



Industry News

■ **Federal Trade Group to Investigate Canadian Paper Subsidies** (Apr 12th)

The United States International Trade Commission is investigating provincial subsidies paid to restart competing Canadian mill, the Port Hawkesbury mill in Nova Scotia, which they say is hurting the state's mills. Both mills produce the similar high quality, glossy paper, known as supercalendered paper.

— *MPBN News*

■ **Lumber Set to Build on Its Rally** (May 21st)

U.S. new home construction jumped 20.2% in April, to the highest level since November 2007. This is good news for housing, which accounts for about 40% of U.S. lumber demand. The housing surge is likely to extend a recent rise in lumber prices.

— *Wall Street Journal*

■ **Catalyst to Invest Nearly \$16 Million in Rumford Pulp and Paper Mill** (May 24th)

Catalyst Paper will invest approximately \$11.4 million in various maintenance projects, including upgrading the Rumford mill's Recovery Boiler C, which involves completely replacing the 35 year old generating bank. An additional \$4.5 million in capital investments will be made in Q2.

— *Paperage*

Industry Overview

Forestland Operations

"Wet". That is just how one of our foresters answered my question of, "How is it going?" the other day.

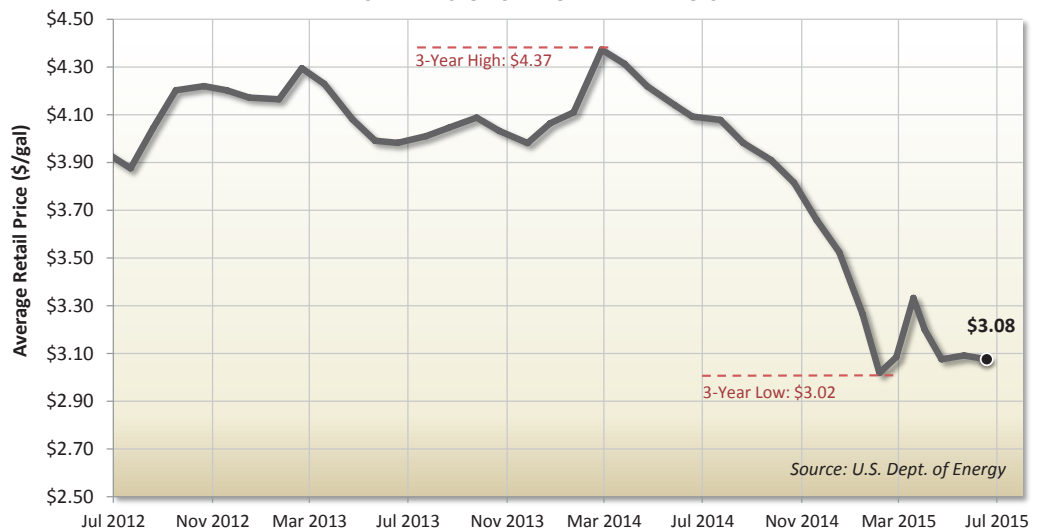
After a productive winter in the Northeast, the forest had initially dried out relatively quickly allowing us to return harvest crews to the woods a few weeks earlier than normal. By mid-May, depending on the region, some crews were already back to work. Loggers these days are working with thin profit margins, so every added week of production is very important.

The exuberance was short-lived, however, because the spring & early summer rains did show up eventually. As with other years past, just as momentum starts to build for summer, the June rains set in and everything comes to a halt. This year, we saw 18-20 days of rain in June, and as of this writing we have not had a stretch of 3-4 days in a row of dry weather that is required in order to really come back up to speed. Foresters are watching the condition of the trails and roads, making sure to manage the water, and carefully metering the trucking activity in order to prevent significant damage that may require later remediation. This has kept the volume of deliveries this quarter lower than what we (and most markets) had anticipated.

The good news is that the dog days of summer are on the horizon, we are in the middle of the forest's growing season, and week after week we are seeing slight improvement in the weather conditions. Furthermore, foresters are gradually moving operations to deeper soils as weather allows. This is all a normal part of transitioning into summer.

