Discount Rates and Timberland Investments

What is a discount rate and why is it important? A discount rate is the rate of return an investor must receive to justify any investment. While it goes by many names – such as the capitalization rate or "cap" rate, hurdle rate, cost of capital – the discount rate is used in financial analysis as the interest rate for discounting expected future cash flows to adjust for risk and the time value of money. Properly used, discount rates match the specific risk of each particular project. Therefore, risky investments employ higher discount rates, and safer investments lower rates.

When conducting financial analysis for timberland investments, as with other asset classes, the challenge with discount rates is that they are not directly observable. In other words, there exists no perfect "discount rate reference manual" that identifies a suitable discount rate for every type of timberland investment. Rather, discount rates must be estimated. Moreover, they vary by the motivations and risk profiles of each investor.

ESTIMATING DISCOUNT RATES

Generally, expected rates of return or discount rates represent the sum of a benchmark risk free rate and a risk premium, which can be broken into two parts: firm or asset class-specific risk (diversifiable) and market risk (non-diversifiable – affects all investments). While rates on the ten-year U.S. Treasury Note frequently serve as the benchmark or risk-free component, financial analysts differ in how they estimate risk premiums.[1] Investors tend to rely on one or more of four general approaches when developing rates for timberland investments (Table 1).

Table 1. Common approaches to estimating discount rates for timberland investments

Approach	Key Assumptions	Data Required
Estimate with Capital Asset Pricing Model (CAPM)	Market rewards investors for risk, not for failures to diversify	Risk free rate; historical returns of a suitable market index and of the specific asset being considered.
Calculate Weighted Average Cost of Capital (WACC)	Firm/project maintain same debt level over time; firm/project have similar risk profiles; capital cost reflects the marginal cost of capital.	Firm market value of debt and equity, historic returns on equity, marginal cost of debt, and applicable tax rate.

[1] As of September 1, 2006, ten-year Treasuries yielded 4.73%, with a 52-week range of 4.01-5.25%.

Survey active investors	Honest responses; rates estimated independently; they know the market.	Discount rates; specify whether real/nominal, before/after tax, benchmark risk free rate.
Derive from comparable timberland transactions	Buyers seek to maximize profits; winning bid represents market; required data are available	Timberland prices; deal characteristics (such as debt, species, acres, volumes); assumptions regarding forest growth, revenue, mgt. costs.

The **Capital Asset Pricing Model** (CAPM) provides a method for estimating expected rates of return for financial investments and projects through the use of historical financial data. It assumes that the market does not reward investors who fail to diversify with higher expected returns. Rather, the risk "premium" CAPM estimates is not a function of a project's stand-alone risk, but its contribution to a properly diversified investment portfolio. In other words, CAPM calculates the risk premium for an asset based on its relative return to the overall market, such as broad measures of the equity markets (e.g., S&P 500).

An investment that correlates perfectly with the stock market has a beta ($\bullet$) of 1.0. Beta is a measure of relative volatility, or risk. For instance, if the weighted S&P 500 index increases by 3%, a timberland investment with $\bullet$ = 1.0 should also rise by 3%. But an investment with $\bullet$ = 0.9 should rise by 90% of 3%, or 2.7%. The beta of a particular investment can be estimated by regressing historical market returns (e.g., S&P 500) on returns for the particular investment over time. We apply this beta to the general CAPM formula:

$$r_i = r_f + \bullet(r_M - r_f),$$

Where:
r_i = expected return of investment i,
r_f = risk-free rate of return, usually Government T-Bills or Bonds,
$\bullet$ = beta, measure of systematic risk of investment i,
r_M = expected return of the market portfolio.

In a portfolio context, timberland investments with low, or even negative, correlations with the equity markets are especially attractive to portfolio managers. Timberland investments tend to exhibit less volatility than the overall stock market, enhancing their appeal from a risk-return standpoint. In practice, CAPM remains the standard for risk and return modeling.

The **Weighted Average Cost of Capital** (WACC) approach, often used for estimating discount rates for investment projects and publicly-traded equities, recognizes the weighted average cost of a firm's different sources of financing. Since financing costs – the rate of interest lenders charge a specific investor and the expected returns expected by shareholders – vary across firms and projects, this approach is appealing in how it can be tailored to specific investments. In application, the marginal cost of debt is relatively easy to calculate as it reflects the investor's current cost of debt. Mistakes are made when analysts rely on historical costs of debt that may have little or no relation to the financial markets' current view of the firm. We use CAPM to estimate a suitable return for equity capital.

