



Managing Timberland Investment Risk

Current and potential timberland investors ask questions about the risks affecting the financial performance of their investments. The long time frames associated with timber investments increase the interest in understanding the range of potential risks. For timberland investors, these risks may include, but are not limited to, the impacts of insects, fire, price volatility, interest rates, and even energy prices. With such a wide range of potential risks, the central question for timberland investors becomes “how should we think about timberland risks?”

TIMBERLAND RISKS

Investors often associate risk with potential loss. However, risk has two faces: upside as well as downside. For instance, there may be gains from favorable prices or tax policy changes. Therefore, in the context of investments, risk may be more aptly defined as potential variation in expected outcomes. Unlike uncertainty, risk is measurable. Its most common empirical metric is the volatility associated with historical returns.

Timberland investment specific risks can be classified as physical, financial, operational, and regulatory.¹ Physical risks include factors affecting the volume and quality of timber, such as fire, insects, and disease. Financial risks include those affecting the price of inputs, including fertilizers and seedlings, and outputs, such as pulpwood, sawlogs, and the timberlands themselves. Operational risks include factors affecting the day-to-day operability on the timberlands, from weather impacts and access issues. Finally, regulatory risks may arise from land use regulations, green certification, and social pressures, all of which have policy implications. Note that in each of the four risk categories, influences on returns may be positive or negative.² It is also important to realize that the *magnitude* of volatility defines the level of risk.

Two key issues affect our perception of these risks. First is the quality and success of active forest management. Financial losses associated with physical and operational risks reported by TIMOs such as Hancock Timber Resource Group and The Campbell Group, and forest industry firms such as Plum

¹ William Duerr, in his classic text Fundamentals of Forestry Economics, groups the relevant timber risks into three categories: physical, such as loss from fire, storms, and insects; financial, such as price changes or “the delinquency of debtor”; and “technical misjudgment” in cruising or grading. We expand the categories to account for all issues faced by timberland investors.

² For instance, a recent change to IRS Sec. 631(b) allows timber owners in the “trade or business” to apply capital gains rates to revenues from lump-sum or “pay-as-cut” timber sales. Previously, capital gains rates only applied to “pay-as-cut” sales for this class of investor.

Creek and Weyerhaeuser, average less than 0.03% per year. Even in the case of catastrophic events, such as the recent hurricanes in South Carolina and Florida, forest managers focus on minimizing loss through salvage efforts and pushing up raw material inventories.

The second issue is the difficulty of obtaining empirical timberland risk information to calculate potential variations in expected outcomes for specific regions, states, and tracts. Because catastrophic losses are so tangible and widely reported, it is important to counter the negative perception of great risk with supportable evidence to the contrary. This issue is more acute with individual timberland investors than with investors in national or global diversified timberland or investment funds. Investors want the information required to help them compare the attractiveness of alternative investment properties, and to make the desired adjustments to their timberland valuation models. In the absence of good data, we must develop a reasonable framework to help investors account for relevant risks.

TIMBERLAND INVESTMENTS AND RISK MANAGEMENT MODELS

In practice, sophisticated timberland investors account for risk by adjusting inputs to their discounted cash flow models – factors, such as growth, price expectations, and discount rates. Some prefer to be conservative with pricing and focus on the discount rate, while others adjust both factors. While often subjective, these changes reflect accumulated experience and perception of the risks associated with specific timberland investments.

Theoretically, adjusting expected cash flows for risk and discounting them back by the “risk-free” or base rate, also called the certainty-equivalent method, may better reflect investor expectations of future outcome.³ However, this approach requires robust data to support accurate projections, and the resources required to develop rigorous probability histograms for future cash flows may be cost-prohibitive or simply unavailable.

Accounting for risk by adjusting the discount rate is simple and intuitive. Previous research into risk-adjusted discount rates indicates that the limited realized losses over long time horizons and the diversification benefits of holding timberland investments in a portfolio might justify lower discount rates than commonly used for corporate investments and shorter projects.⁴ Adjusting the discount rate is especially relevant when the risk profile of alternate investments is different. The rate of return should be adjusted to “equalize” the investment options in terms of risk. A disadvantage of accounting for risk in the discount rate is the built in assumption that the risk increases over time at a compounded rate.

³ Clutter et al in *Timber Management* (1983, Wiley & Sons) and Klemperer et al (1994, Risk and the discount rate in forestry, *Canadian Journal of Forest Research*) both advocate the use of certainty-equivalent methods.

⁴ Zinkhan et al in *Timberland Investments: A Portfolio Perspective* (1992, Timber Press) summarize the literature and describe in detail the diversification benefits with respect to other asset classes. In particular, they emphasize how timberland investments have generated low risk-adjusted returns and exhibited low or little correlation with, for example, the stock markets, enhancing their value as a portfolio diversifier. Fortson (1986, Factors affecting the discount rate for forestry investments, *Forest Products Journal*) emphasizes the importance of matching discount rates to the specific risk of a given project.