NUMBER 2 DIESEL FUEL PRICES - NEW ENGLAND

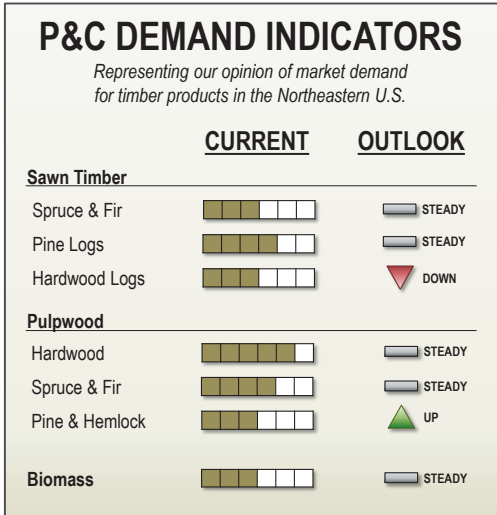
3 YEAR HISTORICAL MONTHLY AVERAGES



Diesel fuel prices remain low relative to what loggers & forestry professionals had become accustomed to over the past 5 years. Although cost management is always a concern, we have been in a prolonged period where diesel has not been a primary factor in loggers' profitability. If oil futures are any indication, it would appear most analysts & speculators agree that we are not returning to a high-price environment for diesel any time soon.

Forest Product Markets

For several manufacturing facilities, we are on the tail end of a "shutdown season" that is timed with the wet weather. There are many reasons for a brief shutdown period – seasonal maintenance, inventory control, a general "breather" period before the next production cycle kicks in. Every market is now either back up to speed or preparing to ramp back up in the coming days.



Because of the extended winter, timber inventories at most markets entered mud season in good shape (with a few notable exceptions, discussed below) but have been depleted and will soon start rebuilding once hauling picks up.

Sawn Products

Softwood

To the relief of many, the spruce & fir dimension lumber market indices have indicated an upward trend for the past month and a half (see chart below). Prior to this recent recovery, which started in the middle of May, the outlook at sawmills was quite gloomy. Mills had been in a rising price environment, boosted by economic news of the day, and had purchased their raw material inventory at high cost, only to see it while the price was dropping. As a result, many sawmills were forced to "buy high" and "sell low" – exactly the opposite of what my investment advisor always tells me to do. Since then, the Random Lengths Composite price has bounced back, and the value of the dimension lumber mills' finished products has come up.

It was a rough winter to be a dimension sawmill, but for the most part they remain healthy. By no means fat & happy -- but collectively they are in a little better shape than they were last quarter. Hopefully the trend will be in the right direction to support the few that are struggling.

The price of high-grade sawtimber has been flat to slightly down during this period. Anxious to sell what they have in inventory, mills have slackened their demand for the softwood timber and reduced buying commitments. The only thing keeping prices from slipping more is simple competition for logs. We expect to be in this condition for at least the next quarter, as log buyers who got stung by the market swings this past winter will want to avoid getting burned again.

We are still hearing that late 2015/early 2016 will bring better days. It seems as though a true recovery in the dimension lumber market has been just out of reach for several years now. Home builder confidence is up strongly year-over-year, consumer spending is up, but we keep waiting for building to strengthen. Although there is little doubt the housing markets are healthier today, construction activity does not yet appear to be in a period of stabilized growth.



■ Forest Service sees hope in battle with bat disease (Jun 1st)

Officials with the U.S. Forest Service are cautiously optimistic that a new treatment may help bats survive a disease known as white-nose syndrome that has killed millions of bats in the U.S. and Canada. Bats play a major role in the ecosystem, serving as a major predator for insects that can damage forests and crops.

— Associated Press

■ Aroostook County initiative touts potential of a 'forest products cluster' (Jun 1st)

The Aroostook Partnership for Progress is leading an effort to advance the forest products sector as a "cluster" with a strong potential for adding good-paying jobs in Aroostook County, Maine. "Clusters" are the key organizational unit for understanding and improving the performance of regional economies.

— Maine Biz

■ Fighting Forest Fires Before They Get Big – With Drones (Jun 9th)

The idea is to enable early location and identification of fires using drones, planes and satellites mounted with special infrared cameras. They are calling it Fuego, or Fire Urgency Estimator in Geosynchronous Orbit. Once fully operational, the system could spot new wildfires barely 3 minutes before they start.

