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# The Forest Companies' Application of Fair Value

- Can the price on the private market be used instead?

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We have enjoyed working with this essay, and hope to provide the reader with some interesting and enjoyable reading.

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## Abstract

- Title:** The Forest Companies' Application of Fair Value  
- Can the price on the private market be used instead?
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- Authors:** Ebba Berkelius and Josefin Nilsson
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- Key words:** Forest valuation, private forest market, fair value, DCF model, difference in value
- Purpose:** The purpose of this study is to investigate what the large difference between the price on the private forest market and the fair value established by the forest companies consists of, and why it appears. This is done in a trial to find out if the price on the private market could be used instead of the DCF model to give a more accurate fair value.
- Methodology:** The foundation of this study is based on a qualitative method with in depth, face to-face interviews, but a quantitative approach is also used as a basis for the interviews.
- Theoretical perspective:** Some previous research has been made regarding the forest companies' application of fair value, but no previous study has investigated the difference between the price on the private market and the fair value established by the forest companies. We have described general valuation theory and the development of different forest valuation models with their input variables in order to better understand the DCF model.
- Empirical foundation:** The quantitative data has been gathered from LRF Konsult and from the forest companies' annual reports, and has then been compiled and analyzed. The qualitative data from the interviews works as a basis for the following analysis and conclusion.
- Conclusion:** The study shows that soft values, conservatism by the forest companies and different purposes of owning forest are the main drivers explaining the difference between the market price on the private market and the fair value established by the forest companies. If the forest companies were to use the private market price instead of the DCF model, they would have to make several adjustments, which would probably be even more misleading than the current use of fair value.

## Definitions

To make the study easier to interpret and understand, this section will present some central definitions which will be used throughout the study.

### **BSEK**

Billion Swedish crowns

### **Fertility**

The natural lumber-producing ability as measured by  $m^3$  forest per hectares and per year (Skogforsk, 2012).

### **Hectare**

A unit of measure often applied within the forest industry.  $100 \times 100 = 10\,000m^2$  (Skogforsk, 2012).

### **$M^3$ forest**

Forest cubic meter. A tree that is measured per cubic meter includes the volume of the stem, the top of the tree, the branches and the bark (Skogforsk, 2012).

### **Monetary values**

These are the values originating from the forest that easily can be measured in dollar and cents i.e. the income from a pruning.

### **MSEK**

Million Swedish crowns

### **P&P Companies**

Pulp and paper companies.

### **Productive forestland**

The productive forestland is the part of the forest companies' total possessions that is able to produce the biological assets, which means that it is the remaining forestland when for example lakes, mines and

unproductive forestland are excluded. The land is often classified as productive when it produces more than one cubic meter of forest per hectare annually (SCA, 2012a).

**Pruning**

Rejection of old branches.

**Rotation period**

Production time for one generation of trees, from planting to natural regeneration or planting to harvesting (Skogsforsk, 2012).

**Silviculture**

Silviculture means taking care and cultivating the trees in the forest.

**Soft values**

These are the values of the forest that cannot directly or easily be measured in dollars and cents. Soft values could for example be biodiversity, what the landscape or scenery looks like, hunting rights, recreational use and material benefits such as the existence of berries and mushrooms.

**Thinning**

Removal of trees in order to increase the growth of the remaining trees, by giving them more space and nourishment.

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# 1 Introduction

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*The study will start with a background followed by a problem discussion within the field of study.*

*Thereafter the aim of the study and its target audience will be presented, followed by an outline of the disposition of the essay.*

---

## 1.1 Background

The Swedish forest industry is vital to the economy of the country; it employs almost 200 000 people and answers for three per cent of the Swedish GDP. The industry includes pulp- and paper companies as well as the wooden product industry, and Sweden is the second largest exporter of these products in the world, after Canada. Private actors own half of the Swedish forest, 25 per cent is owned by public and private limited companies, 15 per cent by state owned limited companies, and the rest by other actors (Skogsindustrierna, 2011, p. 4,11). The structure of the ownership in Sweden is shown below:

