

Valuation Guidance of Forest Properties Within Valuation Standards Needed?¹

Kauko VIITANEN, Simo HANNELIUS, Markku AIRAKSINEN

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SUMMARY

Wood and commodities made of it have a worldwide importance. The global forest area consists of 3.9 milliards (Br) of hectares of forestland; which is about a third of the total global land area. In year 2000 the amount of round wood felled was 3.4 milliards (Br) of cubic meters, half of it firewood. The global production of forestry commodities was about one milliard cubic meter in year 2000. The export value of these commodities in world trade was USD 134 000 million and the import value USD 141 000 million.

In order to maintain free and unchallenged capital transfers globally it is more and more important for the decision makers to have trustworthy and comparable facts at their disposal. This applies to enterprises and accounting systems (IFRS) as well as different kinds of property valuations (IVS).

Our opinion is that present valuation standards pay too little consideration to the valuation of forest properties. We suggest that completely independent and specified valuation guidance should be created for the use of valuation of forest properties.

The draft proposal in the paper distinguishes among various property interests and characters that should be recognised, and discusses concepts that should be understood by financial reporting and regulatory authorities, courts, financiers, investors, participants in natural resource transactions, and other users of valuation services involved in forest properties.

Valuation Guidance of Forest Properties Within Valuation Standards Needed?¹

Kauko VIITANEN, Simo HANNELIUS, Markku AIRAKSINEN

1. INTRODUCTION

Wood and commodities made of it have a worldwide importance. The global forest area consists of 3.9 milliards (Br) of hectares of forestland; witch is about a third of the total global land area. The inventoried tree volume is 386 milliards (Br) cubic meters making on average 100 cubic meters per hectare. The largest forest areas are in Russia, Brazil, Canada, USA and China. Their common share is thus a little above a half of the global forestry resources. In year 2000 the amount of round wood felled was 3.4 milliards (Br) of cubic meters, half of it firewood. The global production of forestry commodities (sawmill products, plywood, veneer, chipboard, fibreboard, pulp, paper and paperboard) was about one milliard cubic meter in year 2000. The export value of these commodities in world trade was USD 134,000 million and the import value USD 141,000 million.

A remarkable part of the annual earnings of people living in scattered settlements comes from forestry. A good example is given by the three southernmost counties in Finland. In year 2003 their common gross stumpage income was 150 euros per forestland hectare. The average annual share of silvicultural and administration costs in northern circumstances make 10-20 percent of the total income from forestry.

There are, however, other values connected to the forests besides timber production. The multiple use of forest produces many kinds of benefits, which can be divided into the following groups:

- Material benefits, such as wood, game and gathering products like berries and mushrooms
- The sheltering effects of forests
- Recreation use
- Cultural values like landscape/scenery
- Nature, conservation of biodiversity, carbon sink

The intangible values accumulate with the increasing population density. In the densely populated European countries these values may even come to weigh a lot more than forestry production. The countries most in need of valuation guidance are those where private ownership is widest; where forestry can be practised as entrepreneurship, where transfer of property is not restricted by any law and no other restrictions of free market oriented price formation exist.

In this paper we will discuss about need for guidance in forest valuation and give some suggestion how the standards could be formulated. The main point of view in this paper is laid to the Northern hemisphere.

2. THERE ARE PLENTY OF FOREST PROPERTIES AND THE NEED FOR VALUATION IS GREAT

Depending on the country the forests can be state or community owned in a way that there are in fact no markets for forest land. However, in many countries there is private ownership of forest land and the market is active. For example, in the member countries of EU private ownership of forests is considerable although there are also vast amount of state owned forests.

In Finland private people own 450,000 forest properties and the amount of owners is about double. This is 61 percent of the total forest area in the country and makes 11.43 million hectares. The average size of a forest property is 26 hectares but this is slowly diminishing because of division of land; 63 percent of the private forestry land belongs to the property class under 20 hectares and 4 percent to the class over 100 hectares. Agricultural entrepreneurs are owners of less than 20 percent of the forest properties. There are no longer legal restrictions on sales of agricultural and forestry land and even foreigners may today invest in forest property.

In Sweden private ownership of forestland is 11.5 million hectares, which constitutes about a half of the total forest area in the country. There are 245,000 taxed units and 343,000 owners. The average size of the unit is 50 hectares. In half of the cases forestry land is the dominating part of the whole property, i.e. it's common that agricultural farms own also forest land. As privately owned forest properties have increased in area the agricultural properties have decreased.