The following example shows how a nominal, after-tax WACC might be derived for a timberland investment:

Assumptions:
    Financing   = debt 40%, equity 60%
    Marginal tax rate of investor   = 30%
    Cost of debt to the investor   = 7.0%
    Equity yield rate (using CAPM)   = 8.5%

$$\text{WACC} = (.6 * 8.5\%) + (1 - .30) * (.4 * 7.0\%) = 7.1\%$$

Surveys of industry professionals offer guidance for estimating discount rates because many of those surveyed also value investments in and work with clients who invest in timberlands. Also, since our perspective is that global forest markets are organized regionally, analysis of regional or local market sentiment and regional or local timberland investments can provide insight into local risks, country-specific premiums, and expected returns for this asset class in this region.

Successful surveys typically require some level of ongoing working relationship or *quid pro quo* where you share final survey results with the respondents in return for their confidential participation. This technique is perhaps the most empirical, as active buyers share the actual discount rates applied to their acquisition analyses. The analyst should account for each investor's motivations, and whether aggressive, moderate, or conservative assumptions were used for key DCF inputs (e.g., growth, harvest levels, timber prices).

Discount rates derived from actual timberland transactions attempt to isolate factors affecting discount rates by distilling the perspectives of similar forestry professionals/investors for similar investments. Use of this data includes taking an average of derived discount rates, or, if sufficient transactions are available, to ascertain which specific timberland characteristics and investment alternatives measurably affect the rate. From here one can tailor a rate to a specific investment given the market's current valuation of specific investment characteristics and comparable assets.

DISCOUNT RATES FOR TIMBERLAND INVESTMENTS IN THE U.S.

Institutional investors, TIMOs, and REITs typically come to the table with an expected rate of return that accounts for their holding period, cost of capital, and target rate of return for the portion of their investment portfolio allocated to timberlands. An investor must be satisfied that this level of "expected returns" meets the perceived risk-return profile of the investment. Portfolio diversification benefits, economies of scale in management, or other strategic factors may justify an aggressive bid. However, particularly aggressive bids can drive down the discount rate to unsupportable levels, especially if applied in conjunction with overly optimistic timber price increases. This may bode poorly for both investment returns and forest stewardship.

Cited discount rates used in the past ten years ranged from 6% to 9% real (not including inflation). Private discussions associated with applied discount rates may not explicitly address these issues one-by-one, but they do include related assumptions implicitly. Then, for a given potential acquisition, the discount rate, say 6%, can be adjusted upward or downward depending on

specific characteristics of the property. Is it in a strong, stable stumpage market? Is it located in a high growth, high development region? Is the property encumbered by a fiber supply agreement or conservation easement, and how will this affect the liquidity and risk profile of the investment? How will this asset affect the overall diversification of my current portfolio? No two timberland investments are the same; the applied discount rate should reflect features unique to a given property and the market within which it is traded.

