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TIR

**TIMBERLAND AND FARMLAND INVESTMENTS:
SEPARATING THE BARK FROM THE CHAFF**

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Executive Summary

- **Size and Scope:** Timberland and farmland have become increasingly attractive asset classes in recent years. Institutional investors have committed \$30-to-\$40 billion to the farmland asset class and \$50-to-\$60 billion to timberland. This amounts to roughly 3-to-4 percent of the investable universe of farmland and 7-to-8 percent of the investable universe of timberland.
- **Similarities and Differences:** As hard asset classes with a natural resource focus, timberland and farmland have many similarities. However, they also are quite different in fundamental ways and it is important for investors to have an informed perspective on them so they can make proper comparisons and develop investment strategies that capitalize on their respective strengths when including one, the other, or both in their broader portfolios.
- **Compelling Attributes:** Farmland and timberland offer perceived safety because they have the capacity to generate self-sustaining income and capital preservation, which can help insulate a portfolio against the impacts of market volatility. They offer compelling macro-economic fundamentals that suggest long-term growth potential. They are core inputs to the global economy so they both can serve as a hedge against inflation. Their returns are negatively to lowly correlated with most other financial and real estate assets so they provide portfolio diversification benefits. And finally, they both have strong histories of solid investment performance relative to other major asset classes.
- **Investment Fundamentals:** Investment in timberland and farmland is usually facilitated through the use of private equity vehicles and can entail owning both the underlying real estate assets, the biological growth potential of the assets, or both. Timberland is usually directly owned and operated by investors and their intermediaries on a fee simple or timber growing rights basis. Farmland is either owned and operated directly, as in the case with most permanent crops like nuts, grapes, apples, citrus and cranberries, or owned and leased, as is most often the case with row crops like corn, soybeans and grains.
- **Past Performance:** According to NCREIF, on a one-year basis, time-weighted annualized returns for farmland were 20.25 percent and were 9.45 percent for timberland. On a since inception basis, however, timberland has generated a return of 12.98 percent while farmland has generated an 11.97 percent return.
- **Future Outlook:** While farmland has outperformed timberland in recent years, TIR believes the outlook for timberland is more promising in the near term because of improving timber market fundamentals that, among other things, are being driven by increases in new home construction, home repair and home remodeling. Conversely, farmland commodity prices have hit cyclical highs during the last half decade and are therefore expected to moderate in the future.
- **Portfolio Fit:** Depending on an investor's specific needs and priorities, farmland and timberland both offer attributes and characteristics that can make them attractive additions to an institutional portfolio. However, it is important for investors to recognize and understand the unique macro-economic conditions and circumstances that are likely to drive or impede value generation in each sector in the future.



Introduction

The extensive volatility of equity and fixed-income markets during the last several years has prompted many institutional investors to consider adding real assets to their portfolios. The attraction of real assets is that they provide direct, physical participation in the economy, which means they possess inherent value that can help insulate a portfolio from the wide swings and shocks that can occur within global financial markets.

Timberland and farmland are among the real asset categories that have garnered significant attention from investors. What makes these two asset classes stand out is their productivity attributes. In other words, investing in timberland and farmland entails investing in the inherent biological productivity potential of the assets. Instead of investing in agricultural commodities like corn or cotton, for instance, one invests in the farmland that produces those crops. And, instead of acquiring lumber futures, one invests in forests that produce logs that can be milled into lumber.

In the case of farmland, its growing popularity in recent years has been fueled by rapid appreciation of both crop prices and farmland values. These factors have led to significant interest and capital commitments from institutional investors. TIAA-CREF, for instance, a major provider of retirement-focused investment services to organizations and individuals active in the academic and medical sectors, has made a strong commitment to the agricultural sector. TIAA-CREF has more than \$250 billion in assets under management across both traditional and alternative assets classes and in 2012 it partnered with other pension funds to create a \$2 billion fund for the sole purpose of investing in farmland. TIAA-CREF now holds global croplands valued at approximately \$3 billion.

Although it has not attracted the same level of attention as farmland in recent years, timberland

also has its proponents. Harvard Management Company, for instance, which oversees the investment activities of the Harvard University endowment, the world's largest, recently renewed its commitment to the asset class – announcing that it was allocating 10 percent, or more than \$3 billion, of its \$32 billion in assets under management to the asset class. Harvard Management has a long history of successful involvement in timberland that dates to the early 1990s and according to Jane Mendillo, who heads the organization, its decision to expand its presence in the asset class was made out of recognition that new and attractive opportunities are emerging in global timberland markets.

However, Harvard and TIAA-CREF are strongly committed to both forestry and agriculture, and have made significant allocations to both asset classes.

This begs the question: What makes an institutional investor choose farmland, timberland, or both? Given the strong similarities they share with regard to key investment attributes, it can be challenging for an investor to decide which best fits their needs and interests. The purpose of this paper is to provide an objective comparative assessment of timberland and farmland as asset classes. We begin by describing them and defining the features that make them each attractive to investors. This overview is followed by a brief summary of their historic performance and an evaluation of their respective strengths and weaknesses. Finally, the paper concludes by providing a current investment outlook for both farmland and timberland. This outlook is accompanied by some practical recommendations for investors to consider as they examine their options for including one or both of the asset classes in a well-balanced portfolio that is being managed with a long-term orientation.



Characterizing Timberland and Farmland Investments

At a conceptual level, timberland and farmland investments are remarkably similar because they rely on the biological productivity of land to generate income and wealth. However, the two asset classes have very different investment fundamentals and value drivers. Here is how they are each currently defined by the investment community:

Farmland investments generate income and capital appreciation from their current and future capacity to produce agricultural commodities. An investor can generate cash flow by either directly farming or cultivating a property or by leasing it to a qualified operator – a tenant farmer who pays rent.

Timberland investments generate income and capital appreciation from the health and growth of forests. The underlying land, itself, may or may not be part of the investment because ownership simply may be vested in timber growing and harvesting rights. Although harvesting and selling timber is the most common and familiar method for generating income from a forest investment, other, non-timber sources of revenue also can be tapped. For instance, depending on the circumstances, a forest investor may be able to generate income from the sale of carbon offsets and wetlands mitigation credits, conservation easements and hunting licenses. It is important to note that trees that generate harvestable crops, such as fruit orchards and nut groves, are not characterized as timberland investments – but rather fall into the farmland sub-category of permanent crops.

