Discount rates used for forest valuation - results of 2003 survey

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Forest valuers were surveyed during early September 2003 about the discount rates used for forest valuation. The survey is an update of similar surveys carried out in 1997 [NZ Forestry 42(4): 47], 1999 [NZ Journal of Forestry 44(3): 39-40] and 2001 [NZ Journal of Forestry 46 (3): 14-15].

A total of 17 forest valuers, mostly from consulting firms, were surveyed and asked:

- What method did they use to determine the market value of a forest?
- When using the DCF (Discounted Cashflow) approach, what discount rate did they use to estimate the market value of a forest?
- What was the basis for using this rate?
- How did they determine the log prices used?

Forest valuers were also asked for their estimates of the discount rate implied by the transaction price of recent forest sales.

1. Method used to determine the market value of a forest

All 17 valuers primarily use the Expectation Value (i.e. DCF) approach to determine the market value of a forest. They commented that there was insufficient transaction evidence to directly determine the market value of a forest.

Nine of the valuers sometimes use the cost compounding approach for valuing young stands - generally stands less than 5-6 years old which are not part of a larger estate. One valuer reported using the cost compounding approach for a 16 year old stand for which the DCF approach gave a negative value. Compounding rates of 4-5% are typically being used.

2. Discount rate used to estimate the market value of a forest

The response from each forest valuer is summarised in Table 1. It is apparent that valuers are still split on whether to value forests using pre-tax or post-tax cashflows. Although the NZIF Forest Valuation Standards adopt a standard convention of using post-tax cashflows, seven of the seventeen valuers discount pre-tax cashflows. Client instruction was one reason given for this.

Valuers apply a discount rate in the range 7 to 9.5 % (average 8.3 %) to post-tax cashflows or a discount rate in the range 9 to 13 % (average 10.2 %) to pre-tax cashflows. A number of valuers described how they varied the discount rate depending on the nature of the forest being valued:

- Valuer 4 uses a 9% discount rate for young stands

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prior to tending. After the completion of tending a discount rate of 8% is used.

- Valuer 7 uses a discount rate of 8% for the valuation of small forests but would use 9% for the valuation of large forests because there are fewer potential purchasers.
- Valuer 14 uses the discount rate to allow for non-quantifiable factors. A discount rate of 10% is used for forests of average risk. A lower rate is used for a forest that has good inventory and that is currently being harvested with harvest reconciliation data available. A higher rate is used for forests that are not accurately mapped, have a greater risk of wind or fire, or do not have diversified and competitive markets for logs.

Has the "market" discount rate changed since 2001?

The survey included 13 of the 19 forest valuers who had responded to the 2001 survey. Their responses to the 2003 survey were compared with their responses to the 2001 survey. (If a valuer responded with a range of discount rates, the midpoint discount rate was used for this comparison).

Five of these valuers use the same discount rate, five use a lower discount rate, while three use a higher discount rate. The average discount rate used by this sub-set of 13 valuers is virtually unchanged.

How was the discount rate selected?

Eleven valuers selected discount rate based on market evidence. This evidence included analysis of the discount rate implied by recent transactions. One valuer commented that the rate selected "seemed to be about the market" in the sense that the valuer's clients had successfully purchased some forests but missed out on others using this rate. Two valuers also use CAPM (Capital Asset Pricing Model) to test the reasonableness of the discount rate used.

Four valuers base discount rate on the WACC (Weighted Average Cost of Capital), the opportunity cost of capital or their estimate of the return required by investors.

Two valuers select discount rate primarily on the basis of current industry practice using information from other valuers and from implied discount rates of transactions reported in previous rounds of this survey.

How are log prices determined?

A range of approaches are used including:

- Current (or most recently reported) prices.
- Average prices for the last 12 (or 6) quarters.
- A weighted average of prices from the previous 7 quarters and current prices.

Table 1 - Discount rate used to estimate the market value of a forest

Respondent	Discount rate applied to post-tax cashflows	Discount rate applied to pre-tax cashflows	Basis for discount rate	Log prices based on
1	8.5		Market implied	12Q
2	9 - 9.5		Market implied	Current
3	8 - 8.5		WACC	12Q
4	8 - 9		Market implied	12Q/Current
5	7 - 8		Required return	12Q/Current
6	9		Market implied	7Q + 5*Current
7	8		Market implied	12Q + Current
8	8 - 9		Opportunity cost + Others/Survey	Current
9	7.5		WACC	8Q + Analysis
10	8.5		Market implied	4Q + Analysis
11		9	Market implied + CAPM	Current + Analysis
12		9 - 12	Market implied + CAPM	Current
13		9.5	Others/Survey	6Q
14		9 - 13	Market implied	Current
15		9.5 - 10	Others/Survey	Current + Analysis
16		10	Market implied	Current
17		11 - 13	Market implied	12Q

- Current (or 4 to 6 quarter average) prices for the short-term with long-term prices predicted from an analysis of trends or market drivers.

Prices used come from a number of sources including MAF, Agri-Fax or other log price surveys or from the valuer's own information. Compared to the 2001 survey there has been a trend to greater use of current prices - some valuers noted that potential purchasers were focusing on current prices. Given the general reduction in log prices over the last 12 quarters, any change in log price conventions is likely to have a marked impact on forest value.

