

U.S. Timberland post-recession

Is it the same asset?

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About R&A Investment Forestry

R&A Investment Forestry is a broad-based forest investment management and advisory company focusing on institutional investments in forestland. In the U.S., with a growing focus on environment, we have particular interest in the interface between financial investors and Conservation. R&A's expertise derives from Jim Rinehart, its President, and our broad range of associates developed over 25 years in the forest investment industry. With deep global relationships and no allegiance to any given manager, R&A manages specialized property-specific direct investments and provides dispassionate strategic advice directly to institutional investors.

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About Forest Economic Advisors, LLC

Section 4, Economic Outlook, was contributed by Forest Economic Advisors LLC (FEA), a Boston area-based forest economics and forecasting firm with strong ties to the forest investment community. FEA is an owner-operated company comprised of engaged, experienced and informed analysts covering the forest products industry for 15 years. For much of that time, R&A has relied on the FEA team to provide actionable information, rigorous analysis, insightful rationale, and disciplined economic outlook.

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Is it the same asset?

Since its inception as an investment asset class in the mid-80s, the institutional timberland portfolio has grown from less than \$1.0 billion to a global portfolio of more than \$50.0 billion, primarily in the U.S. As the primary providers of timberland supply, the U.S. forest products industry has effectively exited timberland ownership. At the same time, timber production has come to share the stage with real estate, which today can comprise 40% or more of timberland value. And Conservation has come to play a more central role in shaping perception, acquiring easements, even timberland, as fee simple owners. All of these changes have implications for the key portfolio attributes that timberland traditionally brings, including (1) high risk adjusted return, (2) low correlation with other financial assets, and (3) ability to hedge inflation.

U.S. Timberland will decline another 10% to 15% in value. Timberland has fared better than expected through the economic crisis, having lost only 4.75% of value in 2009, as measured by the NCREIF Timberland Index. It is the view of R&A Investment Forestry that another 10% to 15% decline has already occurred, hidden by low transaction volume and the valuation process. A sense for why this should be the case will help to form a rational view of the future.

Part 1: Evolution as an asset class

Timberland has progressed through a series of phases characterized by changing competitive conditions.

1983 to 1995. During its initial stage, forest products demand was high, resting heavily on Japan. Stumpage¹ prices were increasing at a real rate of 1.5% per year, competition was low, and values other than timber value were not considered. Expected real² returns were 6.0% to 10.0%, depending on region and perceived risk. Forecasting assumptions were aggressive.

Timberland did well, in part due to the listing of the Spotted Owl and the removal of National Forests as a source of supply. Stumpage prices sky-rocketed and cumulative return from 1986 to 1992 was 26.75%. By 1995, investment interest was increasing rapidly in hopes that this high level of return would continue.

¹ Stumpage price is the value on a 1,000 board foot basis (MBF) of uncut timber, “standing on the stump”, as distinguished from delivered log price, which incorporates costs of harvest and delivery.

² Industry convention generally speaks of return in “real” terms, in this case EBITDDA plus cap ex, net of inflation, i.e., operating cash flow in constant dollars. “Nominal” is described similarly but includes inflation. Likewise, changes in stumpage price, either historical or forecast, are generally expressed in real terms. If inflation were 2.0, real return of 8% would equate to nominal return of 10%. Similarly, a projected increase in stumpage price of 1.0% real would be 3.0% nominal.

1996 to 2000. (See *Figure 1*) Over-supply was becoming an issue, resulting from enhanced productivity through technology and increased U.S. and global plantations. At the same time, demand had diminished, due largely to the demise of the Japanese economy and a resulting 50% decrease in Western lumber capacity. Meanwhile, more investors wanted in, forcing timberland prices to increase in the face of falling revenues. Feeding timberland supply was the forest products industry, now in a divestiture mode encouraged by Wall Street. With C Corp double taxation and low current income, timberland simply became more valuable to investors than to the industry. The fact that per acre values continued upward in the face of increased supply attests to the magnitude of capital available from institutional investors. To resolve the C Corp tax handicap, MLPs and REITs began to enter the scene. Some forest economists feared that the market was becoming overheated.

From 1996 to 2000, the forest products industry downsized their portfolio by \$2.5 billion, mostly sold to investors through TIMOs. Average annual return from 1996 through 2000 had tapered to a nominal 18.9%, with 2000 a disappointing 4.4%.

2001 to 2004. (See *Figure 2*) Just as pressure to “cool down” began, the tech bubble burst, the stock market declined and still more institutional capital became available, actually accelerating the unprecedented transfer of assets. Investors became begrudgingly content with projected returns of 5.0% to 6.0% in real terms, which placed much pressure on managers to eke out more. Investment in long-term “soft” activities gave way to cost-cutting, eliminating much of the R&D, silviculture, and community relations that industry had invested in. Focus on parcelization intensified as a means of increasing per acre value.

During this period, the forest industry was the only net seller, shedding 14.1 million acres. Returns, which had continued downward at the period’s outset, had turned upward on the basis of valuations driven by new high-priced transactions. Average return for the period was 3.88%, but in 2004 annual return, as measured by the NTI, was 11.2%.

2005 to 2009. (See *Figure 3*) By the end of 2009, industry had sold off another \$15.0 billion of timberland, essentially completing the transfer. Weyerhaeuser is the only integrated forest products company remaining and they will convert to a REIT by the end of 2010. From 2005 to 2009, industry gave up another 14 million acres, with TIMOs acquiring 11 million of that. Annualized nominal return for the period was 10.9%. With the economic crisis, however, return in 2009 was negative 4.75%.

From 1983 to 2009, 43.4 million acres valued at \$39.7 billion changed ownership type. The forest products industry gave up 37.7 million acres valued at \$33.1 billion, while TIMOs and REITs gained 26.9 million acres valued at \$30.4 billion. (See *Figure 4*).

Part 2: Review of attributes

Average Per Acre Value vs. Discount Rate

In general, as weighted average value/acre has increased, discount rate has declined. In 2008, when per/acre value peaked, it had risen more than 35% in three years. By the end of 2009, price was still 27.9% higher than in 2005. This has been a period of rapid expansion, high competition, and high demand - conditions ripe for overheating. Investors should be cautious that returns enjoyed by earlier participants not prove to be at the expense of new capital. (See *Figure 5*)

The NCREIF Timberland Index of Return

Performance Over Time. The NTI was established to provide investors an independent measure of timberland returns. The data series begins in 1987. *Figure 6* depicts the timberland index from 1987 forward, distinguishing between Income and Capital Appreciation, both additive components of return. Timberland has been exemplary as an asset class.

There are cautionary observations as well. (1) Both performance and expectation have declined over time. (2) Annual income, primarily from timber sales, has been highly variable as a proportion of total return, but, in general, it has been downward.

Cumulative Annual Return. (See *Figure 7*) Cumulative annual nominal return has diminished steadily over time, from a high of 31.3% in 1989 to 14.1% in 2009. Return since 1997 has declined from 14.75% to 8.5% by 2009. Note that an investor entering at the end of 2007, would be at 2.14% today. Success will become increasingly dependent on acquisition discipline.

Interpreting NCREIF. The NTI is a useful gauge of performance for an asset class whose value is difficult to measure and based on relatively few transactions. It does have acknowledged weaknesses. Capital appreciation, the largest component of return, is based on appraisals. Timberland appraisal in the current environment relies on few comparables, lags reality, and is “sticky” on the high side, hiding actual value.

Portfolio Efficiency. (See *Figures 8 and 9*) Timber returns have been argued to have low to negative correlation with stocks and thus enhance portfolio efficiency. More precisely, timberland appears to have minor negative correlation in some short-term time intervals, but zero correlation in the mid to long terms – itself a positive portfolio attribute. Still, differences between assets diminish in periods of economic decline and structural changes can change relationships. Enhanced efficiency assumes a timber allocation of 10% or higher, where most have been less than 2%. There is room for higher allocation, but a rush to achieve it will create upward pressure on price.

Timberland and Inflation. *Figure 9* indicates consistent positive correlation between timberland and CPI, which applies across regions but not within. Further, because price capitalizes expected inflation, true inflation hedge applies more specifically to high “unexpected” inflation. We believe that timberland, like other “hard” assets is,

and will remain a strong inflation hedge. However, the analytical relationship between timberland return and unexpected inflation shows R^2 of only 0.14. A revised statistical strategy that will reveal higher statistical confidence would be useful.

Part 3: Components of value

Timber Component. While valuation has become increasingly complex, the essential calculation of acquisition price remains based on discounted operating cash flow over a defined time period. Exit is depicted as a hypothetical sale. Calculation of expected income from timber applies a real price appreciation rate (RPAR), which is now generally set at zero except in periods of price recovery or decline, when stumpage price can change sharply. Applied real discount rates have declined from a range of 6.0% to 10.0% to a range of 4.5% to 5.5% across all regions.

Underlying Land Value. Previously, value of underlying land was simply the NPV of future harvest in perpetuity. Today, bare land has intrinsic value higher than value in growing trees, even where its applied use will remain in timber for the foreseeable future. This value is based largely on access and the regional culture of land use.

HBU – Parcelization and Development Value. HBU (Higher and Better Use), referring to value in a higher economic use, has joined timber as a factor in timberland investing. The line of demarcation tends to be legal parcelization, which allows large tracts to be subdivided into parcels that can be sold separately at higher per acre values. HBU increases with available infrastructure. Non-timber value of remote timberland can represent 5.0% to 40.0% of total where parcelization has occurred. Where non-timber values are high, the investment may still be sound, but the interaction between components has become increasingly complex, each requiring separate assessment, risk analysis, and strategy.

Biomass. Woody biomass has received much attention as a source of renewable energy for heating, electricity and transportation. In the U.S. South, renewable energy competes with pulp and paper as a biomass use, which provides investment upside. However, there are factors that will limit the impact of new apparent demand. (1) Demand for biomass will first simply replace diminished demand for pulpwood by a receding pulp and paper sector, (2) less than 50% of announced biomass projects are likely to become operational (See Figure 10), (3) the need for low-cost biomass feedstock will limit the ability of price to exceed cost of production.

Climate Change and Carbon Credits. Reducing and monitoring greenhouse gases (GHGs) relies on new and costly technologies. GHG reduction policy alternatives involve limiting emissions and either taxing excess or developing markets for “carbon offsets”, so-called “cap and trade.” Forests absorb carbon and it is thus tempting to view carbon offsets as a marketable forest product. There are impediments, however, including (1) lack of global cooperation, (2) complexities of carbon accounting that can allow “gaming” the system, (3) high opportunity cost of offset production *vis a vis* higher value products like sawtimber. Cap and trade is not assured, and, in fact has been declared “dead” by some inside observers.

Payment for Ecosystem Services (PES). Ecosystem services comprise all of the environmental benefits that result from forests, including drought and flood mitigation, run-off regulation, biodiversity and others. The potential for PES has resulted in a growing investment industry that creates and markets mitigation units to developers and emitters or to polluters who have incurred liabilities for natural resource damage.

Ecosystem Marketplace, a private non-profit, forecasts a combined global PES market of more than \$1.0 trillion per year by 2020. (See Figure 11) This estimate is highly generalized, based on sparse information, and cannot be verified. To the extent that such a market materializes, forest investors will benefit.

Conservation. During the past decade, Conservation has come to see sustainable harvest as a goal preferable to fragmentation and development. Some larger conservation organizations, such as The Nature Conservancy and the Conservation Fund, have acquired timberland on their own behalf. NGO (Non-Government Organization) capital has been limited, however, and transactions have focused on the Northeast and North Central regions where per acre values are low and environmental payout is high.

There is opportunity for financial investors and Conservation to align. Where conservation and financial values can be separately assessed, financial investors may operate subject to a “working forest easement” that constrains defined management options, primarily parcelization. In this case, Conservation “co-invests” by acquiring and retiring development rights, leaving the financial investor with a pure timber investment.

There are risks. (1) removal of development value diminishes down-line options, (2) easement restrictions tend to be perpetual in nature, (3) to the extent that potential exit buyers are averse to easement risk, liquidity is diminished.

Part 4: Economic Outlook

(Contributed by Forest Economic Advisors, LLC)

Macro Outlook *(See summary table, Figure 11)*

GDP. The US and Canadian economic recoveries are in an early stage, with household indebtedness and sluggish job markets ensuring that recovery will be slow. Return to full employment will take another three to five years and lingering effects will last through the decade. GDP growth rate will decline to 2.0% to 2.5%, and will average 2.5% between 2010 and 2025.

Inflation. Employment overhang will balance public debt, resulting in inflation under 2.0% for at least another 2 years. Over the next 15 years, inflation will average 2.4% in the U.S.

Oil. The FEA forecast shows a generally appreciating trend from 2010-2025, with benchmark prices averaging \$86 per barrel (in 2008 dollars) and varying from \$60 to \$105.

Housing Outlook (See Figure 12)

Housing starts will recover gradually in 2010 and remain well below underlying demand in 2011. Over the longer term, favorable demographic trends assure that home-building will return at least to levels seen in the late 1990s and early 2000s. Housing will trend toward more multifamily homes, so per unit wood usage will diminish. Home size will diminish as well.

Forest Products Outlook

Solid Wood Products and Panels. With a pending recovery of residential construction and improvements, the long-term outlook for solid wood products is positive. Recovery in the short term, however, looks daunting. While year-over-year percent increases will be impressive, actual consumption will remain weak. In the longer term, demand will return to a more normal cyclical pattern.

Pulp and Paper. The outlook for pulp and paper as a source of timber demand is grim. Facing electronic substitution, the traditional link between real GDP growth and graphic paper consumption has been weakened in all economies, but particularly in developed nations. US graphic paper consumption and production will decline by 25 to 30% over the next 15 years.

The long-term outlook for the US paper packaging sector is mixed. Paper packaging follows manufacturers of nondurable goods, which explains China's explosion in paperboard capacity over the last decade. On the positive side, the primary substitute for paper packaging is plastic, which is vulnerable to rising oil prices as well as environmental regulation. Consumption of paper packaging will remain at current levels.

Pulp producers face competition from offshore, particularly South America. Import share of pulp will increase from 10% to 17%.

The US Timber Outlook

Sawtimber Markets. (See Figures 16 a & b) The current rally notwithstanding, recovery in sawtimber markets will likely be modest in the near term, with total consumption remaining below pre-recession levels until 2012. Timber owners have deferred harvest during the last four years, resulting in an accumulation of merchantable volume, which will further limit price recovery in the near term. In the mid to long term, prospects for sawtimber improve substantially with the recovery of housing.

