

CHAPTER E2 – GLOSSARY OF FORESTRY ECONOMIC TERMS

Term	Definition
APLPI	Australian Pine Log Price Index
Articulation	The way concepts, treatments and definitions relate to one another in a (supposedly) logical system. The objective of articulation in a system of valuation is to make parts of the subject of the valuation (e.g. the Forest) susceptible to the general propositions of mathematics and simple logic. (e.g. that the parts add up to the whole, the 'Real Return' when adjusted by the 'Rate of Inflation' equals the Gross Rate of Return). Lack of 'Articulation' is prima facie evidence that the valuation (etc.) is flawed. Because of the long time spans involved in forestry and the complexity of the data, lack of 'Articulation' that would be immaterial in (say) the valuation of a car would be material in the valuation of a large forest.
Beta (β)	<p>A measure of the riskiness of an equity investment and used as a multiplier of the premium rate of return to capital (i.e. above the risk free rate) required in the overall industry or investment class for a particular equity investment. A generalised equation relating rates of return and beta is:</p> $ER_i = R_f + \beta(ER_m - R_f) \text{ where:}$ <p> ER_i = expected rate of return on asset i. R_f = the 'risk free' rate of return. ER_m = the rate of return expected in the industry or investment class (i.e. the market rate of return). $(ER_m - R_f)$ = market risk premium </p> <p>The Beta number is developed from the fluctuations over time in the value of the capital. A beta measure can apply to assets (i.e. an investment in trees) or to equity (i.e. an investment in 50% leveraged company 'A', compared with investment in debt free company 'B' owning identical assets).</p>
Capital (economic sense)	The wealth used in the forms of land, plant, equipment and labour with a view to producing a surplus.
Capital (accounting sense)	A quantum of wealth, measured in monetary terms and owned by an 'Investor', committed to an enterprise and which is at risk dependent on the success of the enterprise. The many categories of 'Capital' have different rights, obligations and risks attached to them.
Cashflow	<p>The movement of cash resulting from transactions with parties external to the forest enterprise. 'Costs' may be regarded as negative cashflows and 'revenues' as positive cashflows.</p> <p>Note: Cashflows are generally 'transaction' based. Value increments (for example) in a forest are not cashflows. For the purpose of analysis cashflows are projected 'transactions' and may include flows which are not strictly 'transaction' based but are implied 'transactions' to fit all value effects into an</p>



	'enterprise' 'life' (e.g. land notionally 'bought' and 'sold' at the beginning and end of a 'rotation').
Compound rate	See 'Discount rate'.
Consideration	In simple terms, the price paid for goods. Although 'consideration' may be other than money it is usually expressed as a quantum of money. 'Consideration' is always related to a transaction.
Cost	The price of a good as viewed from the purchaser's viewpoint.
Cost benefit analysis	An economic analysis technique which aims to evaluate a project in terms of all the relevant costs and benefits associated with it, including imputed social costs and benefits not otherwise recognised in the cashflows.
CPI	Consumer Price Index
CEV	Crop expectation value, being the expectation value of the tree crop. Also see TCEV.
Currency	The units and legal framework given to the money issued within a country.
Deflation	See Inflation.
Discount period	The period (length of time) between a Discount point and the Valuation point.
Discount point	The point in time at which a cashflow is assumed to occur. It is common practice to assign each cashflow to one of a finite number of equally-spaced discount points, typically a year apart; for example, to assume that all of the cashflows in single year occur at a discount point in the middle of the year. The length of time between the first 'Discount point' and the 'Valuation point' need not be the same as the length of time between consecutive 'Discount points'. A common example where they are not the same is when the Valuation point is at the beginning of a year and the first 'Discount point' is mid-year.
Discount rate	A rate quantifying the preference for access to wealth or resources sooner rather than later, now rather than in the future or before now rather than now. A popular expression for this concept is the "time value of money". Discount rate can be defined with reference to the base equation in which it is used:

$$V_2 = \frac{V_1}{(1+r)^{(t_2-t_1)}} \\ = V_1(1+r)^{(t_1-t_2)}$$

Where:

- r = Discount rate
- V_2 = Value at time 2 (\$)
- V_1 = Value at time 1 (\$)
- t_2 = Time 2 (years)
- t_1 = Time 1 (years)

In forest valuation the units of time are typically, but not always, years. Provided that the units of the discount rate are consistent with the units of



time, any unit of time may be used. Likewise, the units of value are typically a unit of currency but the base equation may be used with quantities having other units; e.g. cubic metres.

Time can have any value from the domain of real numbers; it is not restricted to integers or even to positive numbers, but the convention is that larger numbers represent later times.

Discount rates are often presented as a percentage; for example, a discount rate presented as 4% is used in the above equation as $(1 + r) = \left(1 + \frac{4}{100}\right) = 1.04$

Use of the term “discount rate” is often restricted to situations where the present value of a future cashflow is being calculated ($t_2 > t_1$) and may be replaced by “compound rate” where the future value of a current cashflow, or the current value of a past cashflow, is being calculated ($t_2 < t_1$). This distinction serves mostly to highlight the direction of the calculations; forward in time versus backward. The two terms are mathematically equivalent in the calculations to which they are applied. There may be valid reasons for using different rates for compounding (forward) and discounting (backward) but these reasons relate to the context in which the calculation is made, e.g. the time span, and not the calculation itself.

