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TIR

WHAT IS TIMBERLAND'S ROLE
IN A REAL ASSETS PORTFOLIO?

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Economic Research and Analysis

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Executive Summary

Real assets have traditionally attracted investors because of their capacity to generate cash yields, like bonds, as well as their ability to generate long-term capital gains, like stocks.

Within the real asset category of alternative investments, timberland often competes with farmland, real estate and infrastructure-focused investments for institutional investors' attention and portfolio allocations. All four are considered long-term illiquid investments in a core economic resource that that can generate self-sustaining income.

In recent years, some institutional investors have begun showing less interest in timberland and more interest in other real asset categories. This largely has been because timberland's performance has lagged those of its peer hard asset classes.

Based on the returns of the NCREIF Timberland Property Index, an investor who placed $100 in a timberland portfolio in the second quarter of 2011 would have seen that investment grow to $138 five years later. By comparison, those who invested in farmland over the same period would have seen their $100 grow to $203 by the second quarter of 2016. Finally, those who invested in infrastructure or real estate would have seen it grow to $180 or $172 respectively. Nevertheless, this paper asserts that total expected return is just one dimension of many that investors need to consider when they are evaluating whether to include timberland in a portfolio of tangible assets. In fact, we at Timberland Investment Resources (TIR) believe that there are four additional reasons for investors to hold timberland.

1. **Diversification:** Timberland can improve a portfolio's Sharpe ratio and its efficient frontier of risk and return. Historically, when measured against real estate, its statistical correlation of annual returns has been close to zero and about 20 percent when measured against farmland.

2. **Capital Preservation:** Timberland has consistently demonstrated a capacity to retain its value during volatile economic periods and market shocks. Throughout the 29-year history of the NCREIF Timberland Property Index, timberland has never lost more than 10 percent of its value over a period of four consecutive quarters.

3. **Inflation Hedge:** For investors who value protection against inflation risk, timberland returns have historically tracked the progression of rising rates of inflation. Five-year returns for timberland, as measured by the NCREIF Timberland Property Index, have followed the U.S. Consumer Price Index (CPI) at a 60 percent correlation, well above the 21 percent for real estate and the 2 percent for farmland.

4. **Tax Efficiency:** A number of tax jurisdictions, including the United States, treat the harvest and sale of timber as capital gains for tax purposes rather than as revenue. This is beneficial for investors who are subject to income taxes as the marginal tax rate of capital gains is commonly lower than that for earned income, which means that timberland investors are able to keep more of their earnings.

Finally, in upcoming years, timberland's future risk-adjusted returns are well positioned to match or exceed those of other real assets. This is because the long-delayed recovery of the U.S. housing market is expected to gain momentum – generating growing demand for timber in the United States at a time when domestic mill capacity is increasing and when competition from Canada is becoming less robust due to softwood timber supply challenges in that country's western provinces.

Introduction

In recent years, there has been a surge of interest in real assets among institutional investors. Faced with historically low interest rates and significant volatility in equity markets, investors have increasingly been adding real property to their portfolios. This has included investments in real estate, farmland, infrastructure and timberland. Such tangible assets offer the potential to generate higher income than bonds as well as superior risk-adjusted returns than equities. According to Preqin, a leading source of data, intelligence and analysis within the alternative investment sector, investors committed more than US$230 billion to real asset classes and funds in 2015, which was almost double the $123 billion invested in such sectors just five years earlier (Figure 1).
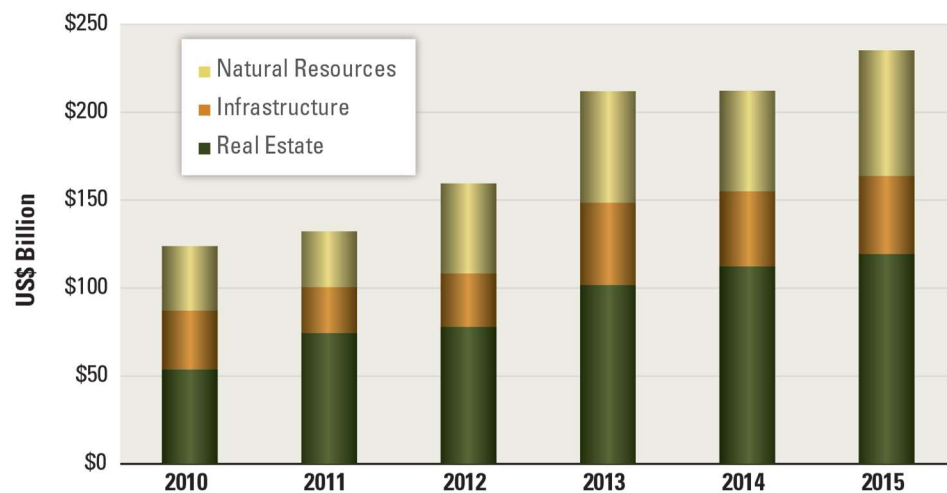

Global Fundraising of Closed-End Real Asset Funds

Figure 1. Global fundraising of closed-end private funds in the three major real asset categories of real estate, infrastructure and natural resources. Natural resource funds include those focused on agriculture/farmland, energy, metals and mining, timberland and diversified natural resources. Source: Preqin.