Institutional investors typically invest in farmland and timberland directly through forest or agricultural-focused private equity vehicles. Holdings of commodity derivatives and the ownership of shares in publicly traded forest products, agricultural companies and exchange-

traded funds (ETFs) are not typically considered investments in farmland or timberland.

Investment Models for Timberland and Farmland Investments

There are two basic models used for investing in farmland. The more common of the two is leasing productive, arable land to a tenant farmer. The tenant farmer, in turn, pays the investor/landowner an annual cash rent or a share of the harvested crop. As one would expect, rental payments structured through crop share arrangements entail more investment risk for investors/landowners, but the approach provides an investor/landowner with the opportunity to benefit from upswings in agricultural commodity prices. The second, less common, business model is for investors to directly operate the lands they own. This approach typically entails the assumption of higher levels of operational and production risk, but it also offers opportunities for greater management control and higher returns. As a general rule, investments in lands that are used to cultivate annual row crops, like soybeans, corn, wheat and vegetables, tend to be leased. Conversely, farmlands upon which permanent crops, like nuts, grapes, coffee, citrus, apples, pears, stone fruits and cranberries, are grown tend to be directly owned and operated. This is because as much as 80 percent of the value of any permanent crop investment is directly attributable to the health and productivity of the trees, vines and bogs that produce the commodities. Consequently, a farmland investor that owns permanent croplands has a greater incentive to directly operate those assets – both to more closely manage the operational and production risks and to associated natural risks and to fully benefit from participation in multi-year crop cycles.

In contrast to farmland, timberland investors rarely lease the land they own to third-party operators. Instead, they hold the land through fee simple (or freehold) ownership and actively and directly manage the standing timber that is growing on their properties. The objective in this case is to



optimize near-term revenue generation and long-term asset growth and appreciation. In some cases, timberland investors may not own a fee simple interest in a timberland asset, but rather may acquire a long-term timber lease that entitles them to grow and harvest timber on someone else's property for a period of years or even decades. While this approach is occasionally employed in the United States, it is more common in countries and regions where private land ownership is restricted (such as much of East Asia and Africa) and where the price of timberland is prohibitively high (such as the southeast coastal region of Brazil). The third, but least common, form of timberland investment is the timber cutting right or timber deed. Investing through this mechanism entails acquiring the option to remove a certain volume of timber from a property owned by another party over an allotted period of time. In some cases, timberlands owned by national, regional and local governments may be subject to long-term timber leases, which investors and other private entities can acquire. In parts of Canada, for instance, the national and provincial governments lease publicly-owned lands to investors and corporate enterprises under a "Crown tenure" system that grants them timber cultivation and cutting rights for a pre-determined period of time. In many cases, this system is used to generate public revenue and to promote economic development by helping to sustain forest-based industries that provide jobs and support rural economies. Of the three investment/ownership models just described, the fee simple ownership approach to timberland investing offers the opportunity to generate the most balanced return – one that includes both an income and an appreciation component. The other two approaches – leasing land and acquiring cutting rights – are considered "pure" timber plays, which means the returns they generate are based exclusively on timber's biological growth and market fundamentals rather than variable land values.

Size of the Investable Universe

As relatively new asset classes that were only introduced to the institutional investment community three decades ago, timberland and

farmland are relatively small in size when compared to traditional investment sectors like equities, fixed income and commercial real estate. Estimates of the investable universes for timberland and farmland currently total US\$716 billion and \$1 trillion respectively.¹ In comparison, the total market capitalization of publicly-traded equities totaled US\$54.6 trillion at end of 2012 –

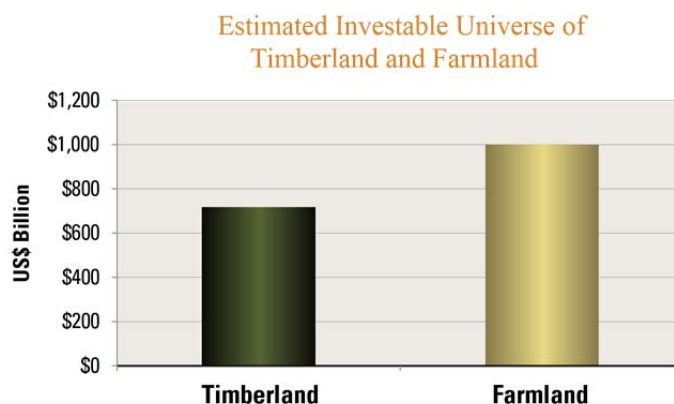


Figure 1. Estimated market of timberland and farmland accessible to private institutional investors, as measured in United States dollars. Sources: Macquarie, IWC.

making the equities market more than 50 times larger than either the farmland or timberland market.²

Despite the modest absolute sizes of both the timberland and farmland asset classes, investors have only captured a small portion of each. Based on the best available estimates, as of 2012, institutional investors had committed \$30-to-\$40 billion to the farmland asset class and \$50-to-\$60 billion to timberland. This amounts to roughly 3-to-4 percent of the investable universe of farmland and 7-to-8 percent of the investable universe of timberland. Consequently, both asset

¹ Investable farmland universe estimate from Macquarie, "Food for Thought", Dec. 2012. Investable timberland universe estimate from IWC, "Global Timberland Investable Universe: June 2009.

² Source: World Federation of Exchanges



classes still offer investors significant opportunities for participation.

Key Attractions of Timberland and Farmland

Over time, farmland and timberland have attracted investors based on perceptions that they both offer five key attributes.