To some extent, differences between discount rates reflect variations in emphasis on the many reasons for placing a time value on money. For example, recognising the expected decline over time of the purchasing power of a nominal unit of currency due to inflation leads to “nominal” discount rates. These are typically higher than “real” discount rates, which ignore inflation and assume that cashflows will be expressed in “real” (constant purchasing power) terms. To a larger extent, variety in the values of discount rates used in forest valuation reflects the fact that discount rates are derived from observation of human behaviour with different evidence at different points in time from different people, with different analytical techniques applied to the evidence and different people involved in the analysis.

Discounted cashflow	A cashflow discounted, using a ‘Discount Rate’ to the ‘Valuation point’.
Enterprise	The scope of the economic venture considered by the analysis. In the forestry sense the ‘enterprise’ may be the age class, or the stand, or the crop type or the forest or any other definable unit. In analysis the ‘enterprise’ is generally given a ‘life’.
Equity	The residual interest in the assets of an entity after deduction of its liabilities.
Exchange rate	The ratio at which the currencies of two countries are exchanged at a particular time.
Exit price	The price that would be received to sell an asset or paid to transfer a liability.
Fair Value	The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.



	Also see 'Market Value' and 'Value'.
Fixed costs	Costs which in the short run, do not vary in total with output or the level of activity. Therefore, in unit terms they vary inversely with output.
Highest and best use	The use of a non-financial asset by market participants that would maximise the value of the asset or the group of assets and liabilities (e.g. a business) within which the asset would be used.
Income	Net profit, i.e. what remains after expenses and taxes have been subtracted from revenue.
Inflation	A measure of the increase of price levels over time as measured by money — and hence, inversely, a measure of the decreasing purchasing power of unit money measures over time. Usually expressed as a percentage rate. 'Deflation' is the same effect but with decreasing price levels and increased purchasing power.
Interest rate	The proportion of a capital sum (usually expressed as a percentage) charged by the lender (actually or notionally) to the borrower for the use of that capital sum over a unit time (usually a year). There are many (mathematically related) ways of expressing this rate, viz 'In Arrears', 'Real', 'In Advance', etc.
Internal rate of return (IRR)	The 'Discount Rate' at which the 'Investment' and the 'Future Returns' equate in a 'Net Present Value' calculation. There are as many varieties of 'IRR' as there are of the type of cashflow input into the model. See in this context 'Real', 'Tax', and 'Interest Rate'.
Investment	The initial capital sum and (generally) any future sums laid out as 'Capital'.
Land Expectation Value (LEV)	The 'price' that can be imputed to land so that all the positive and negative 'cashflows' (including the 'price' imputed to the land) associated with the forestry 'enterprise' when discounted at the required rate % indicate a zero 'enterprise' capital value. In common language, the maximum that can be paid for land to achieve a given rate of project return.
Life	The span of time in which an economic 'enterprise' starts and concludes. In forestry the life is often defined by reference to tree age.
Market	A series of 'transactions' in goods or services of a similar nature carried out by individuals assumed to have a reasonable knowledge of the nature of the goods and services traded, the past history of 'prices' and a reasonable appreciation of the factors influencing 'prices'.
Market value	<p>Market value is the amount for which the defined good or service should exchange:</p> <ul style="list-style-type: none"> • on the date of the valuation; • between a willing buyer and a willing seller; • in an arm's length transaction; • after proper marketing; and



- wherein the parties had each acted knowledgeably, prudently and without compulsion.

'Market price' and 'Market cost' are the same measure. 'Market Values' may be applied (with appropriate adjustments) to a good not yet the subject of a transaction to give a market-based valuation.

Also see 'Value' and 'Fair Value'.

Money	A measure of wealth having universal acceptance in (typically) one country.
Net Present Value (NPV)	The sum of all the 'Discounted Cashflows' appropriate to the item measured. The NPV of a project is a measure of the project's contribution to wealth. In this context the word 'present' means a predefined point in time, typically on or before the first 'Discount Point', and not the date at which the calculation is performed.
Nominal	Refers to the use, in discounted cashflow analysis, of currency amounts expressed in terms of the currency units at the time of the cashflow. For past cashflows this means using the actual (nominal) amount at the time of the transaction and for future cashflows it means calculating what the amount will be after allowing for the effects of expected inflation. This differs from "Real" cashflows in which all amounts are adjusted for inflation so that any unit of currency has the same notional purchasing power (real value) no matter where in the cashflow it appears.
Opportunity Cost	The Opportunity Cost of a decision is the value of the next best alternative which has to be given up because of that decision.
Price	The quantum of money (or money's worth expressed in current money terms) used as the consideration in an economic transaction. 'Price' always has a connotation of occurrence at a defined point in time.
Price point	A geographic point where a commercial transaction is assumed to take place. Differs from 'Point of Sale' in that in fact no transactions as described may actually take place at the Price Point. The Price Point is a convenient point to which costs and prices may be adjusted to bring all transactions in an area on to a common basis. On-stump or 'Stumpage' is an example of a common price point.
Profit	The return due to the owner(s) of invested capital through the operation of an enterprise. 'Profit' may be viewed as a return to the owners of the 'Capital' for their entrepreneurial ability which appears as a cost to the purchaser of the enterprise's products.
Rational	A rational outcome, action or conclusion is based on the rules and processes of reason. Rationality, being based on culturally, personally or organisationally held postulates, precepts and perceptions of facts, will produce different outcomes for different entities from the same situation. In the economic arena market participants may therefore consider the actions of other participants irrational. A market outcome of price, market, volume etc. is, by extension, reckoned to result from the 'average' postulates, precepts and perceptions