Forest ownership in the Northern countries is often based on inheritance or transactions within families. The forest owners are in average elderly on the average population. Forest properties are connecting generations as "Nokia is connecting people". Private forest ownership and its structure are going to change remarkably in the near future. The aging of the population and the ongoing movement to population centres result in more and more properties going for sale.

The majority of the valuation need lies in reorganizing the ownership of private people. In Finland nearly 3000 representative market based forest property transactions are made annually. Donations and sales between relatives are, however, the most common form of exchange between private people, and the total number amounts to 12,000 – 15,000 transactions per annum. In addition there are other types of transfers like inheritance, compulsory purchase and lease agreements.

In addition to the market transactions forest valuation is also needed in taxation, in cases where forest is considered as a security for a loan, in exchange between relatives, in transfer

to a descendant, in cases of real estate exchange, in parcelling or annexing, in breaking up of co-ownership, in compulsory purchase and in accountings. In practice, taxation requires the valuation of property as the seller (conveyer of the land) normally has to pay tax on the conveyance profit. The buyer usually pays a special transfer tax, (4 percent of the assets price in Finland), on the deal when the transfer is registered and legalized. Also inheritance tax, legacy duty, wealth tax and real estate tax exist in many countries.

Compulsory purchase is needed when the society needs land for its needs but a voluntary transaction is not possible. In forest land the cases normally concern roads and power lines but also new nature conservation programs may result in biologically valuable forest areas being purchased.

The newest requirements have been born in capital markets. In order to maintain free and unchallenged capital transfers globally it is more and more important to the decision makers to have trustworthy and comparable facts at their disposal. This applies to enterprises and accounting systems, especially International Financial Report Standards (IFRS/IAS) and in that way also in valuation standards (e.g. IVS). The leading idea of IFRS is that the property values in accountings are expressed in market values. This is e.g. a requirement for all listed companies in EU and it has been adopted in some other countries too. One of those companies responsible to carry out its accounting according to the IFRS is UPM-Kymmene Group which is one of the leading forest products companies in the world and it owns about one million hectare of forest land. According to the UPM Annual Report 2005 (p. 71) "Biological assets (i.e. living trees) are measured at their fair value at each balance sheet date. The fair value of biological assets is determined based among other estimates on growth potential, harvesting, price development and discount rate. Changes in any estimate could lead to recognition of significant fair value changes in income statement."

This shows clearly that there is a real need for standardised valuation practices also on the global level.

3. THE VALUE AND VALUATION OF A FOREST PROPERTY

Forest valuation situations fall into two main groups in practice depending on the unit and its marketability. The first group includes whole real estates and parcels. The second group is normally small lots and forest covered stripes for e.g. road lines or areas where trees have been damaged for some reason. Valuation methods used in the latter case differ normally of those in the first case because of insufficient market data.

As a main rule, the value of forest is based on the income the forest is producing. The main production factors of round wood consist of climatic circumstances such as solar energy, water and soil nutrients. In forestry the (bare) land is a production unit. Wood production is sustainable, dependent on the site quality and use for a long period, up to a hundred years. Different timber assortments are available in the long term and the unit prices (stumpage price) are sensitive to economic cycles.

Characteristic to forestry properties is that an area yields a crop many decades or even a hundred years, in case of final cutting, after the time the stand was regenerated. Annual felling volumes vary considerably in forested areas and between different forest properties, and so do the incomes. The forest owner decides the schedule of felling. The silvicultural costs also give some temporal freedom of action. The annual costs of property ownership, however, remain more and less stable. Vast areas of forestland may yield an annual crop of the same size, if the stand areas are evenly distributed as to age or viable class.

Forest properties under valuation usually include stands of different age or viable class. However, in some countries there are vast forest areas with homogenous trees, i.e. wood fields. Only a part of the stand volume may normally be realized, according to national legislation. The rest of it is forest with expectation value. For young trees (pulpwood) the stumpage price is also lower than for logs, see fig. 1. The best way is to handle these different groups separately as to volume and value in money. A cutting budget and other production estimates can be prepared in forest planning. A forest plan consists of updated stand data. It states and describes in detail and summarized the forest resources and proposes further targets for forestry. It also includes an evaluation of cutting potentials. The inventoried data is needed and updated in the valuation process.

