Hancock Timber
RESEARCH *Note*

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The Benefits of Timberland in a Real Estate Portfolio, Revisited

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Despite the unique risk and return characteristics of timberland, most investors include it with either their private equity or real estate portfolios. Of the two, we think including it with the latter is generally more appropriate. But doing so raises the question of how timberland affects the risk and return of the overall real estate portfolio. Because of timberland's investment characteristics, it can substantially reduce the volatility of a broad, mixed-asset real estate portfolio and at the same time materially increase returns.

This Research Note updates our 1Q 2000 Hancock Timberland Investor analysis with current data. We find that in spite of the recent lower-than-average returns for timberland, investors who held timberland in their real estate portfolios over the 16-year period had higher returns at lower levels of risk than real estate portfolios without timberland.

Three kinds of evidence demonstrate the positive effects of adding timberland to a real estate portfolio. First, we simply compare the historical performance of private timberland equity with both private and public commercial real estate equity. Second, we calculate historical returns for a real estate portfolio with varying amounts of timberland. Finally, we use expectations of future performance to estimate risk-efficient frontiers for real estate portfolios with and without a timberland component.

Historical Returns

Historical return data come from the standard sources:

- National Council of Real Estate Investment Fiduciaries (NCREIF) Property Index (NPI) for unleveraged private equity real estate;
- National Association of Real Estate Investment Trusts (NAREIT) Equity REIT Index for public equity real estate; and
- NCREIF Timberland Index for unleveraged private timberland equity.

The 1987-2002 analysis period corresponds to the availability of the NCREIF timberland data. All returns are nominal.

This analysis contains estimates and projections based on certain assumptions regarding future prices, costs and operating strategies. Specific information as to these assumptions is available on request. There can be no assurance that these projections will prove to be accurate.

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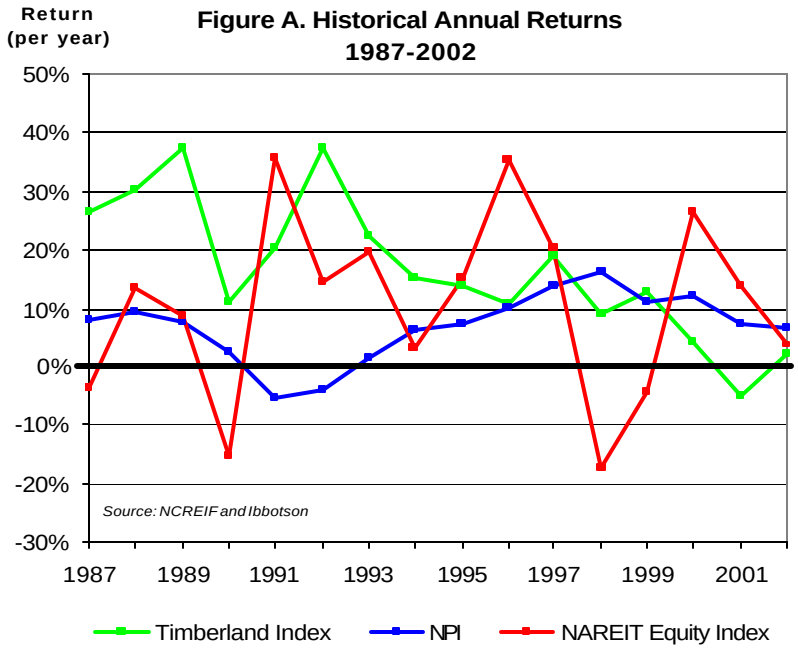
Figure A plots calendar-year returns for the three asset classes.



The NAREIT Index shows the greatest variation in returns, ranging from a high of 35.5 percent in 1991 to a low of 17 percent in 1998.

The table below lists the level, volatility and Sharpe ratios (a measure of return premium per unit of risk) for each asset's returns. Annualized returns to timberland have been highest throughout the 16-year period at 16.1 percent. Public real estate has outperformed private real estate, yet with much greater volatility. Comparisons of Sharpe ratios show returns for timberland have been highest on a risk-adjusted basis as well.