Significant shifts in North America's sawtimber supply will also support higher sawtimber pricing. US market share will increase as a result of the Mountain Pine Beetle outbreak in British Columbia, which will have killed 70% of BC lodgepole pine by the time it is over. Adding to supply pressure, 8.5% of Western sawtimber will be lost to HBU.

The combination of strong demand and a significant loss of supply will support a robust recovery in sawtimber pricing over the next 15 years. Inflation-adjusted sawtimber prices are expected to be near their peak levels of 2004-2005 by mid-decade. Imports and improved sawmill efficiency will limit increase beyond that.

Pulpwood Markets. The outlook for US pulpwood markets is mostly positive, with regional variation between the major producing regions. In the near term, economic recovery and a weaker US dollar will support modest improvement for U.S. pulp, paper, and OSB mills. In the longer term, diminished U.S. paper production will be offset by demand for biomass as renewable energy.

Woody Biomass. Growth of renewable energy and resulting increased demand for woody biomass will not bring substantial marginal value to forestland owners. Increased roundwood demand for bioenergy will simply offset a decline in pulpwood demand from a declining paper industry and high harvest and delivery costs will fully absorb stumpage profits. Further, relatively low competing energy prices will restrain potential price run-up.

Part 5: Post-recession timberland — Is it the Same Asset?

The following represents the scenario most likely in the view of R&A Investment Forestry.

Will Timberland Value Decline?

Of key concern to timberland investors is timberland valuation and the potential for further correction. By second quarter of 2008, it had been our sense that the market had become overheated and more restraint was necessary – which we stated in a presentation to the *Who Will Own the Forest* conference in Portland, OR on September 8, 2008. The fall of Lehman Brothers one week later underscored the point. In the months following, it had been our expectation that portfolio values would be off by 20% by EOY 2009, equating to an increase in discount rate of approximately 200 basis points.

That decline has not yet manifested itself. Portfolio value at EOY 2009 was off by only 4.75%, as measured by the NECREIF Timberland Index. It remains our sense that the true correction remains hidden behind low transaction volume and valuation mechanics and that timberland value has, in fact, already declined in real terms by another 10% to 15% of “pre-crash” value. Value will trend upward from there. If substantial transactions occur by EOY 2010, this decline will likely be reflected in the NTI.

What Leads Us to This Conclusion?

Appraised Values Lag Reality. Timberland portfolios are revalued through a “mark-to-market” appraisal process. With low transaction volume, evidence on which judgments are based is sparse. Thus appraisers must rely on few and outdated transactions that do not fully reflect current value, causing appraisals to be “sticky” on the high side. Given the current bid/ask spread, and the fact that typically low debt levels fend off distress, this circumstance could last considerably longer. Ultimately, however, markets move and appraisers will appraise closer to reality.

Economic Recovery Will Be Slow. The U.S. economic recovery will take an extended period to complete. Real stumpage prices most likely hit bottom in 2009, but will not be at their 2005 levels in real terms until 2015 and will not return to 2000 levels in the foreseeable future.

The Nature Of Housing Demand Has Changed. Deep corrections can be structural. If the current circumstance creates a cultural propensity to delay household formation, pent-up demand will not be fully realized and housing recovery will be delayed.

Higher Perception of Risk Will Raise Discount Rate. The level of long-term risk in timberland has been under-acknowledged. While the standard measures of return volatility indicate relatively low risk, timber rotations transcend business cycles, exposing timberland to longer term risk. The Mountain Pine Beetle is a case in point.

It is our sense that discount rates for timberland will return to 6.0% to 7.5% real for an extended period until new revenue sources solidify and prove sound for the long term. The market is as yet undecided.

Timberland Supply and Demand are Uncertain. For 25 years, the primary supply of timberland has been the forest products industry. With their exit, new supply must come from existing financial investors whose acquisition behavior is well known but whose divestiture behavior is not. Expiration of closed end funds is one possible source. REITs, with a preference for mature age classes, may provide another through divestiture of young stands.

As relates to demand, there is some speculation that timberland might reintegrate to a degree around renewable energy. We see this as unlikely, except at very early stages of the industry's development, on the same grounds that paper companies divested of their timberlands. Renewable energy depends on inputs of low cost raw material, and highest forest value will remain in sawtimber, with housing as the primary end use.

Liquidity Will Bring A Premium. The economic downturn has left pensions and endowments strapped for cash. This will take years to correct, which in the near to mid term will lower the level of demand for timberland with young age-class distributions, giving an edge to properties with higher near term cash flows.

Carbon Offset is Not a Forest Product. There is much uncertainty around the potential for carbon offset markets and we are skeptical that they will develop in the near term or in a structure that will make carbon credits a reliable source of revenue. Investment in carbon offsets may be appropriate for funds targeted to speculative return, but they are not a forest product and should not be part of a forest investors' acquisition analysis.

Biomass Will Be Important – But Will Remain the Lowest Value Forest Product. Renewable energy from forest biomass will be additive or neutral to value, but it is not likely to lead to substantive additional value.

<p>Not a game-changer. While total demand will increase by 60%, biomass will not be the game-changer that some have hoped for. Sawlogs for lumber will remain the core source of timberland value.</p>

HBU Values will Increase. US Population is expected to increase by 42% by 2050. Demographics and population dynamics favor the continued increase of HBU as a component of value. However, its risk profile is not the same as pure timberland, which should be acknowledged in acquisition analysis.

Ecosystem Services Could Be a Long-Term Game-Changer. Environmental awareness has increased exponentially during the last decade and some environmental outputs have already come to market. However, the importance of the economic role of ecosystem services must currently be characterized as a guess. It may prove to be the most important component of timberland value, but not in a currently investable time frame. Different risk metrics must be applied.

Part 6: What should investors do next?

- **Develop a Plan.** This is a time for research and outreach that will provide for considered action as opportunities arise.
- **Develop Internal Expertise.** Timberland has become a far more complex asset. The next period will reward a higher level of internal capability and proactive engagement on the part of investors and their direct advisors.
- **Be Selective.** For the next year, values are more likely to decline than increase. Sound acquisitions will be opportunistic for the time being. Discipline will serve well.
- **Avoid the Bandwagon.** Overheated expectations of additional value from carbon, biomass, and other emerging revenues are unrealistic. New revenues take time to develop and will likely take a form that differs from current expectation.
- **Get to Know the Timberland Investment Managers.** The array of managers has expanded, providing both more options and greater performance variability. Be proactive in getting to know them. Internal expertise will make specialized local management an option.
- **Retain Discretion And Control.** Separate accounts or other routes to retention of control may serve better in some circumstances than traditionally structured and less liquid commingled funds.
- **Peak Values Are Behind Us for the Time Being.** If you currently own timberland and have the sense that the market is still at 4.5%, your strategy should reflect that.

Our Conclusion?

In a September 2009 newsletter, Morningstar drew the conclusion that “The party’s over!” While we would characterize it otherwise, it is true that expectations of dramatic returns of 20% or more that timberland has enjoyed during narrow time intervals in the past are unlikely to be met in the future. Conversely, apparent real discount rates of 4.0% to 5.0% are not reflective of the inherent long-term risk of the asset. We think upward adjustment to 6.0% to 7.5% real is likely and it could be higher – or lower - depending on site specific circumstances.

Anticipated adjustments will likely manifest themselves during the next 12 months. When that occurs, timberland value will grow from there, generating a return reflective of its risk. With expected population growth of 42% by 2050, increased housing demand, and pressure on HBU, timberland is favored by the long term. In fact, the party is not over, it has simply become less raucous.

Timberland will continue as a steady asset, retaining an important role in institutional portfolios.

U.S. Timberland Post-recession

Timberland became an institutional investment asset in the mid 1980s. Since then, the total institutional timberland portfolio has grown from less than \$1.0 billion focused on U.S. timberlands to more than \$50 billion globally and from less than 1.0 million acres to more than 50.0 million. Timberland investment managers have grown in number from 3 to 24. The integrated forest products industry in the U.S., which once owned the majority of industrial timberland, has effectively exited forest ownership. Investment value, which in earlier stages was comprised primarily of timber and underlying bare land values, must now resolve non timber real estate values (HBU in the vernacular of the industry, for “Higher and Better Use”), which in some cases can be as much as 40% of total property value. In addition, Conservation has come to play a more central role, changing the very vocabulary of the business from “timberland”, with its implied focus on fiber and solidwood outputs, to “forestland”, which encompasses habitat and ecosystem values in addition. All of these changes have implications for the key portfolio attributes that timberland traditionally brings.

The most important question impinging on forest investing today centers on the aftermath of the global financial crisis that struck in September of 2008. Timberland has fared relatively well with respect to the resulting value “reset” that has eroded other assets. A sense for why this should be the case and a sober assessment of the future will help to determine what to do next, whether one holds timberland now or might at some future time.

The primary purpose of this review is to encourage an updated appreciation of timberland as a maturing asset class for institutional investors. No doubt, given an increasing global population and inevitable economic recovery, timberland will maintain its appropriate role, but it is not the timberland of twenty years ago. A solid awareness of its changing nature and complexity will be useful.

This discussion considers (1) the history of timberland as a financial investment through the financial crisis and nascent recovery, (2) attributes that have drawn investors to timberland and how they may have changed, and (3) a rational view of what is likely to be in store.

Part 1:

Evolution of timber as an investment class

Timberland has progressed through a series of phases, characterized by changing competitive conditions.

Phase I – 1983 to 1995 - Life Was Easy

Timberland as an institutional investment class is relatively new. Initial investments were “accidental”, resulting primarily from loan foreclosures by agricultural lenders. They did well, however, and early investment managers, realizing timberland’s arbitrage potential (Rinehart, 1985) began to pursue opportunities on behalf of institutional clients, mostly buying non-strategic lands from forest product companies. From its earliest point, timberland was found to have three key portfolio attributes: (1) high risk adjusted return, (2) low correlation with other financial assets, and (3) good inflation hedge. These remain the basis of investor interest in timberland today.

During this period, the primary efforts of Timberland Investment Management Organizations (TIMOs) were in marketing an unknown asset class to a very cautious pension investor. Persistence prevailed, however, and by the mid ‘90s the TIMO industry was underway. Forest products demand was high, in part due to a booming quality-oriented Japanese export economy, timber was perceived as being in short supply, and stumpage prices were enjoying appreciation rates of 1.5% per year, net of inflation, with no sign of slowing. Forecasting assumptions were assertive. Competition was low, operating at the periphery of the forest products industry, and values other than timber value were not, in general, part of the equation. Thus HBU, where it existed, came along for the ride. Expected real returns, as extolled by TIMOs, were 6.0% to 8.0% in the U.S. South and 8.0 to 10.0% in the West – very attractive in an environment where imperfect markets could easily lead to windfall.

Those who took the plunge were well rewarded. When the Spotted Owl was listed in June of 1990, National Forests essentially ceased harvesting timber, western supply dropped by 50%, mills began to panic and prices shot up even in the South. This single-most important event affecting timberland value was largely unexpected, by 1992 bringing a cumulative rate of return of 26.75% to early investors.

But there is room for caution here. By 1995, the number of investors coming into the market was increasing dramatically, and now they were expecting higher than “expected” returns, putting pressure on TIMOs to continue to deliver double-digit performance. Managers never promised 23% returns, but investors nonetheless hoped they would continue.

Phase II – 1996 to 2000 – Not So Easy After All

Where 1985 to 1995 had been about market development and client awareness, by 1996 it was becoming a timber supply story. Soaring log prices, great for timberland investors, had by now caused Western mills to close and capacity to move to the South, pulling demand with it. Separately, the bottom had fallen from the Japanese economy and western timber prices had plummeted in the face of diminished demand. Plantation development and technology had advanced, increasing per acre productivity to the point that it seemed a “Wall of Wood” was coming from every direction, including Australia, New Zealand, and South America. A convergence of diminished demand from Japan and increasing supply from higher productivity and global plantation expansion caused Southern sawtimber prices to fall 26.9% and western Douglas fir to fall 47.7% between 1998 and 2001. (RISI, 2003)

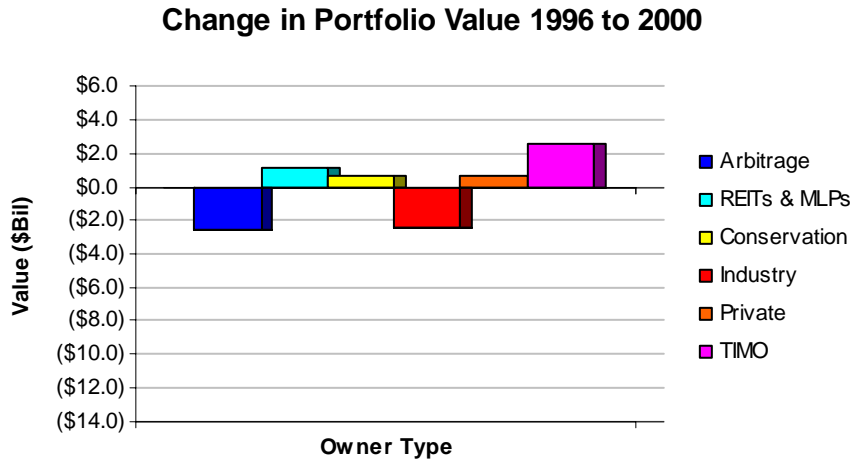
At the same time, there were more investors buying timberland, forcing timberland prices higher in the face of declining income. (Aronow, 2004) Feeding the pipeline was the forest products industry, facing mounting pressure to increase current return on equity. Timberland, with much of its value in the form of capital appreciation, was not performing well for public companies, most of which were C Corporations subject to double taxation. This resulted in marching orders from Wall Street to “unlock timberland value”, i.e., to sell it. Raw material could then be purchased from the new owners. So a traditional orientation to self-sufficiency began to be replaced by the realization that one needn't own the forest in order to have it.

