

effects of thin trading, and the behavioural characteristics of dominant shareholders. It remains necessary too, to consider what some of the listed forest-owning companies might have to spend in order to buy more forest assets.

7. Exchange rate treatment

The treatment of the exchange rate becomes an issue where the forest is not in the same country as the investor who requires the forest value to be reported in their home currency. If the currency conversion processes are too rudimentary, the forest value may be relatively stable in one currency, but volatile in the other, fluctuating in response to the spot exchange rate. Such volatility is intuitively discomfiting. It also raises the question that if there is to be volatility in the value, within which of the currencies should this occur?

There is room for further guidance on this issue. An article in this edition of the Journal by Joe Cheung and Alastair Marsden (Cheung & Marsden 2002) represents a necessary first step in addressing the subject further.

Final comments

Notwithstanding my introductory comments, I believe that there are aspects of New Zealand forest valuation practice about which it is possible to be positive. There is now a substantially greater quantity of forest valuation activity than 15 years ago.

It is encouraging that in the process of evolving practice, considerable consistency in the valuation methodology has emerged.

As a participant in the NZ Institute of Forestry Forest

Valuation Working Party, I might stand accused of self-congratulation by saying fine things about the NZIF Forest Valuation Standards. However, having missed enough of the Working Party's meetings I believe that I can say with impunity that I consider the Standards a remarkable accomplishment. They provide the technical platform from which to consider all of the issues described above, and others besides.

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Current forest valuation issues in NZ

Mike Colley¹

Background

In the early decades of plantation forest development in New Zealand, forest valuation was a discipline that developed slowly. There were very few and infrequent sales, but two notable ones were the purchase of Matea forest by the NZ Forest Service in the early 1960s, and the purchase of Tauhara forest by the Fletcher Timber Company in 1965.

The number and frequency of forest sales increased markedly (by historical standards) in 1990 with the sale of the State plantation forests by the government. Sales of plantation forests have continued at a reasonable pace (again, by historic standards) since then, with around

three or four sales of large forests, on average, each year. The practice of forest valuation has been developed and refined in tandem with this increased sales activity. The publication of the NZ Institute of Forestry Forest Valuation Standards in 1999 is an example.

A number of issues exist in the field of forest valuation and it is timely to reflect upon them. They are listed in no particular order as follows.

Transaction evidence

Although the number of sales has increased markedly since 1990, there are still relatively few sales. Fig. 1 presents the number of significant (more than 1,000 ha) forest sales since 1990 in New Zealand and Australia that have been recorded by Chandler Fraser Keating Limited (CFK). (Note: some of the sales include a number of forests in one transaction.)

By contrast, urban land, vehicles, and many other classes of assets enjoy markets with a large number of transactions. In some parts of the world – notably the US South – forests also enjoy markets with a reasonably large number of transactions. The New Zealand (and indeed the Southern Hemisphere) plantation forest industry must therefore continue to rely on sales



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transactions indirectly (in translating transaction evidence to a subject forest valuation) rather than directly as, for example, a property valuer would do.

There is very little evidence in the public domain for sales of young forests or of forests purely of Douglas-fir. To a large degree, this simply reflects the absence of sales activity in forests of this type. This is presently a major weakness in valuing such forests.

Breadth and Depth of the Market

There are relatively few active purchasers of forests. Purchasers in recent years tend to be predominantly Northern Hemisphere pension funds. Such groups have made seven out of the eight purchases listed in CFK's database of Australasian sales since December 2000. Over the whole database – 48 sales made since 1990 – such groups purchased a total of twelve forests. In recent times forestry companies have been largely absent from the market as purchasers.

The Value Gap

Investors plant new forests. They also purchase existing forests. One might expect that they will have similar earnings expectations, irrespective of the age of forest that is acquired. CFK's transaction evidence indicates that purchasers of existing forests are basing their purchase on earnings rates (pre-tax) of around 10% to 12% per annum. Presumably, those who plant new forests are expecting a return of a similar order. However, the internal rate of return of radiata pine green-fields investment is around 7% to 9%. There is clearly a disjoint (or "value gap") between existing (older) forests and newly planted forests. At some point, those who plant new forests are going to have to mark time (i.e. see the value of their investment remain static for a few years) until it is on the 10% to 12% value curve for older forests as demonstrated by sales transactions.

