CHAPTER 9 - ECONOMIC ANALYSIS

Ian Nicholas (Scion)

Introduction

The economics of growing eucalypts are confounded by the end use options, which range from growing a pulp crop to longer rotations for solid wood. In addition, log prices can be expected to differ between some species. Published economic studies of eucalypt forestry have shown a range of values, reporting IRRs (internal rate of return) from 4.6% to 6.4%, increasing up to 7.5% in one study, depending on input variables.

A recent report on growing eucalypts for short fibre suggested that current unthinned stands are returning approximately 6%. The study suggested that growing a stand for longer and generating LVL material is feasible, but only if a market exists for LVL.

Current prices for eucalypt sawlogs range from $55 to $155/tonne at the mill, depending on species, size and quality. However it needs to be recognised that the NZ market for eucalypt timber is under-developed. The NZ market for hardwoods is still being supplied with cheap tropical hardwoods, especially kwila/merbau, often from rather suspect sources and uncertain longer-term supply. It is difficult to know what the longer-term market values are likely to be for quality hardwoods.

There are more assumptions used in an economic analysis of eucalypt forestry than with radiata pine. This often means that calculated returns often tend to err on the conservative side.

Table 21: Estimated costs used in financial analysis

Operation	Stand age	Cost ($/ha)
Land cost		0
Land prep	0	360
Tree stocks	0	524
Planting	0	250
Releasing etc	0	185
Fertiliser	0	112
Form prune	3	500
First prune	5	500
First thin	5	350
Second prune	10	600
Second thin	10	500
Annual costs		30

Other costs

Management (15% of costs)

Roading, log, load and fees $47/$m^3$

Yields

Information on the potential growth and possible yields for eucalypts is difficult to predict with full confidence, as most of the data collected is from a range of species and

often from stands younger than full rotation, which can be assumed to be of the order of 30-40 years, depending on species.

Experience with milling young eucalypts suggests there is potential for much shorter rotations and/or production thinning (see Chapter 10).

As a general estimate total standing volume of approximately 1,000 m^3/ha is a reasonable estimate for a stand with 200-300 stems/ha at age 35 years. Similarly, the actual log yield is expected to vary between species.

The calculation of yields at rotation age is difficult because of a lack of well-tended stands to assess. Evaluation of MARVL analyses, actual recoverable volumes, data from the national PSP data base and growth model predictions have been used to estimate recoverable yields.

Total standing volume is estimated as 1,000 m^3/ha. Of this it is estimated that 90% is recoverable volume, resulting in 900 m^3 available for utilisation.

This is estimated to be made up of 550 m^3 of sawlogs and 350 m^3 of small diameter logs or pulp.

Revenues

Revenues are based on 550 m^3 of sawlogs and 350 m^3 of small logs, with stumpage values of \$100/m^3 and \$20/m^3 respectively, which provide a total estimated revenue of \$62,000/ha. More data collection and full details of harvested eucalypt stands are required to validate these assumptions.

Sensitivity

The base case estimates an IRR of 8.4%. Sensitivity to changed variables, but keeping everything else consistent, provides an indication of important aspects of the economic analysis. Revenue needs to lift to \$73,000 for this evaluation before IRR reaches 9%. If land cost at \$4,000/ha is included IRR drops to 6.02 %. If seedling costs are doubled IRR is reduced to 7.9%.

The successful sawing of small diameter eucalypt logs adds an exciting dimension to economic analysis of eucalypt forestry by reducing the rotation length. This aspect requires further evaluation.

N.B. As the figures used in this analysis are of a general nature only, more detailed site specific analysis figures evaluated by professional advisers should be used on a case-by-case basis before investing in eucalypt forestry.

Note that no allowance has been made for the possible sale of carbon, nor for possible future sale of eucalypt wood for biofuel. Being generally denser than radiata pine, most eucalypts have advantages in both these cases.

Key Points

- Analysis suggests possible IRRs of around 8%.

  Improved log prices will mean a significant improvement in IRR.

- Eucalypt forestry needs suitable processing facilities paying consistent prices into established markets to develop industry log prices.

- Seek professional input before any large investment in eucalypt forestry.

Suggested reading:

Cavanna & Glass 1985

Maclaren 2005

Thorrold *et al.* 1997