Despite the growth of the alternative investment sector, not all real asset categories have garnered the same levels of consideration and commitment from investors. Real estate received the largest share of investor capital during the last five years. As the oldest and most established segment of the real asset category, it saw fund commitments of $170 billion between 2015 and the first half of 2016 (Figure 2). By comparison, timberland funds drew a mere $2.1 billion during the period. While institutional investment in timberland can be traced back to the early 1980s, other real assets, with comparable histories of participation by institutional investors saw

larger commitments of capital. Farmland funds, for instance, attracted twice as much capital as timberland during the 18 months ending in the second quarter of 2016.
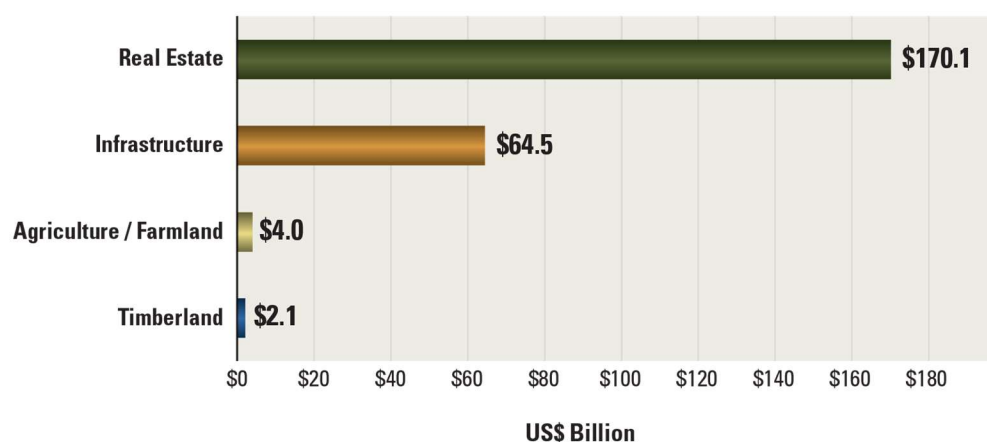

Figure 2. Global fundraising of closed-end private funds in the select real asset categories of real estate, infrastructure, agriculture/farmland, and timberland from the first quarter of 2015 through the second quarter of 2016. Source: Preqin.

Based on the fundraising numbers, it is clear that investors' interest in timberland has not kept pace with their capital commitments to other major real asset categories. The key reason has been that timberland has underperformed these other sectors. Over the five-year period ending in the second quarter of 2016, the time-weighted average total returns for institutional investment in real estate and farmland were 11.5 percent and 15.3 percent respectively (based on the indices of the National Council of Real Estate Fiduciaries – NCREIF). By comparison, timberland generated an average, annualized return of 6.8 percent during the same period.

Given timberland's performance track record, some investors believe that there is little need to invest in the asset class if other real assets provide superior risk-adjusted returns. This paper addresses that supposition by explaining why timberland has become less attractive; by outlining the value-adding role it can play in a real asset allocation; and finally, by discussing why the asset class is positioned to perform better in the near future.

Brief Background on Real Assets

Following the passage of the Employee Retirement Income Security Act of 1974 (ERISA), public and private pension funds in the U.S. were given a mandate to diversify their portfolios beyond ownership of traditional investments like bonds and public equities. Thus, ERISA became the impetus for institutional investors to increase their exposure to alternative investment sectors, including corporate finance-related asset classes like venture capital and private equity as well as real assets like commercial real estate and natural resources. Today, such alternative investments and others, like hedge funds, constitute significant portions of most institutional investment portfolios. As Figure 3 below illustrates, investors currently hold $3.1 trillion in hedge fund instruments; $2.4 trillion in private equity-focused funds; and, $1.1 trillion in various types of commercial real estate. By comparison, the amount of institutional capital invested in natural resource-based asset classes, including timberland, farmland and mining, is estimated at a relatively modest $500 billion.
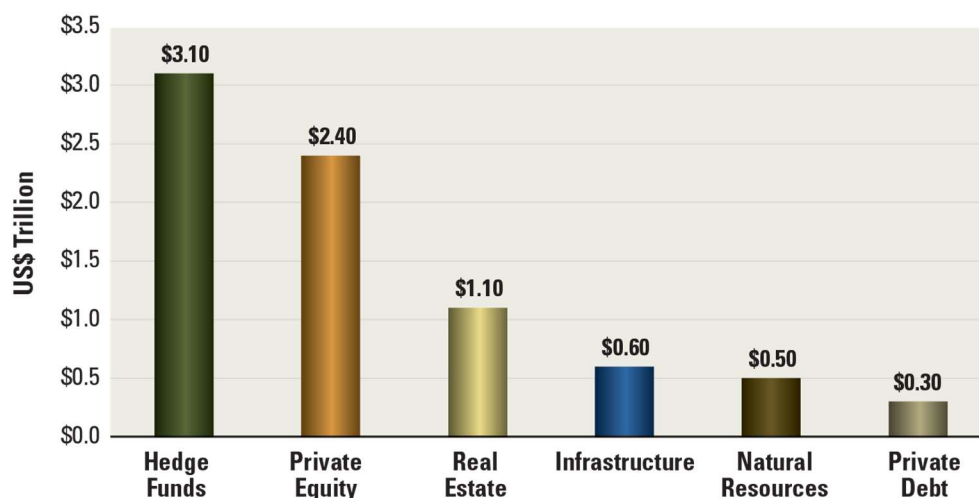

Figure 3. Total assets under management by alternative asset class as of December 31, 2015. The exception are hedge funds, which are for 30 June 2016. Source: Preqin.