Valuation Inputs

The key inputs are yields, log prices, and discount rate. Of these, log prices and discount rate tend to be the most vexatious.

Log Pricing

The approach to structuring log prices in forest valuations tends to change as perceptions of the industry outlook change. Prior to the "price spike" in 1992-1993, practitioners tended to use a short-term series (e.g. 12-quarter average), either on its own or in combination with a longer-term outlook ("trend" prices). It was not uncommon to also build in real log price appreciation, as had been demonstrated by certain historic log price series. The price spike caused much debate and thought as to how log prices should best be represented.

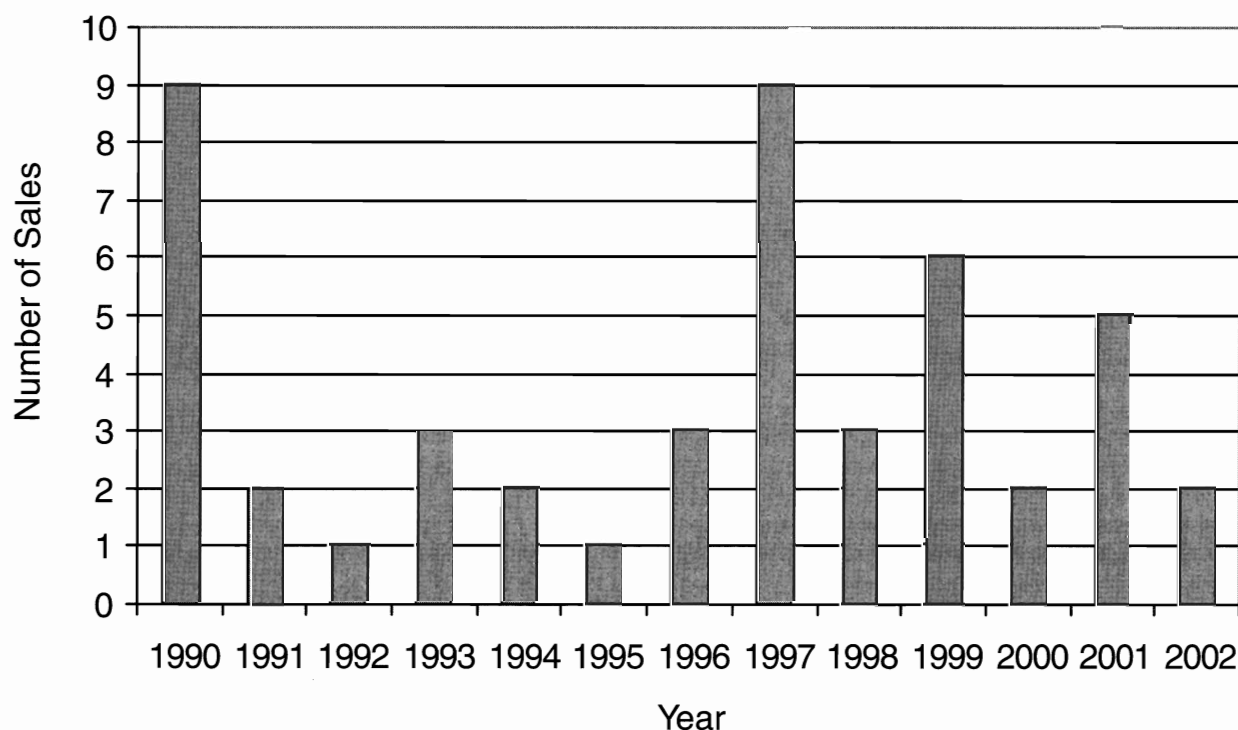
In recent times, CFK has noticed the development among some purchasers of forests of a "current held flat" sentiment towards log pricing. That is, the assessment of a forest value is based on current log prices (e.g. the most recent quarter or quarters) held unchanged in real terms throughout the modelling period. This is probably a conservative reaction at a time when log prices are close to historical lows in real terms.

The outcome of this approach is that the assessed value can vary significantly over periods of just a few months, because quarterly log prices can vary substantially from one quarter to the next. Forestry is a very long-term business, and some representation of long-term log pricing is essential in any evaluation of a forest. This will ensure that short-term influences do not unduly affect the value of a forest.