— Wired.com

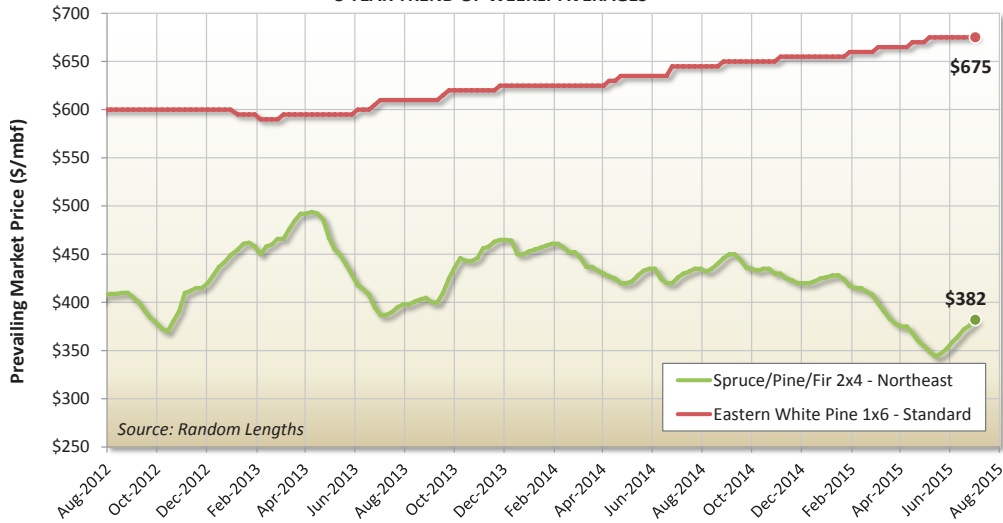
■ National park debate turns focus on land ownership questions (Jun 17th)

Opponents of the 150,000 acre National Park in the Katahdin region of Maine were raising concerns about the park's actual size and who owns the land touted for its creation.

— Bangor Daily News

PRICE TRENDS IN SOFTWOOD LUMBER

3 YEAR TREND OF WEEKLY AVERAGES



The pieces are there, and hopefully what we've seen on the horizon now for months is not just a mirage.

Markets for sawn pine remain good and mills are running straight out. Log pricing is relatively flat as mills are, for the most part, getting what volume they need. This is the time of year when pine inventories must be managed because of the staining that plagues pine in warm, humid weather during the summer. Mills cannot have big inventories, and forest managers must keep pine fresh in the woods. What inventory is maintained is kept either under water or under sprinkler systems to prevent the stain from flourishing. During the summer, therefore, hydration systems are a critical component of a pine mill's infrastructure.

Hardwood

Demand for nearly all hardwood species of lumber continues a long downward slide. This is a near 360-degree turn from where we were when I made my comments in our newsletter one year ago. There is an oversupply of maple lumber on the market right now, and prices continue to drop. Accordingly, demand for the logs has weakened substantially, and we are now seeing this manifest itself in hardwood log pricing as well.

We've seen as much as an 8-10% drop in hard maple log prices in the Northeast, which is actually less than one would expect considering the volatility in finished product prices. We keep hearing – and, to be fair, we've predicted it ourselves – that we're nearing the bottom of the market, but the proof has yet to show itself.

Hard maple logs represent the dominant hardwood sawn product we sell, and many other species shadow what happens with hard maple. Oak continues to see price declines in step with, and in some cases in excess of, that of hard maple. Yellow birch has been stable to slightly down as well. The one counterpoint is ash, which is a small component of the northeast forest, but demand is as strong as it has been historically. Furthermore, quarantines on ash are keeping demand artificially elevated.