Timberland is a Productive, Income-Generating Real Asset

Real assets can be broadly divided into two categories: those that can produce income and those that do not. The difference is akin to owning a gold mine or owning gold bullion. A gold mine can generate income from its mining operations by selling the extracted gold ore. Conversely, the only return gold bullion can provide is through price appreciation in the global gold market. Timberland, like a gold mine, is a productive real asset. Just as a mine produces saleable ore, timberland produces saleable timber from which income is generated. From this perspective, timberland also is comparable to real estate, farmland and infrastructure-focused investments. All four real asset categories can deliver self-sustaining income to an investor. The similarities do not stop there, however. The four asset classes also offer these common features:

Low Correlations	Their returns offer low correlations with many other asset classes, providing diversification benefits at a total portfolio level.
Capital Preservation	Such assets produce essential goods and services that can be marketed within the global economy. As a result, they often preserve their value well during weak economic environments and when markets are volatile.
Leverage Friendly	Adding leverage to augment total returns is a relatively straightforward exercise with tangible assets because they tend to produce predictable cash flows.
Macroeconomic Synergies	Real assets tend to perform strongly when the macroeconomic outlook is for rising global demand and constrained supply.
Market Immunity	Income generated from real assets is generally insensitive to the movements of financial markets and therefore such asset classes are relatively immune to systemic market risk.
Inflation Hedging	Real asset income and valuations often rise in tandem with overall inflation.
Long-Term and Illiquid	These real assets are illiquid and are held and managed through private equity vehicles over long investment horizons of 5 to 15-plus years.

Given these shared investment characteristics, and the generalized impact they tend to have on an institutional portfolio, investors may be inclined to view real estate, timberland, farmland and infrastructure-focused investments as peers. It is not uncommon for institutional investors to give these four real assets a single collective allocation to their portfolio.

Timberland's Challenge Among Investors Today

Although the appeal of real assets has grown among the institutional investment community, that interest is not equally reflected across all asset categories. A growing body of investors have begun to favor real estate, farmland and infrastructure more than timberland. The reason is simple: In recent years, returns for timberland have lagged those of their peer investment sectors. The chart in Figure 4 illustrates this performance disparity. It shows that, based on the returns of the NCREIF Timberland Property Index, an investor who placed $100 in a timberland portfolio in the second quarter of 2011 would have seen that investment grow to $138 five years later. By comparison, those who invested in farmland over the same period would have seen their $100 grow to $203 by the second quarter of 2016. Finally, those who invested in infrastructure or real estate would have seen their $100 grow to $180 or $172 respectively.

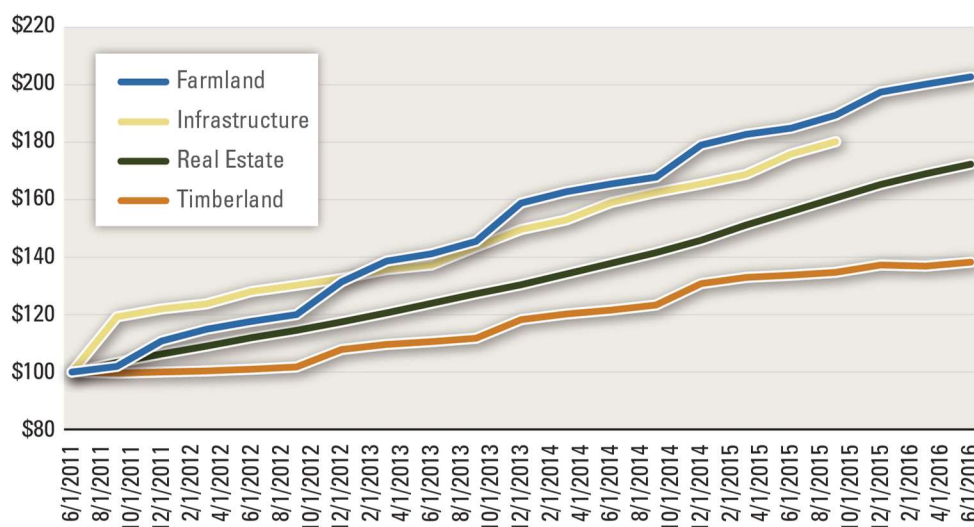

Figure 4. The result of $100 investment June 1, 2011 for the respective asset classes if total returns tracked that of the associated benchmark indices: NCREIF Property Index, Preqin Infrastructure Index, NCREIF Farmland Index, NCREIF Timberland Property Index. Assumes all income and realized gains are reinvested. Sources: NCREIF, Preqin.

There are several market factors that have created this difference in performance. Among other things, values for office, retail and apartment space in prime metropolitan markets such as New York, San Francisco, Vancouver and London

accelerated at a significantly faster pace than the overall economy during the five-year measurement period. In addition, many agricultural commodities, such as corn, wheat, cotton and beef, reached cyclic highs between 2011 and early 2015. In contrast, timberland returns have been sluggish since the 2008 recession because of the economy's lackluster recovery and specifically because of persistently challenging conditions in the U.S. housing market. Softwood sawtimber prices in the U.S. South, which reflect market prices for sawlogs from the region that are converted into solid dimensional lumber, have fallen almost 40 percent since 2005. Meanwhile, the global price of corn was up 80 percent (Figure 5) during that same period, even following a market correction in 2013.
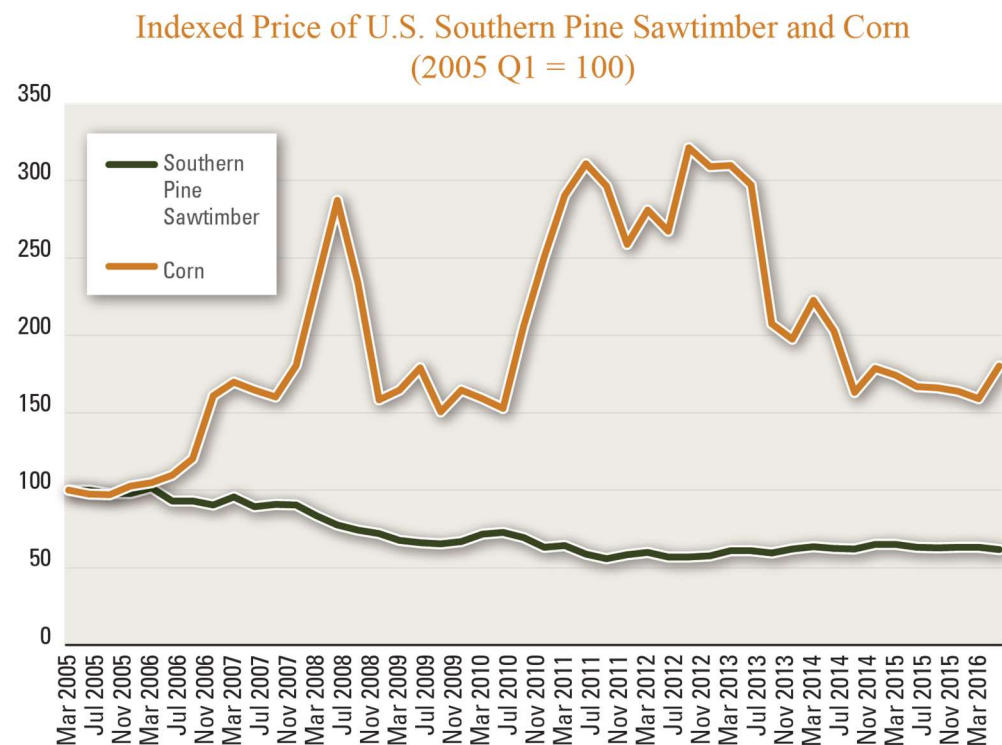

