Forest, Paper & Packaging

Forest Industry: Application review of IAS 41, Agriculture: the Fair Value of Standing Timber

Contents

Executive Summary

IAS 41, Agriculture, effective for periods beginning on or after 1 January 2003, introduced fair value accounting for standing timber, as it did for all biological assets. This entailed a major change from established accounting practices. The application of fair value to standing timber requires considerable judgment.

Five years have now passed with IAS 41 and use of the standard is now widespread globally, as use of International Financial Reporting Standards (IFRS) has spread. Nevertheless, amongst preparers there are major questions about how the standard is being applied to forest assets. Fair value implies a market based value and whilst there are markets around the world for the harvested products of forest, markets for standing timber are limited in comparison with the total volume of standing forest.

In this short study, which is the first of its kind, we have reviewed how fair value is being applied by forest owning companies using IFRS. It aims to provide insight into the key judgments that are made by preparers from around the world and highlights some of the difficulties as well as similarities and differences. What it doesn't seek to do is pass judgment on how IAS 41 is being applied, but that said, it does aim to provide pointers as to what may be considered as best practices in fair valuing forest assets and the related disclosures.

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What is the importance of this study at this time?

The application of IAS 41 and the valuation of forest assets are of increasing importance to preparers and investors throughout the world:

- Preparers and investors have expressed interest in the manner in which IAS 41 has been implemented.
- The forthcoming implementation of IFRS in various regions with major commercial forestry activities, such as the United States, Canada and Brazil, also calls for this study.
- Institutional investors are becoming increasingly attracted to forestland as an asset class, seeing such assets as offering an alternative and sustainable long-term investment strategy.
- Forestry is attracting new strategic investor interest as wood-based biomass is seen as a vital renewable energy resource.

Given this interest, our study attempts to shed light on the fair valuation of standing timber for financial reporting purposes, and closely related valuation issues, by reviewing the disclosures in IFRS-based financial reports for forest owners.

IAS 41 Summary

IAS 41 requires fair value accounting for biological assets; hence, the reported value of standing timber should reflect fair value less estimated point-of-sale costs. As a point of emphasis, land, as distinct from the trees growing on the land, is accounted for under IAS 16 (Property, Plant and Equipment). IAS 41 allows for different methods in determining the fair value estimate: market value is preferred but if reliable market-based prices are not available, fair value is the present value of expected net cash flows from the asset discounted at a current market rate (the “discounted cash flows or DCF” method). In some situations historical cost is an allowed treatment.

Scope and findings of this study

Scope of the study

To our knowledge, this is the first published study of the global application of IAS 41 fair value accounting to standing timber. Therefore two key objectives have been to gain insight to:

- The methods forest owning companies use to determine the fair value of their standing timber.
- The assumptions used in applying fair value and the circumstances in which they differ between preparers.

The study is based on an analysis of the published financial statements (mainly 2007 or later) of companies applying IFRS in the reporting of their forests assets. The study covers 19 companies: eight from the Nordic region, three from the rest of Europe, and four from South Africa. Four Australian companies are also included in the study[1]. The results are briefly summarised below. For a more in-depth analysis, please see the appendix.

Methods used to determine the fair value of forest assets

A key conclusion is that few of the companies studied have used market-based prices for standing timber. This suggests that markets in timberland assets are limited, at least in the geographies where these companies hold their assets or in commercially-sized timber plots. Consequently, net present value arrived at by DCF-modelling is by far the most common method of determining fair value. A few companies apply multiple methods.

Discounted cash flow: 18 of the 19 companies in this study apply this method, both for managed natural forests and plantations. The main reason provided for using discounted cash flow methods is the lack of active markets for large plots of forest land, implying a lack of reliable quoted market prices for standing timber. In particular, all preparers with slow-growing forests located in the Nordic region apply DCF methods.

Market value: In four cases (South Africa and Australia), preparers explicitly state that they apply reliable, market-based prices for certain species and qualities of standing timber. Our study shows that these are plantations with relatively short rotation periods, typically between 5-20 years. These plantations are classified as mature when they reach a certain stage in their rotation and according to these preparers, could be sold at reliable market prices.

Historical cost: Seven companies have stated that newly planted trees are carried at cost, which is deemed to be an indicator of their fair value. Additionally, cost is applied where there are no known reliable parameters, e.g. prices or growth rates or physical volumes. One company, with natural tropical rain forest, has concluded that cost represents the only option for certain areas with diverse indigenous species, where there are less well-known growth patterns and where there are no track records of reliable, quoted prices.

