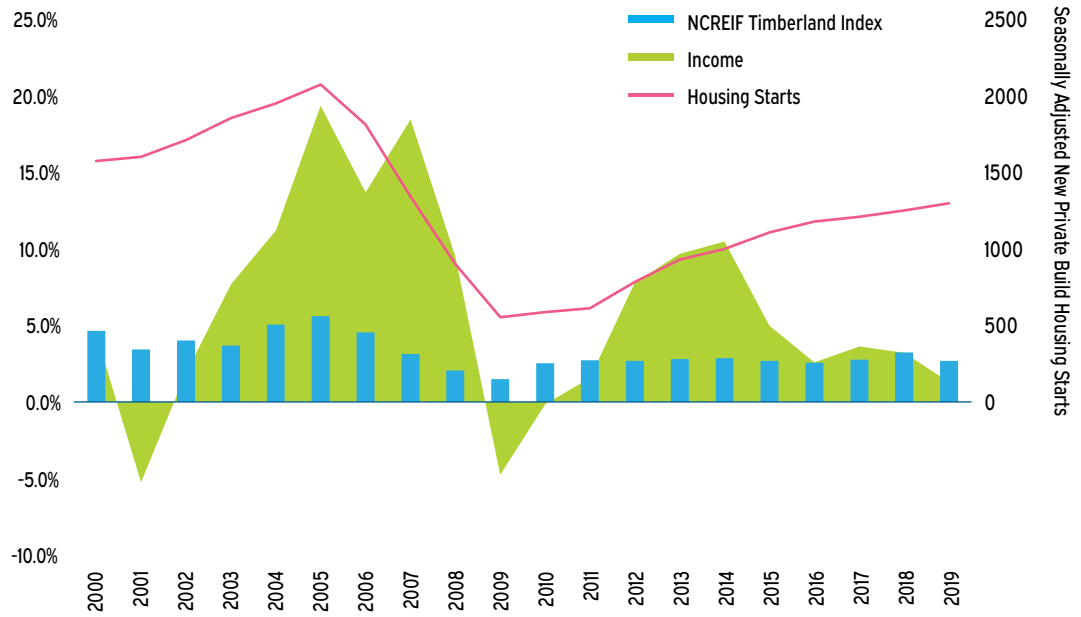

EXHIBIT 6
Timber Returns and Housing Starts[6]

[6] Source: NCREIF & FRED.

With the exception of the high rates of appreciation in the mid-to-late 2000s, timberland has exhibited returns and volatility between that of public stocks and bonds. Appraisal-based valuations are the prevailing practice—private timberland generally is not marked-to-market in real time (as are stocks, bonds, and certain more liquid private investments, for example). The annual appraisal process compares a property to similar properties that have transacted. The timberland market is relatively thin, with a limited number of transactions per year that are of institutional scale and quality to serve as comps. Consequently, timberland values will tend to only change gradually over time, hence reducing observed volatility. During bear markets, timberland has experienced declines, showing that it is not immune to economic downturns. However, it has avoided the level of negative returns experienced by other equity-oriented asset classes.

Over different timeframes, the return differential between timberland versus stocks and bonds has varied significantly, as represented in Table 1. Over the 5-, 10-, and 20-year periods ending December 31, 2019, equities produced the highest returns and highest volatility. Bonds generated the lowest returns with lower volatility than timberland over 10- and 20-year periods. When looking at the 20-year returns, NCREIF Timberland Index was just 20 basis below the S&P 500 annually. However, over the past 10 years, the return differential has been significant at 920 basis points.

TABLE 1
Comparative Historical Return, Risk, and Correlation Statistics As of December 31, 2019[7]

	NCREIF Timberland	S&P 500	Barclays U.S. Aggregate Bond Index
5 Year			
Annualized Return	3.1%	11.7%	3.0%
Standard Deviation	0.5%	5.5%	1.6%
Correlation to Timberland	—	-0.04	-0.31
10 Year			
Annualized Return	4.4%	13.6%	3.7%
Standard Deviation	1.5%	6.3%	1.5%
Correlation to Timberland	—	0.04	-0.14
20 Year			
Annualized Return	5.9%	6.1%	5.0%
Standard Deviation	2.4%	7.8%	1.7%
Correlation to Timberland	—	-0.06	0.03

[7] Source: NCREIF and Bloomberg. NCREIF property index is the non-levered gross return based on the quarterly appraisals and income of participating US timber properties acquired and held in a fiduciary environment.

We believe timberland should provide solid inflation protection in an inflationary environment of increasing timber and land prices. However, there has not been a period of high inflation, the kind that eats away at asset prices, in 40 years. Therefore, while we believe timberland can serve as an effective inflation hedge, there is no return history for the asset class during a period of truly unexpected and high inflation. In addition, given the factors cited above, statistical comparisons of timber with other classes should be undertaken with a degree of caution.