Figure 5. The price of standing pine sawtimber in the U.S. South and the global price of corn where the price is normalized to 100 at Q1 2005. Sources: Timber Mart-South, International Monetary Fund.

Long-Run View is More Balanced Between Real Assets

While the ten-year performance of timberland has lagged those of its peer group in the real assets sector, the disparity is less pronounced when comparative returns are analyzed over a longer time period. During the 25-year period ending in the second quarter of 2016, timberland's annualized average total return was 10.27 percent. This compares favorably with returns for real estate (8.35 percent) and farmland (11.97percent). Based on data available from the infrastructure sector, its performance also lagged timberland's with the asset class generating a total return comparable to that of commercial real estate (8.30 percent).

Table 1. Time-weighted average total return (annualized) of institutional investments in infrastructure, real estate, farmland and timberland over a 25-year period ending in the second quarter of 2016. Note: At the time of this writing, data for the infrastructure asset class was only available for the period from 2008 to the second quarter of 2016. Sources: NCREIF, Preqin.

Real Asset Class	Average Return (Time-Weighted Annualized)	Period
Infrastructure	8.30%	Life of Benchmark 2008-2015 Q3
Real Estate	8.35%	25 yr ending 2016 Q2
Timberland	10.27%	25 yr ending 2016 Q2
Farmland	11.97%	25 yr ending 2016 Q2

The narrowing of performance across the different real asset classes over longer periods reflects the fact that they are each driven by very different economic and market forces. During any measurement period, one sector or another may do better or worse than its peers. No single sector can sustain superior return performance indefinitely. To this point, when we segregated returns for real estate, timberland and farmland into five-year periods from 1991 to 2015, none of the three real asset classes consistently was the top or bottom performer among the peer group (Figure 6).

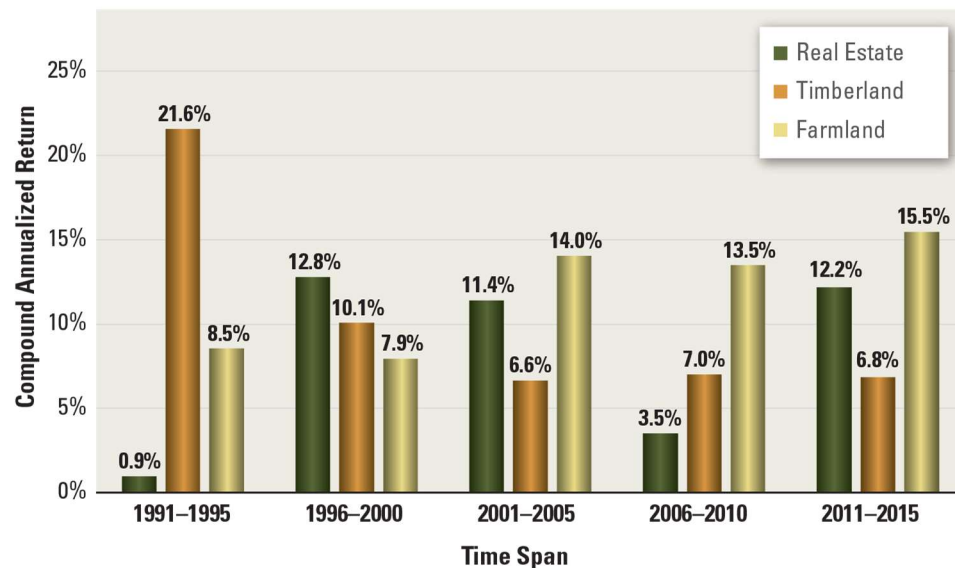Five-Year Returns of Real Estate, Timberland and Farmland
from 1991 through 2015

Figure 6. Compound total annualized return from institutional investments in real estate, timberland and farmland over five-year periods from 1991 through 2015 as measured by the NCREIF Property Index, the NCREIF Timberland Property Index, and the NCREIF Farmland Index. Source: NCREIF.

Contribution of Timberland in a Real Assets Portfolio

Total expected return is just one dimension of many that must be considered when constructing an optimally performing portfolio. Timberland can contribute to the performance of an institutional investor's real assets portfolio in several compelling ways.