1 The Australian companies have applied the AASB 141, which is similar to IAS 41 as regards measurement and recognition at fair value.

Scope and findings of this study

Assumptions in applying fair value via DCF methods

The study has shown that the most important assumptions used in the DCF-modelling include harvesting plans, timber prices, forestry costs, growth rates, and the discount rate. Preparers use different approaches to determine these key assumptions. There are obvious differences such as those due to geographic location, silvicultural practices, rotation periods and species which will drive different modelling assumptions; however there are less obvious ones too, notably the basis of timber prices.

Timber price assumptions are fundamental in estimating fair value. Some companies base their assumptions on current market prices for timber; others use adjusted current market prices. It is notable that companies in the Nordic region in the main use adjusted price assumptions. To our understanding, this likely relates to the fact that trees in the Nordic regions, mainly natural forests, have considerably longer growth cycles compared to the plantation trees in the southern hemisphere and the adjustment is made to smooth out short term volatility in market prices for logs. For plantations in regions with faster rotation species, there appears to be less need for adjusted price assumptions, as current timber prices are considered sufficiently reliable for modelling fair values. That said, length of rotation period (and species diversification) does not entirely explain why some companies adjust current market prices for timber and others do not, as companies handle the price variable in differing manners within similar timber growing regions

Concluding observations

Our study has highlighted various approaches to the application of the fair value requirements of IAS 41 to standing timber, and in related disclosure practices. Several companies make extensive disclosures which supports transparency to the users of the financial statements. However, often the reasons for the fair valuation approach selected are not explicitly discussed, meaning that users may not appreciate the judgments and related uncertainties that are inherent in the valuation of forest assets.

From our study, it seems that the majority of preparers have concluded that active and transparent markets in timberlands are the exception rather than the rule. Hence the use of net present value/DCF methods is the prevailing method of determining fair value.

Where markets do exist, often they are restricted to smaller timberland plots, not on a scale that is of interest to strategic or financial investors, and hence the community of IFRS preparers. A further condition of an active market is that items traded within the market are homogenous. This concept does not square readily with forest as no two forest plots are the same. That said the degree of similarity between same species short rotation plantation plots within a local region is far greater than in a managed natural forest. Hence, considerable judgement is required in determining what constitutes an active and transparent market.

Our overall conclusion is that there is room for further improvement with regard to the level of the transparency of critical valuation assumptions especially given that the overwhelming majority of standing timber valuations are site specific. Generally, we would welcome an enhanced discussion in the financial reports on price assumptions used in DCF calculations and sensitivity analysis as regards the most significant value driving assumptions.

Finally, with forests at the heart of climate change, some preparers already make reference to how climate change is affecting timber growth rates and hence valuation. Climate change is already driving changes in commercial forestry, for example, the increasing role of woody biomass as a renewable energy source. There are nascent markets in forest carbon credits, which is seen as one way of monetising the environmental contribution of forests. These developments and more will impact upon forest valuation and hence financial reporting. We would expect more disclosures on these developments in financial reports.