A number of valuers use different approaches depending on the circumstances. For example, valuer 4 uses current prices in the valuation of older stands but a 12 quarter average for younger stands.

Some valuers base long term prices on detailed analysis of fundamental drivers of supply and demand in log markets. One such valuer commented that such analysis was required and it was not appropriate to "assume a mechanistic perpetuation of rolling averages or simply apply historical trendlines to recent data".

3. Discount rate implied by recent transactions

Information provided by valuers on estimates of the

Table 2 - Estimates of the discount rate implicit in the transaction price of sales in 2001-2003 of forests or interests in forests

Forest	Number of respondents	Implied discount rate (applied to post-tax cashflows)	Implied discount rate (applied to pre-tax cashflows)
1. Small forest Wanganui	1	8.5	
2. Small forest Wairarapa	1		9
3. Small forest Northland	1		13
4. Medium forest Central NI	1	9	
5. Medium forest Central NI	1	8-8.5	
6. Medium forest Nelson	3	9 – 9.2	13
7. Medium forest Canterbury	3	8.5	7.5 - 8
8. Medium forest Otago	3	8 - 8.5	
9. Large forest Northland	3	8.4-8.5	11
10. Large forest East Coast	1		10
Secondary market – forest investments	1	8	

implied discount rates in recent transactions is summarised in Table 2. Forests are described by location and size class (Small <1000 ha; Medium 1000 to 10,000 ha; Large >10,000 ha).

There is variation in the implied discount rate of different transactions and also between the discount rates that different forest valuers have estimated for the same transaction. This is particularly so for the medium forest in Canterbury for which the two estimates of the implied discount rate to be applied to pre-tax cashflows are lower than the third valuer's estimate of the implied discount rate to be applied to post-tax cashflows. The valuers providing these estimates clearly had different assumptions about yields or prices. This illustrates the requirement for consistency stated in the Guidance Notes on Discount Rate in the NZIF Forest Valuation Standard: "*If a discount rate is derived using transaction evidence it should be derived using the same set of assumptions (taxation, borrowing, log prices, log price increases) as will be used in valuation of the target forest.*"

Market activity subsequent to the survey
FCF
On 12 September FCF reported a forest value

(including crop and land) of $728 million. This was calculated using prices from the previous 2 quarters rather than the previous convention of using a 12 quarter average. FCF log prices for the last 2 quarters prior to June 2003 were 15% below average prices for the 12 quarters prior to June 2003. In addition, FCF increased the effective discount rate applied to post-tax cashflows from 8.0% to 9.75%.

The annual results were followed on 15 September by an announcement that FCF had signed a letter of intent to sell the forests to The Campbell Group for $685 million. FCF subsequently announced, on 8 October, that a variation to this letter of intent had been negotiated to enable consideration of a competing bid of $725 million by Kiwi Forests Group. Due diligence and negotiations are proceeding.

CNIFP
On 24 October it was reported that the 165,000 ha Central North Island Forest Partnership estate had been sold to GMO Renewable Resources acting for the Harvard Management Company. Details of the sale are confidential at this stage.

White-spotted tussock moth response – how good was it?

Gordon Hosking[*]

Learning from past experience does not seem to be one of the more obvious attributes of the human race. Despite this, and at the risk of attempting to push the proverbial uphill, Forest Research has recently completed a comparison of the white-spotted tussock moth response with currently accepted best practice (Hosking 2003), with the aim of improving performance in similar operations in the future. The comparison draws on extensive documentation of Operation Ever Green, the personal experience of those involved, and a recently published review of 'best practice' in incursion response (Myers & Hosking 2002, Hosking 2002).

The comparison is broken down into the major response phases of detection, evaluation, response decision, operation, monitoring and review, within each of which key activities were evaluated. The review attempts to provide a performance rating against best practice for each phase and the results are summarised below.

The **Detection** phase was rated only 3/10 against best practice. The white-spotted tussock moth was not found by any formal survey but by a member of the public. A resident of the heavily infested zone, having noted the distinctive caterpillars, claims to have called a

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Government agency in October 1995 without success, six months before the flag was raised. Capitalising on public involvement could contribute significantly to the early detection of new pests and diseases, but requires obvious and responsive pathways for diagnosis and information.

Performance in the **Evaluation** phase was good and rated 8/10. Ground assessment of the problem was excellent, as was consultation with affected parties and the involvement of specialist expertise. Two areas where improvement could have been made were: (i) the explicit involvement of the affected community from day one, and (ii) the use of spatial information management in delimiting survey data collection. However, it should be acknowledged that, in 1996, neither the routine use nor the accuracy of GPS units was anything like that of today.

The **Response Decision** phase also rated highly at 8/10, and included a rigorous evaluation of the problem by a well-balanced group representative of all affected parties, with the exception of the affected community. Although the response decision was well documented and unanimously agreed, it was not supported by a formal evaluation report. The production of such a report and the involvement of community representation would enhance this phase in future responses.

The **Operation** itself involved one major short-coming,