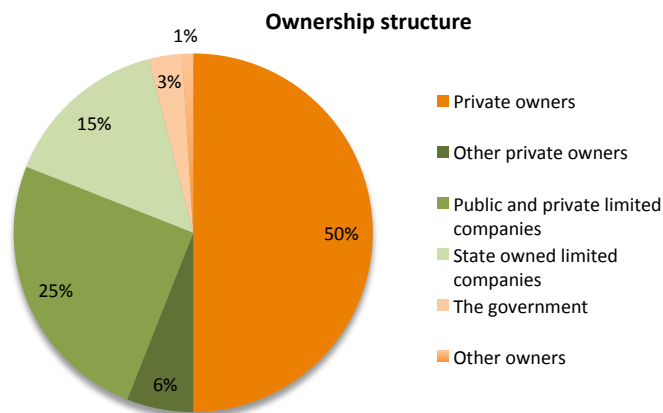


Diagram 1.1 Ownership structure

Sweden is one of the world's most heavily forested countries with around 23 million hectares productive forestland. The four largest forest owning companies in Sweden are Svenska Cellulosa Aktiebolaget (SCA), Sveaskog, Holmen Skog and Bergvik Skog, which together own 40 % of the productive forest land in Sweden (Skogsstyrelsen, 2012 and Annual reports, 2011). Sveaskog and Bergvik Skog are purely engaged in forest management activities, since they do not own any forest industry themselves. Their main focus is therefore to be representative forest owners and attractive suppliers of industrial wood products. SCA and Holmen on the other hand, are both forest and forest industry owners, and they are



listed on the Swedish stock exchange (Annual reports, 2011). However, there is also a large, active private market, representing 50 % of the total forest holdings in the country, which makes Sweden one of the countries in the world with the largest amount of private owners (Skogsstyrelsen, 2012). LRF Konsult, a subsidiary to the Swedish federation of farmers, values the properties sold on the private market on the basis of current selling prices. They take notice about the selling of forest properties independent of size, which makes their estimation of a market price relevant (Arvidsson & Bordowski, 2011, p. 32).

The large accounting institutions worldwide, such as the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), have since long encouraged the use of market value, which led to the transition from historical cost valuation to the use of fair value in 2005 (Argilés, Bladón & Monllau, 2005, p. 37). The four large forest companies in Sweden mentioned in the beginning, Sveaskog, Bergvik Skog, Holmen and SCA, all follow IFRS. They do not believe that there is an accurate market price for their properties, and this has led to the use of fair value calculated by discounting the future cash flows generated from the biological assets (Annual reports, 2011). However, this change in accounting has given rise to an intense debate regarding the reliability and comparability of the fair value estimations. Furthermore, the large difference in value between the market value on the private market and the fair value as estimated by the forest companies has been questioned.

Earlier research has given proof of the complexity of IAS 41 and the problems that it entails. The standard is especially problematic within the forest industry due to the long product life cycle, which results in heavy estimations of the future cash flows. Arvidsson and Bordowski (2011), found in their study that there is room for subjectivity in the interpretation of the standard, and suggests that an alternative to the present value calculation could be found on the private market, with developed market prices. However, the market price on this market has shown to be a lot higher than the fair value estimated by the forest companies, and has therefore not been considered as relevant for a comparison. But if the market price on the private market could be considered as relevant for the forest companies' assets, it would be an alternative to the present value calculations that the forest companies accomplish today.

## 1.2 Problematization

Several recent studies have tried to investigate the perceived problems with fair value when implementing IAS 41 *Agriculture*. We believe that it would be interesting to take this further, and investigate why there is such a large difference between the estimated fair value and the market value of the forest on the private market in Sweden, and why this difference appears.

When applying fair value, companies should use the market value, but if there is no market value available, one can instead use the discounted cash flow method (DCF method) or multiple methods. It is often difficult to find a market value, and as a result, the discounted cash flow method is, as previously mentioned, most commonly used (Grege-Staltmane, 2010, p. 55). This study will examine how the large forest companies use the discounted cash flow method when calculating the fair value of their forest properties, in order to understand why the difference between this value and the private market value appears. As Bingsby (2004) describes in Penttinen and Rantala (2008, p. 18), it is problematic to use the DCF model when estimating the value of the forest, because it gives the opportunity for the companies to make subjective estimations since several assumptions have to be made. One has to make future estimations and assumptions concerning monetary values, such as the input values of harvesting plans, timber prices, forestry costs, growth rates and the discount rate, which opens up for subjectivity and differences in estimations (Grege-Staltmane, 2010, p. 55). There is also a tendency that the forest companies upgrade the value of the forest in industrial downturns to improve the result, which is another indication of undervaluation. An example of this is when Holmen both in year 2007 and 2010 upgraded the value of their forest with billions of SEK (Dagens Industri, 2011).

As a result of the above mentioned, there are two values, the fair value estimated by the forest companies and the market value according to LRF Konsult, based on recent sales. The difference between these two values depends on how the forest companies establish their fair value and on the factors included in the market price of forest. The market price established by LRF Konsult is based on sales within the private market, where both monetary values and so-called soft values are taken into account. Soft values include for example the biodiversity, what the landscape or scenery looks like, hunting rights, recreational use and material benefits such as the existence of berries and mushrooms (Viitanen, Hannelius & Airaksinen, 2006, p. 2). Private forest owners are taking these values into account when valuing the forest, although these values are often difficult to estimate. Large forest companies, however, do not consider these values since they have other purposes with their ownership of forest.