1. **Safety:** Farmland and timberland have the capacity to generate self-sustaining income and capital preservation, which can help insulate a portfolio against the impacts of market volatility.
2. **Macro Fundamentals:** Their long-term macroeconomic supply and demand fundamentals look compelling. Some argue that the available inventories of investable farmland and timberland are limited and that population growth and rising rates of global income will drive demand for agricultural commodities and timber higher, thus causing farmland and timberland values to escalate.
3. **Inflation Hedge:** Farmland and timberland are considered real assets and are core inputs of the global economy. As such, they should, in theory, hold their inherent value and serve as a potential hedge against inflation risk.
4. **Diversification:** Both asset classes have histories of generating returns that have low correlations with those of other asset classes. Investors can therefore diversify and lower the overall risk profiles of their portfolios by including farmland or timberland investments in their mix of assets.
5. **Performance:** Over most time frames since the 1990s, average risk-adjusted returns for farmland and timberland have been very competitive historically with those of other major asset classes, including equities, fixed income, commodities and hedge funds.





Comparison of Historic Performance

For private equity investments in timberland and farmland, the leading benchmark indices are the NCREIF Timberland Property Index (since 1987) and the NCREIF Farmland Index (since 1991). Both indices are produced by the National Council of Real Estate Investment Fiduciaries (NCREIF), a non-profit organization dedicated to research and education on real estate investments. The chart below (Figure 2) shows the rolling annual total returns for U.S. farmland and U.S. timberland from 1991 through the first quarter of 2013 according to the two NCREIF indices.

Risk and Return Performance

The historic performance data shown in Figure 2 demonstrates that farmland generally outperformed timberland during the last decade. This was a period when many, major agricultural commodities, including wheat, soybeans, corn and cotton, experienced a “super-cycle” driven by rising demand for food from emerging countries like China and India. However, looking back further, the tables were reversed in the 1990s when a robust U.S. housing market and drastic reductions in timber harvesting in U.S. national forests created strong returns for timberland investments.

All things considered, while timberland and farmland often trade places in performance (and thus could complement each other in a portfolio diversification strategy), they are not immune to macroeconomic cycles. Both asset classes have benefited from periods of general economic recovery and have generated lower performance during periods of economic downturn. In Figure 2, note the dip in returns for both asset classes during the U.S. and global recessions of 2001-2002 and 2008-2009.

The robust performance of farmland since 2003 has eclipsed that of timberland during most of the intervening periods (see Table 1), but when viewed from a “since-inception” standpoint, the

Rolling Four-Quarter Annual Returns for Farmland and Timberland

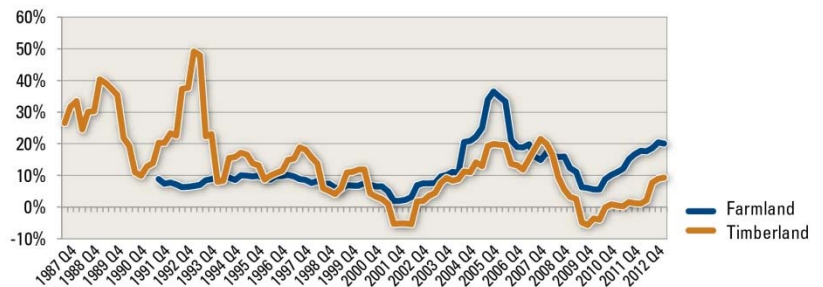




Figure 2. Annual total return from inception through 2013 Q2 of farmland and timberland through rolling four-quarter performance, as tracked by the NCREIF Farmland Index and the NCREIF Timberland Property Index. Note: the NCREIF Farmland Index started reporting farmland returns in 1991.

two sets of returns are comparable, with timberland holding a slight edge.

When compared to other asset classes, timberland and farmland investments offered competitive returns on a total return and risk-adjusted basis over the last 20 years. As is shown in Table 2, timberland and farmland outperformed public equities and fixed income, as well as commercial real estate, between 1993 and

Table 1. Historic time-weighted return of farmland and timberland through 2013 Q2, as measured by the NCREIF Farmland Index and the NCREIF Timberland Property Index. Farmland Index inception was 1991. Timberland Property Index inception was 1987.

		
Time-weighted Annualized Return	Farmland	Timberland
1 Year	20.25%	9.45%
3 Year	16.36%	3.64%
5 Year	13.37%	2.12%
10 Year	17.23%	8.36%
Since Index Inception	11.78%	12.97%



2012. Clearly, past performance does not guarantee comparable future performance, but the track records of the two asset classes give weight to the argument that agriculture and forestry investments can make effective contributions to a well-diversified portfolio.

Correlation and Diversification

Beyond absolute return, another argument for including farmland and timberland in one's investment mix are their low correlations with other asset classes. In fact, their statistical correlations fall below 50 percent when compared with other popular asset classes. Furthermore, rates of timberland and farmland performance do not track each other closely. Their 20-year statistical correlation is only 45 percent. This suggests that farmland and timberland not only complement other assets when they are included in a broadly diversified portfolio, they also complement each other.

Inflation Hedge

Another characteristic that often attracts investors to natural resource investments is their potential to serve as hedges against inflation. To test this theory, we compared the five-year performance of the NCREIF Farmland Index and that of the NCREIF Timberland Property Index with U.S. price inflation as measured by the Consumer Price Index (CPI). A five-year span is a more appropriate gauge of inflation than a single quarter or year because farmland and timberland investments are generally made with a long-term investment horizon – with most such investments being held for at least five years or even longer.

As is shown, (Figures 4 and 5), farmland and timberland returns both have visible relationships with inflation. The upward trajectory of their five-year returns (from the lower left to the upper right) indicates that when inflation is higher, farmland and timberland investment returns tend to be higher as well. These trend lines clearly demonstrate the inflation hedging attributes of the

Table 2. 20-Year annual compound return and standard deviation of various asset classes from 1993-2012. The Sharpe ratio assumes a risk free rate equal to the return of 30-day U.S. Treasury bills during that period, which was 3.00 percent. Sources: Ibbotson, Credit Suisse, NCREIF, Cambridge Associates.