Appendix: detailed results of the study

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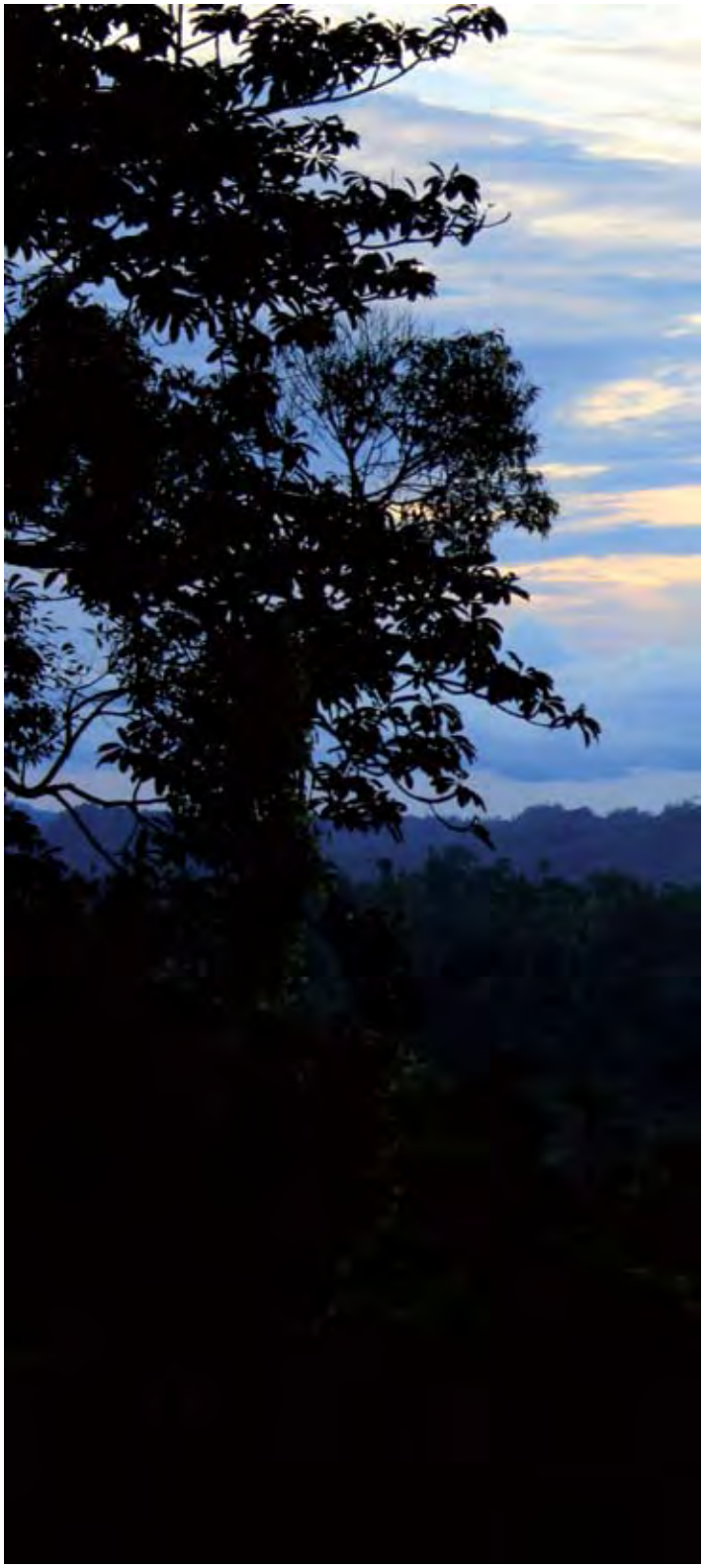


Introduction

IAS 41 prescribes the accounting treatment, financial statement presentation and disclosures related to standing timber and other biological assets. The standard prescribes, among other things, the treatment for standing timber during its period of growth, degeneration, production, and procreation and for the initial measurement as agricultural produce, i.e. harvested timber. There is a presumption that the fair value of standing timber can be reliably measured. For assets with no market-determined prices or values, and for which no alternative estimates are available, historical cost can be used, that is, until the fair value becomes measurable. Fair value is stated net of point-of-sale costs. During the period of growth any change in the fair value should be recognised through comprehensive income and should be included in the profit and loss of the period in which it arises. IAS 41 does not prescribe a valuation method; each preparer must determine the valuation approach which is most representative for its forest assets.

If market-determined prices or values are available, it may be reasonable to expect preparers to use those to estimate the value of their own standing volume. However, in most circumstances no such active markets are available to provide prices or values for standing timber. Absent reliable market prices, a preparer is required to apply valuation techniques, typically discounted cash flows to give a net present value, requiring that management make judgments about, amongst other matters, prices and discount rates.

The study includes 19 companies. Our main purpose has been to provide a summary of how standing timber, is valued and how that value is actually derived. Given that no worldwide study has been previously published, we have presented our findings in some detail in this appendix. The main questions we have sought to address are:

- What methods do forest owning companies use to determine the fair value of their standing timber?
- What assumptions are used in applying fair value models and in what circumstances do they differ between preparers?

The following forest owning companies have been included:

Home country	Company	Forest in '000 Ha	Location of main forests
Portugal	Portucel Soporcel	125	Portugal
Portugal	Altri	79	Portugal
Switzerland	Precious Woods	534	Brazil and Central America
Norway	Green Resources	10	Tanzania, Uganda, Mozambique
Sweden	Holmen	1,037	Sweden
Sweden	SCA	2,000	Sweden
Sweden	Sveaskog	3,300	Sweden
Finland	Metsäliitto Group	Not published	Finland
Finland	Stora Enso	106	Finland, Sweden, Brazil, Uruguay
Finland	UPM-Kymmene	1,017	Finland, USA
Finland	Tornator	600	Finland
South Africa	York	61	South Africa
South Africa	Mondi	245	South Africa
South Africa	Sappi	369	South Africa
South Africa	Safcol	142	South Africa, Mozambique
Australia	Great Southern Plantations	240	Australia
Australia	Gunns	16 millj m3	Australia
Australia	Timber Corporation	96	Australia (Tasmania)
Australia	Wilmott Forests	1	Australia