Risks

Besides the economy-driven fluctuation of timber prices and land values, there are several special risks to investing in timberland. Fortunately, timberland risks may be partially addressed by diversification and active silviculture management. The four main risks are outlined below.

Political and regulatory risk—domestically and internationally

Political and regulatory risk can take a variety of forms. In the US, environmental concerns and changing government policies mean that enacted regulations (e.g., the Clean Water Act and Endangered Species Act) can serve to restrain or prohibit a number of timberland management activities, including the harvesting of certain timberlands. Tariffs can also pose a significant risk to the import and export volume of timber. The effect of new tariffs on lumber products will be felt by the timber managers and saw mills that process the lumber. Other international risks include the threat of expropriation, weak regard for property rights, and the rule of law, particularly in emerging and frontier markets.

Liquidity risk

The marketplace for timberland is notoriously "thin," characterized by few buyers and sellers at any given time. This can lead to wide disparities among buyers' and sellers' expectations for prices, frustrating transactions. Skilled fund managers may be able to take advantage of these inefficiencies, highlighting the importance of backing the right manager. Since timber transactions may comprise several non-contiguous tracts, transactions can be complex, resulting in a lengthy process. All of these factors result in substantial illiquidity for investors. As a result, any investor expecting a timber investment to meet its expectations should assume a very long holding period, preferably extending beyond ten years.

Currency risk

Timberland is a global industry, with different regions and climates producing various dominant species. The income and land values are typically transacted in the foreign currency where the timberland is located, which will introduce currency risk. Diversifying exposure across regions can help mitigate a single currency risk. Managers can also elect to delay harvesting and wait for more favorable currency environments, or to hedge their currency exposure for select assets.

Physical risk

Timberland is subject to losses from natural and human-caused events such as fire, insect and vermin infestations, disease, inclement weather, and theft. Unsurprisingly, the degree of physical risk varies considerably by geographic region, as some areas are more prone to certain diseases, forest fires, etc. These risks can be somewhat mitigated through proper silviculture management or insurance. However, the best mitigant against physical risks is portfolio diversification.

Leverage

Leverage allows a timberland manager to purchase or develop more properties with the same amount of equity capital. The effect of this is an amplified positive or negative return on equity; that is, leverage increases volatility. Not only does leverage increase volatility during "normal" times, but in rare circumstances (i.e., a severe liquidity crisis), leverage could lead to an inability to refinance properties, ultimately leading to "fire sales" of properties.

In addition, the need to service the borrowing costs of leverage requires a minimum level of generated income. After the Global Financial Crisis and US housing bust in 2008, new construction and remodeling activity in the US plummeted, reducing the demand and prices of timber products. As a result, some debt-laden timberland assets temporarily experienced negative income, stemming from debt servicing obligations and the need to harvest trees in a sub-optimal price environment.

Implementation and strategic allocation

Institutional investors typically hire Timber Investment Management Organizations (TIMOs) to manage their timberland investments. A TIMO acts in the interest of the investor to identify, analyze, acquire, and manage timberland properties based on the client's requirements.

Investors may acquire timberland through both public and private investment vehicles, each of which exhibits different return characteristics. Public investment vehicles, including timberland REITs, are more likely to exhibit equity-like volatility and be correlated with the stock market. Private investment vehicles, on the other hand, are expected to exhibit lower observed volatility (as noted above). Furthermore, investors expect private timber vehicles to provide an additional return over similar public investments because of an illiquidity premium and higher potential alpha.

As a private investment, there is more flexibility with implementing value creation and long-term initiatives without having to address the short-term valuation impacts experienced within public investments. Public access is limited to the handful of publically-traded timberland REITs, such as Potlatch, Rayonier, and Weyerhaeuser, which are required to distribute most of the income they generate, resulting in a reliance on raising capital for growth instead of growing organically. Higher potential returns, a lower correlation to public markets, and a broader opportunity set argue strongly for employing private market vehicles for a timber allocation.

Still, fully funding a commitment to a private investment vehicles may take several years. Though closed-end private timber funds display the characteristic "J-curve," it is generally less pronounced than those that private equity investors are accustomed to, due to the income component of a timberland investment. For immediate exposure, investors could consider timberland REITs alongside a private allocation.

Vehicle

There are two main types of private commingled timberland investment vehicles: closed-end and open-end structures. Closed-end funds, which control the timing and amount of investor contributions and distributions, have historically been the most common vehicle. Closed-end vehicles generally have 10 to 15 year terms with two to three year extensions at the end of the term. The fees on private partnerships generally include both a management fee of approximately 1.0% and a performance-based fee. The performance fee typically involves a preferred return and a carried interest of up to 20%.