Discount Rate

The Forest Valuation Standards state that the

Figure 1. Number of forest sales in each year that are recorded in the CFK database.



discount rate should be derived from transaction evidence when the expectation valuation method is used (as it nearly always is). CFK notes that purchasers will often bring their own required earnings rate to bear in the valuation of a forest investment opportunity.

The Capital Asset Pricing Method is also used in evaluating an investment. One would expect transaction evidence to provide the most compelling measure of discount rate but it must be handled with caution where the transaction evidence is limited in amount and frequency – as is the case in forestry as noted above. Transaction evidence is “backwards looking” and will not signal any fundamental shifts in perceptions of forest value that might lie ahead.

Yields

The matter that is currently topical is that of genetic gain. CFK notes that some practitioners explicitly include it in yield projections, whilst others do not go beyond what gain is captured during the course of forest inventory. Knowledge in this area continues to increase, and is not complete at the present time.

What is Valued

It is important to explicitly state what is valued. CFK notes that this is not always the case. Are assets other than the tree crop – such as sealed arterial roads – included in the value?

A Couple of Warnings

The timing convention that is adopted can have a significant impact on the assessed value. Timing convention pertains to the assumed timing of costs and returns in each year of the modelling period. In CFK's experience, a mid-year convention is commonly adopted. A trap awaits those who simply apply the Microsoft NPV function to a cash flow projection – this function assumes an end-of-year timing. The discrepancy can amount to millions of dollars in the valuation of a large forest.

The rule-of-thumb relationship between pre-tax and post-tax discount rates (“around 2% difference”) breaks down when one is assessing a near-mature forest with a compressed area-age distribution. The purchasers of such a forest will enjoy recouping amortisation losses over a few brief years, with a consequent wide divergence between pre- and post-tax measures.

Forest valuation, capital budgeting and discount rates

Joe Cheung and Alastair Marsden^a

1.0 Introduction

Valuation of a forest is a complex task. There is limited market based evidence that can be used for value comparisons due to the low number of actual transactions and the heterogeneous nature of forests (see Manley 2001). Valuers often resort to other valuation techniques. A widely used method is the “Expectation Approach” as prescribed in the NZIF Forest Valuation Standards¹. In essence this approach is based on discounted cash flows (DCF) to arrive at the forest's net present value (NPV).

In this paper we seek to highlight issues from a financial market perspective where valuers may have greatest disagreement or where the Forest Valuation Standards provide less definitive guidelines. We focus on two aspects of the Expectation Approach - the impact of exchange rate forecasts on log prices and the determination of the cost of capital. We also highlight that the DCF methodology does not recognise the value of flexible harvest strategies.

2.0 Log Price and Exchange Rate Forecasts

Critical to any DCF forest valuation is a forecast of log prices. Log prices are typically denominated in United States Dollars (“USD”). This suggests two possible approaches to undertake any DCF valuation. The first

approach is to forecast log prices and costs in New Zealand dollars (“NZD”) and discount at the NZD cost of capital (the “NZD approach”). The second approach is to forecast prices and costs in USD, use a USD discount rate and convert the resulting DCF value to NZD at the current exchange rate (the “USD approach”).

We discuss briefly below potential problems in implementing these two approaches.

2.1 The NZD Approach

According to the latest Manley (2001) survey data, most forest valuers in forecasting future log prices:

- Assume no real increase or decrease in log prices over time; and
- Use current log prices with an adjustment to long-term trend prices or use an average price over some previous quarters.

It is not clear from the Manley survey data whether log price forecasts and long-term price trends are based on prices observed in NZD or in another currency (e.g. USD).

To demonstrate some of the potential problems, assume that prices for logs are stable in USD but fluctuate in NZD due to changes in the exchange rate.²

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¹ See Chapter A3 of the Standards.

² Empirical evidence in support of this proposition is contained in Market Report, Issue No 5 by the Ministry of Forestry. Based on log prices measured over the period 1986 to 1996, prices in USD terms were more stable than prices denominated in Japanese Yen or NZD (See Figure 7 of Market Report, Issue No. 5).