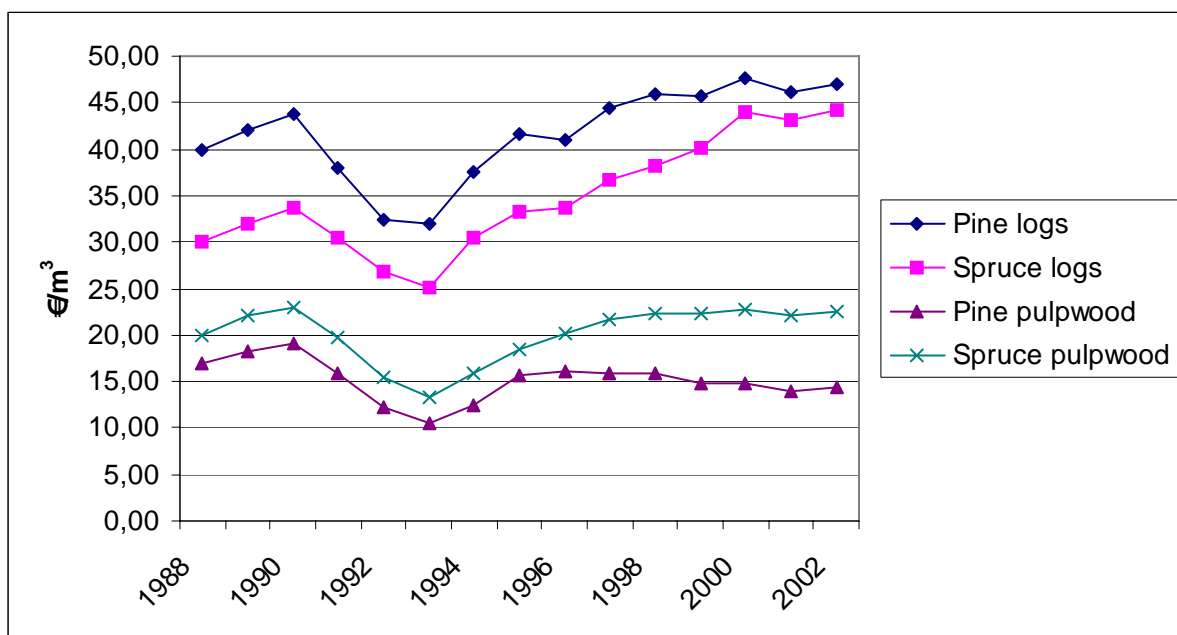


Fig.1 Stumpage prices of roundwood in private forests. (Source: Statistics Finland and Viitanen et al. 2003)

In conducting a market valuation, the three valuation approaches are generally available for consideration:

Income Capitalisation Approach, including market-related discounted cash flow. The meaning of real rate of interest is very important, because the life cycle of trees is very long.

Sales Comparison Approach is very important especially for forest with low tree stands if there are enough comparative sales. For older forests it is more difficult to use because the value lies in the tree stands and the similar information is very difficult to get from the comparative sales.

Cost Approach within forestry can only be used to value young growth as seedling stands.

The Summation Approach is a valuation method, which is often used in valuation of forest properties. It is a method where the total value equals the sum of the parts of the property. The separate parts are bare land, seedling, cutting value as well as the additional expectation value of a growing thinning stand. All these separate stand values can be calculated by using Faustmann's income formula. In case of valuation of market value the sum-value must be corrected by the gross discounting factor.

The main benefit of the summation approach is that it is easy to use and understand even by non-experts. It is also often the only useable method when assessing compensations for narrow forest stripes e.g. for roads or power lines. When used for whole forest properties the valuer has to be very careful that the sum of parts will be corrected to correspond to the market value of the whole property. The value of parts is often much higher than the market price of the whole property. In Finland Airaksinen (1988 and 1998) has found out that the discount is normally over 50%.

As applied to forest resource property interests, the appropriate valuation methods depend upon the stage of stand age classes or cash flow expectation time of the property. For convenience, forest properties can be categorised as four main types, though the categorisation is sometimes the subject of the opinion of a valuer or a technical expert: bare land suitable for wood production; young growth (seedlings); young stands; and mature and realizable stands.

There are calculation models for future growth estimates². They are needed to produce the volume factors and net income estimates especially for cash flow analyses. Although wood production is normally sustainable and rather easy to forecast the stumpage prices, however, are sensitive to economic cycles.