Higher potential returns, a lower correlation to public markets, and a broader opportunity set argue strongly for employing private market vehicles for a timber allocation.

Several closed-end funds have lately experienced difficulty liquidating as they reached the end of their terms. As a result, open-end and evergreen vehicles have been introduced, including several previously closed-end vehicles converting to open-end structures as term expirations near, eliminating the imperative to exit investments. The fees are typically lower than for closed-end vehicles, with management fees less than 1.0% and reduced or sometimes no carried interest. Like closed-end funds, open-end funds are typically valued quarterly. Similar to core real estate funds, most include lock-up provisions and the potential for redemption queues. A risk in entering an evergreen fund is that exiting the vehicle is subject to the manager raising additional capital in order to fund the redemption. This can result in either forced asset sales or delays in satisfying redemption requests.

Larger investors who are able to make sizable commitments (e.g., more than $100 million) to timberland may also be able to access the asset class via a separately managed account ("SMA"). SMAs often have lower negotiated fees and will allow an investor to acquire a customized portfolio of directly-owned properties with the ability to control the portfolio strategy and exit timing. SMAs should be of considerable size in order for the portfolio to provide the level of diversification achieved by a typical commingled fund.

Valuation

Valuations of private timberland investments are typically completed by the fund manager on a quarterly basis using data provided by independent sources and an annual third party appraisal. Typically every three to five years, a full appraisal is completed on every property, which includes a detailed inventory of current timber volumes and estimates of biologic growth rates for all represented species. The appraiser determines the current fair market value of all assets including bare land, merchantable and non-merchantable timber, and possible HBU parcels.

Benchmarks

As described earlier, the private universe of timber funds raised per year is small. The leading private benchmark providers currently track between two and five closed-end funds per vintage year, an insufficient data set for use as a benchmark. Because of the small sampling across vintages and complexity of valuing timber properties, the NCREIF Timberland Index (NTI) is often used as a proxy for benchmark purposes. The NTI is an index of unlevered core US timberland returns as reported by timber fiduciaries.

The properties within the NTI account for approximately half of the investable universe. However, a limited number of participants report to the index[8]. Furthermore, the NTI is not investable and does not account for management fees and operational expenses. Lastly, the NTI is not constructed in a way to be directly comparable to most TIMO strategies (e.g., the NTI is unlevered, while most TIMOs employ some degree of leverage).

[8] A single TIMO comprises the returns of the NTI during the first two decades of its existence.

Summary

Timberland is an asset class with a return profile exhibiting risk and returns between those of public equities and bonds, and potentially provides valuable portfolio diversification benefits. The low reported volatility of returns is due in part to the steady income component and also due to its significant lack of liquidity.

The marketplace has evolved from mainly closed-end private partnerships, to include a proliferation of open-end vehicles. These open-end funds do not face the same pressure to exit, and they generally offer lower fees.

An investment in timberland is not without risks or disadvantages, including illiquidity, the lack of an investable benchmark, and high fees. An investor must understand these risks associated with an allocation to timberland and determine if the return profile is appropriate for their portfolio objectives.

Appendix

Types of conservation income

- **Mitigation bank credits** Mitigation banks were created to protect or enhance wetland or stream ecological systems in ways that can help offset impacts of development projects within a certain area. Timberlands with damaged wetlands or streams can be restored to such levels that they receive mitigation bank credits awarded by the regulatory authorities, the US Army Corps of Engineers (USACE), and the US Environmental Protection Agency (USEPA). Awarded credits can then be sold to developers within the approved region that have disturbed wetlands or streams with construction projects. The value of the credits is determined in each market based on supply and demand and the number of issued credits is determined based on the success and timing of restoration.

- **Conservation bank credits** Similar to mitigation banks, conservation bank credits are awarded based on net gains in habitat restoration and can be used to offset losses of endangered species and their habitats. These credits are regulated by the US Fish and Wildlife Services (USFWS) and can be sold in a similar fashion as mitigation credits.

- **Conservation easements** This is a perpetual voluntary legal agreement that encumbers or restricts the rights of a land owner under the easement. The restriction typically limits the use of land from development, subdivision, public recreation, etc. In some cases, the restrictions allow sustainable timber harvesting activities. As a result, a property owner receives a lump-sum payment for the easement and may collect modest income from the harvesting.

- **Planting incentives** Many states have developed programs to ensure the sustainability of natural and plantation forests with programs incentivizing the replanting of trees after harvesting. This ensures the land continues to be maintained as forest and not converted into a different use.

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