Diversification

While timberland may not offer as high a return as a number of other higher-profile alternative assets, it can improve a portfolio's Sharpe ratio and its risk/return efficient frontier. This is true because timberland's returns move quite differently over time when compared with those of other real assets. As the correlation matrix in Table 2 illustrates, timberland's annual returns between 1987 and 2015 were negatively correlated with returns for real estate and had a relatively low correlation (21 percent) with those for farmland. By comparison, farmland and real estate had

a moderate correlation with each other (0.42 percent). By way of context, a statistical correlation of 1.00 (or 100 percent) means that the values of two asset categories track or follow each other perfectly over time. A correlation of 0.00 (or 0 percent) means that they move independently of each other. We have excluded infrastructure from the correlation analysis that is presented because there is less than eight years of performance data history available for the asset class. The information that is available has been tracked in the Preqin Infrastructure Benchmark index, but it is inadequate to be statistically meaningful for the purposes of this white paper.

Table 2. Statistical correlation of calendar year returns of institutional investments in timberland, real estate and farmland, as measured by NCREIF between 1987 and 2015. Note: the NCREIF Farmland Index was initiated in 1991. Source: NCREIF

Real Asset Class	Timberland	Real Estate	Farmland
Timberland	1.00	-0.04	0.21
Real Estate	-0.04	1.00	0.42
Farmland	0.21	0.42	1.00

Given timberland's correlation characteristics with other forms of real assets, the decision not to include timberland in an alternative investment portfolio may result in an investor foregoing additional portfolio-level risk reduction.

Capital Preservation

For some investors, protection from the loss of principal is very important. Timberland can be a valuable addition to a portfolio that is being managed to this objective and constraint. In fact, the asset class's history of capital preservation is comparable to that of farmland and superior to that of real estate. Over the 29-year history of the NCREIF Timberland Property Index, timberland has never experienced a loss of value (as measured by negative appreciation returns and capital gains) of greater than 10 percent over any period of four consecutive quarters. By comparison, according to NCREIF, the real estate asset class experienced such losses in 12 full-year periods (or 12 percent of the time) during the last 25 years (Figure 7).

Rolling Four-Quarter Appreciation Return (Capital Gains)
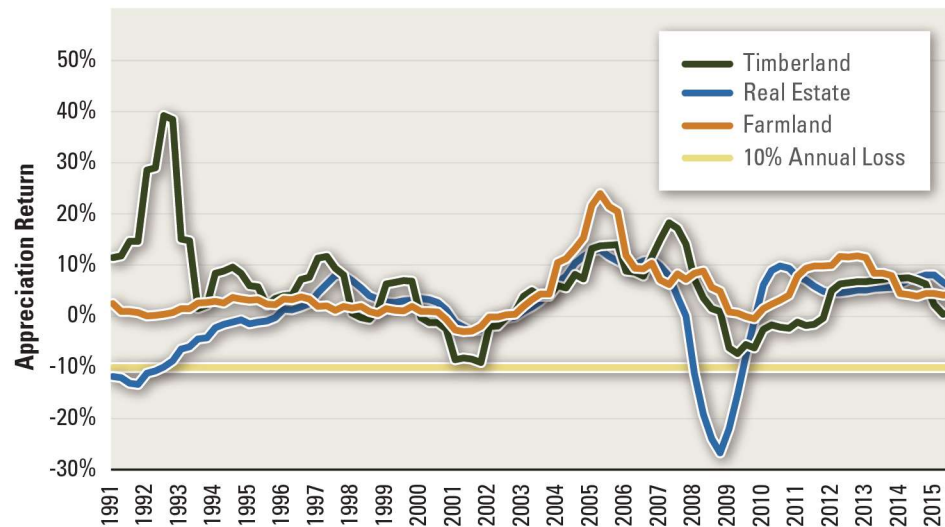of Timberland, Real Estate and Farmland (1991-2015 Q2)

Figure 7. The appreciation returns (or capital gains) of four consecutive quarters from 1991 through the second quarter of 2015 for institutional investments in timberland, real estate and farmland, as tracked by NCREIF. Source: NCREIF.

One of the reasons timberland is able to protect its value is because of the biological growth of trees. While real estate assets, such as office buildings, require capital improvements to maintain their value through time, forest assets continue to add value naturally, and with minimal intervention by their owners. With an office building, monthly lease income that is lost because of vacancy is gone forever. With a forest investment, the economics are different. During weak timber markets, timber harvests can be delayed or curtailed. Over time, as timber is stored on the stump, it continues to grow in height, width and volume – and also in value because larger trees can be used to manufacture higher-value products, like dimensional lumber and high quality furniture. Consequently, the timber that is not cut will continue to grow and actually add the property's net worth, thereby helping to ameliorate the loss from poor markets.

Inflation Hedge

In addition to its diversification and capital preservation features, timberland has the capacity play another important role in a hard asset portfolio – serving as a hedge against inflation. While timberland's association with inflation is typically weak when measured over the short run, over longer periods of time, its hedging potential is

both obvious and compelling.   In fact, five-year timberland returns move with the U.S. Consumer Price Index (CPI) at a 60 percent correlation, well above the 21 percent for real estate and the 2 percent for farmland (Table 3). The charts below demonstrate these impacts.

Table 2. Statistical correlation of the five-year compound annualized return of institutional investments in timberland, real estate and farmland, as measured by NCREIF, against the corresponding CPI inflation rate of that same period between 1991 and the second quarter of 2016. The exception is infrastructure, which is measured by Preqin and covers the period between 2007 and the third quarter of 2015. Source: NCREIF.