Hardwood inventories are also tightly managed this time of year – some species are vulnerable to stain much like pine, and some such as hard maple can actually darken if left out in the sun, much like biting an apple and letting it sit out for a few days. In times of weak demand, lumber buyers can afford to be highly sensitive to discoloration, and mills don't want to keep finished goods inventory any longer than they have to. This tight inventory control has also kept log demand depressed.



update

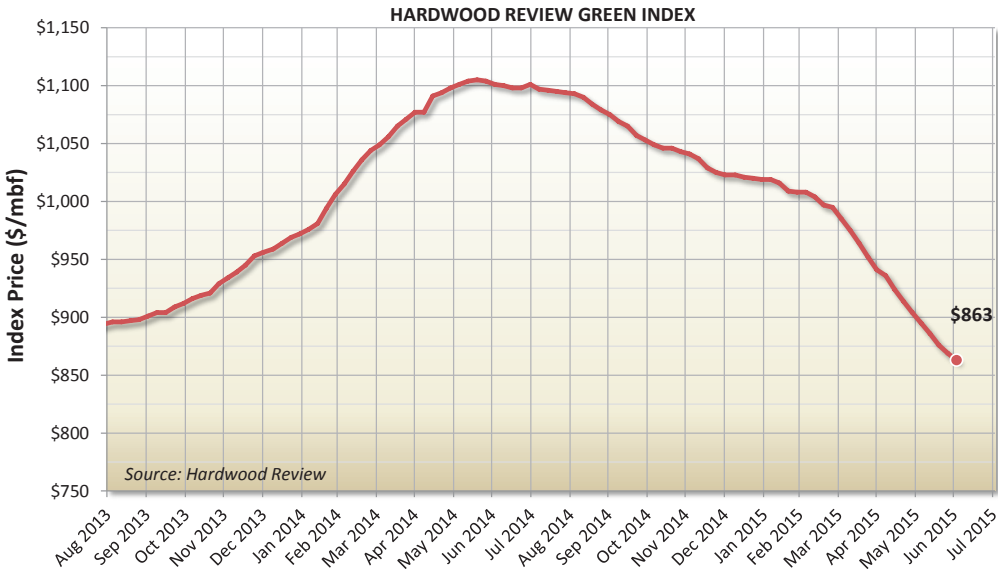
2nd Quarter 2015

- **25th anniversary of spotted owl listing: Fewer owls, less timber industry** (Jun 20th)
Twenty-five years of state and federal data and studies show the number of spotted owls on the Olympic Peninsula declined an estimated 40 percent between 1992 and 2006 and the number of wood-products mills in the Peninsula's four counties sank 71 percent to 32 mills between 1988 and 2012.
— *Peninsula Daily News*

- **Timberland value plummets after conservation easement** (Jun 28th)
A Minnesota Tax Court Judge rejected the land appraisals from four Minnesota counties and delivered a victory to UPM Blandin, which owns the giant baby blue paper mill in Grand Rapids. Blandin's forest, restricted by a conservation easement with the state, is worth about 1/8 the collective value quoted by the county's assessor.
— *Star Tribune*

- **Canadian lumber market is back on the beam** (Jul 3rd)
A steady rebound in U.S. housing activity over the next two years will spell much better times for North American lumber producers and lessen their reliance on the big Chinese market. The U.S. is traditionally the Canadian industry's principal market.
— *Montreal Gazette*

RECENT PRICES IN HARDWOOD LUMBER



The net is that times are tough in the hardwood industry, particularly in contrast to how things looked a year ago. It is worth mentioning, however, that last year was an incredibly atypical year of growth in the hardwood industry. In reality, the market – both in terms of pricing and in lumber demand – is far above the ‘Great Recession’ doldrums of 2009 and 2010. It is worth reminding ourselves how far we’ve come, and that the correction we are seeing was probably necessary considering the economic realities.

Pulpwood Products

We are going to take a small departure from our traditional format of discussing the regional softwood pulpwood market separately from the hardwood pulpwood market. This distinction has been historically very helpful for analysis – for forest owners, these two types of pulp markets can behave quite differently. In many cases, our regional pulp mills were consuming either hardwood or softwood.

Over the past several years the distinction between a “hardwood mill” and a “softwood mill” has become more blurry, and it has become difficult to talk about the softwood market without also discussing the hardwood pulpwood market. Bear in mind the distinction in the raw material still exists, and the finished products are very different and sell into different markets. Our observation here is intended to underscore the interconnection between the two species groups and discuss the pulpwood markets as a connected whole.

