Timber growth confers attractive attributes to timberland investments…or does it?

*If you believe the popular literature on timberland investments, you’ll come away thinking that physical timber growth confers a number of desirable investment characteristics to timberland properties.*

*Higher rates of timber growth translate directly into higher rates of return for timberland investments.* This relationship is often used to explain the relatively high returns expected from “fast-growing” plantations of radiata pine and eucalyptus in the Southern Hemisphere.

*Higher rates of timber growth facilitate efforts to market-time timber sales.* Timber that is not harvested continues to grow in volume and value. This allows for a multi-year window during which timber can be stored “on the stump” at little cost and metered into the market in response to price movements.

*Stable and predictable timber growth— which is immune to fluctuating conditions in financial markets— lessens the volatility of periodic timberland returns and “breaks” their correlation with returns for other investments.* Some commentaries go as far as to suggest that the rate of timber growth places a floor on timberland performance.

We think that only the second claim is clearly true. The first and third claims are clearly false, although price responsive timber sales, which are aided by timber growth, may indirectly contribute to the stability and independence of timberland returns.

This confusion can lead timberland investors to make poor decisions about timberland investment and management. We thought it would be useful to set the record straight.

Our perspective on timber growth is best understood by viewing timberland properties as timber-producing factories.

*The factory is the forest itself—the land and timber growing stock. Many of the inputs into a forest factory are natural—rain, sun, air and nutrients in the soil. Other inputs are provided by foresters—genetically improved seedlings, chemicals to control competing plant species, fertilizer and the like. The primary product is timber. Other outputs include the environmental services of forests—recreation, clean water, wildlife and perhaps carbon sequestration credits.*

The financial fortunes of any factory owner depend on the value of the outputs, the cost of the inputs, and the change in the value of the factory itself. Similarly, the rate of return for a timberland property is as follows:

\[
\text{Rate of Return} = \frac{\text{Net Revenue} + \text{Change in Timberland Asset Value}}{\text{Beginning Timberland Asset Value}}, \text{where}
\]

\[
\text{Net Revenue} = (\text{Timber Harvest Volume} \times \text{Timber Price}) - \text{Forest Management and Capital Costs}
\]

With this perspective, let’s evaluate each common claim about the influence of physical timber growth on timberland investments.

**I. Faster rates of timber growth do not translate directly into higher expected rates of return for timberland properties.**

Most participants in timberland markets are pretty smart. They recognize that some properties are capable of producing more timber than other properties, and price those differences into timberland values. As a result, if the trees grow faster on one property than on another, the higher growth rate of the former will simply be capitalized into the asset value.

Consequently, variation among properties in expected return levels is a

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function of differences in the risks associated with the properties rather than their relative productivity. Risks depend on factors such as the depth and diversity of timber markets, the predictability of timber harvest volumes and the robustness of markets for timberland properties. Expected returns from “fast-growing” plantations are relatively high because participants in timberland markets perceive those investments to be relatively risky. In many cases, these investments are located in regions with poorly developed timber markets and considerable sovereign and currency risk (e.g., South Africa).

Indeed, properties with relatively low rates of timber productivity can be priced to generate relatively high returns.

Consider, for example, the U.S. Pacific Northwest. The rate of timber production on properties located in western Washington and western Oregon is among the highest in the United States. In contrast, properties located in the eastern part of these two states, where rainfall is much less abundant, produce substantially lesser amounts of timber. Where are expected returns higher? The less productive East-side timberlands are generally priced to generate higher returns than West-side properties because timber markets are much thinner in the eastern part of the region.

Radiata pine plantations in New Zealand and Australia provide another illustration of an inverse relationship between timber growth and timberland returns. Plantations in New Zealand typically grow at a faster rate than plantations in Australia. Expected returns, however, are generally higher in Australia, where timberland properties are priced at lower levels due to the greater currency exchange rate risk, and perhaps other factors.

In short, expected returns depend on how timberland properties are priced, not on how fast the trees grow.1

II. Timber growth does facilitate price-responsive timber harvesting.

A timberland property is unusual in that factory and product are one and the same. Although there are other examples of convergence between product and factory—a fishery or a cattle ranch, for example—timberland is distinguished by the relatively long life span of its timber product.

This coincidence of factory and long-lived product confers several useful properties to a timberland asset. First, the timber product can be stored on the stump with little risk that it will perish. Other products, such as space produced by commercial buildings or most agricultural crops, perish quickly if they are not consumed.

Second, the stored timber continues to grow in volume and value. This growth reduces storage costs substantially. Although many products can be warehoused for sale at a later date, the cost of the capital tied up in the unsold product is significant. In the case of timber, growth in volume and value on the stump can completely offset this capital cost.