With the forest products industry holding approximately 50 million acres of U.S. timberland and now willing to sell it, abundant supply could have been expected to hold price in check. The fact that per acre values continued upward attests to the amount of capital available from institutional investors and to timberland's attractive portfolio attributes. In fact, as early as 2001, some forest economists began to wonder if timberland might be experiencing its own “irrational exuberance.” (Washburn, 2001)

Figure 1 represents net change in timberland value held in six ownership types representing all large-scale forest owners. In the five year period from 1996 to 2000, a net \$5.0 billion of value representing approximately 7.9 million acres transferred ownership to institutional investors, transacted primarily by TIMOs. Approximately 50% of this value came from the forest products industry.³ The rest came from a single seller, Cavenham Forest Industries, a large arbitrage investor that had accumulated more than 1.5 million acres in 1985 through a series of corporate takeovers. That was a trickle compared to what would happen next, but it clearly established that the separation of timber ownership from processing was gaining momentum and the forest products industry had become net sellers.

³ In fact, during that period, industry actually divested of \$10.2 billion in value, but acquired \$7.8 billion back. This would be the last interval during which industry would be a major buyer.

And a new class of investor had entered the scene. In addition to TIMOs, the asset class began to attract so-called “pure-play” publicly traded corporate-style investors – Master Limited Partnerships and Real Estate Investment Trusts.



Source: R&A Investment Forestry

Figure 1. Change in Portfolio Value 1996 to 2000

Timberland held directly is highly illiquid - from the time a sell decision is made to the time of actual sale can be more than a year. REITs and MLPs, with shares publicly traded in the stock market, resolve this issue. Being tax pass-through vehicles, they also resolve the double taxation faced by C Corps. So some integrated forest products companies began to convert to REIT and MLP structures.

Like public forest products companies, however, REITs and MLPs, while they avoid double taxation, are subject to pressure on current income in order to maintain share value. In addition, they are big borrowers with substantial debt. So when product prices decline, more timber must be harvested in order to cover debt service, which proved the demise of several early attempts, including MLPs, all of which sold out, went bankrupt, or converted to REITs.

So by the end of Phase II, the forest products industry had downsized its portfolio by another \$2.5 billion and TIMOs had added an equivalent amount to theirs. Average annual return from 1996 through 2000 had tapered to 18.9% in nominal terms, with 2000 a disappointing 4.4%.

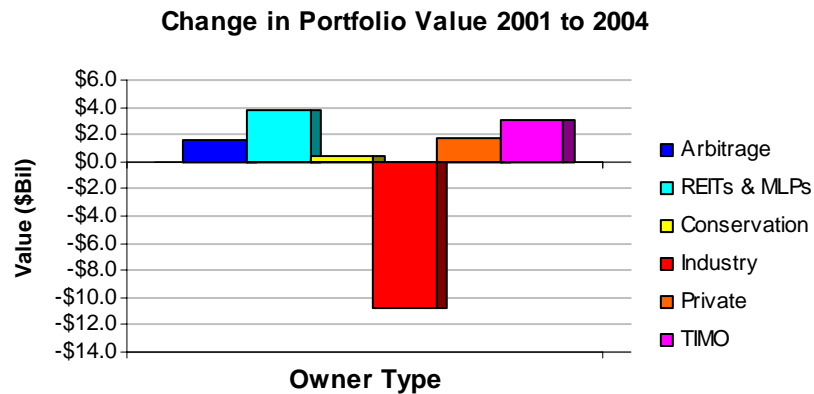
Phase III - 2001 to 2004– Looking for a Home

By now, investors began to realize that the returns from inception could not be sustained and that recent returns had begun to give the appearance of an over-heated market. But just as pressure to “cool down” began, the tech bubble burst, the stock market declined, and still more institutional money began looking for a home. The forest industry was happy to oblige, given pressure from Wall Street, so this period saw an unprecedented transfer of assets from industry to institutional investors. Timberland attracted an ever increasing supply of capital and investors appeared to be content with projected returns of 5.0% to 6.0% – or lower. It was, once again, a sellers market.

Content was begrudging, however, which placed much pressure on managers to seek return wherever they could find it. Investment in long-term “soft” activities with uncertain return gave way to cost-cutting, eliminating much of the R&D, silviculture, and community relations that industry had invested in. And investors, through their managers, found themselves in the real estate business. Timberland began to be parceled into increasingly smaller holdings for sale at higher per acre prices.

Figure 2 depicts the change in timberland ownership between 2001 and 2004. Note that the exit of forest product companies from timberland ownership is now in full swing. Industry has shed another \$11.0 billion and REITs, primarily Plum Creek, have established themselves as even bigger buyers than TIMOs. The forest industry was the only net seller.

During this period, private investors and arbitrage funds played a substantial role to the tune of about \$1.7 billion. These are very large investment specialists who acquire companies whole, then increase value by spinning off assets. They are highly leveraged, very savvy investors with little patience for long term forest ownership.



Source: R&A Investment Forestry

Figure 2. Change in Portfolio Value 2001 to 2004

Returns, which had continued downward at the beginning of this period, had turned upward on the basis of valuations driven by new high-priced transactions. Long-term asset or not, this was a matter of timing. Average return for the period was 3.88%, but in 2004 annual return, as measured by the NTI went again to 11.2%.

Phase IV - 2005 to 2009 – The Process is Complete

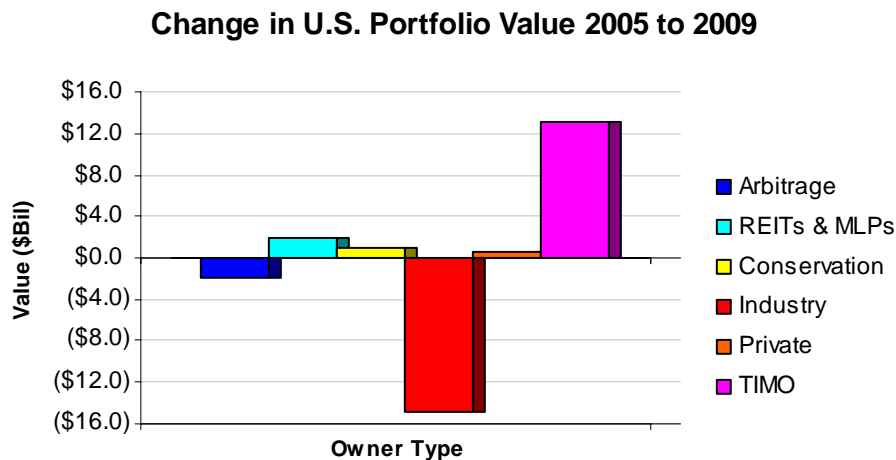
Arbitrage investors are focused on speed. In this case, they entered in 2004 and were gone by 2006.

The most important change to note, however, is the shocking exit of the forest products industry from the ownership of timberland. By the end of 2009, industry had sold off another \$15.0 billion of timberland, essentially completing the process. With the sale of Temple Inland for \$2.38 Billion in 2007, Weyerhaeuser is now “the last man standing.” With 6.4 million acres, they are the only public integrated forest products company left with significant holdings of timberland and they have announced their intended conversion to a REIT by the end of 2010.

Note the big buyers in Phase IV. REITs were active to an extent. Three public Timber REITs operate today, all former integrated forest products companies, together owning 11.1 million acres. Plum Creek is the largest with 7.3 MM acres, followed by Rayonier and Potlatch. Weyerhaeuser Corporation, with 6.4 MM acres, will bring the REIT total to 17.5 MM acres, 43% of the total 40 MM U.S. acres held by institutional investors.⁴

Conservation and Private Investors were barely there.

But by far the big buyers were TIMOs, as depicted in Figure 3, picking up another 11.0 million acres of what industry sold and adding \$13.0 billion to their portfolio.



Source: R&A Investment Forestry

Figure 3. Change in U.S. Portfolio Value 2005 to 2009

⁴ The database from which these figures are drawn account only for actual sales from one ownership to another. It does not account for conversions from forest products companies to REITS, which are considered restructurings.

For the period 2005 through 2009, annualized return as reflected by the NTI index was 10.9% in nominal terms. Note, however, that 2009 showed a negative 4.8%.

Figure 4 depicts the net acres and value changing ownership type since investors began to own timberland. Of this, the integrated forest products industry gave up 37.7 million acres valued at \$33.1 billion, while TIMOs and REITs gained 26.9 million acres valued at \$30.4 billion. This represents a stunning transfer of assets and wealth, especially considering that much of it occurred in a single decade. Further, unlike the explosion of technology during the same period, this transfer was based on assets and an industry that could be characterized as having always been there.

	x 1 Million	x 1Billion
1983 to 1995	6.0 acs	\$5.0
1996 to 2000	7.9 acs	\$5.0
2001 to 2004	14.0 acs	\$11.0
2005 to 2009	15.5 acs	\$16.8
Total	43.4 acs	\$37.8

Source: R&A Investment Forestry

Figure 4. Acres and Value Transferred

Note that Phase I spanned 12 years, so the process began slowly. The high-volume year was 2006, with 6.4 million acres and \$7.3 billion changing ownership type.

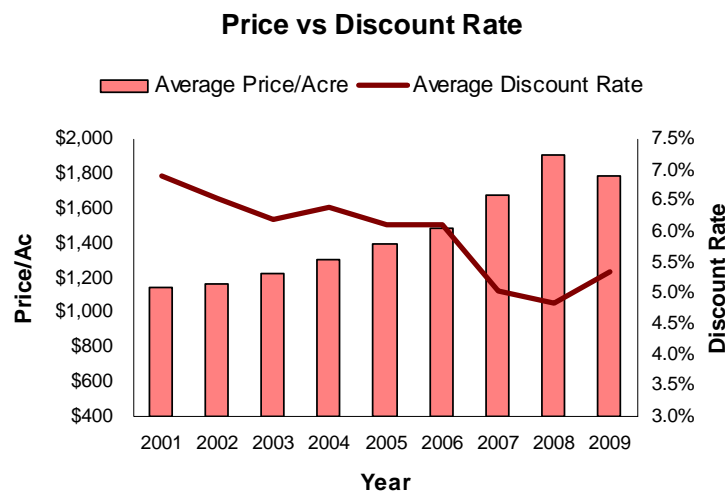
So investors now have a big stake in this historically stable, but highly illiquid, asset class.

Part 2: A review of attributes

For twenty-five years, investment managers have lauded timberland for an array of attractive attributes – high risk adjusted return, portfolio diversification, ability to hedge inflation. Investors have in turn accepted these claims. The asset class has indeed performed exceedingly well, with a return since inception of 14.1% in nominal terms. Those who timed entry and exit correctly, and with a bit of luck, fared even better. Timberland has matured as an investment during that time, however, and a review of the strengths and weaknesses of these arguments, and consideration of how they may have changed, will be useful.

Average Per Acre Value vs. Discount Rate

Timberland investment value increases for two reasons, (1) income increases, or (2) investors become willing to pay more for the same income. Figure 5 implies the latter in the case of timberland, depicting the behavior of weighted average price/acre vs. average implied discount rate for the South and Pacific Northwest combined.⁵



Source: NCREIF Timberland Index, Barak, Musselman, R&A Investment Forestry

Figure 5. Price vs. Discount Rate

⁵ A note of caution. Both parameters depicted are generalized estimates. Discount rate here is an average of discount rates reported by forest consultants from the Pacific Northwest and the US South, the primary U.S. growing regions. The rate depicted is Implied Discount Rate (IDR), i.e., the rate implied by expert opinion, knowing the sales price and property characteristics. Price/acre is likewise indicative only, derived from the NTI. Some acres are more valuable than other acres simply because they are worth more and not necessarily due to discount rate compression. In this case, focus is on trend.

Based on the NTI, when per/acre price peaked in 2008, it had risen more than 35% in three years. By the end of 2009, 15 months after the fall of Lehman, price was still 27.9% higher than in 2005.

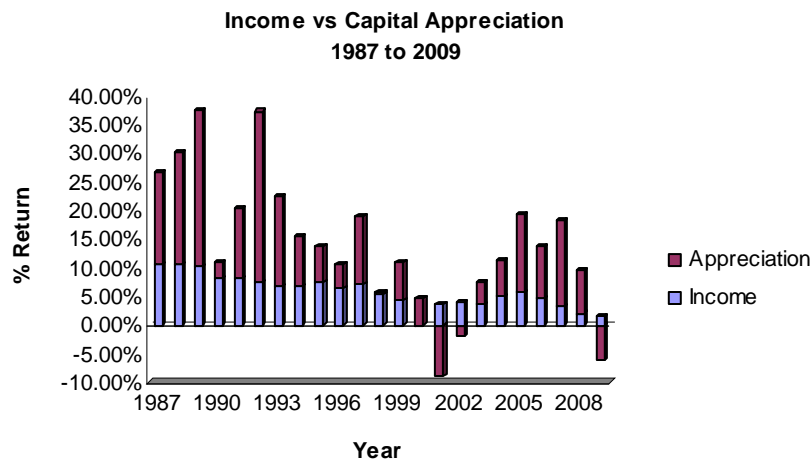
As per acre price of timberland increases, discount rate tends to compress consistently across the time period. This has been a period of rapid expansion of the total institutional investment portfolio, a high level of competition between buyers, and, in general, a period during which demand for timberland exceeded supply - conditions ripe for overheating. Conjecture about “irrational exuberance” has occurred throughout the history of timberland investment and thus far, no bubble has burst. Certainly, given declining prices for sawtimber in all markets combined with the high level and steep rise of capital appreciation upon which timberland returns have been based, investors should be cautious that returns enjoyed by earlier investors not prove to be at the expense of new capital.

The NCREIF Timberland Index of Return

Performance Over Time

The NCREIF Timberland Index was established by timberland investment managers in 1992 in cooperation with NCREIF to provide investors an independent measure of timberland returns. Contributors are TIMOs who submit performance data based on revenue generated and on annually appraised value of timber properties. The data series begins with 1987.

Figure 6 depicts the timberland index from 1987 forward, distinguishing between Income and Capital Appreciation, both additive components of return. (NCREIF, 2009)



Source: NCREIF Timberland Index

Figure 6. Income vs Capital Appreciation

There are several items of note here. First, timberland has indeed performed well over the period. Returns in most years have exceeded 10% and have exceeded 30% in some. Some individual stocks

have done that well or better, but timberland has been exemplary as an asset class, exceeding return expectations in most years and certainly in total.

There are cautionary observations as well.