Although most pulp producers still predominately consume one or the other, several are now purchasing & consuming both. Some mills have a mixed wood supply as part of their regular “pulp recipe,” whereas others are being more opportunistic than they have in the past – when the confluence of pricing and supply work in their favor, they will alter their production. Not all kraft pulp mills in our region are capable of doing this well, but those that are have certainly taken advantage of it.

Furthermore, we are approaching a point in the hardwood pulpwood market where demand is not in balance with overall supply. Many mills have become dependent on available hardwood resource, but they have to reach out further and further to get it reliably. As a result, regional fiber costs for hardwood are reaching the point where some mills – those that can – are biasing their production mix more toward softwood. This may sound like a small thing, but it’s a noticeable shift. Mills reacting to a lack of overall supply in hardwood are trying to avoid long-distance (a.k.a. high cost) wood, and supplementing that volume with local softwood. While we have not seen major pricing adjustments, this shift has reduced the options for selling hardwood in distant regions and stabilized the spruce/fir softwood pulp market. We expect more of this hardwood/softwood substitution, particularly in Maine, where the softwood resource is abundant and expected to become more so with the young growth from the spruce budworm die-off from the early 1980’s now reaching merchantability.





As a result of this evolving consumption pattern, demand for pulpwood remains quite high considering the region has, in short succession, permanently lost two mills in East Millinocket and Bucksport, Maine (both softwood groundwood mills). Shortly after the closure of those facilities, softwood pulpwood demand was filled in by other mills that needed the resource. Some of those mills were “traditional” hardwood consumers.

Not all hardwood facilities have been able to successfully tailor their mix to become more in line with supply, or have been unable to perfect the process. This winter, we noted wood buyers at those facilities purchasing hardwood in new locations – we’ve seen this before in the springtime so that mills could get through “mud season” but indications are this will continue in earnest over the next few quarters. We believe those mills will do what they can to utilize more softwood, or otherwise manage their raw material costs.

Biomass

Through the spring weather, we put things on hold trying to clean up what biomass we had on the ground. Although the market is not great right now for biomass, we are able to sell our chips at a small margin. Dedicated biomass-to-energy generation facilities continued to run through mud season, which aided springtime demand. Once summer arrives fully, demand should elevate seasonally.

The sustained low price of natural gas continues to affect demand for biomass at pulp mills, many of which use wood chip boilers for heat and power production. The price per BTU for natural gas is currently lower than that of biomass, and those mills which are equipped to use natural gas are supplanting their biomass consumption accordingly.

Benjamin D. Carlisle
PRESIDENT

Timberland Appraisal FAQ's: The Income Approach

by Sam Radcliffe, Vice President

Of the three common approaches to valuation of timberland (income, cost and comparable sales), the income approach can be the most complex and often raises questions from clients and appraisal auditors. The following “frequently asked questions” will hopefully solve some of the income approach mysteries.

What is the income approach and why is it relevant to timberland?

As readers of this newsletter understand, timberland is an investment asset that generates annual or periodic incomes. The income approach to valuation is based on the concept that the net present value (NPV) of an asset is the discounted value of future net cash flows to the owner. In timberland appraisal the income approach is implemented using a discounted cash flow (DCF) model, in which projected future cash flows resulting from property management and the terminal value of the property are discounted to the present at a market discount rate. The three underlined terms are the key elements of a DCF model.

What cash flows are projected in the DCF model?

On the revenue side, future timber harvests and future timber prices must be projected and are usually the largest items in the model. Other revenue streams could include land sales, recreational lease revenues, minerals sales, or carbon credit sales.

On the expense side, the typical items include road building and maintenance, silviculture, timber sale administration, property taxes and general management/administration. Where a property is third-party certified or under a carbon contract, there would be periodic or annual costs associated with those activities. Where land sales are projected there could be costs associated with entitlement and marketing of lots. Generally the asset management fees charged to an institutional investor by a Timberland Investment Management Organization (TIMO) are not included in the model.



In timberland appraisal, it is common to project free cash flows, which are cash flows generated by the investment available for distribution to all providers of capital. Therefore, debt service is not a specific line item in the DCF model. The use of debt is accounted for by the weighted average cost of capital, described below.