Thus, timber growth eliminates much of the risk of market timing timber sales.

III. Timber growth neither stabilizes timberland returns nor lessens their correlation with returns for other assets.

To be sure, a timberland property will produce a relatively predictable flow of timber over time. Further, properties with an even mix of timber inventory in all stages of maturity will produce a relatively steady flow of timber harvests.

It is also true that this physical timber production is immune to fluctuations in financial market conditions. Trees will grow as long as the sun shines and the rain falls.

None of this, however, by itself, confers stability or independence to returns from timberland properties.

To help illustrate this point, consider that many productive assets or factories possess this same capacity for stable and predictable physical productivity. A commercial building, for example, produces a stable and highly predictable flow of space. An oil well pumps a steady flow of crude oil to the surface. A stable and predictable stream of vehicles can run off the assembly lines of an automobile factory. In all of these cases, stable physical production is also independent of fluctuations in financial market conditions. As long as any of these factories receive proper inputs, they will produce the same flow of products in any economic environment.

Stable production does not lend stability to investment returns from a timberland property, office building, oil well, or automobile factory. Nor does it “break” the correlation between returns for these types of investments.
Figure 1. Regional Softwood Sawtimber Stumpage Prices

Softwood log export prices moved little during the third quarter, while export log volumes continued to shift away from traditional markets. Third-quarter log exports to Japan from Washington and Oregon suppliers were down 17.5 percent over the same period last year, yet shipments to China and Korea were up 36 percent. Japanese mills cutting Douglas-fir and western hemlock continue to shut down, as demand for Japanese finished products remains weak. A similar situation exists for New Zealand radiata pine, where the Japanese packaging sector is running at only about 80 percent and the plywood sector has cut processing levels by 30 percent. All this in the face of increased competition from lower-priced Russian logs has suppliers working overtime to find new markets and keep prices from falling. Stumpage prices in domestic markets in the US Pacific Northwest fell over 5 percent, equating to price levels of the southern US.

Figure 2. Regional Softwood Pulpwood Stumpage Prices

Southern pine pulpwood prices fell again—the seventh consecutive quarterly decrease—with prices now at a level not seen for over a decade. Pulpwood demand continues to fall throughout all regions of the United States due to pulp mill closures, with the third quarter being no exception. Before the events of September 11, many analysts indicated prices had hit bottom. With the possibility of pulp and paper demand slipping further in 2002, pulpwood markets may face additional price declines.

Figure 3. Timberland Prices

Timberland values remained stable in the Northeast and the South and rose slightly in the Pacific Northwest. With slack housing demand, extant declines in lumber and timber prices should begin to show up in lower timberland values in future quarters.
Private market timberland values in the South remained at last quarter’s level. Yet public timberland markets (TEV/SEA), exposed to the general public market declines, lost most of last quarter’s gain by falling $65 per acre.

Lower timber prices continue to pull down timberland income levels in all regions. In the South, lower income combined with flat to slightly lower timberland values, beginning the much-anticipated decline in the region’s pricing multiple. In contrast, the Northeast and Pacific Northwest multiples showed no signs of falling this quarter, as higher-than-normal timberland values continue to outpace earnings.

As public equity markets continue to fall, as measured by the S&P 500 Index, so too do publicly traded forest products markets, as measured by the S&P Forest Products Index. In contrast, private timberland was up slightly, with the All-Region NCREIF Timberland Index returning a positive 0.9 percent for the third quarter.
Figure 7. Timberland Returns (1994-2001)

Weak lumber, paper and packaging markets nationwide impacted returns to public market forest products companies, as measured by the S&P Forest Products Index. Similar declines occurred for public timber-intensive companies in the third quarter as calculated by our Securitized Timberland Index.

Figure 8. Hancock Securitized Timberland Index

Share prices for all five companies in our Hancock Securitized Timberland Index fell during the third quarter, mirroring declines experienced in most public equity markets. The number of companies in our HSTI was reduced from five to four in October when Plum Creek’s acquisition of the Timber Company was finally completed. Plum Creek’s market capitalization is now close to $5 billion. The market capitalization of our entire HSTI was only $5.2 billion at the end of the third quarter. Thus, in future quarters, our HSTI is likely to follow closely the share price of Plum Creek.
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and other assets. Rather, variability in investment returns—and co-variability of the returns with those of other assets—depends on fluctuations in the price of the product and in the costs of producing the product.

There are few priced inputs for timber production—time is the most important. Consequently, timberland returns are not affected much by changes in the costs of inputs. Timberland returns fluctuate primarily because of changes in timber prices, which affect both net revenues and, indirectly, timberland asset values.