Asset Class	Benchmark Index	Annual Returns	Standard Deviation	Shape Ratio
Timberland	NCREIF Timberland Property Index	8.90%	7.90%	0.75
Farmland	NCREIF Farmland Index	11.89%	7.28%	1.22
Commercial Real Estate	NCREIF Property Index	8.85%	8.52%	0.69
Corporate Bonds	Citigroup Long-Term High Grade Corp Bond Index	8.26%	7.98%	0.66
Hedge Funds (since 1994)	Dow Jones Credit Suisse Hedge Fund Index	8.37%	11.56%	0.46
High Yield Corporate Bonds	Barclays U.S. Corporate High Yield Bond Index	8.21%	16.20%	0.32
Large Cap Stocks	Standard & Poor's 500	8.21%	19.08%	0.27
Private Equity	Cambridge Associates Private Equity Index	15.23%	15.75%	0.78
Small Cap Stocks	Russell 2000	8.43%	18.67%	0.29
U.S. Long-Term Treasuries	20-Year maturity U.S. government bonds	8.59%	12.58%	0.44
U.S. Treasury Bills	30-Day maturity U.S. government bonds	3.00%	2.10%	0.00



two asset classes.

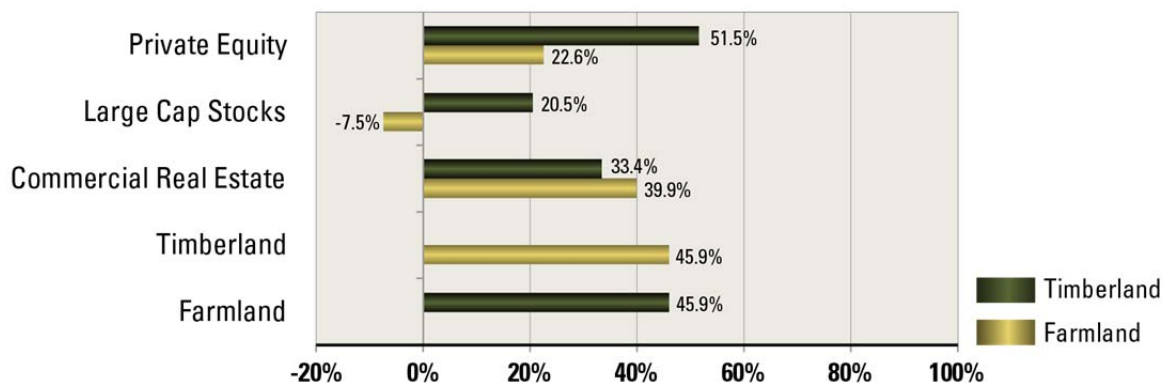
When a linear regression line is added to the two charts (Figures 4 and 5), we can quantitatively measure the strength of these relationships using the regression line's R^2 value. In the case of farmland, the R^2 is 0.0631 (Figure 4). This means the five-year farmland returns for farmland match up with 6.31 percent of the inflation rate over that period. For timberland (Figure 5), the R^2 is 0.361, which indicates that 36.1 percent of the asset class' five-year inflation rate shows up as changes in returns. In other words, both farmland and timberland have shown a history of generating positive responses to rates of inflation. However, on a comparative basis, timberland's response has been stronger and clearer.



Loblolly pine plantation in East Texas

Figure 3. Statistical correlation of annual returns of private equity (Cambridge Associate Private Equity Index), large cap stock (Standard & Poor's 500), and commercial real estate (NCREIF Property Index) against farmland (NCREIF Farmland Index) and timberland (NCREIF Timberland Property Index) from the 20-year period of 1993 to 2012.

Statistical Correlation of Annual Returns of Select Asset Classes with Farmland & Timberland (1993-2012)





Five-Year Farmland Returns Against Corresponding Five-Year Inflation Rate (1Q 1991 - 2Q 2013)

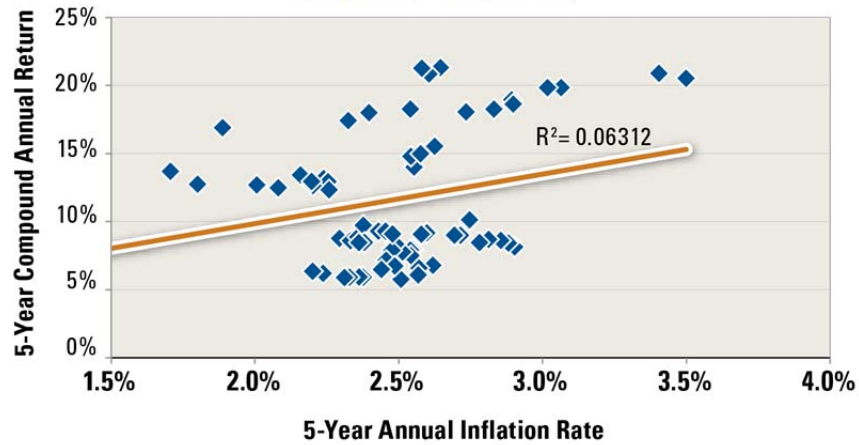


Figure 5. Measuring five-year timberland returns against U.S. inflation over the matching period, as tracked by the U.S. Consumer Price Index (CPI) over the period 1Q 1991 through 2Q 2013. Timberland returns are represented by the NCREIF Timberland Property Index.

Five-Year Timberland Returns Against Corresponding Five-Year Inflation Rate (1Q 1991 - 2Q 2013)

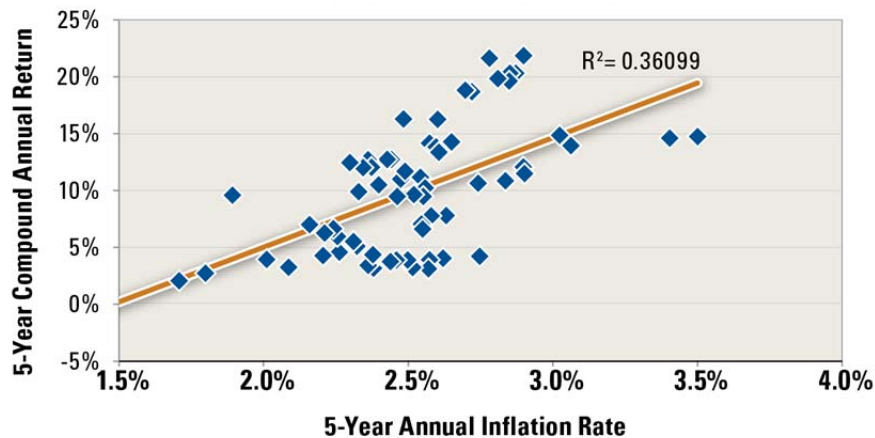


Figure 4. Measuring five-year farmland returns against U.S. inflation over the matching period, as tracked by the U.S. Consumer Price Index (CPI) over the period 1Q 1991 through 2Q 2013. Farmland returns are represented by the NCREIF Farmland Index.