This analysis occurs as the acquisition of investment grade timberland properties remains an increasingly competitive enterprise. Rising prices paid for major timberland investments, as seen in the recent divestiture of International Paper's timberland holdings, imply decreasing discount rates and returns for timberland investments. In the past eighteen months, cited rates have fallen to 5% to 7%, and lower. The strong returns earned by institutional investors across U.S. regions speak to the appreciation and yields associated with the past twenty years (Figure 1), and the strong continued interest in and attraction to the timber asset class.
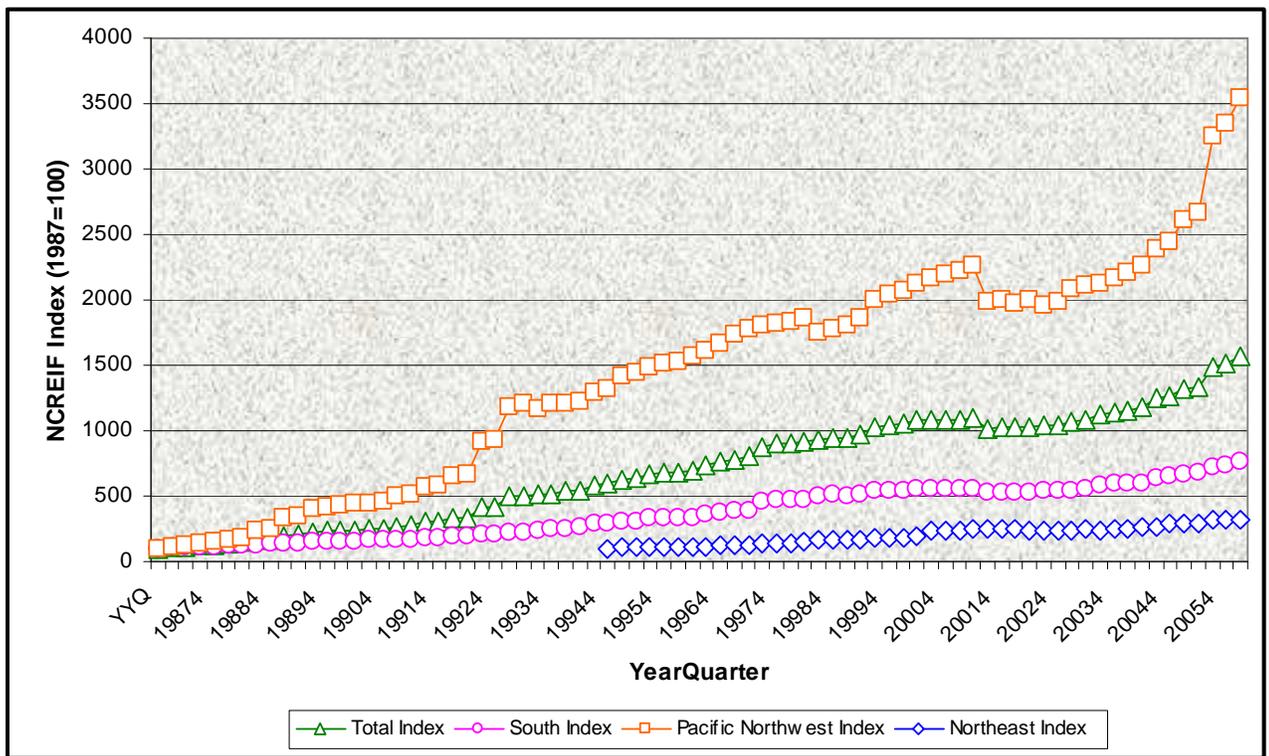

Figure 1. U.S. timberland returns by region (Source: NCREIF)

Recent research supports the contention that applied discount rates and expected returns have fallen with rising per acre timberland transaction prices. Surveys indicate that winning bidders for timberland investment properties are generally 10% to 25% higher than the "pack".[2] The NCREIF Timberland Index suggests average real returns around 12% over the last 19 years, which is higher

---

[2] Lutz, Jack. "Current Rates of Return for Institutional Timberland Investments," presented at the Southern Forest Economics Workers meeting, March 2006, Knoxville, TN. Follow up interview by Ashley Miller, Forest Analyst., James W. Sewall.

than the historical "8 percent" standard.[3] Investment managers increasingly manage for total timberland returns (rather than timber growing returns) by leveraging debt, selling conservation easements and recreation interests, developing higher-and-better-use (HBU) sales, and entering new (international) markets. Regarding HBU sales, TIMOs have added real estate professionals to their staffs, a trend that parallels land development strategies among publicly-traded timberland firms like Plum Creek, Rayonier, St. Joe, Temple-Inland, International Paper, and Weyerhaeuser. And, as markets develop for ecosystem services (e.g., carbon credit trading), investors hope to generate additional cash flows.

DISCOUNT RATES FOR INTERNATIONAL TIMBERLAND INVESTMENTS

Should discount rates applied to international timberland investments by U.S. based investors differ from those applied domestically? If yes, when? Discount rates should reflect the specific risk of the investment and its context. Buying stocks on the New York Stock Exchange, the world's largest by dollar volume, differs from buying stocks on La Bolsa of Uruguay, which lists fewer than twenty actively traded firms.   While both exchanges trade equities, the trading rules differ, the exchanges and their liquidity differ, and the equities themselves differ. For timberland investors, the issues to address can be grouped into three categories: price/foreign exchange risk, country risk, and trade/market risk. Analyzing these risks permits the investor to dismiss overstated exposures, mitigate undesirable exposures through the investment structure, or adjust the discount rate to account for the risk.