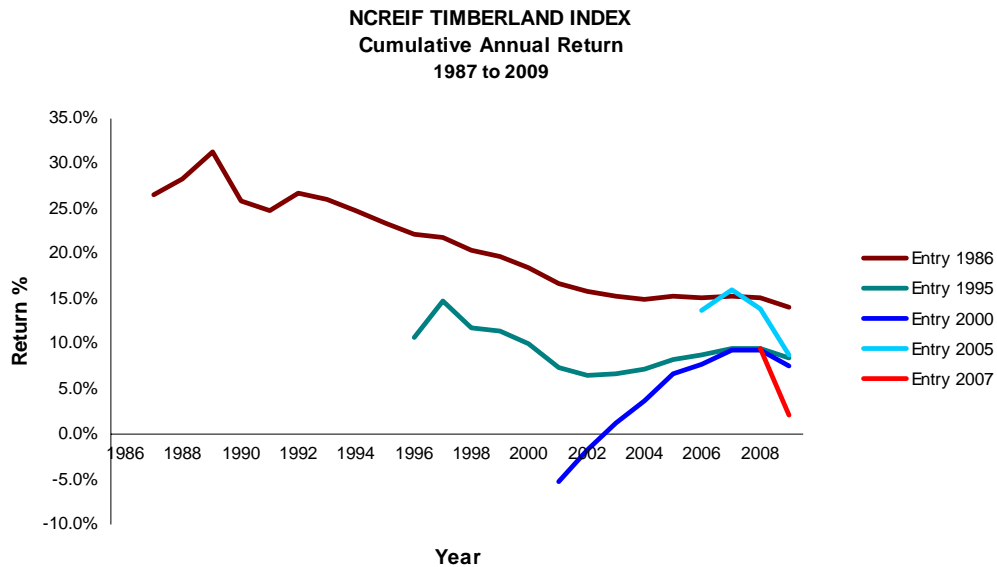
Return has diminished substantially over time. Thus, given the behavior of discount rate depicted in Figure 5, both performance and expectation have declined.

While investors are theoretically indifferent to the source of return, all value derives ultimately from monetization in some form. Annual income, primarily from timber sales, has been highly variable as a proportion of total return, but, in general, it has been downward. Income is the most concrete component of return, leaving some softness in the total.⁶

Most return has derived from capital appreciation, which is based not on actual monetization, but on appraisal. Appraisal is an expert's opinion of value, but it is not value itself. Certainly there have been noteworthy secondary transactions that give it credence, but there is judgment involved in distinguishing between real value and over-value.

Cumulative Annual Return

Figure 7 is another view of NTI, depicting cumulative return since inception in 1987.



Source: NCREIF Timberland Index, R&A Investment Forestry

Figure 7. Cumulative Annual Return

⁶ In absolute terms, income has been somewhat more stable.

An investor entering timberland in 1986 expecting a nominal return of 10.0% (8.0% real), by 1989 would have enjoyed a return of 31.3%, diminishing to 14.1% by 2009. Still, a very good performance over the period, given a 10% expectation. Another investor, entering in 1995 expecting nominal 10.0%, would have seen 14.75% by 1997, diminishing to 8.5% by 2009. A third, entering in 2000 expecting 9.0% would have been under water until 2003, recovering to 7.6% by 2009 – saved by an extraordinary three year run at 17.1%. Note that an investor entering at the end of 2007, enjoying 9.2% in 2008, by 2009 may have fallen into a decline from which it may take years to recover.

Timberland has moved to a new phase. The nature of the industry has changed as it has matured and as it has separated from the forest products industry. Success will become increasingly dependent on acquisition discipline.

Interpreting the NCREIF Timberland Index

The NTI is a well-constructed, useful index of performance for an asset class whose value is difficult to measure and based on relatively few transactions. It is not a benchmark and it does have weaknesses which its authors and contributors openly acknowledge. (Aronow, 2004).

Appraisal. Capital appreciation, the largest and most steeply rising component of return, is based on periodic valuation of properties comprising the index. Timberland is largely an illiquid asset, so valuation must be based on appraisal rather than actual transactions. Appraisals are based on expert judgment and expertise is variable. Further, appraisal, dependent on historical comparable transactions, lags current market. Where transaction volume is exceptionally low, as in the case of economic downturn, appraisal must be based on fewer and less current data, causing “true” value to be hidden. In particular, appraisals tend to be “sticky” on the high side.

Periodicity. NTI is a quarterly index but not all properties are appraised quarterly – or even annually. Valuations without an appraisal are based on “desktop” analyses by the investment manager, not on dispassionate outside review.

Composition. Properties cycle through the NTI as they are bought and sold, so successive analyses are based on a changing property base.

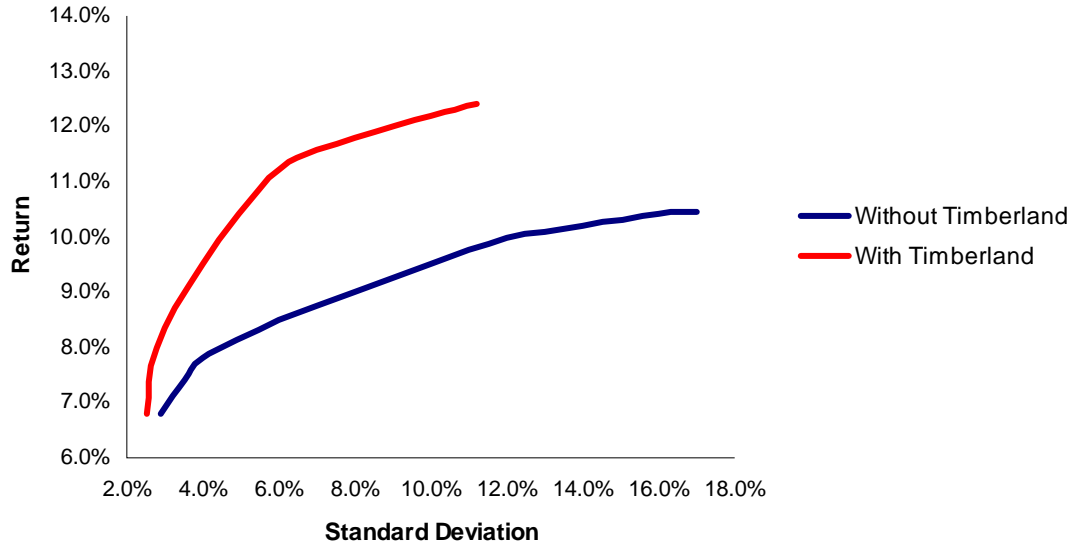
Inventory. Inventory, itself a complex and costly activity, changes over time with growth and harvest.

Portfolio Efficiency

Since its inception, investment timberland, when combined with real estate and other financial assets, has been shown to increase portfolio efficiency, as illustrated in Figure 8. The argument is made that timber returns have low to negative correlation with other assets, and thus a portfolio that contains timberland yields equal or better return with lower risk than a portfolio without it. (Hancock, 2003) Figure 9 illustrates timberland’s correlation with an array of financial assets over various time periods. Focusing on the long-term from 1960 to 2009, a claim to negative correlation would appear to be valid. In the short to mid term, however, these correlations change randomly with time period. Note

especially the long-term negative correlation between timberland and commercial real estate, contrasted with the very high correlation during the last decade. (Lutz, 2010)

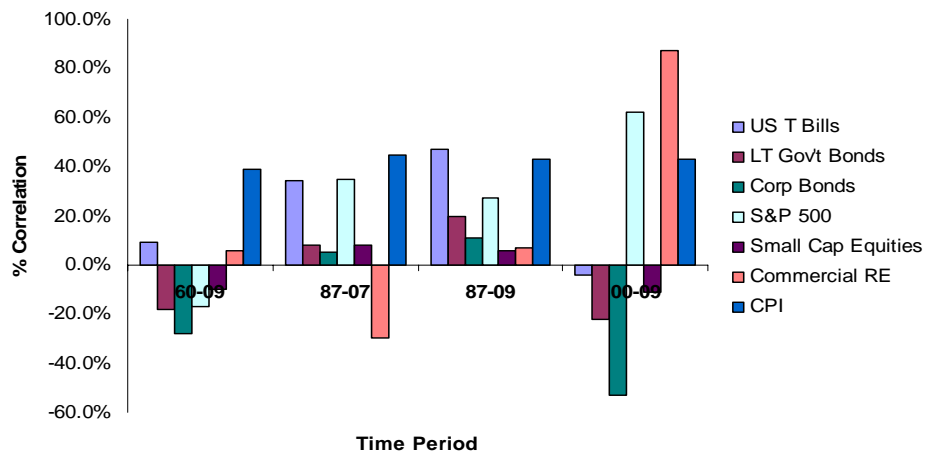
Risk Efficient Frontiers



Source: Hancock Timber Resource Group (2003), R&A Investment Forestry

Figure 8. Risk Efficient Frontiers

Return Correlations with Timberland



Source: Ibbotson Associates, Lutz

Figure 9. Return Correlations of Various Assets with Timberland

Several other factors invite consideration:

Correlations Change Over Time. The way in which various assets relate may change structurally over time. Large economic events, such as the current crisis, cause once uncorrelated assets to behave

similarly. (Swensen, 2000) Whatever the changing mix or direction of correlations, few exceed 40% and many are less than 10%. Thus the magnitudes of correlations are for the most part unsubstantial. It cannot be stated at any time thus far that timberland has shown definitive negative correlation with other financial assets, which has been acknowledged by timberland investment managers.⁷ (Binkley and de Bever, 2004).

It can be claimed, however, that timberland has zero correlation with other assets, which, in itself, is a positive portfolio attribute. As Swensen notes, “portfolio management is a mix of science and art” and the notion that zero correlation is likely more stable than either positive or negative correlation has intuitive appeal. Negativity is not a requirement for diversification.

Unachieved Allocation. The efficient frontier including timber in Figure 8 assumes a portfolio-wide timberland allocation of 10.0% or greater. While some investors have voiced intent to have as much as 10.0% timberland in their portfolios, thus far few have exceeded 2.0%. At current levels, it is doubtful that timberland alone has much diversification effect in institutional portfolios. This leaves room for more and portfolio managers may find opportunity to enhance efficiency by increasing timberland allocation. Price, of course, is a factor in efficiency, so an industry-wide rush to meet higher timber allocations could have some adverse effect.

Timberland may also be combined with other assets that behave similarly, such as existing commercial property, agricultural land, and infrastructure.

Timberland and Inflation

Figure 9 shows consistent positive correlation between timberland returns and CPI. Closer analysis shows that while total U.S. timberland correlation with CPI consistently exceeds 40%, regionally it does not. Thus investors should be regionally diversified within the asset class to achieve positive correlation (Lutz, 2007), a goal that may be achieved over time. While some level of correlation likely occurs simply because both timberland value and CPI have increased steadily over similar time periods, ability to hedge inflation is one of timber’s most attractive attributes when diversified across markets and viewed over the long term.

A closer view of timber and inflation focuses on “unanticipated” inflation - the difference between how investors think inflation will behave *a priori* and how it proves to have actually behaved over the forecast period, after the fact. Given the positive correlation between timber and CPI, if one assumes a given level of inflation, that assumption is capitalized into the acquisition price. Thus the true measure of inflation protection lies in how well an asset does in the face of higher than unexpected inflation.

As early as 1993, and in follow-up analyses in 2005 and 2009, forest economists have proposed that the link between timberland return and CPI is through unanticipated inflation. In the most recent analysis, applied to data through 2008, regression showed the statistical coefficient related to unexpected inflation to be significant. (Hancock, 2009) Thus the relationship would appear to hold in

7 In “Timberland: The Natural Alternative, the authors state “There is virtually no correlation between timberland returns and returns from financial assets..... This means that timberland can dramatically improve the risk-efficiency of a mixed-asset portfolio.”

economic conditions through 2008. It should be noted, however, that R^2 of this model was only 0.14, indicating low statistical confidence in the regression itself. In the context of this analysis, this would appear to cloud the relationship between timberland return and unexpected inflation.

Nonetheless, the revenues of “hard” assets in general, such as fully leased developed real estate, farmland, and timberland, incorporate changes in inflation, causing them to be efficient inflation hedges. This relationship has been demonstrated over time and across an array of assets, providing both intuitive and statistical appeal.

Part 3: Components of value

Timber is no longer assumed to be timberland’s only source of return. HBU, referring to value in an economic use higher than timber, is increasingly a factor in timberland investing and has changed the acquisition calculus. HBU is essentially real estate; no bidder not incorporating HBU would win a bid, so every timberland investment is now to some extent a real estate investment. Value components must be stratified accordingly and a strategy developed for each.

Timber Component

Timber value has traditionally relied on housing as its primary end use and secondarily on the paper industry. At the inception of timberland as an investment, value was based solely on expected income from timber. It was, for the most part, simply a matter of expected stumpage price, expected harvest volume, real discount rate, and inflation. Expected stumpage price was current price times a real price appreciation rate (RPAR) of 1.5% annually for the foreseeable future. Expected harvest volume was derived from growth and yield models adjusted for current market conditions, and inflation was assumed to be 2.0%.

Timber investing has become substantially more complex over time. The essential measure of return remains cast in real terms at the EBITDDA level, so the calculation of acquisition price is still based largely on an assessment of income over a defined time period. Exit is depicted as a hypothetical sale based on an assumption of market discount rate at the time.

RPAR. Timber markets during the last decade have lowered the assumption of RPAR essentially to zero, except to accommodate local markets and except where adjustments in either direction are required to accommodate business cycles. In the current circumstance, where stumpage values have declined by more than 50%, assuming the bottom has been reached, one would expect relatively steep real increases until recovery is complete.

Discount Rate. Discount rates have declined from a range of 6.0% to 10.0% depending on region, to a range of 4.5% to 5.0% across all regions. This in itself has raised timberland values as income has declined.

Underlying Land Value

In the old timber economy the value of underlying land, likened to a bare acre, was simply the NPV of future harvest in perpetuity.

In the new economy, bare land has intrinsic value over and above its value in growing trees, even where its applied use for the foreseeable future will continue to be growing timber. Viewed differently, intrinsic value is the market value of a given tract, less near-term parcelization or development value, less its value in growing trees. Appraisers in the West refer to this as “leftover value.” This value is regionally variable, even site specific, depending on the regional culture of land use. In the South, where terrain is generally flat, accessible, and open to public passage or recreational use, intrinsic value has always been a factor. In the West, where land may be open to the public but terrain and remote location cause it to be less accessible, this has not always been the case. In the twenty-five years since timberland became an investment asset, U.S. population has increased by 39%, causing people to reach farther from cities for open space, raising intrinsic land value to some degree in all regions. U.S. population is projected to increase by another 42% by 2050.