Sufficient market data of forestry properties transacted is needed for comparative analyses. At least in Nordic Countries it is normally available. This means that the sales comparison method to get the market value can be applied when whole properties and larger areas are valued. However, each forest property is unique in situation, size, site quality, terrain, tree species and their age classes and cutting possibilities, and therefore, direct comparison of responsible property transactions is often difficult to find especially in the matured forest

where the income approach is according to Hannelius (2006) the most appropriate method. In practice summation approach and income capitalisation approach are often applied to get market values but even then there is a need for information of sales. Sales analysis and other market analysis can often yield market factors such as a market discount rate, a risk factor or uncertainty factor that may be used in the income approach. (Hannelius & Airaksinen 2005)

The most important factor in income approach is the discount rate, because of the long time horizon. However, the yield of round wood, based on growth, is in many cases better predictable than in any other natural material production. Also expectation times, income series as cash flow can be forecast and set in discounting against prices paid on the market. This kind of economic analysis gives information about the discount rate level applied in forest property investments.

In a recent study (Hyytiäinen et al. 2006) the estimated forest incomes in Finland has been compared to the sales prices of forest properties. According to the results the discount rate in whole country in average was 4% in real terms. However, the variation in the country was quite wide. In the Southern Coastal area and in the Northern Finland the rate was about 3% when it was about 5% in the middle of Finland. The average sales price of representative sales (1404) over 10 ha forest land in whole Finland was 1758 €/hectare in 2003 (National Land Survey in Finland). The variation was high depending on the region (average 450 – 2885 €/hectare) and property (interquartile range from 843 to 2308 €/hectare in the whole country).

4. THE FUNDAMENTALS FOR AN INDEPENDENT AND SPECIFIC GUIDANCE FOR VALUATION OF FOREST PROPERTIES

In the present International Valuation Standards (IVS 2005) there is no real guidance for valuation of forest properties. Forest property valuation is only extremely superficially treated in the agricultural Guidance Note (GN 10) where the only reference to the end result is the similarity between forestry and agricultural land; both of them yield a crop. However, the expectation time for crop gains in forestry is considerably longer than in agriculture. The income from the latter varies annually but there is always some amount of income. Forestry, however, does not yield income from the same area annually. The expectation times vary from tens even up to a hundred years in the Nordic circumstances. The economic value of a forest property includes the immediately realizable stock and the different expectation values deducted by the costs of forestry.

When it comes to forest zones, dominant tree species and methods of silviculture there is a great variation between different countries. These facts are the bases for wood production, valuation of forest properties and the needed guidance. In the Nordic and evergreen boreal zone circumstances the guidance must be mainly based on forest properties for round wood production. In other forest zones there might be also other bases.

The highest and best use of forestland is normally reached by timber growing. These areas are often for multiple use, too: recreation, gathering of berries and mushrooms, hunting, and as pastures e.g. for reindeer. Besides forestry other means of livelihood are potential within the object: soil may be taken, which gives it a special value. Good examples are gravel areas and bogs suitable for turf production. Also other values may have influence on the market value like expectations of urban land use near urban centres. Market valuation of a forest property requires thus consideration of integrated use, such as special rights to use shorelines for building, peatlands for peat extraction, or for hunting etc. if such uses are possible. Consideration must also be given to a change in the basic land use, development or operating strategy, or potential for leasing the property, in order to maximise its economic utility.

Forests as ecosystems have also been set under special protection regulations in order to maintain the basic functions of nature. The ultimate target is to protect the biodiversity of nature and to maintain the natural state of exceptional objects. Nature conservation is being promoted by creating nature reserves, by safeguarding the living surroundings of endangered species and by paying attention to biodiversity in handling the forests. Nature reserves are most needed for species, which do not survive in commercial forests because they require special and appropriate habitats. Conservation usually becomes the more important the more densely populated the region is. Mountains, snowfalls, rainfall and floods all influence local need for conservation. The use of forested areas in wood production may be restricted in many ways. Financial losses for the owner maybe compensated. Restrictions to harvest the forest, land use plans especially near urban settlements, and plans for nature conservation may be laid out on the basis of legislation. In valuation all kinds of restrictions shall be stated if cutting potentials are in any way affected by them.

For us it is clear that there is a great need for an international valuation guidance of forest properties and we suggest that it should be taken into the IVS as a special Guidance Note (GN). The purpose of the Guidance Note (GN) should be to provide clarification and guidance on the valuation of properties for forestry. It should distinguish among various property interest and characters that shall be recognised, and discuss concepts that should be understood by financial reporting and regulatory authorities, courts, financiers, investors, participants in natural resource transactions, and other users of valuation services involved in the forest properties. The valuation of forest properties is demanding and requires also knowledge of forestry. Reliable and transparent guidance require judgement and knowledge of both the physical and economic preconditions of the land area, soil, wood quality, harvesting, transportation, etc., and knowledge the price formation and market of round wood as raw material. If the valuer does not have that know-how he/she has to use services of (an) appropriately skilled technical expert(s).