Effective Differences of Farmland and Timberland Investments

Historic rates of performance are certainly important for establishing how farmland and timberland fit within an investor's portfolio. However, returns are not the only consideration. Beyond the fact that one investment is focused on growing crops and the other on growing trees, the two asset classes behave differently as investments. They each have distinct features that could cause an investor to choose one over the other. However, they also have compelling similarities that could argue for investing in both concurrently.

Investment Features of Farmland

One feature of farmland that may make it more attractive than timberland to some investors is the option it provides to remove a layer of operational risk and market volatility. When a farmland tract is leased to a tenant farmer, its investor/owner no longer holds the risk associated with producing and selling a crop from that land. In effect, the investor has monetized the cash flow on an upfront basis by relying on rental income in much the same way the owner of a commercial office building collects lease payments from tenants. This approach also insulates the farmland investor from falling crop prices. However, conversely, it prevents the investor from participating in any upside that might be generated because of surging agricultural commodity markets. By comparison, most timberland investments are structured to facilitate the direct management of land and the direct sale of timber.

Investors that have a preference for current income may favor farmland over timberland for another reason – its comparatively higher cash flows. Although certain types of timberland investments do provide robust income generation opportunities, as a general rule, timberland's income component is more modest than farmland's and its total return is more heavily calibrated to capital appreciation. For instance, according to the NCREIF Farmland Index, the

average time-weighted annual income return for farmland over the last 20-years (ending in 1Q 2013) was 7.10 percent. This was 2.7 percent higher than the 4.44 percent income return timberland generated during the same period.

One aspect of farmland that some investors view in a negative context is its sensitivity to governmental involvement and politically-motivated restrictions. Many countries around the world consider agricultural resources of strategic importance and therefore some local and national governments are highly responsive to the will and sensitivities of native landowners and farmers. Much of Africa, Southeast Asia, China, and India, for instance, have restrictive policies against significant corporate ownership or foreign control of farmland. Furthermore, these political dynamics are not exclusively a concern in emerging economies. Developed countries like Japan and several EU nations also have such restrictive agricultural land ownership and operation policies. Even in the United States, Iowa, Nebraska, Minnesota, Missouri, North Dakota, Oklahoma, South Dakota and Wisconsin all have had laws in place since the 1970s limiting corporate or foreign ownership of lands that are to be used for livestock raising and crop production. These restrictions significantly reduce the universe of farmland investment opportunities that are available to institutional investors. Although private forests are not immune from government regulations, restrictions on timberland ownership are less common.

Investment Features of Timberland

When compared to farmland, timberland offers some unique features that certain investors may find attractive. One of its more compelling characteristics is the ability it offers investors to accelerate or delay harvests so they can capitalize on favorable market conditions. When timber markets are strong, harvests can be accelerated to some degree to take advantage of



attractive pricing dynamics. Conversely, when they are weak, harvests can be withheld or curtailed until prices recover. Furthermore, under such circumstances, the timber that is not harvested continues to grow and appreciate in value. This ability to time harvesting gives timberland investors the flexibility to take advantage of managing market cycles, regardless of their direction. This can help produce stronger, long-term returns and reduce fundamental investment risk. The ability to “store timber value on the stump” is something that cannot be replicated with most agricultural investments. Farmland harvests must be executed on schedule regardless of the prevailing market conditions.

Supply response is another factor that investors must consider when evaluating the relative benefits of timberland and farmland. In the case of timberland, timber markets are relatively inelastic, which means that increases in timber demand cannot be quickly met by increased timber production. This is because establishing new working forests and managing them through the biological cycles that are required to produce mature, merchantable timber takes a very long time. This characteristic is beneficial for timberland investors because it reduces the long-term volatility of their earnings. Conversely, demand increases in agricultural commodity markets can be met in relatively short periods of time by putting more arable land into production. For instance, a year or two of high crop prices can have an outsized impact on supply dynamics within the farm sector as farmers bring more marginal lands into production, or switch the crops they are cultivating, to capitalize on the changing market conditions. The coffee market is a recent case in point. In 2011, Arabica coffee reached a cyclic high of US\$3 per pound. Coffee growers in Brazil, the leading producer of Arabica coffee, responded by planting more coffee trees. Consequently, Brazil achieved a record coffee harvest in 2012 and coffee prices responded by plummeting 13 percent in the second quarter of the year – nearing a four-year low. Similar trends have impacted the global market for soybeans. Between 2012 and 2013 Brazil’s output of soybeans rose 34 percent. This occurred five years after Brazilian farmers began cultivating 40

percent more arable land for soybean production in response to an anticipated jump in global demand. However, the dramatic one-year increase in the country’s soybean output caused prices to fall to ten-month lows in June of 2013.

Finally, a third feature of timberland that investors may find compelling when comparing the asset class to farmland is the fact that timberland is an appreciating asset. Timber is long-lived and timber values tend to appreciate through time. As trees grow and become larger they also become more valuable because they can be processed to produce or manufacture higher value products. Loblolly pine trees in the U.S. South, for example, reach average maturity within 25 to 33 years. However, they can continue to grow and increase in value beyond age 50. Hardwood trees, like cherry, maple, beech and oak, which are among the more dominant species found in the U.S. Northeast and northern Europe, are often harvested when they are well over 100-years-old – and as they continue to grow, they often continue to increase in value. This dynamic is not characteristic of farmland. Permanent crops and livestock, such as apples, grapes and dairy cows, are depreciating assets, and row crops, like corn, wheat and soybeans, have no long-term value appreciation because they must be harvested annually. In effect, any capital gains generated by a farmland investment are derived primarily from the underlying land. This is not the case with a timberland investment because its capacity to generate appreciation is driven by both its timber value and the value of the underlying property upon which that timber is growing.