HBU – Parcelization and Development Value

Compatible use has always been a component of timberland value, exemplified by hunting and mineral rights that add marginal value without interfering with timber management. The encroachment of real estate value has reached a level exceeding its compatibility, generally requiring immediate or eventual spin-off.

As access to remote land improves and as population encroaches, higher-level real estate becomes a third component of value. The line of demarcation tends to be legal parcelization, where recorded entitlements enable a large tract to be subdivided into parcels that can be sold separately under local ordinance. The fact of legal parcelization causes land value to increase significantly if sold in pieces at a scale accessible to smaller buyers for recreational property or ranchettes. As amenities are added – proximity to paved roads, power, telephone service, and home sites - value ultimately increases to the point that value above land and timber value must be acknowledged. Non-timber value of remote timberland can represent 5.0% to 40.0% of total where parcelization has occurred.

Where non-timber values are high, the investment may still be sound, but investors must take care that the acquisition is stratified into its separate components, i.e., two investments, one in timberland, the other in real estate. Undeveloped real estate risks are typically higher than the risk attributed to timberland, and discount rate on the real estate component should be appropriately higher, generally 15% to 25% in nominal terms. Where HBU value creates a substantial margin over timberland value, separate analysis is required. In a recent survey of TIMO acquisition practices, a blended rate was most commonly applied, which implies simply adding a subjective risk premium to the timberland rate.

Some managers applied no change in discount rate unless HBU represented at least 40% of total value. (Vicary, 2008) Some recent acquisitions, made in the heat of auction, appear to have made no adjustment whatever, with investors content to apply an ever-diminishing discount rate.

Expanding Sources of Timberland Value

Climate Change and Carbon Credits. It is now generally accepted that climate change is a fact and that it is caused by human activity, chiefly through the use of fossil fuels for heat, electrical power, and transportation. There have been other events in geologic time scales when the success of a single species has caused global atmospheric change, but never so rapidly, nor with humans as part of the equation. Increased levels of carbon dioxide and other greenhouse gasses (GHG), such as methane (CH₄) from livestock and trifluoromethane (HFC-23), a refrigerant, trap heat in the atmosphere and thereby change climate, disrupting ecosystems and potentially global human distribution..

Reducing atmospheric GHGs has become the largest global scientific and political endeavor of our time. Global carbon efforts focus on two activities, (1) removing GHGs from the atmosphere, and (2) diminishing the emission of more. Both rely on rapidly developing but still new technologies and both will be costly to consumers and producers alike. The most direct approach to reducing emissions is to set ever-increasing limits and to levy a “carbon tax” on producers who exceed it, a solution that is at this time politically infeasible. Another approach, and the one receiving the most attention currently, is to issue allocations to emitters equivalent to emission limits and to establish a market that will allow under-emitters to sell “carbon offsets”, otherwise known as “carbon credits”, to over-emitters, so called “cap and trade.”

Forests absorb carbon and thus the recent avid discussion of incenting forest landowners to create and sell carbon offsets by engaging in activities that increase forest inventory or diminish forest loss. In this sense, it is tempting to view carbon offsets as a forest product that can be additive to return.

There are impediments to realizing this potential value.

- **Lack of Global Cooperation.** Reducing GHGs must be a global effort and, thus far, no meaningful and enforceable cooperative agreement has been reached. The Kyoto Protocol, which has been successful in creating an offset market of substance in Europe, will expire in 2012. The December 2009 climate conference in Copenhagen failed to deliver an agreement to replace it.
- **Carbon Accounting Is Complex.** For cap and trade to be successful as a financial product and, at the same time, permanently reduce emissions, it must result in lower carbon levels than would have occurred otherwise, thus the requirement for “additionality.” A carbon credit is a “counterfactual”, much like proving a negative - what must be demonstrated is absence rather than presence. Thus monitoring and measurement of marginal reduction is technologically difficult and arguably infeasible at a project level. Forest credits have been dubbed “anyway credits” by some observers to the extent that they merely pay landowners to do what they would

have done anyway. (Wara, 2008) European systems under Kyoto do not recognize forest offsets except where they result from new plantations where additional carbon is more easily measured.

- **Carbon Has High Opportunity Cost.** In order to generate offsets on existing forests, some level of harvest must be forgone for a period of 100 years, the definition of “permanence” under carbon protocols. Thus, over the life of the investment, the income from carbon must exceed the NPV of harvest or other land use foregone. Depending on species and markets, the price of carbon would have to reach \$60 to \$150 per tonne, where the most recent U.S. auction drew \$3.51 per tonne. (Environmental Leader, 2010) A 2009 analysis by the Energy Technology Innovation Center at Harvard concludes that carbon must reach a price of \$100 to \$150/ton to drive technology-based carbon capture and storage. (Al-Juaied, 2009)
- **Cap And Trade Is Not Assured.** At this point, Congress is resisting cap and trade as restrictive to the economy and it is doubtful that it will be a part of the 2010 Senate Energy Bill. The current consensus appears to be that “cap and trade is dead”, it’s demise the result of its characterization as “cap and tax”, and the fear that Wall Street will game the system, contributing nothing to the atmosphere. (Broder, 2010)

As a further signal of uncertainty, on March 29, 2010 HSBC Bank removed two large carbon traders from their market index for having lost so much value that they failed to achieve the Index’s minimum capitalization of \$400 Million. The two companies, the Climate Exchange and Trading Emissions, together comprise much of the North American and European carbon markets, including the Chicago Climate Exchange and The European Climate Exchange. (Kanter, March 29, 2010)

Biomass. As global focus on climate change expands and regulatory pressure on the use of fossil fuels creates a shift to renewable energy, wood biomass has gained much attention as a fuel source – and as a potential source of forest value. What was formerly “wastewood” – tops, branches, logging residue – along with pulpwood, can now be utilized for fuel. In the liquid biofuels sector, Catchlight Energy, a joint venture between Weyerhaeuser and Chevron, anticipates that by 2022, the U.S. must produce 16 billion gallons per year of cellulosic ethanol in order to meet regulatory requirements (Godwin, 2008). By their estimate, this will require roughly 16 million acres of land to produce the necessary feedstock. In the heat and power sectors, as of January 2010, in the US South, 126 new projects had been announced, which would require 46.5 million new tons of pulpwood and biomass, representing 38.0% of current demand. (Forisk Consulting, 2010) Clearly, if this were to layer on top of an undiminished current market, fuel, heat, and electricity would put substantial pressure on production sources.

However:

- **Demand Will Draw First from Wastewood.** Tops, limbs, and harvest residue currently have little value and even as biomass demand increases, it is unlikely to exceed its cost of extraction in the foreseeable future, perhaps never.

- **Demand for Paper Is Diminishing.** The next level of demand for biomass will be met by pulpwood, the traditional raw material for a declining U.S. pulp and paper industry. New demand will simply replace old.
- **Not All Announced Projects Will Be Installed.** Figure 10 represents Forisk Consulting’s analysis of Southern biomass demand, distinguishing between announced demand and demand that they expect to materialize. Note that their expected demand is only 40.0% of announced.

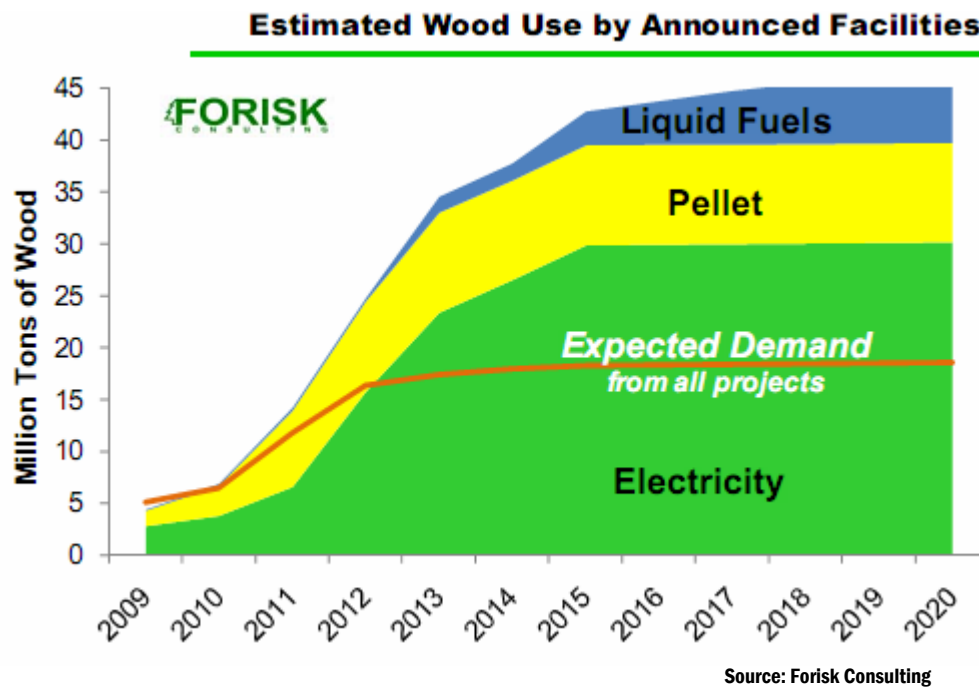


Figure 10. Announced vs. Expected Biomass Demand

- **Economics of Biomass End Use is a Cap.** Until the price of oil increases substantially, which is unlikely in the near to mid-term, biomass end uses will rely on low-cost feedstocks, capping the gain that biomass might otherwise achieve. Current pulpwood prices are a reasonable proxy for the price that biomass will bring. Even at that, should demand ultimately force biomass price higher, it is unlikely to substantially exceed its extraction and delivery cost, leaving little profit for the landowner.

Still, at minimum, increasing demand for renewable energy will provide for investments in silviculture that will increase the value of standing inventory. Additionally, biomass provides upside should competing energy prices increase to levels higher than currently anticipated.

Payment for Ecosystem Services (PES). Ecosystem services comprise all of the direct and indirect environmental benefits that result from forests and other ecosystems, including carbon sequestration and renewable energy in the form of biomass. Other services include drought and flood mitigation, run-off regulation, slope stability, weather and climate stability, biodiversity, waste decomposition, air and water quality, and a host of other obvious and less obvious outputs. Payment for ecosystem

services (PES), an updated term for the established concept of “transfer of development rights” (TDR), seeks to monetize previously non-marketable economic externalities.

TDR has for decades been applied to wetlands mitigation, which has been a cost of real estate development that transfers the right to develop a given location that will not use it to another location that will. PES takes this concept to a new level and has led to the establishment of an investment industry that creates and markets mitigation units to developers and emitters or to polluters who have incurred liabilities for natural resource damage. Where such damage will or has occurred, the developer must pay not only for mitigation, difficult enough to quantify, but for past and future costs of deprivation to resource users, which can be determined only through negotiation or litigation. The cost of mitigation can be relatively minor, as in the case of a housing development that impinges on a pond, or a multi-billion dollar liability, as in the case of environmental disasters such as Three Mile Island and the PCB contamination of the Hudson River.

PES is a growing industry. Ecosystem Marketplace, a private non-profit research and analytic organization at the center of ecosystem services, estimates a combined global PES market of more than \$1.0 trillion per year by 2020.

PES Market	Estimated Size per Year
Compliant Carbon Forestry	\$5 MM to \$5 BB
Voluntary Carbon Forestry	\$10 MM to \$5 BB
Compliant Water Quality	\$1 BB
Voluntary Water Quality	\$2 BB
Gov't Mediated Watershed Mgt	\$6 BB
Compliant Biodiversity Offsets	\$10 BB
Voluntary Biodiversity Offsets	\$100 MM
Fisheries Quotas	\$25 BB
Genetic Resources	\$100 MM
Land Conservation	\$20 BB
Certified Forest Products	\$50 BB
Certified Agricultural Products	\$900 BB
TOTAL	More than \$1.0 Trillion

Source: Ecosystem Marketplace, R&A Investment Forestry

Figure 11. Estimated Global PES Annual Market by 2020

This estimate is highly generalized, based on sparse information, and cannot be verified. Nonetheless, even 10% of this estimate would be significant, which illustrates the attention currently given to PES and the potential magnitude of its impact. To the extent that the effort to monetize these services proceeds, forest investors will benefit.

Conservation. Conservation and forest management have a history of being at odds, with Conservation opposed to any level of harvest and forest owners seeing conservation as encroachment on private property rights. During the past decade, however, with increasing forest health issues and erosion of forest area by ownership fragmentation and development, Conservation has come to see forest management as the least of their concerns and sustainable harvest as a goal. Larger conservation organizations, such as The Nature Conservancy, The Trust of Public Land, and The Conservation Fund, have all proven to be competent and competitive buyers, acquiring forests and engaging in management on their own behalf. However, as NGOs dependent on philanthropy and government funding, capital has been limited and transactions have focused on the Northeast and North Central regions where per acre values are low and environmental payout is high.

Partnership between Conservation and Financial Investors. There is opportunity, however, for financial investors and Conservation to manage their separate perceptions of risk through co-investment. Where conservation and financial values can be separately assessed, financial investors may choose to operate subject to constraints imposed by their conservation partners, with Conservation contributing capital equivalent to the diminution in investment value that results from management restrictions. A “working forest easement” is an increasingly popular contractual device that allows environmental values to be monetized. The clearest application of such an easement is to value in HBU, which has in the last decade become far more environmentally threatening than timber harvest. In this structure, Conservation acquires and retires development rights, leaving all other compatible rights with the financial investor. Where investors prefer pure investments in timberland, without accompanying real estate risk, this lowers required capital and focuses it solely on timber.

There are risks. Stripping away diverse components of value diminishes down-line options, limiting investors’ ability to manage through problem periods. Second, term easements have thus far been avoided by Conservation and restrictions tend to be perpetual in nature. Every easement has some form of ongoing monitoring, and perpetuity is a long time to tolerate third-party oversight. Further, easements tend to limit exit and potential buyers have in the past have raised discount rates to accommodate easement risk. With increased use of easements and acceptance by investors, easement premium has declined.

Part 4: Economic Outlook

Part 4: Economic Outlook was contributed by Forest Economic Advisors, LLC.