Real Asset Class	Correlation with U.S. CPI Inflation 1991 – 2016 Q2
Timberland	0.60
Real Estate	0.21
Farmland	0.02
Infrastructure	0.43 (2008-2015 Q3)

Figure 8. Five-Year compound total annual return of the NCREIF Timberland Property Index plotted against the Five-Year CPI inflation rate of the same period from 1991 through the second quarter of 2016. Source: NCREIF.
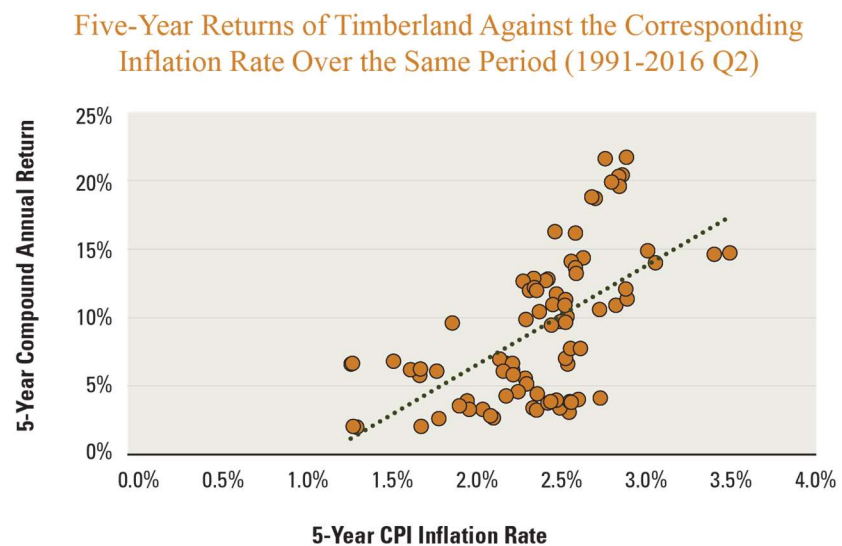

Five-Year Returns of Timberland Against the Corresponding Inflation Rate Over the Same Period (1991-2016 Q2)

Figure 9. Five-Year compound total annual return of the NCREIF Property Index plotted against the Five-Year CPI inflation rate of the same period from 1991 through the second quarter of 2016. Source: NCREIF.
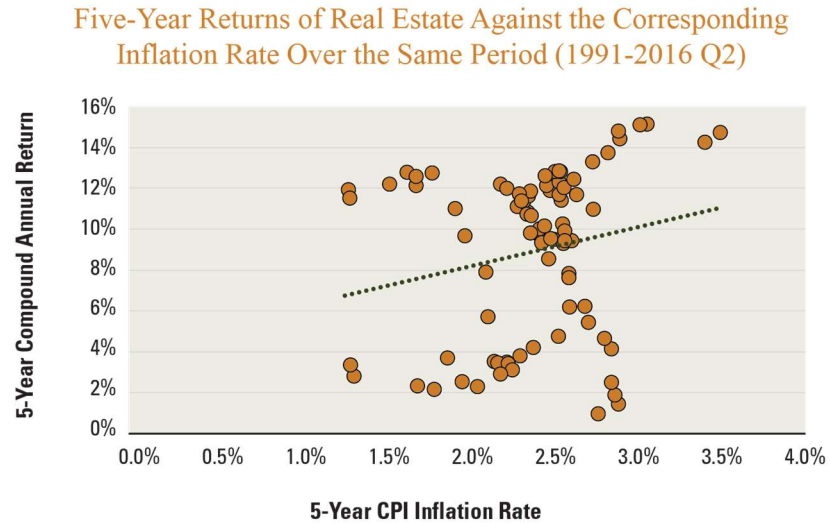

Five-Year Returns of Real Estate Against the Corresponding Inflation Rate Over the Same Period (1991-2016 Q2)

Figure 10. Five-Year compound total annual return of the NCREIF Farmland Index plotted against the Five-Year CPI inflation rate of the same period from 1991 through the second quarter of 2016. Source: NCREIF.
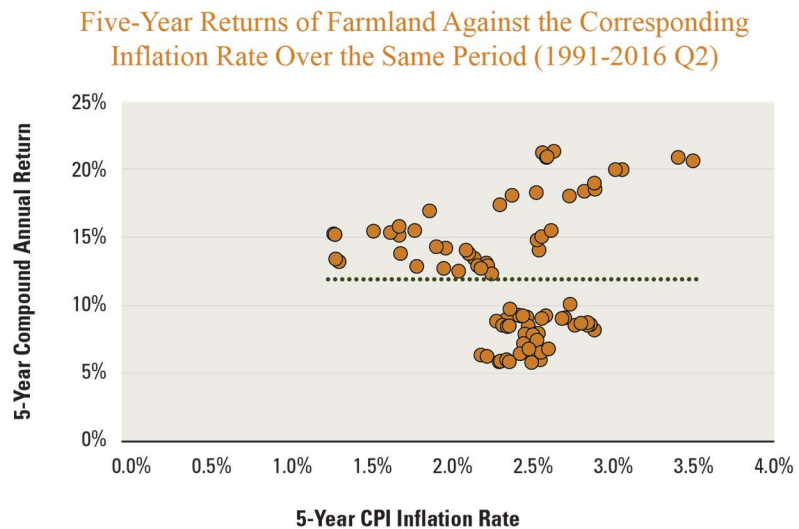

Five-Year Returns of Farmland Against the Corresponding Inflation Rate Over the Same Period (1991-2016 Q2)

Figure 11. Five-Year compound total annual return of the Preqin Infrastructure Index plotted against the Five-Year CPI inflation rate of the same period from 2006 through the third quarter of 2015. Source: Preqin.