Source: Individual company's annual financial statement for 2007

Appendix: detailed results of the study

Details from our study

In the following sections, we highlight significant observations related to the valuation methods and assumptions applied. The appendix is structured into two main sections:

- Methods used
- Perspectives on discounted cash-flow models

Methods used

The companies in our study are applying IAS 41 or AASB 141[1] using three different methods for valuation of the standing timber; discounted cash-flow (of expected or current log prices), historical cost (of newly planted trees), and market value (of trees approaching harvest age at current market prices). Certain companies are using multiple methods depending on their forest configurations.

Discounted Cash Flows

A valuation based on the present value of anticipated future net cash-flows is by far the most commonly used method. Nine companies are DCF-modelling cash flows based on expected future log prices; seven companies are DCF-modelling based on the current market prices for logs. No company in our study is using both i.e. expected prices and current market prices for logs.

The most common reason for using net present value of standing timber is the lack of active markets with reliable available market prices for large plots of standing timber. Many companies have concluded that the only realistic option is to use DCF-methods applied to log prices. As one company, Wilmott Forest[2], puts it *"Although there is an intermittently active market for softwood plantations, there is no suitable market evidence available to value the plantations by reference to equivalent sales. Accordingly, the best indicator of net market value is net present value.*"

There is an interesting divide between companies building their models using unadjusted current market prices for logs, and those using expected future log prices. In general terms, it appears to depend on the length of the growth cycle. Standing timber with faster rotations seems more likely to be valued based on current log prices, while standing timber with slower rotations seems to be valued using current log prices with adjustment to reflect expected future log prices. In our study, eight of ten companies in Europe are using expected future prices. In South Africa, three of four companies are using current market prices, although one company is using expected future prices. In Australia all four companies are using current prices. In general, it seems that adjusted log prices are used to smooth out the shorter term volatility in prices.

Cost

A valuation based on historical cost is used by seven companies. The most common reason given is that forest comprises newly planted seedlings, i.e. immature forests, where cost is believed to approximate fair value. IAS 41 acknowledges that cost may be the best indicator of fair value where limited biological transformation has taken place. The other instance is where there is a lack of reliable information on growth rates (typically less well-known indigenous tropical species), and newly planted seedlings, i.e. immature forests, where cost is believed to approximate fair value. As one company, Precious Woods[3], puts it *"Due to the lack of reliable information about biological growth rates of more than 300 species in the field and associated market prices for potential harvest qualities, the fair value approach cannot be applied."* With respect to newly established plots, some companies characterise the fair value of these as the standard cost of maintenance including cost of capital.

Companies using historical cost for portions of their forest estates comprise five from Europe (Stora Enso, UPM, Metsäliitto, Altri and Precious Woods), and two from Australia, (Great Southern Plantations and Gunns).

1 The Australian companies have applied the AASB 141, which is similar to IAS 41 as regards measurement and recognition at fair value.
2 Wilmott Forest Limited – Australian, 2007 Annual Report, p. 41
3 Precious Woods – Switzerland, 2007 Annual Report, p, 66

Market Value

A valuation based on quoted prices seems to be relatively uncommon. In our study only four companies, Sappi, York and Mondi in South Africa and Great Southern Plantations in Australia, apply a market value model. The applied approach is referred to by some companies as 'the standing value method'. According to this method, fair value is calculated on the basis of the estimated current volume of standing timber (typically measured in metric tons) and the unadjusted current market price. No company has disclosed further details about the applied price-variables. It is, therefore, difficult to comment on what basis these companies have concluded there are active markets. This is not a required disclosure, but it does mean it is unclear as to why some preparers have used market value whilst others have not whilst both own what seem to be broadly similar plantation assets within the same geographic regions.

Companies applying market value have classified their plantation forests into mature and immature stands and have, then, applied the market value to the mature stands. The companies have developed varying classes of mature timber, depending on species and age. As an example, one company has classified their stands as mature if the trees are older than five years for hardwood and eight years for softwood. For these trees, which have a short growth cycle, the company has stated that reliable market prices are available. Classification based on age is a matter that could be analysed further, implying as it does a judgment as to when a particular plot should be considered to be mature and is, consequently, to be valued at market based prices. IAS 41 includes no guidance on the issue.

Other companies have used different age classes. We believe this is mainly explained by the fact that companies in our study are spread across two continents – Africa and Australia – and that their forests, therefore, may have differing growth patterns. However, what they all have in common is that the market value method is being applied to short rotation plantation species and where species variety within any plot is limited.