Common Investment Features of Timberland and Farmland

Although there are clear differences between the two asset classes, timberland and farmland do share certain features that investors may find beneficial in a real asset portfolio allocation context. Both benefit from technology and productivity gains. Advances in agronomy (agricultural science) and silviculture (forestry science) and genetics are raising the rates of productivity being achieved on farms and forest plantations over time, which can significantly boost returns. For example, the U.S. Department



of Agriculture has calculated that total farm productivity between 1999 and 2009 rose at an average annual rate of 1.6 percent per year.³ Similarly, according to the Brazilian forest industry association (ABRAF) the mean productivity of a eucalyptus plantation in Brazil rose from 36.7 cubic meters per hectare per year in 2005 to 40.7 in 2012 – an average annual gain of 1.5 percent per year.⁴

Both farmland and timberland also offer a wide range of opportunities for improving diversification and overall investment performance. The spectrum of investment opportunities is broad – encompassing numerous crop and timber types that are processed to meet demand in a variety of end-use markets. Investors can own timberland and farmland assets in locations that have diverse climates and soils, and that employ different legal, currency, tax and regulatory structures, and this adds attractive variability – offering investors the flexibility to select investment opportunities that suit their particular risk and return appetites. For instance, established end-use markets, such as the U.S. Corn Belt and the Douglas fir timber market of the U.S. Pacific Northwest may only generate real returns in the range of 5 to 7 percent. However, niche and specialty agricultural and forestry opportunities, like palm oil plantations in Indonesia and teak plantations in Central America, might be capable of generating returns in the upper teens.

In general, investors who are considering their options for including farmland and timberland assets within their portfolios need to be aware of the constraints associated with each asset class. First and foremost among these is the fact that both are illiquid investments. It can take several months to properly sell a farmland or timberland

asset at the best possible price. This is true even in deep and well-developed farmland and timberland markets like those found in the United States. In emerging economies, farmland and timberland markets can be even thinner and disposition processes can be more complicated. For this reason, it is important for investors to recognize that farmland and timberland are both long-term investments that generally do not offer the opportunity for a quick exit.

Investors must also recognize that farmland and timberland investments are vulnerable to changes in governmental policies and regulations. National and regional governments can alter trade, agriculture and land use policies as well as taxes and subsidies for farmers and timberland owners and this can change the economics and dynamics of timber and crop production considerably. For instance, when the U.S. passed amendments to the Lacey Act in 2008, and the European Union adopted the European Union Timber Regulation (EUTR), which outlawed the trade of illegally harvested timber, these policies helped improve market conditions for timber grown in sustainably-managed hardwood plantations. In the case of agriculture, the U.S. Environmental Protection Agency's (EPA) Renewable Fuels Standards (RFS) program mandates the amount of ethanol that can be contained in refined gasoline that has been produced for domestic consumption. Ethanol is currently made primarily from corn-based biomass feedstocks. Consequently, the EPA's goal of raising the RFS from 9 billion gallons of renewable fuels to 36 billion gallons by 2022 could significantly increase demand for corn.

The point is, regardless of whether public policies and regulations are beneficial or harmful, investors who participate in the farmland and timberland asset classes must be comfortable with some level of uncertainty with regard to the impact governmental involvement could have in their activities.

³ U.S. Department of Agriculture, Economic Research Service. "Indices of farm output, input, and total factor productivity for the United States, 1948-2009." January 23, 2012.

⁴ Associação Brasileira de Produtores de Florestas Plantadas (ABRAF). *Yearbook Statistical ABRAF 2013*.



Table 3. This table summarizes the common and differentiating features of farmland and timberland investments.

Feature	 Farmland	 Timberland
Option to reduce operational and product market risk through leasing	✓	
Strong sustained cash yield	✓	Some cases
Prevalent government restrictions to corporate or foreign ownership and operation	✓	Some cases
Flexibility to advance or push back harvests to better align with market movements		✓
Long-term supply growth is limited, which helps prevent an over supplied market		✓
An appreciating asset beyond the underlying land		✓
Continued advances in productivity	✓	✓
Wide diversity of investments by type, market, geography, structure and expected return	✓	✓
Illiquid	✓	✓
Subject to government policy and regulation	✓	✓



Current Prospects for Timberland and Farmland

Investors who have decided to allocate capital to farmland and timberland need to have an informed perspective on the current investment environments for each. As was noted earlier, farmland performed extraordinarily well in recent years – especially from 2010 to 2012. In fact, during that time, its returns significantly eclipsed those of timberland. The questions investors need to be asking are: Will that trend continue and if one wishes to invest in both farmland and timberland which asset class has stronger near term prospects?

Clearly, no view of the future is perfect, but we at TIR believe that timberland offers a more compelling near-term value proposition than farmland. While exposure to both asset classes makes sense, we would advise investors to consider an overweighting to timberland over the next two to three years. We base this view on our analysis of relative property values.

Capital gains represent a large source of potential value for both farmland and timberland investors. Farmland values in both the U.S. and in other parts of the world appreciated strongly after the global recession of 2008 – buoyed, in large part, by elevated prices for agricultural commodities (Figure 6). Timberland values, on the other hand, declined in many markets during this period. For instance, in the U.S. South, the average value of large timberland tracts offered for sale fell 22 percent from \$1,773 per acre in 2008 to \$1,380 in 2010 (Figure 6).

This was no great surprise as timber markets in the U.S. South, which is the largest wood basket in the world, retreated dramatically during this period while markets for staple food crops such as corn and wheat reached cyclical highs (Figure 7). In addition, rising crop prices pushed up income returns for farmland during the period. Conversely, weak timber prices caused income from timberland assets to decline.