A watch-out for timberland investors is over-accounting for risk. For example, making conservative assumptions about future cash flows (adjusting on the top) while simultaneously adjusting the discount rate (adjusting on the bottom) can double-count the true financial exposure of a given investment. This may be necessary to satisfy an investor’s objectives or risk profile, but it may not provide the most accurate estimate of net present value (NPV). At the end of the day, the challenge of quantifying risk in valuations relies on access to data and expertise. Anything we can do to “inform” this perception can improve our ability to account for relevant risks.

A simple risk management model provides a framework for putting into context the exposures faced by timberland operations. One basic approach is to build a risk map with the frequency-severity model. This model asks simply “How often does this occur?” and “When it occurs, how significant is the impact?” This approach enables us to consider the significance of each risk, and then prioritize them.

In practice, building a risk map is a qualitative exercise informed with quantitative data. The investor and forestry professionals plot the actual and perceived risks for a given asset or region (Figure 1). To the extent possible, the frequency would be described on a per year basis, and the severity in dollars per 100 or 1000 acres.

— Sample Timberland Risk Map —

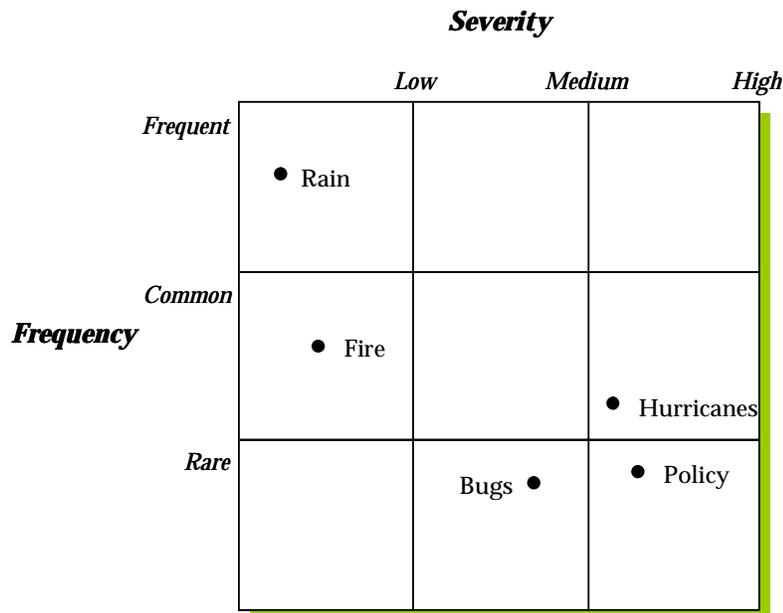


Figure 1. Risk map of timberland risks using the frequency-severity model.

The process of building the map provides the basis for understanding the actual exposures associated with the investment, and provides a framework for discussing and developing a risk management plan. For example, the high frequency and low severity of rain indicates “this happens a lot, but will not materially impact financial returns.” Alternately, the modest frequency and high impact of hurricanes leads to asking “how comfortable am I with this exposure? How well positioned are we to mitigate and salvage? Is insurance available for this risk and does it make sense?”

Risk maps and similar risk assessment tools provide a means for assessing timberland investments from several perspectives. In addition to comparing the relative exposure of different risks for a given region or property, they can be used to compare the risk profile of alternate properties and alternate species within the same property, the risk profile of a property over time, and the relative financial impacts of risk by category.

Ideally, the team would have access to or gather the information required to move beyond a frequency-severity model. However, these types of risk maps and scoring systems are dynamic and not static. To be useful, the risk map must be updated regularly to reflect changing investor needs and access to new data. Moreover, the investor can use the map to develop a strategy for diversifying a timber portfolio so as to spread out the risk associated with any given risk agent.

IMPLICATIONS FOR TIMBERLAND INVESTORS

Getting comfortable with timberland risk begins by getting familiar with available information. Public data on physical risks is available at both the national and state levels.⁵ While this data emphasizes the impacts to public lands, it provides relative impacts across regions in the U.S., and puts information available from state forestry associations in perspective. Private sources of risk data include insurance firms that sell policies covering physical and legal risks to timberland owners, appraisal firms, and forestry consultants. Additionally, timberland investment management organizations and diversified forest products firms make available limited information, through their literature and financial statements, describing the financial impacts associated with timberland risks on their ownerships.

In summary, risk, like value, is relative and “lies in the eyes of the beholder.” By reputation, timberland investors are risk averse and therefore, in considering alternate investments, consider relative risk in addition to expected value. At the end of the day, investor interest in these risks stems from the impacts on financial returns from the potential loss of trees, potential impacts on operating costs, and potential impacts on product prices and revenues. Basic risk management tools provide a basis for studying, understanding, and determining which risks matter and should be managed or included in property valuations.

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Editor: Brooks C Mendell, PhD, Associate of James W. Sewall Co. and Principal of Forisk Consulting, LLC.
bmendell@forisk.com

Producer: Bret P Vicary, PhD, MAI, Vice President, James W. Sewall Co. (207) 827-4456 bret@jws.com
www.jws.com

⁵ For example, the Forest Service (www.na.fs.fed.us) and the National Intragency Fire Center (www.nifc.gov) summarize key physical risks. States such as Georgia and Oregon publish on-line detailed state-specific timberland information.