Projected cash flows should all be tied to a specific property management scenario, and should be reflective of what a new owner could prospectively achieve, which may be different than the property's historic experience. This is particularly true with regard to the timber harvest projections.

What is terminal value? How is terminal value estimated?

One of the first DCF modeling tasks is to determine how far out into the future cash flows should be projected. At the end of the projection period, the property still has value. That value is called the terminal value.

There are different views on how long the projection period should be. One view is that the period should match the holding period of the typical investor. In the case of investment grade timberlands, that means 10-15 years. Whereas a commercial building might fully depreciate in that period, it is fairly short when considering the development of a forest. My problem with such a short period is that the NPV becomes heavily dependent on the discounted terminal value. When the terminal value is estimated using a cost approach (discussed below), the values indicated by the income and cost approaches converge as the projection period is shortened.

Another view is that the period should be as long as it takes to reach stability (e.g. equal annual timber harvests). This seems reasonable but in the case of very "lumpy" forests that period could be 100 years or more. A 100-year forest projection is actually not that uncommon but it strains credibility to make economic forecasts of that length.

In practice I tend to choose a projection period that is longer than the typical holding period but short enough to be reasonable for a forest and economic projection. That period tends to be in the 20 to 30 year range.

There are essentially two methods of estimating terminal value. The implicit assumption is that the property will be liquidated at the end of the period. The price that will be obtained for the property in liquidation is based on either a cost approach or an income approach.

The cost approach is based on the value of the projected timber inventory and bare land at the end of the period. A growth and yield model is used to project the changes in inventory that have occurred through growth, harvest and mortality. The gross timber value is a multiplication of the projected inventory by timber prices that have been projected throughout the period. The value of bare land is more difficult, but a Soil Expectation Value approach can be implemented. Using a cost approach as described in a previous newsletter¹, valuation multipliers are applied to the gross timber value and to the compositional value (land + timber) to estimate the terminal value of the property.

The income approach is based on the assumption that cash flows at the end of the period have stabilized and will continue so in perpetuity. The net cash flow for the last period is capitalized at the model discount rate to estimate the terminal value of the property. In essence, this produces the same result as a perpetual projection period with stable cash flows, so the earlier comment about strained credibility applies.

Since neither terminal value calculation is perfect, appraisers should estimate both and then reconcile the two values in the same way that indicated values from the three appraisal approaches are reconciled.

How is the discount rate estimated?

Cash flows are generally estimated on a pre-income tax basis, therefore a pre-tax discount rate must be estimated. There are several approaches to discount rate estimation:

- a. Surveys. A number of timberland appraisers regularly conduct discount rate surveys and publish the results. These can be a useful guide, but survey respondents are usually self-selected and often have an interest in having the world think that timberland investments always churn out that "6-7% real".

Survey results also depend on how the question was asked. Did the survey ask for a target rate of return, a benchmark rate of return or a realized rate of return? Over the long term among an aggregate of investors these rates may converge, but can differ from each other quite a bit at a point in time for a particular investor.



For timberland appraisals we are interested in the current target rate of return among the type of investors who are most likely purchasers of the subject property.

- b. Actual return data. The National Council of Real Estate Investment Fiduciaries (NCREIF) publishes a Timberland Index that measures the performance of properties owned by institutional investors (<https://www.ncreif.org/timberland-returns.aspx>). Clearly data such as these would inform an investor's choice of a target rate of return. Care must be taken to refer to the correct geography and the appropriate time period. The index is developed for four US regions: South, Pacific Northwest, Northeast and Lake States. For the 12 months ending 3/30/15, the total returns in those regions range from about 10% to over 14%. The index dates back to 1987, but long historic averages are probably misleading given the development of timberland as an institutional asset class. In the early years the market was not transparent and buyers were able to consistently enjoy 20%+ annual returns. As more money was allocated to timberland and sellers became more sophisticated marketers, timberland prices rose and returns have declined. For purposes of informing a current target rate of return, it is my opinion that only about the last five years are relevant.
- c. Build-up method. This approach starts with a risk-free rate of return and adds risk elements to reflect the riskiness of the particular subject property. In the general financial investment world, the Capital Asset Pricing Model (CAPM) is a well-accepted build-up approach that has been applied to timberland as well. In my own research, I have estimated and used a "timberland risk premium" which is the amount by which timberland returns exceed the risk-free rate as represent by long-term US treasury bonds².