Macro Outlook

Real Economy	1993	2003	2008	2009	2010	2011	2009	2014
	-2008	-2008					-2013	2025
Real GDP, Bil. \$2005	11,078*	12,714*	13,312	12,984	13,261	13,637	13,609**	17,323**
GDP (% Chg.)	3.0%	2.4%	0.4%	-2.5%	2.1%	2.8%	1.5%	2.5%
Real Consumption, Bil. \$2005	7,584*	8,880*	9,291	9,229	9,324	9,556	9,547**	11,954**
Real Consumption, (% Chg.)	3.3%	2.4%	-0.2%	-0.7%	1.0%	2.5%	1.5%	2.4%
Ind. Prod (% Chg.)	2.7%	1.4%	-2.2%	-9.9%	2.8%	3.8%	0.2%	2.2%
Housing Starts (Mil. Units)	1.57	1.66	0.90	0.57	0.91	1.48	1.22	1.75
Unemployment Rate (%)	5.2%	5.3%	5.8%	9.3%	10.4%	9.0%	8.4%	5.4%
Prices								
CPI (% Chg.)	2.7%	3.2%	3.8%	-0.5%	1.4%	1.6%	1.4%	2.5%
PPI (% Chg.)	2.3%	4.3%	6.4%	-2.6%	2.2%	1.9%	1.1%	2.2%
WTI Oil (\$ per Barrel)	\$36	\$61	\$100	\$63	\$76	\$87	\$77	\$118
Home Prices (Case-Shiller 20 City)	N.A.	177.5	165.9	142.0	135.0	137.0	144.9	223.7
Interest Rates								
3-Mth T-Bill	3.7%	2.7%	1.4%	0.2%	0.3%	1.2%	1.2%	4.3%
10-Year Bond	5.3%	4.3%	3.7%	3.3%	3.9%	4.4%	3.8%	5.8%
30-Year Mortgage	7.0%	6.1%	6.0%	5.1%	5.7%	6.4%	5.7%	7.6%
* Value in beginning of period								
**Value at end of period								

Source: Forest Economic Advisors, LLC

Figure 12. FEA Macro Forecast Summary

GDP. The US and Canadian economies are in the very early stages of recovery from the worst recession in 75 years. In the US, highly indebted households and a compromised financial sector will ensure that economic growth recovers only gradually in the near-term. Canada's economy has fewer imbalances, but near-term growth will nevertheless be tepid due to weak US demand and a strong currency. The US and Canadian economies will not likely return to full employment for another three to five years. The presence of a large overhang of underutilized labor will mitigate the effects of the declining working-age population in both countries until the middle of the next decade. GDP growth rate will decline from the 3.0% to 3.5% that prevailed for most of the last 30 years to 2.0% to 2.5%, thanks primarily to demographic shifts. FEA's long-term forecast shows US and Canadian real GDP growth averaging 2.5% per year between 2010 and 2025.

Inflation. The near-term inflation risks for both the US and Canada are virtually nonexistent. Barring a supply shock, CPI inflation will remain under 2.0% for at least the next two years. Although FEA is also

optimistic about the long-term inflation forecast, we are mindful that huge public and private debt loads give rise to concern that US policymakers will be tempted to “inflate away” part of the burden. This is unlikely. Our 15-year forecast shows CPI inflation averaging 2.4% in the US and a bit lower in Canada. The risk to this forecast is tilted towards higher inflation.

Oil. The WTI⁸ oil price has been on an increasing trend since the late 1990s and currently stands nearly three times higher than its average of the 1990s on an inflation-adjusted basis. The forecast shows a generally appreciating trend from 2010 to 2025, with WTI prices averaging \$86 per barrel (measured in 2008 dollars) and varying from \$60 to \$105.

Housing Outlook

The housing sector is still dragging itself off of the mat. While FEA’s near-term housing forecast is somewhat optimistic, it nevertheless shows housing starts recovering only gradually in 2010 and remaining well below underlying demand in 2011. As depicted in Figure 13, over the longer term, favorable demographic trends and the release of pent-up demand virtually assure that home-building will return at least to the levels seen in the late 1990s and early 2000s before the strong market became a bubble.

The 2009 Housing Depression. The housing depression of 2009 resulted from surging foreclosures, rising unemployment, the collapse in credit markets, and dramatically diminished new household formation. In fact, during 2009 the number of households actually diminished. Overhang of existing homes for sale, pending foreclosures, and a “shadow inventory” will hamper housing recovery. Unemployment will remain high, causing drag on economic recovery.

This phenomenon is temporary. The current contraction will result in pent-up demand to be met in the future as credit markets ease, employment improves, income rises, and individuals forced to share households separate. FEA expects a solid recovery over the next decade, which bodes well for wood products and timber.

⁸ West Texas Intermediate, a grade of oil used as a benchmark in pricing.

Graph 2
Housing Starts Will Remain Below
Underlying Demand Until 2012

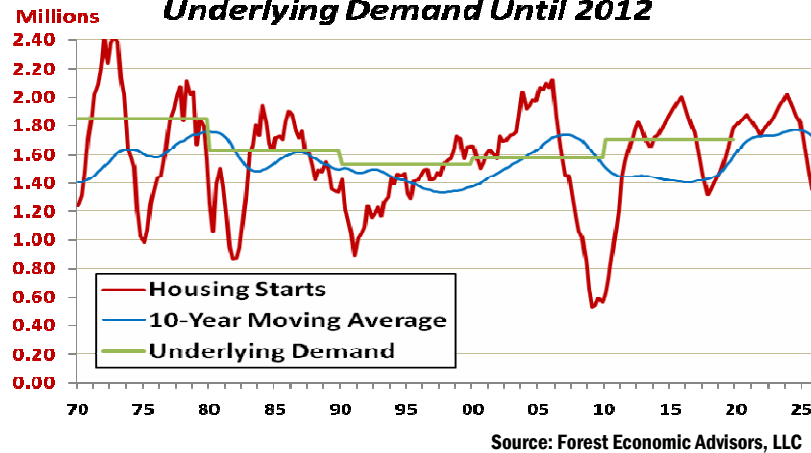


Figure 13. FEA Housing Forecast

Downside Trends Will Temper Optimism. Home starts will not return to 2006 levels until 2013-2014 and will increase at a modest rate of 1.3% from 2013 to 2018. FEA expects a trend toward more multifamily homes relative to single-family units, driven by an increased population in the 60+ age group, which will result in lower per unit wood usage. Additionally, we anticipate moderation in home size during the next 15 to 20 years. Home size has diminished by 5% since 2006, resulting from diminished affordability and changing tastes.

Forest Products Outlook

Solid Wood Products

Based on the expected strength of residential construction over the next decade, the outlook for solid wood products is positive. Residential construction is the primary driver of softwood lumber markets, accounting for 43% of lumber consumption over the last decade. Residential improvements, correlated with existing home sales, have accounted for another 29% of lumber demand over the same period.

Over the course of an economic cycle, single family housing starts account for approximately 80% of total starts. Each new single-family unit uses about 15,500 board feet of lumber, and 12,700 square feet of OSB and plywood structural panel. It takes a lot of wood to build a typical American home. While the fundamental drivers of solid wood products are positive over the long term, in the short term, recovery from the recent downturn will be daunting. Consumption of softwood lumber fell 44% in 2009. While year-over-year per cent increases will be impressive as we emerge from recession, actual consumption will remain weak through 2013 relative to mid-2000s levels. Beyond 2013, we expect demand to return to a more normal cyclical pattern. Gains in panel consumption will follow a similar course.

Pulp and Paper

In contrast to the solid wood products, the outlook for pulp and paper markets is decidedly less sanguine.

The situation facing graphic paper demand and production in the US is grim. Economic downturn has resulted in a plunge in advertising revenues and pagination for newspapers and magazines. The traditional link between real GDP growth and graphic paper consumption has been weakened substantially in advanced economies, somewhat less in developing economies. In mature markets such as the US and Canada, paper will draw a diminishing share of marginal income. Proliferation of electronic substitutes will accelerate decline in graphic paper demand. Our forecast shows US graphic paper consumption and production declining by 25% to 30% over the next 15 years, with the risks to this forecast toward the downside.

The long-term outlook for the US paper packaging sector is mixed. Paper packaging tends to follow its primary user, manufacturers of nondurable goods, which explains China's explosion in paperboard capacity over the last decade. Additionally, paper packaging does not face the threat from electronic substitution that the rest of the paper industry faces. Still, its primary substitute is plastic, which is vulnerable to rising oil prices as well as environmental regulation. As a result of these crosscurrents, we expect production and consumption of paper packaging to track sideways over the next 15 years.

With the contraction in domestic paper production and greater competition from offshore pulp producers, US producers will also face deteriorating market conditions. The demand for wood pulp is driven by production trends in graphic paper and packaging as well as by the distribution of fiber use between virgin and recycled sources. Pulp consumption will trend downward over the next 15 years as a result of declining graphic paper production, stagnant paper packaging production, and substitution of recycled fiber for virgin fiber. In addition, US pulp producers will face stiff competition from offshore producers, primarily from South America, which is characterized by newer, large-scale, highly efficient pulp mills that benefit from lower labor and fiber costs. As a result, the import share of US pulp consumption is expected to increase from its current level of 10% to 17% by 2025.

The US Timber Outlook

Sawtimber Markets

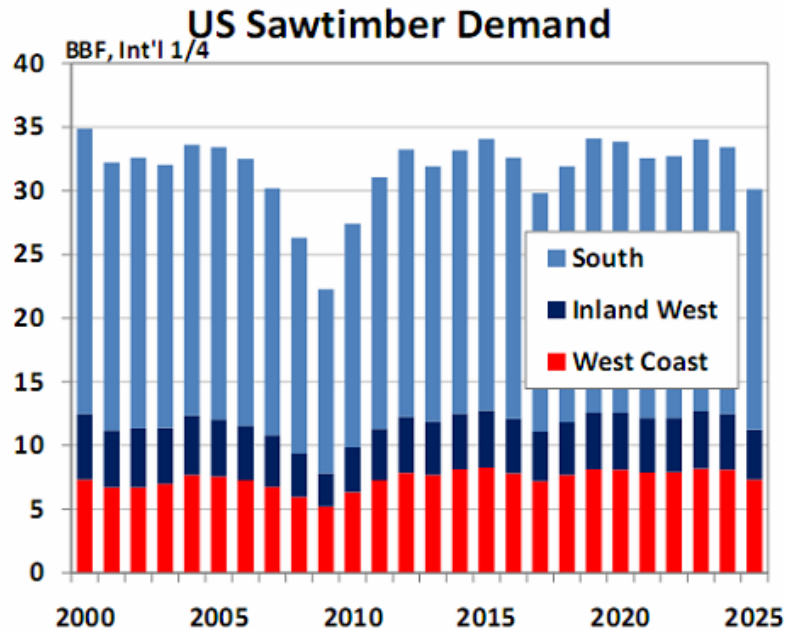
Near-Term. US sawtimber markets are beginning to emerge from recession. From 2006 to 2009, sawtimber demand in all major producing regions fell sharply. The greatest price declines were recorded in the US West, both Coast and Inland, where overreaction to rapidly deteriorating lumber and plywood markets sent delivered and stumpage prices plummeting in 2009. The declines in the US South were less drastic, but still sent sawtimber prices to their lowest level in 15 years.

In the near term, while recovery in lumber and plywood markets will bolster sawtimber demand, total volume of sawtimber consumption is expected to remain below pre-recession levels until 2012. Looking forward, we expect the current rally in log prices, due largely to building depleted inventories, to lose momentum over the remainder of 2010. The underlying fundamentals of demand for solid

wood products will remain weak and price recovery will be limited by an accumulation of merchantable volume resulting from a sharply deferred harvest during the last four years.

However, while we expect the increases in log prices to subside, we do not anticipate prices returning to anywhere near the lows reached in 2009. Overall demand has moved above the 2009 low and a drop in prices would quickly force timber owners to reduce their harvest levels, limiting price declines.

Significant shifts in North America’s sawtimber supply will also support higher sawtimber pricing. The dramatic collapse of timber supply in interior British Columbia due to the mountain pine beetle epidemic will have substantial impact on North American timber markets. The infestation has killed 50% of British Columbia’s lodgepole pine and total losses are expected to top 70% before the epidemic ends. As a result, we anticipate a 30% reduction in potential harvests in the region, a contraction in lumber capacity that will increase US market share.



Source: Forest Economic Advisors, LLC

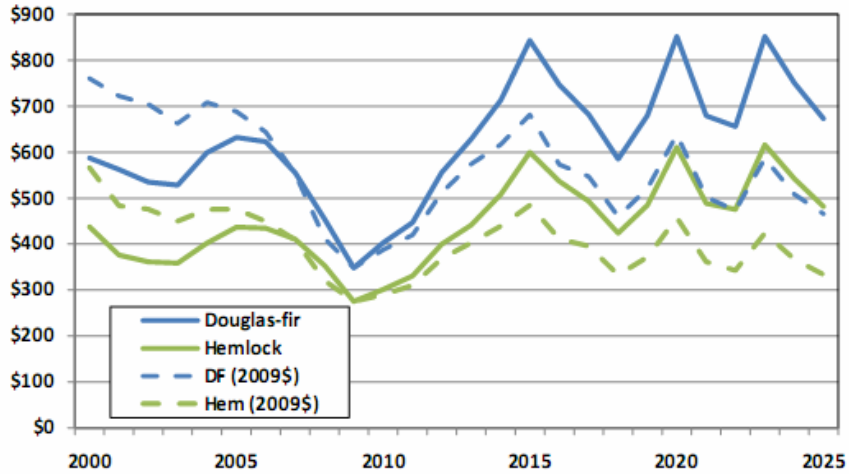
Figure 14. FEA US Sawtimber Demand Forecast

Mid to Long-Term. Mid to long-term prospects for sawtimber improve substantially as the solidwood products industry shifts from recovery to expansion. Expansion will be fueled by robust increases in housing starts, which by mid-decade are expected to once again approach the 2 million unit mark. By 2015, strong demand from solidwood mills, and declining fiber supplies in British Columbia, will support higher sawtimber pricing. Inflation-adjusted sawtimber prices will approach their peak levels of 2004-2005. Over the remainder of the forecast, sawtimber prices will cycle slightly lower on an inflation-adjusted basis, as demand pressure from expanded US lumber capacity is offset by gains in sawmill efficiency, increased use of smaller diameter logs, and contraction in demand from offshore consumers. As the strength of the \$US improves, surging lumber imports will also limit the price of domestic lumber and sawlogs.

Adding to supply pressure, FEA estimates that 8.5% of West Coast sawtimber volume will be removed from operable inventory due to conversion to higher and better use.