Appendix: detailed results of the study

Perspectives on Cash Flow Methods

The application of DCF-models requires management to make several important assumptions for use in their calculation of the fair value of forest assets. The basic systems, such as software support related to the control and monitoring of the standing timber volume at the balance sheet date and harvested during the period, is, indeed, of vital importance to management establishing a reliable estimate of fair value. The integrity of the DCF-model, itself, is also of fundamental importance, and, based on our experience, the use of spreadsheet software is widespread. The models used vary and the companies using DCF employ differing assumptions for similar variables. Similarities and differences in the following key variables are described below: Formula, Harvest Plans, Growth, Prices, Costs and Discount Rate.

Formula

All companies in our study applying DCF-modelling have based their assessments on four significant types of variable. However, the assumptions and conditions that underlie some of these variables differ and are discussed below.

- Expected income at harvest: volume * growth rate * price/unit of volume
- Expected costs during growth: silvicultural, maintenance and thinning, etc.
- Expected point-of-sale cost: harvesting, transport to market, etc.
- Discount rate: cost of capital

Harvest plans

Harvest plans can be perceived as the heart of the modelling. The harvest plan includes planned volumes to be harvested (both clear felling and thinning) over a foreseeable future, and related extrapolations of the remaining volumes for the period of time until harvest. The plan typically includes one complete cycle from seedlings to harvested trees although for short rotation plantations, the plan may cover more than one rotation where trees are left to regenerate naturally after the first felling. The harvest plan is, in turn, based on assumptions about growth rates and the expected yield.

Growth rates

Growth, i.e. the increase in volume through biological transformation during any given period of time, is essential to the fair value calculation. For any species of tree, growth is dependant upon general climate conditions, soil, silvicultural practice, and quality of genetic material. However, management must perform a series of qualified judgments, assessments and field studies. Sometimes external specialists are engaged to establish growth rates during one cycle for various species taking into consideration local conditions. Without growth rates, it is not possible to use DCF-modelling based on future growth until harvest.

Companies in the Nordic region often refer to the harvesting or felling plan as the basis of assessing the volumes that can be harvested each year during the forecast period. In this plan assumptions of growth, the need for reforestation, and related thinnings are estimated. Two Australian companies present their calculation of growth similar to those provided by the Nordic companies. Their models are also specific in terms of estimates of growth rates, yields and expected thinnings during the production cycle. Common factors are that the companies in both regions are concentrating on softwood, which has relatively long growth cycles (25 years in Australia, 80-100 years in the Nordic region). In contrast, companies with plantations in Central America and South Africa, estimate annual growth through a substantial number of sample plots each year. A reasonable conclusion is that varying conditions require a company to use different approaches to monitoring and adjusting growth rates, where necessary.

The valuation is more sensitive to variations in the assumed growth rate for fast-growing trees than for slow-growing trees. It is worth noting that companies in the Nordic region tend to develop or update their forest management plans each 7th to 10th year. These updates, labelled "forest tax assessment" or similar, typically represent a more thorough inspection of the stands across the entire population and thereby provide a check on assumed growth rates.

Two Nordic companies' comments on the effects of such assessment are revealing. One, Stora Enso[4], stated: *"The new valuation [for 2007] was based on a new felling plan based on forest tax assessments… Some increase of possible felling volumes had a positive impact on the valuation…"*. SCA[5], stated: *"During the year [2007], extensive surveys were undertaken, the main conclusion of which was that growth had been under-estimated for a number of years, not least as a result of climatic changes leading to longer growing season".* To our knowledge, these inspections are typically executed on the basis of manual inspections with the use of GPS guided tools for the highest and best accuracy. It is interesting to note that both statements refer to slow-growing forests in Sweden, where delving deeper shows that the two companies have used differing growth assumptions. These variations may be due to objective differences in local conditions or simply due to different judgements as to how evolving conditions may impact future growth rates.

Timber Prices

Timber i.e. log, prices, are key and can be sometimes difficult to determine. Rather than using current market prices for logs, prices are often averaged based on price trend data that is periodically updated. Hence the actual prices used in models may be higher or lower than prevailing log prices. Inflation is considered in some cases, but not in all. Regardless of whether or not current log prices are modelled, they would seem to be referenced into the assessment process on price assumptions in all cases. Log pricing therefore is a key area of management judgment, supplemented sometimes with the help of independent forestry experts.