Annual Returns for Timberland and Commercial Real Estate, 1987-2002

	Annualized Return	Standard Deviation	Sharpe Ratio
Timberland	16.10	12.06	1.38
Private Real Estate	6.79	5.99	1.15
Public Real Estate	9.49	15.75	0.67

Note: For Sharpe ratio calculations, we used 5 percent as the risk-free rate, corresponding to the 30-day U.S. Treasury Bill rate over the 16-year period.

Casual observation of Figure A suggests that timberland returns have not tracked returns for commercial real estate. Indeed, timberland returns were relatively high when returns for private equity real estate bottomed in the early 1990s, and have been relatively low, as private equity real estate performance has recovered during the late 1990s.

The table below presents a correlation matrix for returns to timberland and commercial real estate. Timberland had a negative correlation with private real estate and a low positive correlation with public real estate. Interestingly, private and public real estate were negatively correlated. This result is consistent with discussions in the real estate literature, which posit that public equity returns lead private returns and are influenced by the stock market.

Correlation of Returns for Timberland and Commercial Real Estate, 1987-2002

	Timberland	Private Real Estate	Public Real Estate
Timberland	1.00		
Private Real Estate	-0.35	1.00	
Public Real Estate	0.07	-0.27	1.00

Adding Timberland to a Real Estate Portfolio

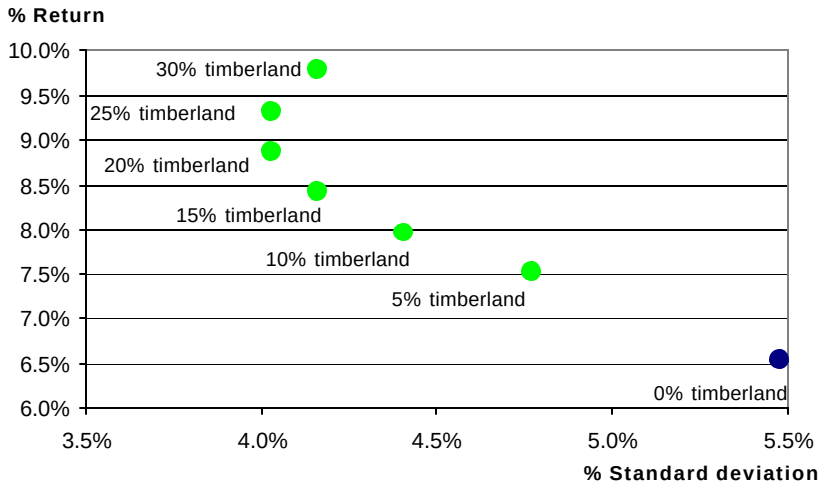
These historical results suggest that a real estate portfolio with a timber component would have generated both higher and more stable returns than a real estate portfolio without timberland.

To quantify these effects, we first modeled a real estate portfolio without timberland, weighted 90 percent to private real estate and 10 percent to public real estate. Using historical returns and standard deviations, our hypothetical real estate portfolio returned 6.5 percent with a standard deviation of 5.5 percent.

Figure B shows the increase in return and reduction in risk with the addition of timberland to the portfolio. We included timberland in increments of 5 percent up to a maximum of 30 percent, while proportionately decreasing both the private and public real estate equity holdings.

As little as 5 percent timberland added 98 basis points of return to the overall portfolio, while at the same time lowered volatility. At 30 percent timberland, we were able to add over 300 basis points and decrease volatility by almost 25 percent.