The lack of co-variance between timberland returns and returns for other investments results from the independence of rates of timber price change. In part this independence may be a product of the capacity for timberland owners to time markets for selling their timber. That is, as we have discussed, the fact that timber grows means that timberland owners can wait a period of time for favorable prices rather than selling timber in a down market. This means that as demand for timber moves up and down (say, due to changes in the demand of housing), timberland owners will seek to sell more timber in times of high demand than in times of low demand. This might tend to reduce the fluctuations in timber prices, and break their correlation with macro-economic demand drivers.

To sum up, trees do indeed grow. Timber growth is the ultimate source of investment returns from timberland properties. But the popular timberland investment literature tends to overstate the benefits that timber growth confers to timberland properties.

Timber growth does facilitate market timing through storage of timber on the stump at little cost. However, fast growth does not mean high returns. Furthermore, stable and predictable growth neither lessens the volatility of timberland returns nor “breaks” their correlation with returns for other investments.

1 The notion that faster rates of physical timber growth translate directly into higher rates of return for timberland properties often stems from an incorrect assumption that the rate of return for timberland is simply the sum of the rates of physical timber growth, timber price change, and land appreciation. Such a view ignores the crucial role of the initial purchase price in determining timberland returns.

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Figure 1. The composite price for southern sawtimber is based on quarterly average Timber Mart-South published prices for pine sawtimber and chip-n-saw stumpage. Pacific Northwest prices are derived from quarterly average Log Lines published prices for whitewoods and Douglas-Fir with internal analysis of logging costs for stumpage calculations. New Zealand export prices are based on New Zealand Ministry of Forestry quarterly average published prices for Radiata unpruned A, J and K sort export logs with internal analysis of logging costs for stumpage calculations. Northeast sawtimber prices are calculated from internal analysis.

Figure 2. Pulpwood composite prices are derived from quarterly average Timber Mart-South published prices for southern pine pulpwood stumpage, Log Lines published whitewood and Douglas-fir pulp logs with internal analysis of logging costs for the Pacific Northwest, and HTNG analysis of Spruce/Fir pulpwood in the Northeast.

Figure 3. Regional NCREIF timberland market value per acre is derived by dividing the total regional market value at quarter end by the number of acres reported in that region. Due to the small sample of property in the Pacific Northwest in 1987 Q1 and 1987 Q2, these values were back cast from 1987 Q3 with quarter-end appreciation returns. Market values for Northeast timberland were re-estimated for the period 1999 Q4 through 1999 Q3 to adjust for what we believe to be an anomalous property included in the NCREIF database during those quarters. This re-calculation in the Northeast results in a re-calculated All-Region NCREIF return series during the same period. Libboston Assoc. database was used for S&P 500, U.S. T-Bill and S&P Forest Products quarter-end returns (dividends reinvested).

Figure 4. Timberland Enterprise Value per Southern Equivalent Acre (TEVE/SEA) for five timber-intensive publicly traded companies compared to southern timberland values per acre calculated from the NCREIF database. TEV is a quarterly estimate based on total enterprise value (total market equity + book value debt) less estimated value of processing facilities, other non-timber assets and non-enterprise working capital. SEA uses regional NCREIF $/acre values to translate a company’s timberland holdings in various regions to the area of southern timberland that would have an equivalent market value.

Figure 5. EBITDDA multiples are calculated using NCREIF timberland value per acre at quarter end divided by a trailing four-quarter average NCREIF net income per acre.

Figure 6. Total quarter-end returns to timberland based on the NCREIF database. Northeast returns prior to 1994 are based on the John Hancock Timber Index. Additional adjustments were made to return calculations in the Northeast for the period 1998 Q4 through 1999 Q3 to adjust for what we believe to be an anomalous property included in the NCREIF database during those quarters. This re-calculation in the Northeast results in a re-calculated All Region index series during the same period. Libboston Assoc. database was used for S&P 500, U.S. T-Bill and S&P Forest Products quarter-end returns (dividends reinvested).

Figure 7. Total quarter-end returns to securitized timberland based on internal analysis. The Securitized Timberland Index includes Plum Creek (PCL), Crown Pacific (CRF), U.S. Timberslands (TMBZ), Deltic (DEL) and The Timber Company (TFC) (dividends reinvested).

Figure 8. The Hancock Securitized Timberland Index (HSTI) uses a base-weighted aggregate methodology similar to that used to construct the S&P 500 to calculate a market capitalization-weighted value for five publicly traded timber-intensive forest products companies. Base weights were readjusted for the emergence of new companies or at the beginning of each year. Dividends are not reinvested. The companies included in the HSTI have no investment relationship with the Hancock Timber Resource Group.

References to expected investment performance in this newsletter are based on historical information and are based on management’s projections. Potential for profit as well as for loss exists.