Application of general build-up methods should include consideration of any extra risk presented by the particular subject property. For example, when real estate sales comprise a significant portion of the projected cash flows, extra risk might be added due to the inherent riskiness of real estate markets. Where the property is under a contract that limits management options, such as a conservation easement or a carbon contract, consideration should be given to adding extra risk.

- d. Extraction. Extraction of discount rates from recent comparable sales is typically a rare opportunity, as a good bit of knowledge of the sale property is required to develop a cash flow stream and then "back out" the discount rate that equates net present value to the actual transaction price.

I have heard this approach criticized because the appraiser does not know the assumptions the buyer was making to develop his projected cash flow stream, and therefore can't know what the buyer's discount rate was. For example, the buyer may have used a higher timber price growth rate than the appraiser, which would indicate a higher discount rate. I don't think this criticism is valid. The appraiser uses his best judgement of the cash flows the property will produce. The purchase price is a known fact, so the extracted discount rate is the appraiser's best estimate of the discount rate that would apply if a typical well-informed buyer bought the property at the actual transaction price.

In practice, the appraiser should use as much information and as many approaches as are available to arrive at a reasoned opinion on the discount rate. The sources and methods described above are useful for estimating the return on equity. The total rate of return is indicated by the weighted average cost of capital (WACC), which takes into consideration costs of both equity and debt. The cost of debt is indicated by typical timberland lending rates, which tend to be approximated by the return on medium grade corporate bonds. Here is an example WACC calculation where the estimated cost of equity is 5%, the estimated cost of debt is 3.5%, and the assumed equity:debt ratio is 80:20 is: $(.8 \times 5\%) + (.2 \times 3.5\%) = 4.7\% = \text{WACC}$

The weights in the WACC calculation should represent the typical capital structure among timberland investors. In actuality, capital structures vary widely among entities, and more research needs to be done on this aspect of the industry.

What is the role of inflation in the model?

DCF models may be based on either nominal or inflation-adjusted cash flows. The important point is that the discount rate must match the type of cash flows, i.e. if the cash flows are inflation-adjusted then a real discount rate must be used, and vice-versa.



The various sources of discount rates cited above provide both real and nominal discount rates. Surveys generally provide real discount rates while the other three approaches indicate nominal rates. Adjusting the nominal rates to real is a simple arithmetic exercise but one that many analysts get wrong³.

The inflation rate used either to adjust nominal discount rates or to project current cash flows in nominal dollars should be an expected rate, not a current or historical inflation rate. There are a number of ways to estimate inflation expectations, including analysis of inflation protected US treasury bonds. Fortunately for the appraiser, much of this work is regularly done by researchers at the Federal Reserve Bank, investment banks and pension consultants. Consulting numerous sources will usually lead to a reasonable consensus.

When is the income approach most relevant and when is it not relevant?

For large investment grade properties, the income approach is always relevant because it is the approach most favored by institutional investors. It is particularly relevant when the property is encumbered by conservation easement or has some unique revenue streams such as carbon offset sales or leases for such things as sugarbush, wind towers and recreational lots. In such cases, the detailed accounting of the income approach systematically accounts for property-specific cash flows.

For smaller properties where income generation is not the principal objective, it may still be instructive to carry out an income approach, but the value indicated would likely not be given much weight when reconciled with the value indicated by the comparable sales approach.

[1]. Samuel J. Radcliffe. 2010. Cost Approach and the Timber Value Multiplier. Prentiss & Carlisle Quarterly Update, 2nd Quarter.

[2]. Samuel J. Radcliffe. 2013. Timberland Return on Investment and the Discount Rate. Prentiss & Carlisle Quarterly Update, 2nd Quarter

[3]. The expected inflation rate cannot be simply subtracted from the nominal discount rate to get the real discount rate.

The proper formula is: $(1 + n) / (1 + i) - 1 = r$

where: n = nominal discount rate
i = expected inflation rate
r = real discount rate

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