Five-Year Returns of Infrastructure Against the Corresponding Inflation Rate Over the Same Period (2007-2015 Q3)
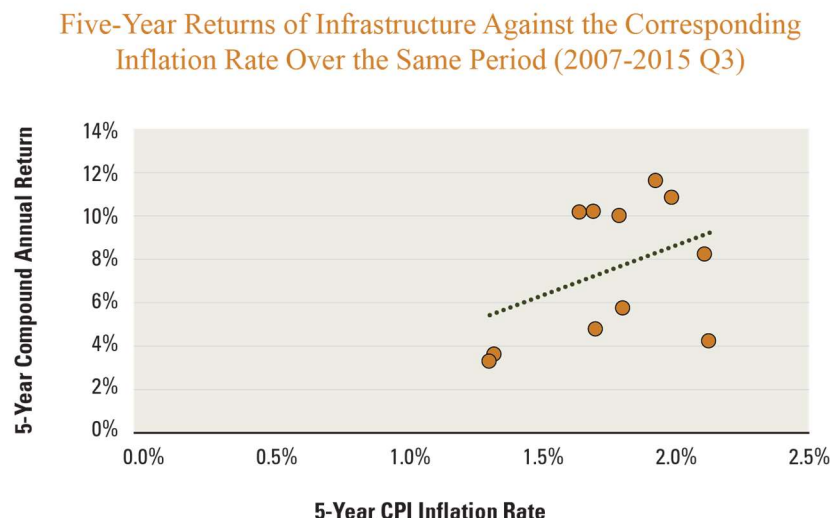
Tax Efficiency

Investors who are subject to income tax also may benefit from including timberland in their portfolios because of its tax efficiency. A number of countries, notably the United States, treat the harvest and sale of timber as capital gains for tax purposes rather than as revenue. Since the marginal tax rate for capital gains is lower than that for earned income, investing in timberland can be a tax-efficient way for investors to retain more of their earnings – more than they likely will with their direct investments in real estate, farmland and infrastructure, which typically are taxed on an earned income basis at the standard corporate rate. Investors who are interested in exploring the tax efficient nature of timberland, and its potential applications within the context of their own portfolios, should seek appropriate tax and legal counsel in the jurisdictions in which they are domiciled.

Positive Position for Timberland

Altogether, adding timberland to an existing portfolio of real assets can produce four valuable benefits for investors: It can produce enhanced, risk-adjusted returns; it can facilitate greater capital preservation; it can provide a mechanism for further hedging inflation risk; and, it can provide the means to retain a larger share of one's earnings because of the asset class's tax efficiency. Beyond these benefits, there is one additional reason investors should consider including timberland in their portfolios – the outlook for the asset class is very favorable.

Clearly, it is impossible to predict the future, but based on emerging and evolving trends and market conditions, there are a number of encouraging signs that timberland is well positioned to generate returns that compare favorably, and that could even exceed, those of its peer asset classes in the future.   This argument is largely based on the anticipated rebound of the U.S. housing market.

The price of timber in a number of key domestic markets is currently well below its long-term average. Sawlogs in regions such as the U.S. South, for instance, are unquestionably undervalued, even when compared to many other commodities (Figure 11). In active, open markets, such discrepancies are typically not sustainable and eventually result in corrections.   The signs that such a correction is poised to take place are already being seen in the U.S. building products sector.

Comparing the Real (Inflation Adjusted) Price of Various Commodities of the Last 12 Months Ending in Q2 2016 to the 30-Year Average
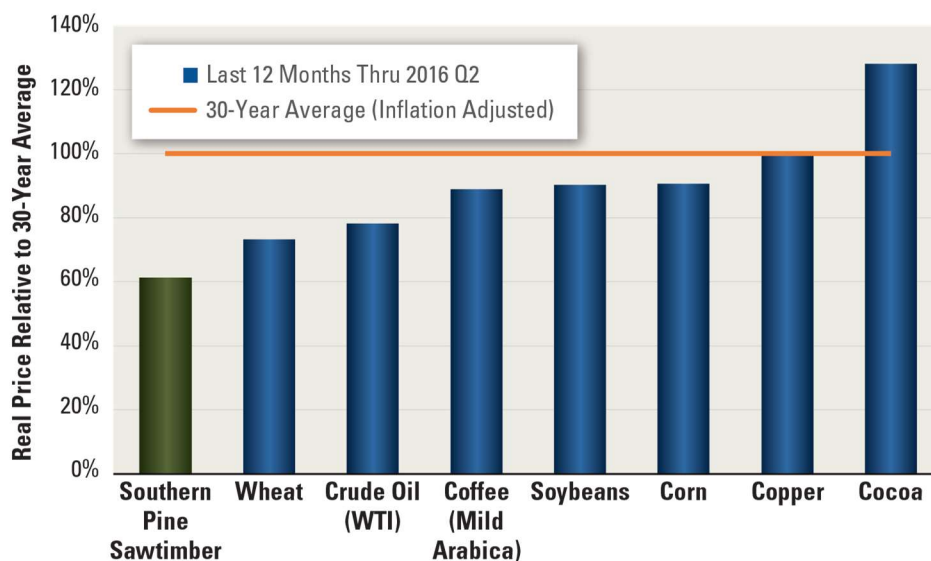

Figure 11. The price of a commodity over the last 12 months ending in the second quarter of 2016 (June 30, 2016) relative to the 30-year average real price. Real prices are adjusted to current U.S. dollars as of July 2016 as measured by the U.S. Consumer Price Index – All Urban Consumers, All Items. Sources: Timber Mart-South, International Monetary Fund, U.S. Census Bureau.

In recent years, as building products manufacturers have assessed the anticipated recovery of the U.S. housing market, they have begun to make substantial facility investments.   This has included building new mills and buying, upgrading and