Figures 16a and 16b illustrate FEA's expectation of sawlog price in nominal and real terms through 2025. Note that, in real terms, neither returns to the peaks of the past.

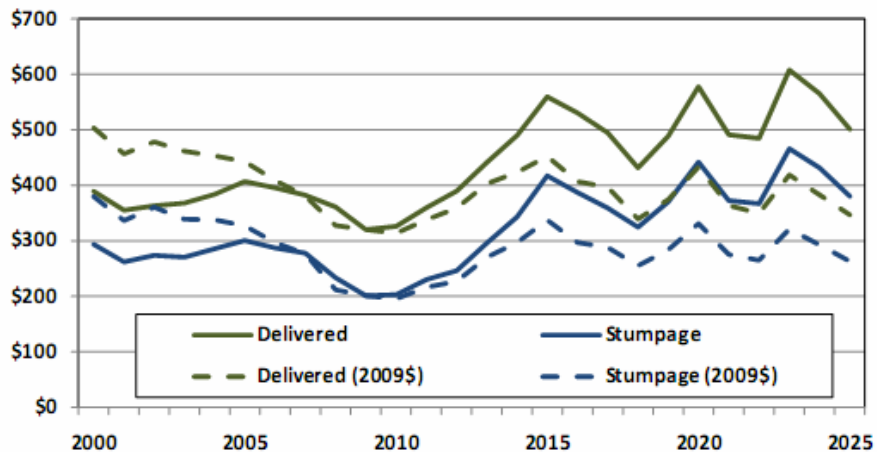
US West Coast Douglas Fir Del. Sawlog Price \$US/MBF, Scribner



Source: Forest Economic Advisors, LLC

Figure 16a. FEA West Coast Price Forecast

US South Pine Sawlog Price \$US/MBF, Scribner



Source: Forest Economic Advisors, LLC

Figure 16b. FEA US South Price Forecast

Pulpwood Markets

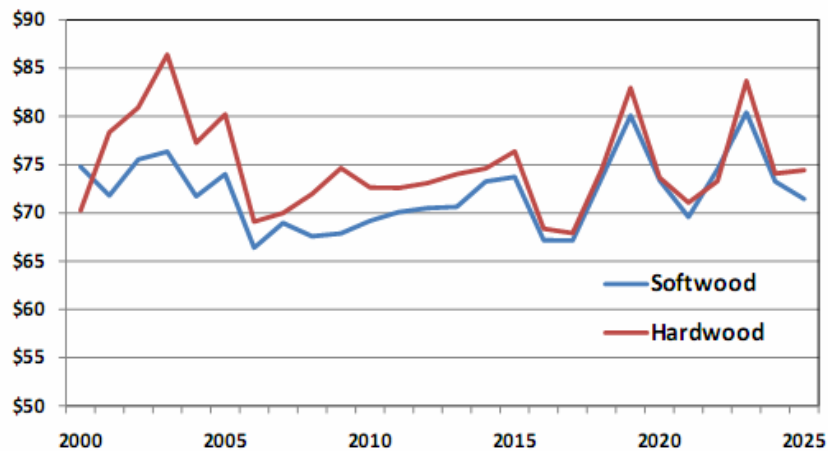
The outlook for US pulpwood markets is mostly positive, with significant variation among the major producing regions. In the near term, a recovery in the economy and a weaker US dollar will support modest improvement in operating rates at pulp and paper mills across the US.

Recovery in the OSB industry, the primary consumer of pulpwood after pulp and paper, will add to pressure on pulpwood markets. This will be especially evident in the US South, where the strong markets of the mid-2000s prompted capacity expansion. As structural panel markets gain strength during the recovery, new OSB capacity will begin operations as idled capacity resumes, boosting pulpwood demand. In addition, an expanding renewable energy industry will compete with traditional pulpwood uses.

Over the next 15 years, pulpwood prices in the US South are expected to move slightly higher on an inflation-adjusted basis (Figure 17), as expanded OSB capacity and bioenergy producers combine to offset continued contraction of pulp and paper capacity.

In the US Northeast and North Central regions, the influence of bioenergy and OSB expansion will be lower, with real pulpwood prices remaining relatively flat. However, there is upside risk to our Northeast price projections should bioenergy producers use a greater volume of growing stock than we currently anticipate. Higher pulpwood cost would in turn impinge negatively on bioenergy

US South Inflation-Adjusted Delivered Pulpwood Price \$US/Cord, 2009\$



Source: Forest Economic Advisors, LLC

Figure 17. Inflation Adjusted Delivered Pulpwood Price

Woody Biomass

Woody biomass has long been used as a fuel source, primarily by industry to help meet the enormous energy requirements of pulp and lumber mills. In the past decade, however, global demand for

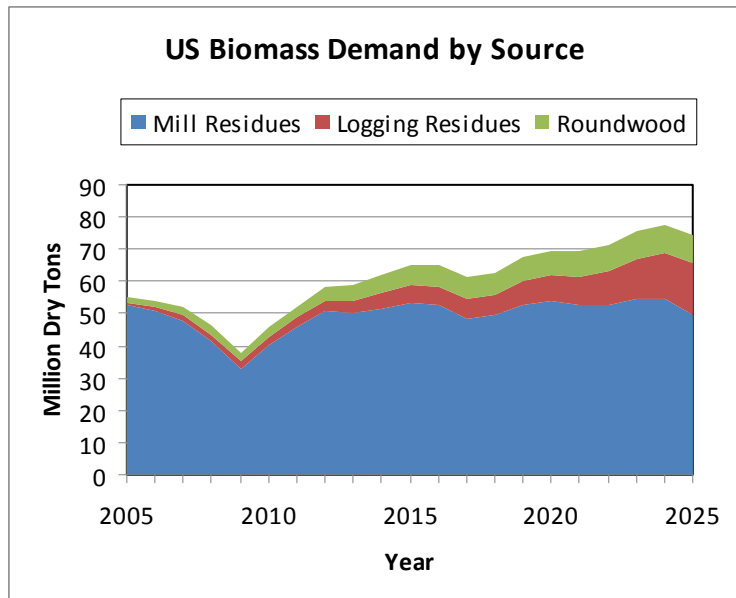
biomass for heating, electricity, and biofuels has grown dramatically on the heels of high energy prices and government mandates for renewable energy.

Traditionally a cost center for timberland owners, low-grade biomass material such as pre-commercial thinnings, logging residues, and whole tree chips will slowly become a viable product over the next 15 years. Mill residues will not suffice, enabling increasing extraction of in-woods material.

However..... we do not expect renewable energy growth to bring substantial marginal value to forestland owners. Increased roundwood demand for bioenergy will simply offset a decline in pulpwood demand. Although delivered prices for logging residues and pre-commercial thinnings will rise, high harvest and delivery costs will fully absorb stumpage profits until greater production efficiencies can be realized. Further, relatively low competing energy prices will restrain any potential price run-up for biomass.

Perhaps the greatest value provided to forestland owners from the rise of bioenergy will be the ability to practice better forest management. Forests in need of increased management to protect from insects, disease, and fire and for thinning to enhance sawlog value will enjoy increasing demand at prices sufficient to cover removal costs.

While bioenergy growth slowed in 2008 and 2009 as energy demand declined and readily available financing evaporated, we expect significant growth to occur throughout the forecast period. Public energy policy will continue to strengthen the emerging industry over the long term, and in the near term 20 million dry tons of mill residues will ease prices and help fuel the startup of previously announced capacity. We see growth across all sectors, resulting in total biomass demand increasing by approximately 30 million dry tons over the forecast period, an increase of over 60% from current levels.



Source: Forest Economic Advisors, LLC

Figure 15. Biomass Usage

Part 5:

U.S. Timberland post-recession – Is it the same asset?

The purpose of this economic outlook and review of fundamentals is to assess what might be expected of the future. The implosion marked by the fall of Lehman in September 2008 and the sluggish economic recovery has placed a number of investors appropriately on the fence. Eventually, however, markets will move, lumps to be taken will have been taken, and a new balance will be found.

The following represents the scenario most likely in the view of R&A Investment Forestry.

Will Timberland Value Decline?

The larger question goes to timberland valuation and whether further correction is likely. By second quarter of 2008, it was our sense that the market had become overheated and more restraint was necessary – which we stated in a presentation at the *Who Will Own the Forest* conference in Portland, OR on September 8, 2008. The fall of Lehman Brothers one week later underscored the point. The sales of large industrial timberland ownerships through investment bank managed auctions had been successful in pitting TIMO against TIMO and in wringing the last dollar from investors. The timberland sales of International Paper in 2006 and Temple Inland in 2007 marked the peak of transaction volume and, except for Weyerhaeuser, the last of public corporate ownership of timberland.

Following the near economic collapse of September 2008 and the subsequent liquidity crisis that struck institutional investors, it had been R&A's expectation that portfolio values would be off by 20% by EOY 2009. This equates to an increase in discount rate of approximately 200 basis points, from 4.5% at the peak of investment fervor to 6.5% to 7.0%, more typical of expected returns 10 years ago. Our sense was that such a “reset” would have been necessary if timberland were to maintain momentum in a post-industrial milieu, and that values would trend from there under a revised set of drivers. We were not alone in this sense. In August 2009, an informal R&A survey of experts, including TIMO executives, economists, and appraisers, showed a full range of expectations. Of those who expected timberland to decline substantially, representing most respondents, the general consensus was 10% to 20%. One TIMO executive said 30%. Of those who felt that timberland would fair better, consensus was 5% to 10%. Some said there would be no decline in value. One said that, if anything, discount rates would decline further, arguing that timberland would benefit from the downturn.

But...the decline has not been as deep as we anticipated. By the NIT measure, portfolio value at EOY 2009 was off by only 4.75%, with income of 0.4% and capital appreciation of negative 5.15%, variable by region. In a world where stock markets fell precipitously (then partially recovered) and where some investors lost 50.0% of their real estate portfolios, why would timberland fair so well? While it is likely that further correction will be slow to manifest itself, it remains our sense that the true correction

remains hidden behind the lowest transaction volume since 2001, the year following the last and only other decline. Investors remain reluctant and bid-ask margins will continue to be wide. This means a year or more of uncertainty.

Timberland Value will Decline by Another 10% to 15%. It is our sense that by mid-year 2011 timberland will show a decline in real terms of another 10% to 15% of “pre-crash” value, which will likely be reflected in some transactions by EOY 2010. Again, we are not alone in this view of diminished value. A March 17, 2010 Deutsche Bank report states “PCL [Plum Creek] suggests that values are down just 10-15% from the peak, with discount rates....up about one percentage point.” (Chun, 2010)

What Leads Us to This Conclusion?

Appraised Values Lag Reality. The NTI and institutional portfolios are seemingly insulated from events in the broader economy in part due to the appraisal process. The NTI consists not of actual sales, but annual “mark to market” appraisals. Appraisers depend largely on comparable sales, and with low transaction volume, they must rely on increasingly lower quality “comps” and their own personal judgment. Judgment and expertise are variable and appraisers face suasive pressure from a range of interests. Given the current bid/ask spread, and the fact that typically low debt levels fend off distress, this circumstance could last considerably longer. Ultimately, however, markets move, distress manifests itself, and transactions begin to occur. Armed with higher quality comps, appraisers can then begin to appraise closer to reality.

Note also that cap rates for commercial real estate stocks went from a low of 5.2% in 2007 to a high of 10.3% in January of 2009. They have since come down to 7%, almost 200 basis points above their low. (Litt, 2010) Much of timberland’s inherent correction likely remains hidden.

Economic Recovery Will Be Slow. The U.S. economy, while currently on the upswing, will take an extended period to fully recover. Stumpage prices most likely hit bottom in 2009, but will not be at their 2005 levels in real terms until 2015 and will not return to 2000 levels in the foreseeable future. This will push income back several years, thus limiting near-term return and lowering value regardless of discount rate. It can be argued that harvest foregone during the decline is stored on the stump and can be recouped later. Certainly this is true, but the advantage will be diluted by a rush of product to market and its consequent effect on price.

The Changing Nature of Housing Demand. Housing is a function of contraction this time, not oversupply. People simply can’t afford to form new households. But deep corrections have a tendency to stick, even after the root cause has passed. If this creates a cultural propensity to delay household formation, pent-up demand may diminish and it will be years before traditional levels of housing starts are achieved.

Demand For Timberland Is Uncertain. There has been much discussion of late of European buyers entering the market to replace exiting U.S. buyers. These investors are said to have large appetites

and low discount rates, content with returns at 4.5 to 5.0% real, and eager to place capital in global clean energy projects. In 2009, Denmark's largest pension fund, ATP, made sizable investments in upstate New York timberland, a biomass resource, and in the Hudson Clean Energy Fund, an investor in clean energy, including biomass. (Valente, 2009) Similar motivation has been attributed to the Temple Inland transaction. A substantial influx of such investors would be supportive of timberland values.

This leads to the interesting speculation that timberland might reintegrate, to a degree, with a new industry - renewable energy. Just as paper companies previously saw the ownership of timberland as supply insurance for large investments in pulp and paper mills, the growing renewables industry could see this as worth the cost. Were this to occur, it would provide an unanticipated exit for current timberland investors.

We see this as unlikely, except at very early stages of the industry's development, on the same grounds that paper companies divested of their timberlands. Renewable energy depends on inputs of low cost raw material, and highest forest value will remain in sawtimber, with housing as the primary end use.

Additionally, offshore investments in the U.S. tend to be based in large part on the relative strength of the \$US. The Euro, which increased against the \$US throughout 2009, has recently shown signs of decline against the \$US. If this trend continues, investors are likely to be drawn more to emerging markets, where spending habits are changing and consumption is on the rise. BRIC nations (Brazil, Russia, India, and China) are likely magnets for capital.

Supply of Timberland is Uncertain. With the exit of the forest products industry from ownership, the primary source of timberland for investment has been depleted. Thus timberland for new investment must come from exiting current investors. Where early investments were primarily in large separate accounts, during the last decade the industry has migrated more to closed-end commingled funds as the vehicle of choice, representing approximately 50% of the current institutional portfolio. These funds have 10 to 15 year horizons. Within five years this will trigger a new round of divestitures, seeking exit strategies that will generate the highest return. How much supply this will bring remains to be seen. A perception of greater risk and higher discount rates between now and then could suppress that market.

Historically, REITs have preferred the higher yield of mature age classes. Their potential divestiture of young growth provides another potential source.