Figure B. Risk and Return with Incremental Additions of Timberland to a Real Estate Portfolio



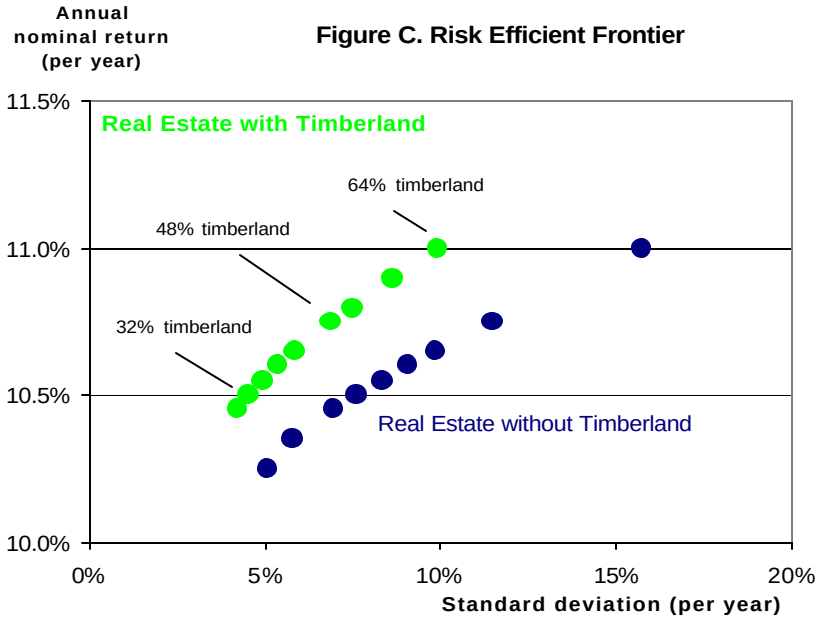
Risk-Efficient Frontiers

We also examined the consequences of adding timberland to a real estate portfolio by creating risk efficient frontiers with and without timberland. The efficient frontier shows the risk that must be undertaken to achieve each desired level of return. Portfolio allocations below this frontier are inferior; greater returns could be achieved without incurring additional risk.

We used expected nominal returns of 11 percent for public equity real estate and 10 percent for private equity real estate. Timberland returns were set at an expected rate of 11 percent. Standard deviations and correlations were based on historical data for all three assets.

The two frontiers are traced in Figure C. Our results are further evidence that the addition of timberland to a portfolio of private and public real estate can substantially reduce its volatility. Consider a target return of 10.5 percent. Without timberland, the risk-efficient portfolio has a standard deviation of 7.6 percent. With timberland (32%), the standard deviation decreases to 4.6 percent and the Sharpe ratio increases 67.3 percent to 2.29.

Figure C. Risk Efficient Frontier



Summary

Three conclusions appear to be warranted. First, since 1987 timberland has generated higher returns than real estate, timberland returns have been relatively stable, and timberland returns have been poorly correlated with both public and private equity real estate. Second, institutional investors that included timberland in their real estate portfolio over the 16-year period had higher returns with lower levels of risk. And last, because of the negative correlation between private equity timberland and private equity real estate, timberland could improve the investment performance of a mixed-asset real estate portfolio even with lower expected rates of return for timberland and higher expected rates of return for real estate. Our results are based on domestic timberland investments alone, and the further diversification and additional returns associated with a global timberland portfolio would still further improve portfolio performance.

Research Publications from the Hancock Timber Resource Group

Title	Date Published	Reference #
Exchange-Rate Risk for Timberland Investments in New Zealand	6/03	N-03-8
The Benefits of Timberland in a Real Estate Portfolio, Revisited	6/03	N-03-7
Disposition Discipline and its Contribution to the Performance of Timberland Investments	2/02	N-02-6
Review of Southern Pine Sawtimber Prices on HTRG Properties in Alabama and Mississippi	8/01	R-01-3
Stochastic Simulation in Timberland Investment Analysis	7/01	R-01-2
The NCREIF Timberland Index	7/01	
Timberland as a Portfolio Diversifier	7/01	
Historical Returns for Timberland	7/01	
Relating Cash Flow and Total Return: Do Properties With Lower Near-Term Cash Flow Produce Higher Total Returns?	1/01	N-01-2
Investing in Forests as Part of the Response to Climate Change	9/00	B-00-2
Taking Advantage of the Wholesale Discount for Large Timberland Transactions	2/00	R-00-1
Levering Timberland Investments: Consequences for Equity Returns	2/00	N-00-1
Dueling Views of Timberland in P&I: What's the Real Story?	2/00	B-00-1
Hancock Timberland Investor	Quarterly	