4 Stora Enso – Finland, 2007 Annual Report, p. 158
5 SCA – Sweden, 2007 Annual Report, p.88

Appendix: detailed results of the study

It is evident that amongst the companies studied, those in the Nordic region are using adjusted current log price assumptions, to a greater extent than in other regions. This is most likely explained by the fact that the growth cycles of the trees, depending on the exact species, vary considerably but in all cases are long. For the Nordic region, the cycle varies between 60-120 years; in contrast, for other regions growth cycles are shorter or much shorter for example, Australia between 10-25 years, South Africa between 8-18 years, and Latin America (for teak) between 26-30 years. As a general rule, the longer the growth cycle, the greater the tendency to adjust current log prices to smooth out short term price movements over typically long forecast periods.

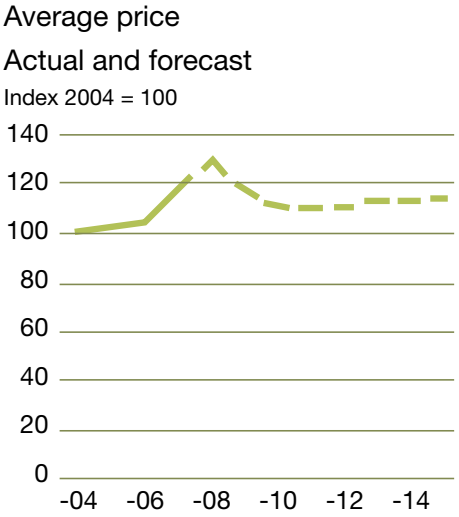
Given the critical nature of the log price assumption to the valuation, we highlight some of the disclosures made by Nordic-based companies. During 2006-2007, saw logs and pulpwood prices increased dramatically. As SCA[6], explains: *"… the single greatest impact on the increase in value [for 2007] was higher wood prices. To avoid over-estimation of the effect of today's high price levels, a ten-year adjustment period was used in the valuation model in order to revert to a real trend price for wood that is lower than today's."* Another Nordic company, Holmen, has included with similar reasoning, a graphic illustrating the adjusted price curve and trend price, as well as the estimated cash-flow effects for the expected price-inflated, ten-year period[7]. In a sense, the subsequent falls in saw log followed by pulpwood prices may be seen to vindicate this smoothing approach. For regions with much shorter growth cycles, there is, perhaps seen to be less of a need to adjust current log prices as these are seen to be sufficiently reliable for financial reporting purposes.

Forestry costs

Costs, i.e. expenses related to various inputs in the forest management activities, are also an important factor. Throughout the forest cycle, including land preparation, nursing seedlings, planting, thinning, fertilizing, protecting from animals and insects, harvest and so on, various activities are required to be performed, and the resultant costs can vary considerably between species, geographies, and over time.

Costs included in DCF-models appear to differ slightly, partly depending on the location of plantations. In summary the companies in our study include, with some exceptions, the following costs in their DCF-calculations:

- Felling costs.
- Silvicultural costs (including fertilizing).
- Point-of-sale costs, including all costs that would be necessary to sell the harvested timber; certain companies include and others exclude costs necessary to get the assets to market.
- Costs incurred to protect from natural hazards, such as fires and hurricanes which are included in the calculations by the companies included in our study.
- Statutory replanting (Nordic region but others also).



6 SCA – Sweden, 2007 Annual Report, p.88
7 Holmen – Sweden, 2007 Annual Report, p.50

The costs of silviculture and felling are included in the calculation by the majority of the companies. Although not all companies are explicit, there is no evidence that the costs incurred to protect from natural hazards are excluded. As regards estimated point-of-sale costs, all companies include the costs necessary to sell the trees, but at least two companies, both in Australia, have clearly stated that they do not include costs necessary to bring the harvested timber to market. We would have expected all companies to include estimated point-of-sale costs.

Of particular note is the treatment of replanting costs. Replanting is the process of reforesting after a clear felling. In certain countries, the land owner is required by law to fulfil this obligation; in other countries reforestation is not a legal requirement. Although most companies whether by regulation or practice do replant in order to ensure sustainable forestry, the companies in our study are not always explicit regarding their treatment of replanting costs. However, companies in the Nordic region are known for including replanting costs in their DCF-calculations, and in our study, both the Portuguese and Swedish companies explicitly state that they have included such costs. Companies from the other regions have not provided a clear statement as to how they treat replanting costs. This particular issue seems to represent an area of diverging practice within the industry and as such, perhaps a clarification from the IASB is justified.

Appendix: detailed results of the study

Discount Rate

The discount rate is a very significant factor, and even a small change in the applied rate can have significant effects on the valuation.