Higher Perception of Risk Will Raise Discount Rate. The level of long-term risk in timberland has been under-acknowledged. While the standard measures of return volatility indicate relatively low risk (some have likened it to a bond), in fact, long holding periods and 25 to 70 year rotations transcend business cycles, exposing timberland to risks that shorter term assets are less likely to confront. The mountain pine beetle is an example. All tree species are subject to a variety of insects and pathogens and there have been previous epidemics, but it is tempting to attribute this one to climate change. The mountain pine beetle will ultimately take a significant area of British Columbia out of production. To

the extent that the beetle outbreak results from climate change, this could have implications for other growing regions as well.⁹

Further, the argument that 4.5% real return is justified so long as spreads against treasuries are maintained ignores the fact that a point is reached where the inherent risk in the asset itself requires more. The facts of the economic crisis, climate change, and the mountain pine beetle will sensitize investors to higher long-term risk.

Additional risk lies in the social costs of operation. With a single-minded focus on return, an emphasis on cost-cutting has developed, particularly where returns to specific activities are difficult to measure. This is particularly true for R&D and community outreach – affecting the so called “social license to operate.” No manager’s acquisition model contains line items for these activities, where forest products companies once did. Communities are beginning to push back, which will ultimately have the effect of increasing operating costs and lowering value.

It is our sense that discount rates for timberland will return to 6.0% to 7.5% real, with regional or site specific variation. This will continue until new revenue sources develop and prove sound. The market is as yet undecided.

Liquidity Will Bring A Premium. With too little of their portfolios in liquid assets, the economic downturn has left pensions and endowments strapped for cash. This will take years to correct, which will lower the level of demand for timberland with young age-class distributions, giving an edge to properties with higher near term cash flows. Pre-crash, near term was seen as more risky because of its reliance on volatile stumpage markets. This still holds, but as investors seek new acquisitions, properties with higher components of mature timber will have an advantage.

This will also benefit REITs. As timberland managed by TIMOs increases in merchantable volume, REITs will be competitive buyers, most likely increasing their market share.

What Other Factors Warrant Attention?

Supply Demand Relationships Have Changed. Lumber has become further commoditized along with the shift to higher productivity, global plantations, and advanced milling technology. Western Douglas fir and Ponderosa pine will be less competitive than Southern pine and Radiata. The West, as the higher cost producer, will thus experience downward pressure on values, resulting in a relative tendency to move toward longer rotations and larger diameters. Some part of the market will shift to higher quality and production of specialty product rather than commodity.

Loss of timber in BC from the Mountain Pine Beetle will ultimately cause the South to increase market share. The Pacific Northwest may capitalize on this for a time, but the South will be advantaged in the long-term as a result of its lower production costs.

⁹ Arguably, climate change would have lesser effect on intensively managed stands than on natural stands, favoring the US South over other regions.

Inflation Hedge is Due A Revisit. The massive influx of federal capital to fend off economic collapse has caused some to expect a period of high inflation. Thus far, however, inflation pressure has been absorbed by high unemployment and lingering restraint of credit. FEA and other others believe that such fears are unlikely to be realized in the foreseeable future. We agree. Where investors expect higher inflation and price investments in timberland to accommodate, to the extent that their expectations are not met, they will have overpaid.

It remains our sense that timberland and other “hard” assets will continue to do well in periods of higher than expected inflation. The consistent correlation between timberland return and past inflation intuitively supports this view. However, the nature of timberland has changed over the past decade, with dramatic increase in value and the influence of non-timber value components, especially undeveloped real estate. New analytic strategies designed to reveal higher statistical significance would increase investor confidence.

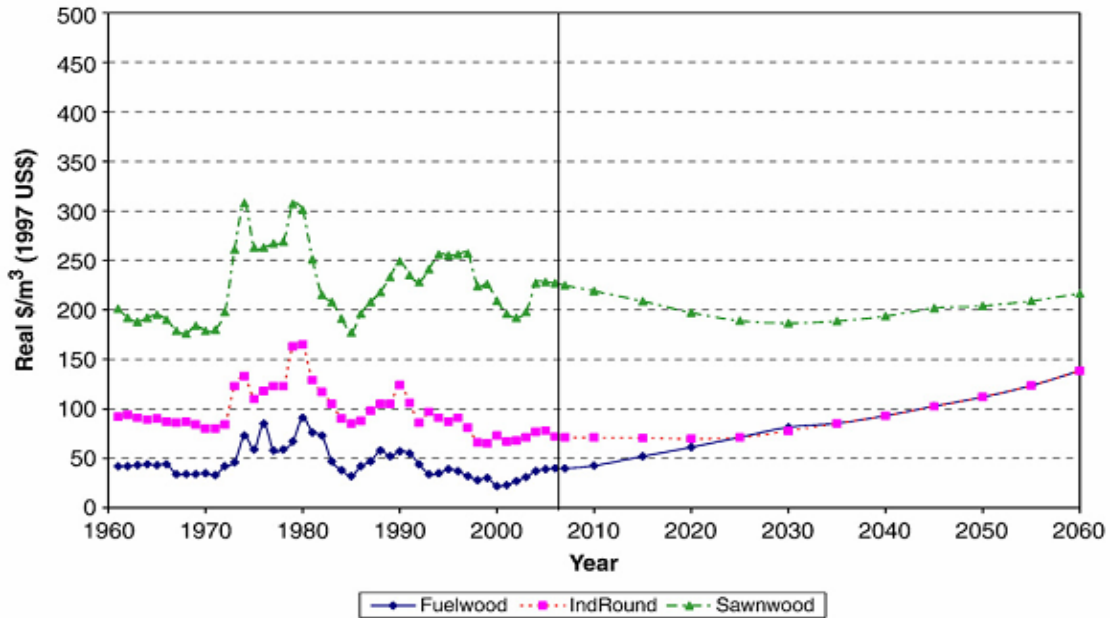
Likewise With Portfolio Diversification. Similarly, it remains our sense that timberland is uncorrelated with other assets and as such contributes to portfolio diversification. Still, given changing economic conditions, we think this claim warrants revisit. Figure 9 demonstrates that correlations between timberland and other assets change randomly by time period, showing zero correlation from interval to interval. Even over the long term, correlation coefficients are statistically low. The fact that timberland and real estate have generally been unrelated but show significant positive correlation over the last decade demonstrates that periodic reevaluation is justified.

Carbon Offset is Not a Forest Product. Investment in production of GHG offsets may be appropriate for funds targeted to speculative return, but they are not a forest product and should not be part of a forest investors’ acquisition analysis. If an offset market *per se* does develop, there is no certainty that it will include credits generated by less intensive management of existing forests. Even if science develops means of measurement accurate enough to include existing stands, carbon will still have difficulty meeting its opportunity cost. Post acquisition, however, carbon is a potential revenue source under limited conditions where protocols allow for its sale without adversely affecting management plans.

Biomass Will Be Important – But Will Remain the Lowest Value Forest Product. Renewable energy from forest biomass will be additive, but it will come first from logging and manufacturing residues that cannot be used for pulp. While demand for residues will exceed supply, for the foreseeable future roundwood for energy will simply replace declining demand for pulpwood for paper production. A recent analysis of the utilization of fuelwood and industrial roundwood to produce biofuels, depicted in Figure 17, indicates that global roundwood prices will exceed fuelwood prices until 2025 when they will merge into a single product. From 2025 through 2060, price of biomass will increase at a real rate of 1.96%. During that period, sawtimber will increase at a rate of 0.46%, decreasing the margin between the two by 35% in 35 years. (Rauniker, 2010)

Figure 17 also demonstrates that, even as biomass price increases, sawtimber continues to be the higher value forest product. With energy competing with pulp and paper only at the more distal

segment of the supply curve, biomass will remain at the lower end of the value chain. Still, demand for renewable energy will place upward pressure on timberland value, making biomass an increasing, but still relatively minor, portion of timberland return.



Source: Forest Policy & Economics 12 (2010) 48-56. Rauniker, Buongiorno, Turner, Zhu

Figure 17. Predicted World Price of Forest Outputs

Biomass will not be the game-changer that some have hoped for. Sawlogs will remain the core source of timberland value.

HBU Values will Increase. US Population, now at 310 million, is expected to increase to 341 million (+10%) by 2020 and to 439 million (+42%) by 2050. Global population, now at 6.9 billion will increase to 7.6 billion by 2020 and to 9.1 billion by 2050. (US Bureau of the Census) Based on these broad demographics, post-recovery HBU will continue its advancement as a component of US timberland value.

This shift in use will apply to some extent to all timberland, regardless of its location, but will be of particular importance within a three-hour drive of population centers. During the last decade, as a result of the liquidation of timberland by the forest products industry, much of the immediate development value of timberland has been monetized. Thus it is our sense that the anticipated growth in HBU value will be largely from “dispersed recreation” and the desire on the part of speculators and high net worth individuals to own land. The propensity for large contiguous or proximate ownerships to be fragmented will continue in an effort to realize greater value.

As these values are incorporated into the price of timberland, appropriate component stratification and assignment of risk will take on new meaning in acquisition analysis.

Ecosystem Services Could Be a Long-Term Game-Changer. The importance of the economic role of ecosystem services must currently be characterized as a guess. There is no doubt that awareness of environmental quality has increased exponentially during the last decade and that it takes on vastly greater significance as population and its cumulative effects increase. Air and water will likely prove to be the most valuable of assets. What is in question is its comprehensive marketability. The PES industry is betting heavily that it is. Even if Ecosystem Marketplace is wrong by an order of magnitude, it represents financial value of enormous scale. On the other hand, they could prove to be assets more effectively conserved through regulation than through private ownership and economic markets, which implies increasing regulatory risk

It is our sense that ecosystem services will become increasingly monetizable, just as wetlands mitigation has been. If that proves correct, forest owners and all owners of large scale undeveloped land will benefit. The newest ecosystem service to come to market is renewable energy in the form of biomass, a long-standing forest product. Payment for water quality services, basically for flow-through filtration, is likely to be next.

But as to the balance of ecosystem services, it is also our sense that this will not occur within an investable time period or along a determinable path and thus does not lend itself well to acquisition analysis as customarily applied to timberland. Like GHG offsets, it may well be an appropriate institutional investment in a more speculative asset class, but it is not a traditional timberland investment and thus different metrics must apply.

Conservation. Where financial investors prefer to concentrate capital on the timber component there will be opportunities to avoid HBU risk by partnering with conservation NGOs. At least one TIMO focuses on such transactions as a differentiating strategy. Conservation, however, is limited in their ability to participate.

- **Scale is a Problem.** To efficiently partner with large institutional investors, the conservation partner must operate at sufficient scale. Few NGOs will qualify and most that do will rely heavily on State and federal participation.
- **Capital is a Problem.** Since the economic crisis, little conservation capital has been available from traditional philanthropic donors or from State and federal government. It is unlikely that State bond capital will be available for such projects for the foreseeable future. Public funding will remain limited.

Where capital is available, conservation partnership remains a viable option for financial investors, providing opportunity to offload even small components of value that carry large risk.

Part 6:

What should investors do?

The core question inherent in this review of history and expectations has been “Will values decline?” Having offered our sense for that, another key question is “What do we do next?” Our suggestions include the following.

Develop a Plan. The current low level of transaction volume and wide bid/ask spreads provide an opportunity to organize. No doubt some are doing that now. Pursue the research and outreach that will provide for considered action and the ability to recognize a good opportunity when it is presented.

Develop Internal Expertise. The next period will reward a higher level of internal expertise or a proxy for it that will feel more like your advisor is in the office next door. That needn't mean a large dedicated staff, simply someone to “lean in your doorway”, or you in theirs, with the expertise to read the signals and ask the right questions.

Be Selective. Values are unsettled and good timberland investments will be opportunistic in nature for the next several years. Much will be determined by seller needs, local markets, and property attributes. Until then, offerings will be of mixed quality, many not reflecting true underlying value. Recall Figure 7, Cumulative Annual Return. An investment that declines in value by even 5% shortly following acquisition, generating 6% thereafter, will see cumulative return below 3% for a decade.

For the time being, prices are more likely to decline than increase. Discipline will serve well. But begin the process soon. Some sellers will face reality and motivation sooner than others and some attractive opportunities are no doubt available even now.

Avoid the Bandwagon. Overheated expectations of large windfall from carbon, biomass, or HBU are tempting but unrealistic in our view. The inherent value in timberland remains largely in sawtimber for housing. Demographics are in your favor.

Get to Know the Timberland Investment Managers. Over 20 years, investors have come to rely on an expanding array of managers. Be proactive in getting to know them. Visit them in their offices before they come to you. Smaller local managers who know local properties and markets could serve well in the right circumstance. Some level of internal expertise will allow you to select the manager best for you. In any event, know enough to evaluate your options.

Retain Discretion and Control. Commingled funds can work well as a means of distributing risk, but seek opportunities that provide a measure of control. Avoid fixed or narrow exit strategies. Consider separate accounts. A well placed smaller transaction may work better than a large traditionally structured commingled fund that affords little autonomy.

Peak Values Are Behind Us. If you currently own timberland, consider that peak timberland value is likely behind us, at least for the time being. If it is your sense that the market is still at 4.5%, your strategy should reflect that.

Our Conclusion?

In a September 2009 newsletter, Morningstar drew the conclusion that “The party’s over!” (Morningstar, 2009) While we would characterize it otherwise, it is true that expectations of dramatic returns of 20% or more that timberland has enjoyed during narrow time intervals in the past are unlikely to be met in the future. Even 20-year nominal cumulative returns of 14.1%, as have accrued to timberland since 1986, should not be expected. But then, they never were. Returns projected by timberland investment managers have always been more moderate than historical results, generally ranging from 6% to 10% in real terms, depending on region, local markets, and property characteristics.

On the other hand, apparent real discount rates of 4.0% to 5.0%, as were applied prior to the current recession, are too low and do not reflect the inherent long-term risk of the asset. We think upward adjustment to 6.0% to 7.5% real is likely. It is our sense that actual timberland values have already declined by 15% to 20% and that the 4.75% decline reflected by the NCREIF Timberland Index is understated, with more hidden by low transaction volume.

These adjustments will likely manifest themselves during the next 12 months. When that occurs, timberland will continue from there, generating a return reflective of its risk. In fact, the party is not over, it has simply become less raucous. Timberland will continue as a steady asset and will retain its appropriate role in institutional portfolios.

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