Therefore, the difference between the market value of the forest, as established by LRF, and the fair value estimated by the forest companies, can probably partly be explained by the existence of soft values on the private market, but the question is to what extent.

However, the soft values cannot possibly be the only factor explaining the difference in value, which could be evidence of undervaluation by the forest companies. Earlier research has, as already mentioned, shown that the use of fair value opens up for some subjectivity in the valuation, and also that large companies might not consider soft values in the valuation process. However, there is still reason to investigate to what extent the soft values can explain the difference in value, and whether there are other explanations to why it might, or might not, be suitable to use the price on the private market instead of the discounted cash flow model. In the study by Svensson, Nylén and Gunnevik (2008), they translated the prices on the private market onto Holmen's assets, and argued that this showed a more proper estimation of the value of Holmen's assets. However, the forest companies on the other hand, argue that the price on the private market is not suitable for them, since this price is calculated with another object in mind than what the forest companies have for their properties (Arvidsson & Bordowski, 2011, p. 32-33). It would therefore be interesting to investigate if what Svensson, Nylén and Gunnevik did could be considered as relevant, or if the forest companies are right when they argue that the use of the DCF model is the best possible solution to establish a fair value.

### **1.3 Literature review**

Previous research within the field of study have focused more on the pure application of IAS 41 and the implications of the use of fair value. For example Elad (2004) looked at what implications the use of fair value accounting in the agricultural sector would have for the international accounting harmonization, and found that some key provisions are incompatible with the fourth EU directive. Grege-Staltmane (2010) made a study on how international forestry companies apply IAS 41, what factors that mostly affect the fair value accounting of forest, and the main problems that forest accounting entails. He found that a lot of improvement of the standard is needed, such as better guidelines on for example which timber prices to use in the calculations and from what age the trees could be considered as mature. Viitanen, Hannelius and Airaksinen (2006) even suggest that new, independent and specified guidance should be set up on how to value forest properties, since the current standards pay too little attention to this matter.

Danbolt and Rees (2008) investigated the difference between historical cost and fair value accounting, not specifically within the forest industry, but by applying these methods on the British real estate and investment fund industries. They found that fair value is considerably more relevant than historical cost in general, but in a market where the valuation is more subjective, such as the real estate market, fair value is less relevant because of the ambiguity in the valuation.

There are two recent Swedish studies that have focused on the perceived problems with the discounted cash flow model. Arvidsson and Bordowski (2011) tried to give a clearer view of the subjectivity problems when valuing biological assets at fair value. They found that there is room for subjectivity in the valuation process, but that the forest companies are well aware of this and therefore try to make the annual reports as reliable and relevant to the users as possible. This is made by a continual dialog with external experts and other interested parties within the industry, as well as by taking notice of the surrounding environment and by questioning their own valuations models. They also mention that the large difference that can be observed between the prices on the private market and the fair value established by the forest companies, can probably to some extent be explained by soft values, but that it is not reasonable to assume that this is the only explanation.

The other Swedish study, made by Svensson, Nylén and Gunnevik (2008), wanted to investigate whether a market based approach when valuing the growing forest could give a better measure of fair value than what the DCF model that the forest companies currently use does. They analyzed this partly by translating the selling prices on the private market on to Holmen's properties. They discovered that this resulted in something that they call "noise", which they explain as the soft values, and the fact that land is valued separately from the biological assets creates further sources of errors. However, they came to the conclusion that the DCF model underestimates the fair value of Holmen's assets, and that using the transaction prices from the private market gives a better indication of a fair value.

#### **1.4 Aim**

The difference between the fair value calculated by the forest companies, and the market value on the private forest market will first be established. The aim is then to investigate what the difference consists of and why it appears, in order to answer whether the private market value can be used instead of the DCF model to give a more accurate fair value of the forest companies' assets.

### **1.5 Target Audience**

This study is mainly intended for lenders and analysts of the forest industry, but also for the forest companies themselves as well as other interested parties of forest properties and business students. Although an overall understanding of and interest in the forest industry would possibly benefit the reader of this study, no background knowledge is needed to be able to interpret and understand the results.