The companies in our study are based or have forest assets in Australia, Africa, Europe, and Latin America in the main. Some of these companies are forestland owners only, others are agricultural companies, and others again are integrated forest product companies. Hence it is reasonable to expect varying discount rates throughout this diverse group of companies. Nine companies have disclosed their discount rate(s) (two without comparatives) and nine companies have not.

The discount rate used varies from applying a company's overall weighted average cost of capital (WACC) to differentiated rates for individual plantations. Most companies use pre-tax cash flows and pre-tax discount rates; still a few companies are using after-tax discount rates – and it is presumed these are applied to after tax cash-flows. From the perspective of the companies, it seems appropriate to use different discount rates for different forest assets located in different regions with varying risks. Another somewhat modified approach is taken by a company in Australia. This company has adopted "a conservative method" and has applied a higher cost of capital for immature forests, thus taking into account the risks associated with an illiquid market for this type of forest.

For the nine companies which disclosed the discount rates used, the variations between regions can be seen as follows:

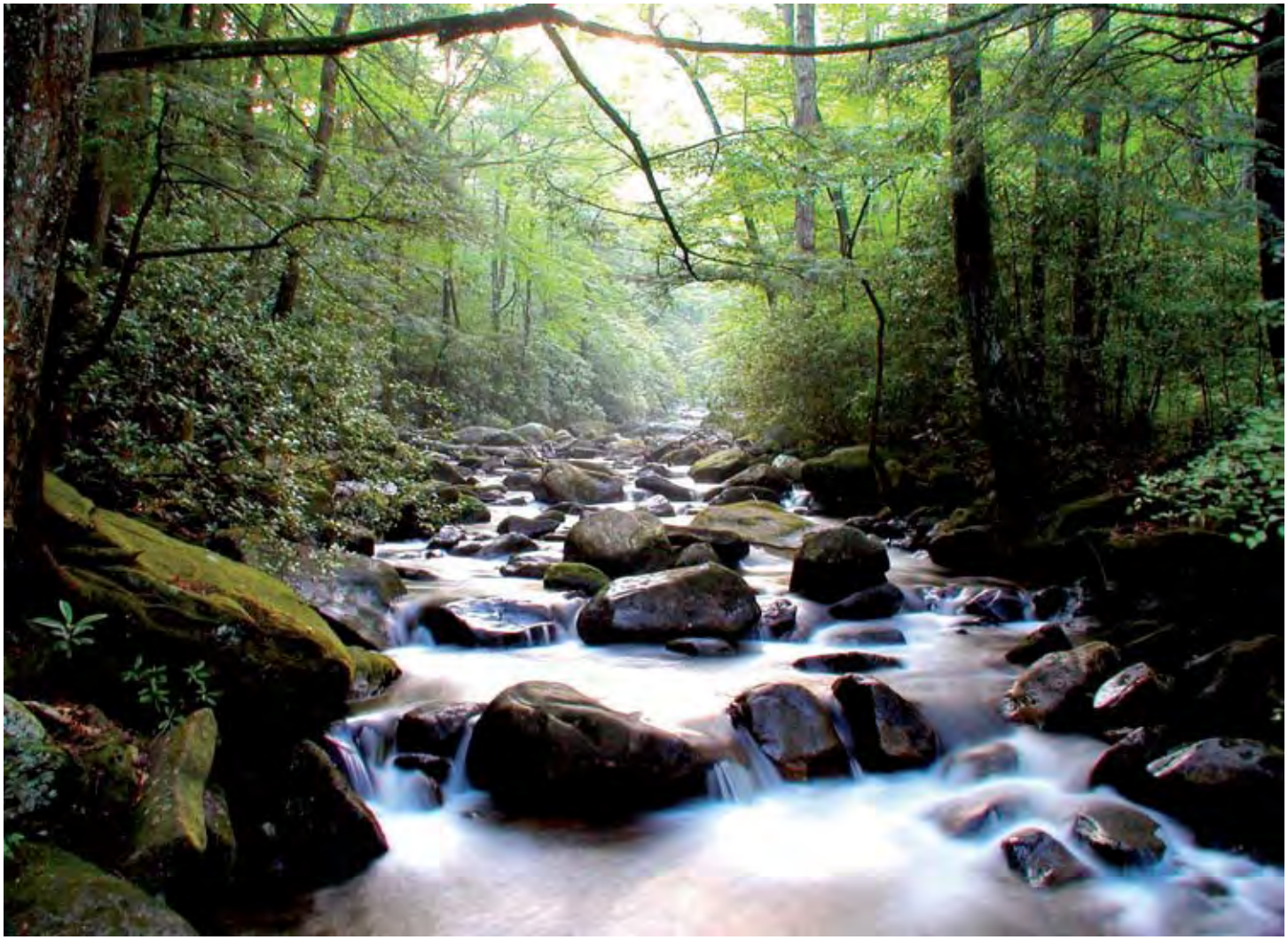
Forests in region	Pre-tax rate	After-tax rate
Nordic region 1 company 3 companies	7.50%	 5.50 – 6.25%
Central America 1 company	10.87%	
Australia 2 companies 1 company	12.00 – 17.50% 10.00 real rate	
South Africa 1 company	Yes	
Eastern Africa 1 company	12.00%	

