Discount rates used for forest valuation - results of 1999 survey

Forest valuers were surveyed during August/September 1999 about the discount rates used for forest valuation. The survey is an update of a similar survey carried out during the second quarter of 1997. The results of this earlier survey were published in February 1998 in *New Zealand Forestry* (Vol 42(4): p47).

A total of 15 forest valuers in a range of forestry companies and consulting firms were surveyed and asked (i) What discount rate did they use to estimate the market value of a forest? and (ii) What was their estimate of the discount rate implicit in the transaction price of recent forest sales? As assumptions about discount rate articulate closely with log price assumptions, the forest valuers were also asked what log prices they used - both the initial prices used and any growth assumptions.

Responses as shown in Table 1 were:

(i) Discount rate used to estimate the market value of a forest

The responses indicate a strong consensus about the appropriate discount rate to use for estimating the market value of a forest. Most valuers apply a discount rate in the range of 8 to 9% to post-tax cashflows or a discount rate in the range of 9 to 11% to pre-tax cashflows.

The log prices used in forest valuation are estimated in a range of ways. However almost all respondents base the initial log prices for forest valuation on either current prices or an average of prices over the last one to three years. Around half of the respondents adjust these initial log prices towards longer term trendline

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Table 1

Respondent	Discount rate applied to post-tax	Discount rate applied to pre-tax	Log prices based on	Log price growth (%)
1	8 - 10		Current prices + forecast	0
2	8 - 8.5		Average last 12 quarters	0
3	8		Ave 12Q + analysis	0
4	9		Current	0
5	8		Ave 12Q + long-term trend	0
6	8.5 - 10.5		Current + cyclic adjustment	0
7	9		Ave 4Q	0
8	8		Ave 6Q	0
9	9		Ave 12Q	0.5
10		9	Analysis + trendline	0
11		10 - 11.5	Current + return to trendline	0
12		9	Ave 6Q	0
13		9 - 10	Ave 12Q + return to trendline	0
14		9 - 11	Current + return to trendline	0
15		9.5	Current	0

Table 2

Forest	Implicit discount rate (applied to post-tazx cashflows)	Implicit discount rate (applied to pre-tax cashflows)
New Zealand forests		
Te Awahohonu (1999)	9	9 - 11.5
Tainui-Kawhia (1997)		10
Small forests/partnerships (1999)	8 - 9	
East Coast young stands (1998-990	8.5	
Mortgagee/Receiver sales (1998-99)		
Australian forests		
Victorian Plantations Corporation(1998)	7	7 - 10
Forestry Tasmania (1999)	10 - 11	11 - 11.5
CSR (1999)		9
Mortgagee/Receiver sale		14

prices. Only one of the 15 respondents assumes any real growth in log prices over time (after any movement is made to constant trendline prices).

A comparison of the responses of the eight respondents to the 1997 survey with their responses to the 1999 survey indicates that:

- Three valuers use the same discount rate, one valuer uses a lower discount rate (0.5% lower) and four valuers use a higher discount rate (0.25%, 0.5%, 0.5% and 1.75% higher). (If a valuer responded with a range of discount rates, their midpoint discount rate was used for this comparison).
- There is an increasing use of average recent log prices with adjustment to longer term trends rather than unadjusted current prices.
- None of the three 1997 respondents who assumed real growth in log prices now makes this assumption.

(ii) Estimate of the discount rate implicit in the transaction price of recent sales of forests or interests in forests (See Table 2)

These estimates are based on a very limited response. However the estimates of the discount rate implicit in recent "non-distressed" New Zealand transactions generally fall within the consensus range (8 to 9% for post-tax cashflows or 9 to 11% for pre-tax cashflows) of survey responses given in (i) above. Estimates of the discount rates implicit in Australian forest sales show a wider range. Substantially higher discount rates are implicit in "distressed" sales.

One feature of the survey was the low number of transactions reported. A number of respondents provided examples of other forests which had been put on the market but which did not sell because of different expectations between buyer and seller. One example was given where buyers were basing bid prices on discount rates of 10 to 11% (post-tax cashflows) whereas the seller was setting the reserve price using a discount rate of 9%. Consequently a willing buyer/willing seller transaction did not take place.

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Can forestry restore whitebait fisheries?

Dr D.K. Rowe

Whitebait catches mostly contain three species of native galaxiid fish. These species, commonly called inanga, banded kokopu, and koaro are the aquatic equivalent of kiwis and are referred to as galaxiids because the diffuse spotting on the sides of adults resembles a galaxy of stars. The adult stage of one of these species, the banded kokopu, is an attractively camouflaged, scaleless fish found only in New Zealand. It was known as the native trout, and is what makes New Zealand whitebait unique. Because of where it lives, it is a significant species for forest managers.

Galaxiid life cycle

Adults inhabit rivers and streams where they spawn on stream banks at high water levels. The eggs develop out of the water. When inundated by a rise in water level, the eggs hatch and the larvae are washed out to sea. Here they grow into the transparent juveniles called whitebait which migrate into river mouths during spring. Those that don't end up as fritters continue to swim upriver until they reach adult habitats where they grow to adulthood before spawning starts the cycle again.

Once, galaxiids were common throughout New Zealand river catchments but today they are scarce and whitebait fisheries have declined. Although trout predation can take some of the blame for this decline, changes in land use may have been more significant. For example, adult banded kokopu are still common in the smallest (< 2 m wide) streams running through dense native forest, but they are rare in pasture streams. Therefore, the historic conversion of native forest to pasture will have greatly reduced adult populations of banded kokopu.

Recent research by NIWA scientists has revealed that high densities of banded kokopu now occur in streams running beneath mature pine plantations in the Coromandel and Bay of Plenty. This land was once farmed, so it is clear that banded kokopu have recolonised the streams after the pine plantations became established. It is also apparent that the type of forest cover (native tree, or exotic pine tree) is not as important as the presence of forest cover *per se*. This finding raises the prospect that the spread of pine plantations now occurring throughout the country could help restore banded kokopu populations and hence whitebait fisheries.

Being good climbers, banded kokopu are capable of ascending most waterfalls and can colonise small streams at altitudes up to 600 m. However, they usually occupy streams above those frequented by inanga (the lowland galaxiid), and below those occupied by the koaro (the upland species). One of the reasons for this mid-altitude distribution is that banded kokopu prefer to live in the small (1-10 m^2) pools that form in small moderate-gradient streams. They are less common in the large pools of lowland rivers (where inanga occur) and in the faster flowing waters of steep-gradient streams (where koaro often occur). Therefore, prior to the spread of agriculture, when native forest and bush covered much of the land, juvenile banded kokopu will have penetrated into most small streams and adults will have occupied most of mid-altitude, hill country throughout New Zealand.

This hill-country land would have contained a vast amount of habitat for adult banded kokopu, particularly in the North Island. The numbers of adults must have once been huge and they probably contributed to the barrowloads of whitebait that were once commonly caught in our rivers. Today, however, the forest and bushis gone (replaced by pasture) and banded kokopu whitebait are relatively scarce. In most rivers their numbers fall well below those of their pasture-tolerant, lowland cousin, the inanga.

As exotic forestry replaces pasture over large tracts of this hill country, banded kokopu may re-establish in the streams under pine plantations, just as they have done in the Coromandel and Bay of Plenty. If this occurs throughout the country,