held by the participants in the market rationally assembled. It is generally held that a market will tend to impose a common rationality on participants in the medium to long term. Economic rationality is generally considered able to be represented by mathematical constructs, but this does not imply that market participants will always proceed from a pre-existing rational model.

Real	With reference to 'cashflows' and calculated 'Net Present Values' refers to a calculation and a result in which future (or past) inflation or deflation has been excluded from the included money quanta and interest rates. Hence 'Real Interest Rate', 'Real Value', 'Value in 2020 dollars'. The underlying postulate is that value concepts can be best comprehended by reference to the present prices of goods and services and value impacts of present interest rates.
Revenue	The total amount of income generated by the sale of goods or services.
Risk	The likelihood of occurrence of an event adverse to the 'enterprise'. Usually expressed as a percentage of the 'capital' of the 'enterprise' exposed to future adverse events. May be categorised by the type of risk, viz 'Inflation Risk', 'Capital Loss Risk', 'Industry Risk' etc. Risk is connected to both 'Interest Rate' and 'Profit'.
Social cost	Costs which may not feature in financial accounts in the short term, e.g. costs of air and water pollution, but which are real costs to society as a whole.
Tax	Any contribution levied on a person (including a corporate person) by law for the support of national, state or local government. In the context of forestry analysis local government taxes ('Rates') and 'ad valorem' national government taxes ('GST', 'Land Tax', 'Stamp Duty', 'Filing Fees', 'Excise Duties') are generally internalised into cost and the expression 'Pre-Tax' is taken to mean (with respect to a cashflow) 'before the impost of Income Tax and the benefit of any associated tax deductions or write offs on the forest owning entity'.
TCEV	Terminating crop expectation value, being the terminal expectation value of the tree crop, typically computed at the end of a modelling period. Also see CEV.
Transaction	A transfer of goods and/or services from a seller to a buyer in return for 'consideration' transferred to the seller from the buyer. A 'transaction' is the best evidence of value in that two separate individuals are agreeing at a definable point of time with respect to definable goods/services and a specific and universal measure of value. At the point of the 'transaction', 'price' and 'buyer's cost' and 'value' are an equal quantum of wealth.
Valuation date	<p>The date upon which a valuation is declared to be valid. Perceived value changes with time for a variety of reasons: e.g., growth, legislative changes, natural disasters, changing access to information.</p> <p>That is why it is important, for every valuation, to declare a date upon which the valuation is considered to be valid.</p> <p>When discounted cashflow analysis is used it is often the case that the Valuation date is the same as the Valuation point for the NPV calculation, but this is not universally true and the two terms express different concepts.</p>



Valuation event	<p>Expected occurrence relevant to a valuation process and its associated cashflows.</p> <p>Includes: land purchase, establishment operations, tending operations, other operations, harvesting operations and the associated costs of those operations. Recognition of overheads. Payment of interest, dividends and taxation. Receipt and return of capital and borrowings.</p>
Valuation point	<p>The point in time at which Net Present Value is defined. In other words, the point in time that defines the Present in NPV.</p> <p>A valuation may have more than one valuation point; for example, a closing value representing the value of future rotations beyond some future point in time has an internal valuation point at that future point in time.</p>
Value	<p>The quantum of moneys worth placed on a defined good or service by an individual or market at a particular time. Two individuals may legitimately hold that the same good or service has a different value at the same time. A 'transaction' in the subject good or service can only take place in a free 'market' if each prospective party separately holds that their personally held value for the good or service is either, below the transaction value (in the case of the seller) or, above it (in the case of the buyer). Value is always subjective and largely immeasurable until a completed transaction places a 'price' or 'exchange value' on the good or service in that instance. It follows that each party to a transaction will receive a surplus of personal value from the transaction. The subcategories of personally held value (e.g. need, sentimental, ecological, aesthetic, compensation, spiritual, cultural, time preference, loss minimisation) are extensive. Articulate analysis of the personal value components plus the personal surplus back to price is rarely possible. (See 'Market Value' and 'Fair Value').</p>



Revision History

Original Standard

Released in May 1999

Revision in August 2023

Main changes are:

- Addition/editing of
 - Discount rate
 - Nominal
 - Valuation date
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