The valuation of forest land has many similarities with the valuations for extractive industries because there also is a need for a special expert. Because there are also some similarities with the problems in agriculture we have suggested that the GN for valuation of forest properties could be based on the Guidance of agriculture and extractive industries. The provisions of the GN should assure application of Generally Accepted Valuation Principles (GAVP) to

Valuations of Forest Properties, in accordance with the valuation fundamentals expressed in the IVS General Valuation Concepts and Principles.

REFERENCES

Airaksinen, M. (1988) Metsän hinta Suomessa v. 1983-84. (The price of forest in Finland 1983-84.) National Land Survey of Finland, Publication 61. Helsinki.

Airaksinen, M. (1998) Metsän hinta Suomessa 1995. (The price of forest in Finland 1995.) National Land Survey of Finland, Publication 88. Helsinki.

BM win, 2000. Beståndsmetoden för skogsvärdering. (Bestånds-method for forest valuation.) Lantmäteriet. User's manual. Gävle, Sweden.

Finnish Association for Real Estate Valuation (2005) A proposal for a valuation guidance of forest properties. A letter delivered to the International Valuation Standards Committee on February 14th, 2005.

Hanneliu, S. (2005) Puustoisen metsäalueen lunastuskorvauksen arviointi. (Determining the compensation in compulsory purchase for a wooden forest area.) In "Suomen kiinteistöarviointiyhdistys 25 vuotta 1978-2003. Juhlajulkaisu." (The Finnish Association for Real Estate Valuation 25 years 1978-2003. Anniversary publication." The Finnish Association for Real Estate Valuation. Helsinki.

Hanneliu, S., Airaksinen, M., (2005) Kauppahintatilastot metsätilojen kiinteistöarvioinnin ja markkina-analyysin tukena. (Sales price statistics in the valuation and market analysis of forest properties.) Maanmittaus 1/2005, pp. 42-88.

Hyytiäinen, K., Hanneliu, S., Salminen, O. (2006) Metsäomaisuuden arviointi tuottoarvolaskelmien ja markkinahintojen mukaan. (Valuation of forest properties based on income evaluations and market prices.) Draft 5.6.2006. The Finnish Forest Research Institute.

International Financial Reporting Standards (IFRS). International Accounting Standards Board (IASB). London.

IVS (2005) International Valuation Standards 2005. 7th edition. International Valuation Standards Committee. London.

Redsven, V., Anola-Pukkila, A., Haara, A., Hirvelä, H., Härkönen, K., Kettunen, L., Kiiskinen, A., Kärkkäinen, L., Lempinen, R., Muinonen, E., Nuutinen, T., Salminen, O., Siitonen, M. 2004. MELA2004 Reference Manual. The Finnish Forest Research Institute.

Salminen, H., Lehtonen, M. & Hynynen, J. 2005. Reusing legacy FORTRAN in the MOTTI growth and yield simulator. Computers and Electronics in Agriculture 49(1):103-113.

UPM (2006) Annual Report 2005. UPM-Kymmene Corporation Helsinki.

Viitanen, K., Palmu, J., Kasso, M., Hakkarainen, E., Falkenbach, H. (2003) Real Estate in Finland. Institute of Real Estate Studies, Helsinki University of Technology, Publication B 107. Espoo. <http://www.tkk.fi/Yksikot/Kiinteisto/julkaisut/verkkojulkaisut/julkaisuB107.pdf>

BIOGRAPHICAL NOTES

Kauko Jussi Viitanen (1955)

Professor of Real Estate Economics and Valuation, PhD

Dean of the Department of Surveying, and Head of the Institute of Real Estate Studies, Helsinki University of Technology

Chair elect of the FIG Commission 9

Chair of the Finnish Association for Real Estate Valuation

Chair of the Valuation Board of the Central Chamber of Commerce of Finland

CONTACTS

Kauko Viitanen

Helsinki University of Technology

P.O. Box 1200

FI-02015 TKK

Espoo

FINLAND

Tel. +358-9-451 3870

Fax +358-9-465 077

Email: Kauko.Viitanen@tkk.fi

Web site: http://www.hut.fi/Yksikot/Kiinteisto/henkilokunta/kauko_viitanen.htm

¹ The paper is based on the proposal of the Finnish Association for Real Estate Valuation delivered to the International Valuation Standards Committee on February 14th, 2005.

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² In Finland there are e.g. MELA- and MOTTI-models and in Sweden Beståndsmetoden-model, see e.g. Revsen et al. 2004, Salminen et al. 2005, and BM, win 2000.