expanding existing manufacturing assets. Some of the heaviest capital investments have occurred in the sawmilling sector in the U.S. South, where sawtimber prices are among the lowest in the world. As a result, total lumber capacity in the U.S. South is projected to grow from a low of 18.2 billion board feet in 2009 to 22.3 billion board feet by 2020; an increase of 22 percent (Figure 12). Meanwhile, Canada, which in the past has supplied one-third of the lumber consumed in the U.S., is expected to see its mill capacity to flatten and decline in coming years. Forest industry analysts suggest this largely will be a result of the country facing declining harvest levels – a condition that is due to timber losses sustained in Canada's western provinces, where a massive mountain pine beetle infestation decimated regional forest resources earlier in this decade.
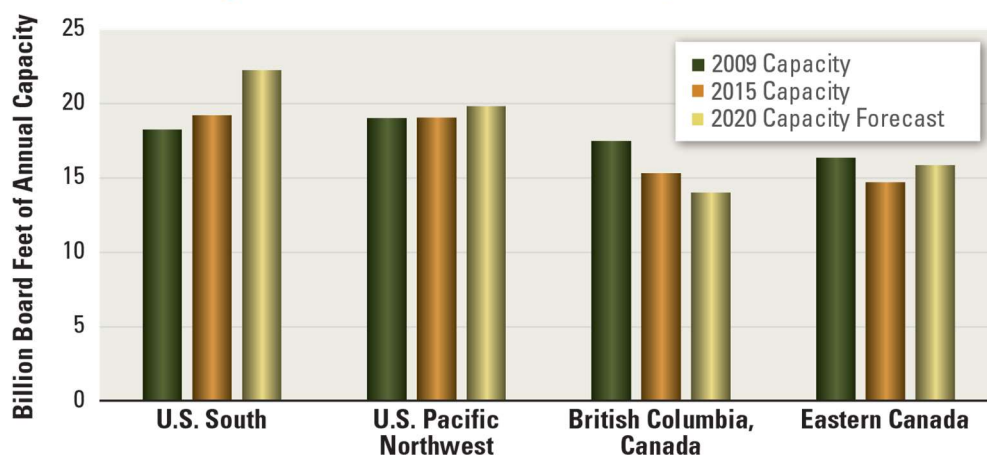

Figure 12. Historic and forecasted total installed softwood lumber capacity by North American region for 2009, 2015 and 2020. Source: RISI.

Given the new mill capacity that has been put in place in the U.S., TIR and other market analysts expect demand for sawtimber to move in concert with increasing demand for building products – an outgrowth of improving conditions in the rebounding U.S. home building, renovation and repair sectors.

While the recovery of the U.S. housing market has been slower than many anticipated after the housing crash of 2007, key drivers are in place for its continued expansion in the coming years. Among other factors, demographic growth has resulted in pent up demand for new housing. The U.S. population is increasing at a rate of 0.8 percent per year, adding about 2.5 million people each year. This level

of growth supports an underlying need of about 1.4 to 1.5 million homes per year. However, homebuilding over the past eight years has fallen well short of 1.4 million units per year (Figure 13). The backlog of unmet housing demand, by some estimates, currently exceeds 2.5 million homes. The expectation is that steady gains in employment and income in the U.S., along with historically low mortgage rates, will drive new home construction in the months and years to come. Many economists project U.S. housing starts to break the post-War average of 1.5 million units a year by 2018 or 2019, thereby helping to spur lumber consumption to a level that is 24 percent higher than was observed in 2015.

U.S. Housing Starts Forecast by Forest Economic Advisors

Figure 13. Historic and forecasted total private housing starts in the United States from 2005 through 2025 along with the underlying fundamental demand for housing based on demographic growth. Source: Forest Economic Advisors.

In closing, TIR believes that higher lumber consumption and increased mill capacity will set the stage for improving timber markets in the near future. This, in turn, is expected to offer a potential window of opportunity for timberland investors over the next decade – one that could produce rewards that exceed those available to them in other hard asset classes.

Conclusions and Recommendations

As an asset class, timberland has much in common with the other primary real asset sub-sectors – real estate, farmland and infrastructure. All four are illiquid, long-horizon investments with the potential to generate sustained income flows. They also offer some protection against capital loss and inflation risk – a signature feature and benefit of tangible property ownership. Given the similarities amongst them, when building an alternative investment portfolio, some investors believe the four real asset categories are interchangeable. This supposition often leads to decision-making and asset class selection that is based primarily on the near-term investment performance of one or more of the asset classes relative to that or those of the others. Given timberland's most recent history of total investment performance, in recent years, this rationale has led some investors to channel more capital into its peer group asset classes – specifically real estate but also farmland and infrastructure focused opportunities.

In this paper, we argue, among other things, that timberland is unique among real assets – and that not including it in the alternative investment portion of one's portfolio can represent a lost opportunity to further reduce overall portfolio volatility even further   Moreover, we argue that portfolios that lack exposure to the timberland asset class are less capable of hedging inflation and preserving capital. Finally, we posit that timberland's tax efficiency, which is facilitated by its investment characteristics and the structures and vehicles typically employed to hold it, offers compelling value for certain types of investors. In short, timberland offers important and measurable benefits to investors even if they are already investing in its peer asset classes with the real asset sector – real estate, farmland and infrastructure.

While timberland has generally underperformed these other real asset classes in recent years, when its performance is analyzed against them over longer periods of time, and through various economic cycles, it has performed comparably and, in some instances, even better. This affirms the principle of free capital markets, where investors can exploit differences in value over time and where gaps in risk-adjusted returns can be expected to narrow and even close based on prevailing market and economic conditions. On that note, this paper argues that the existing performance gap between timberland and real estate, farmland and infrastructure is likely to narrow or disappear in the coming years because the long delayed recovery of the U.S. housing market should generate increased demand for timber at a time when U.S. mill capacity is expanding and when timber supply challenges are expected to plague Canadian lumber producers.

To close, investors should understand that timberland is a diverse and complex asset class. The performance of a timberland investment is influenced by its unique market conditions; by its species composition; by the prevailing demographic trends of the area that surrounds it; by its local log grade demand drivers; by the degree to

which customized and intensive forestry regimes are employed in its management; and, by its biological timber productivity characteristics. The selection of a timberland investment manager also can have strong bearing on the performance of timberland asset because each timberland investment firm (TIMO) has its own philosophy, strategy and management capabilities. Informed, and prudent investors that weigh all of these factors when investing in the asset class are well positioned to produce exceptional risk-adjusted performance.

For questions and additional information, contact:

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