But the question we need to ask is whether these price trends are likely to continue? The answer

Average Price of U.S. Farmland & U.S. South Timberland

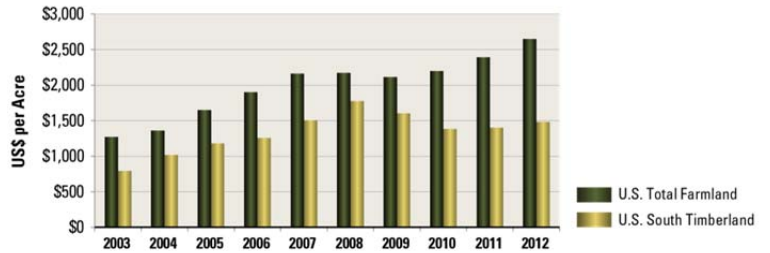


Figure 6. Average prices in the United States for farmland (nationwide) and timberland (South) as tracked by the US Department of Agriculture and Timber Mart-South, respectively.

Price of Corn, Wheat & Southern Pine Sawtimber

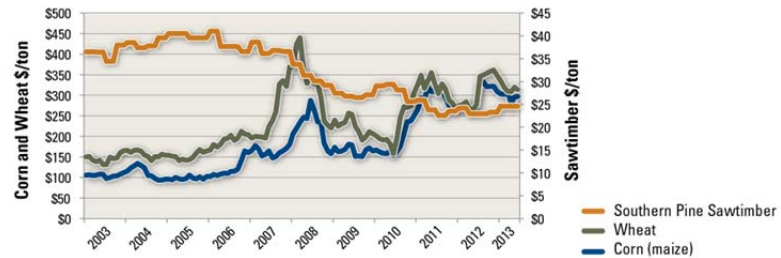


Figure 7. Reported average market prices of corn (maize) wheat and southern yellow pine sawtimber, 2003 through June 2013. Sources: U.S. Department of Agriculture, Timber Mart-South.

depends on how timber markets perform in the future relative to markets for agricultural commodities. While it is very difficult to project market movements, there is reason to believe that gains for many agricultural commodities will not be as robust as those experienced during the last five years – and, that agricultural market fundamentals will lag those likely to be seen in timber markets. In fact, strong corrections in the agricultural sector are quite possible. As was explained earlier, this has already happened with crops like Arabica coffee and sugar (Figure 8), which saw rapid supply responses occur as a consequence of demand and pricing changes.



Looking ahead, many of the major value drivers that caused agricultural commodity prices to climb have retreated. For instance, China's once robust growth has moderated, as has the growth of other leading, emerging markets, such as India, Brazil and Russia. This is having a significant impact on global agricultural supply and demand dynamics. As for developed markets in North America and Western Europe, they also continue to face structural issues that are severely constraining their growth. Meanwhile, supplies of agricultural commodities continue to grow in response to the recent run-up in prices. Furthermore, inventories of agricultural land are growing in Brazil, Africa and Asia. Even the United States, a leading global exporter of agricultural products, is projected to show rising output for many of its major crops over the next decade (Figure 9).

In contrast to the farm sector, the macroeconomic picture for the forest products sector is more encouraging. On the demand side, the U.S. is emerging from an historic five-year downturn in building and construction demand as a result of the housing bubble. During this time, the U.S. population continued to grow at an average rate of 0.9 percent per year. This means that fundamental demand for homes is increasing as 1.3 to 1.5 million new households are being formed each year. However, because of the housing market's challenges, average annual rates of new home construction were below 600,000 during each of the last four years. This has erased the excess inventory of homes that may have existed in the market during this period and has created pent-up demand. As a result, economists forecast that new home construction in the U.S. will exceed 1.0 million annual starts by 2014 – and more than 1.5 million starts by 2016 (Figure 10). This will help drive demand for timber and for end-use building products, such as lumber and panels.

It is not just the U.S. that will see timber demand grow through an expanding housing sector. According to the equity research group at CIBC, China's demographic shift to urban centers and its rising rates of personal income mean its cities are expected to add an average of 11 million housing units per year. Over the next 3 to 4 years, this will

Price of Arabica Coffee & Sugar

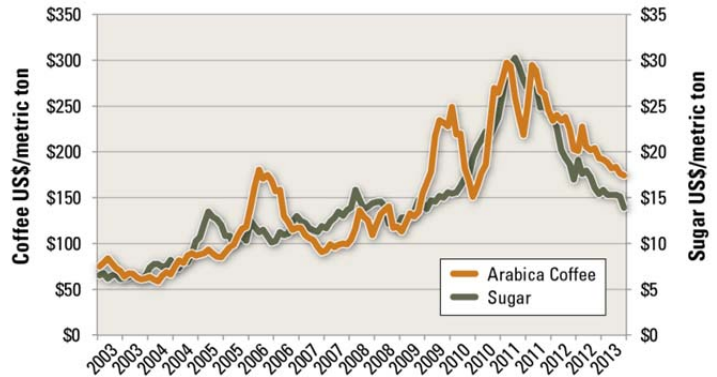


Figure 8. Reported average market prices of arabica coffee and sugar, 2003 through June 2013. Sources: U.S. Department of Agriculture, International Coffee Organization.

USDA Forecasted Increase in U.S. Crop Output (2012/13 to 2022/23)

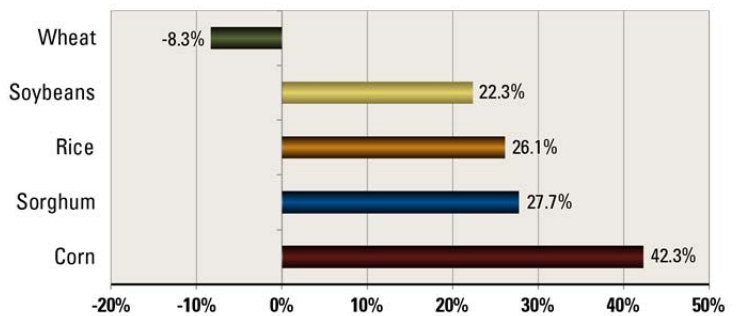


Figure 9. Long-term forecast by the U.S. Department of Agriculture's Economic Research Service of future U.S. total crop production for 2022/23 compared to 2012/13 harvest season.

increase the country's wood fiber deficit by 8 to 10 million cubic meters per year, or about 5 percent per annum.