Foreign exchange (price) exposure and country risk are central areas of concern for international investors. Many firms devote substantial resources to hedge perceived foreign exchange risk. However, long-term research studies fail to establish statistically significant relationships between exchange rates and asset values, particularly stocks and bonds. "Long-term" – 10 years or more – is the key here because exchange rate changes, over time, are offset by adjustments in interest rates and inflation, or prices. Country risk, it seems, remains a more pressing concern.

Country risk analysis is the assessment of the potential risks and rewards associated with the business climate in a specific country. The need for this analysis stems from the reality that political considerations often lead countries to pursue economic policies detrimental to business and to their own economic health (e.g. protectionist trade regulations, unenforceable contracts and property rights, ponderous bureaucracies). Thus, a country risk analysis includes the study of political factors. A thorough country risk assessment would address questions such as:

1. Rule of law – are contracts enforceable? Will the court system support you?
2. Property rights – are they respected and enforceable? What is the potential for expropriation (without compensation)?
3. Transparency – are rules and procedures in the financial communities fair and clear? Is the legislative process fair and clear? To what extent do bribery and hidden fees and taxes exist?
4. Resource base – what is the availability and quality of natural, human, and financial resources? Is the workforce skilled, willing, and literate? Can foreign investors access local financial markets?

---

[3] This assumes average annual inflation of 3%.

This assessment of country risk investigates factors that infer whether or not a country will have a healthy investment climate. Research indicates that most country risk is "homegrown", and takes the forms of corruption, massive bureaucracies, government intervention in markets and ownership of enterprises, and monetizing deficits. Affirmative responses to the above questions reduce the need for adding country-specific risk premiums to applied discount rates.

Quantifying these exposures begins with assessing the yields of domestic government securities (bonds) relative to U.S. Treasuries. This approach relies on the assumed "risk free" nature of U.S. bonds, and the markets ability to price the added risk of holding a bond from a different country.

Finally, the diversity of forest products trade flows and markets affect the risk profile of the potential acquisition. Countries that do not depend on three or fewer key commodity for exports exhibit less volatility with respect to their terms of trade, exchange rates, and economic growth. In other words and unsurprisingly, countries with diversified economies and trade flows exhibit preferable investment climates. Specific to timberland acquisitions, the question becomes "who will buy the trees?" A country does not require both strong domestic and export markets to remain desirable. U.S. timberland investments rely almost exclusively on domestic markets, with the exception of the Pacific Northwest. New Zealand, long an attractive international market, relies heavily on exports, though the country continues to develop its domestic softwood lumber industry. Regardless, the question must be answered and quantified.

What do discount rates applied to international timberland investments look like? In 2005, James W. Sewall surveyed market participants regarding the discount rates they used to value forest investments in Australia. Respondents included U.S. TIMOs and Australian-based appraisers. The responses for real, pre-tax discount rates ranged from 8 percent to 13 percent for transactions prior to 2005. Since then, applied rates appear to have fallen as timberland markets mature, while investors use higher rates for other markets (Table 2).

Table 2. Discount rate ranges for international timberland investments, 2005

Region/Country	Range (Real)	Comments
Australia	5.4-9.1%	Strong domestic demand for wood products; maturing timberland investment market
Brazil	8-12%	Attractive growing conditions; strong domestic and export markets; moderate country risk
Uruguay	6.5-8.5%	Dependent on exports; investments in US$; low country risk, attractive investment climate
Central America	10.8-15%	Hardwood plantations; young timberland investment markets; non-financial buyers (i.e. churches) buying land in Guatemala at lower implied discount rates (~5%)
New Zealand	6.8-8.7%	Export dependent; dependent on exports; mature timberland investment market; low country risk

CONCLUSION

Developing discount rates is both art and science. Historical double-digit returns and low risk have attracted great interest in timberlands. Investment managers increasingly focus on maximizing a portfolio of returns from timberland assets, building in more value for realized and potential non-timber returns. Coupled with the diversification benefits, this has attracted excess capital to the asset class. Investors have bid discount rates down to unprecedented levels. Geographic differentiation in rates among U.S. regions virtually disappeared in 2005-6, and offshore rates fell as well.

Ultimately, financial analysts do the best job possible with the information available while simultaneously trying to satisfy client needs. In assessing potential timberland investments, investors need to exercise discipline, particularly in hot markets. The key question should be, "Does this discount rate represent an appropriate return relative to other investments of similar duration and risk?" Those who answer this question objectively and remain disciplined in their investment decisions will succeed.