Summary

Our study has highlighted many similarities in the way the fair value provisions of IAS 41 are applied to standing timber, both within regions of broadly similar forestry regimes-managed natural and plantation – and also across regions. It has also highlighted some differences. Above all, it has shown that many judgments are necessary to arrive at fair value and that often further disclosure would be beneficial to users in understanding some of the key judgments that are made.

In short it shows:

Reliable market-based prices for standing timber are rare. Of course, even where there are active markets, prices must be imputed from transaction prices which would normally include bare land value as well. A common approach therefore is to use a standing volume method to value mature or near mature timber volumes at (imputed) current market prices. There is however limited disclosure as to how active markets have been assessed, including for example, information to understand the degree of liquidity and the price ranges of relevant/comparable market transactions.



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- Active markets to the extent they exist and are relevant to valuing standing timber for IFRS purposes appear limited to faster rotation plantation stands, where one would expect a high degree of species homogeneity and hence comparability with other stands. This questions whether the active market criteria can ever have any relevance other than for shorter rotation plantation stands.
- Hence the overwhelming majority of valuations must be site specific and for which a net present value of discounted cash flows is deemed the best measure of fair value. Significant management judgment is needed in applying this method requiring significant disclosures also of the many valuation critical factors.
- Although other assumptions are important, the most critical to the DCF-based valuation generally seem to be growth rates, log prices and discount rates. There would seem to be some variations also in the type of costs that are included, but the significance is difficult to judge. This includes replanting costs, where there are arguments also as to whether those are valid costs in getting to the point of sale, even though they might be obligatory and in any event essential to sustainable forestry practices.
- Growth factors are critical. Broadly, the sensitivity of the valuation to changes in growth factors increases as the growth cycle for standing timber reduces. However disclosures of growth assumptions and the variables that have caused or might cause them to change are often limited.
- Another important facet of biological transformation is age classification. There is often limited disclosure of timber age classes, although this may be critical in determining the basis of fair value measurement. Cost is often a proxy for fair value for immature stands and that is based upon age; further markets in timber stands tend to be most active for harvestable or near harvestable timber. Hence for plantations especially, age classification is significant information.
- Log price assumptions have a major impact on valuation. The broad conclusion is that for shorter rotation timber stands, current log prices tend to be used in valuations, but that these are modified for longer rotation standing timber in order to avoid introducing undue volatility in the value of an asset which will yield income over a long, often very long time frame. However whilst this is the main pattern, it is not universal amongst the companies we studied. It is notable also that many companies use the assistance of external specialists in setting their price assumptions.
- Discount rates. Valuation is highly sensitive to this assumption and considerations as to the choice of discount rate are not unique to fair valuing standing timber. What is noteworthy is that the discount rate is often not disclosed.

Finally a few thoughts on the future.

Forest biomass on a commercial scale is becoming an important source of renewable energy. Traditionally the valuation of standing timber has been measured by reference to log prices; however biomass sourcing extends to the whole tree, potentially roots and all. As markets in woody biomass develop, this suggests that greater, or at least more explicit, recognition should be given to fuel wood pricing in fair valuing forest assets.

There is also the issue of how environmental benefits should be recognised, measured, reported and disclosed. For example, carbon is increasingly being monetised and hence recognised in financial statements. In future and especially as active markets in forest carbon develop, forest owners will need to consider whether their standing timber has additional value beyond its log value and further whether forest currently not accounted for as commercial timberland, for example, for conservation reasons, has an economic value requiring recognition.

These are all aspects of climate change. It is noteworthy that some reporters are making references to climate change impacts as they have already impacted valuation assumptions such as growth rates but otherwise might constitute broader risk factors. Disclosure of this type of information is likely to become of increasing currency, especially for longer rotation timber stands, as the impacts of climate change will likely have both potentially negative and positive impacts on standing timber fair values.

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