A third major emerging driver in global wood demand is the push by major industrialized countries to utilize renewable sources of energy. A notable example is the European Union, which has adopted a policy goal of generating 20 percent of its electricity from renewable energy sources, and reducing carbon emissions by the



Historic & Projected U.S. Housing Starts

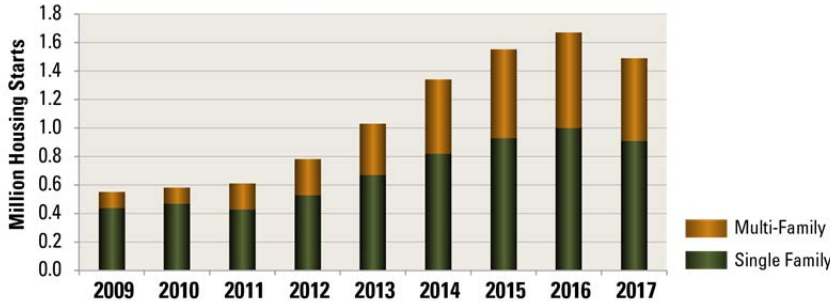


Figure 10. Historic U.S. housing starts through 2012 and projected starts by RISI through 2017. Sources: U.S. Commerce Department, RISI.

same amount, by the year 2020. To attain these goals, several EU member countries, including the United Kingdom, Belgium and the Netherlands, are aggressively developing wood-based bioenergy projects that are utilizing wood fuel pellets. In the U.S. South, alone, existing and planned wood bioenergy plants, including mills that will export pellets to the EU market, are expected to spur an increase in pulpwood demand by more than 25 percent per year.⁵

Against this outlook of increasing global demand for timber, supply pressures are also developing. Canada, which in the past has provided more than 30 percent of the lumber used in the United States, and which also has been a leading exporter of logs and lumber to Asia, has suffered a massive infestation by the mountain pine beetle. The pest has killed more than 40 percent of the softwood timber growing in the western province of British Columbia. Separately, there has been a push by many developing countries, including Indonesia, Malaysia and Brazil, to eliminate the harvest of natural forests and to rely only on sustainably-grown plantation timber. This will mean more and more of the timber grown in those countries will have to originate from forest

⁵ Forisk Consulting: *Wood Bioenergy US*, May/June/July 2013 for wood bioenergy demand. University of Georgia, Center for Forest Business: *Wood Demand Report*, Q2 2013 for total wood demand.

plantations that are being cultivated on smaller land bases.

In conclusion, farmland and timberland both offer healthy, core fundamentals. However, farmland valuations are less likely to show the same rates of appreciation that were experienced during the past three years because many agricultural commodity markets have peaked and some are showing signs of a cyclical correction. Conversely, timberland appears to offer a stronger value proposition – at least for the next three years. Timberland values are poised to rebound as a consequence of the market correction that occurred in 2009 and 2010. In addition, the timber supply and demand outlook is increasingly positive. The U.S. housing market has entered a period of recovery that will result in increasing levels of new housing starts. Furthermore, construction and renovation spending is increasing. Both trends will drive increased demand for timber. Likewise, global wood demand is also increasing. Population growth, rising levels of personal income and the associated demand for more and better housing in China and other developing countries is expected to drive increased levels of wood consumption. In addition, Europe's growing focus on the use of renewable fuels is already spurring increased demand for pulpwood production in the U.S. South and elsewhere.

For all of these reasons, in the near term, a strong argument can be made for overweighting timberland within one's portfolio. In the long run, however, both farmland and timberland will remain compelling investment opportunities. Their risk-adjusted return profiles should converge and this means a well-diversified portfolio can benefit from including both in a portfolio of real assets.



Summary and Recommendations

Since institutional investors first began making direct investments in farmland and timberland in the 1980s, the two asset classes have built solid track records of competitive, risk-adjusted returns. In addition, both have been shown to offer returns that are lowly correlated with the performance of other asset classes and to provide protection against inflation risk. Investors also appear to find their macroeconomic supply and demand fundamentals, and their perceived capacity to provide capital preservation, to be of great interest.

For most sophisticated investors, weighing the relative benefits of farmland and timberland when developing or evaluating one's asset allocation strategy does not require choosing to include or exclude either from one's portfolio because the two asset classes are not mutually exclusive. They can, in fact, be highly complementary, which means a strong case can be made for including both in one's portfolio.

Farmland has historically offered robust cash flows and the option to structure investments around the generation of rental income. Timberland, on the other hand, provides the capacity to time the realization of cash flows by staggering and matching harvests to evolving timber market supply, demand and pricing dynamics.

One advantage farmland and timberland both offer investors is the flexibility to tailor the composition of one's portfolio to one's risk and return profile. For instance, both asset classes offer investors access to mature, conservative, income producing opportunities in well established markets. However, they also offer opportunities to participate in aggressive, niche-oriented specialty markets like Maine blueberry farms or exotic sandalwood plantations in Australia.

As with any asset class, it is prudent to not chase returns in the farmland and timberland sectors – or to make investment decisions based solely on their recent performance. For instance, the strong returns farmland has generated over the last five

years were the result of cyclical supply and demand factors and there is no guarantee that the asset class's performance can be sustained or repeated during the upcoming five years.

In assessing the role farmland and timberland should play in one's portfolio, either separately or on a combined basis, investors should evaluate whether the economic forces that are driving supply and demand for the end use products they produce – agricultural commodities and timber – will continue to support an attractive and acceptable level of performance – one that is calibrated to one's risk and return objectives. This requires being disciplined by developing an informed perspective on the market trends and events that are most influencing value generation within each sector at present, as well as those that are likely to drive performance in the future. In the case of timberland, which is TIR's particular area of specialization, we see opportunities to generate strong performance developing in the coming years as a direct result of three factors: (1) The recent market correction in timberland values; (2) The level of expanded investment in milling capacity that is being observed in the wood processing and manufacturing sectors; and, (3) The rate at which demand is growing globally for wood products that can be used for building, packaging and bioenergy uses.