## 1.6 The continuing disposition of the essay

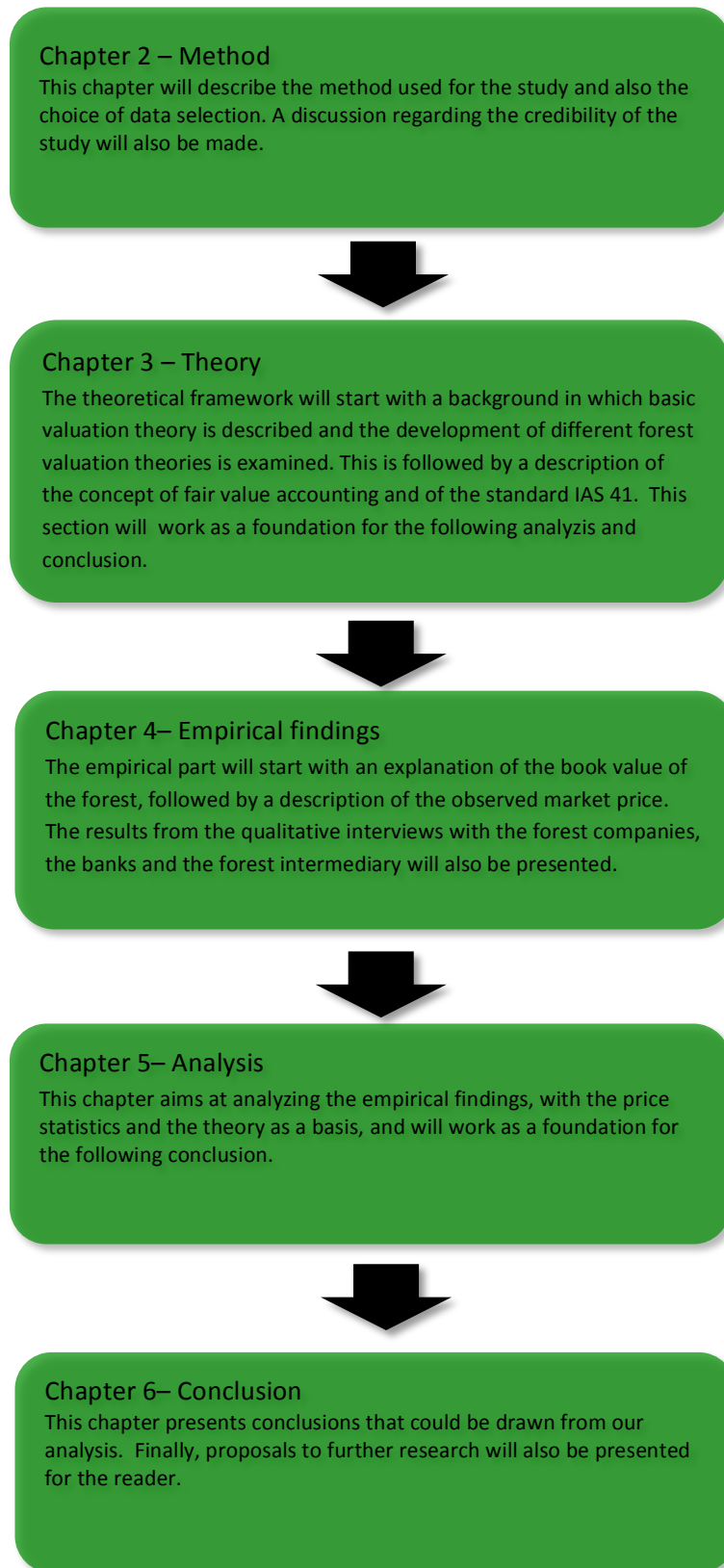


Figure 1.1 The continuing disposition of the essay

## 2 Methodology

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*This chapter will describe the method used for this study and also the choice of data selection. A discussion regarding the credibility of the study will also be made.*

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### 2.1 Choice of scientific approach

The study applies both a quantitative and a qualitative approach. The quantitative study is made in order to establish how big the difference is between the market value on the private market and the fair value as established by the forest companies. The result of this will work as a foundation for the following personal interviews, in which a qualitative research strategy is used with an interpretative approach. To be able to understand both how the forest companies establish their fair values and why the difference between these values and the market price appears, interviews will be made with representatives from the four forest companies, analysts at Carnegie investment bank and Danske Bank and with the head broker at LRF Konsult. This is made in a trial to understand both the accounting perspective and the market value perspective, to be able to analyze the difference between them. The study aims to supplement related, existing research. Since the four forest companies together own 40 % of the forest in Sweden, and the private owners represent 50 %, our study in total covers as much as 90 % of the Swedish forest market, see Diagram 1.1.

### 2.2 Quantitative data collection

#### 2.2.1 Secondary data – Sales statistics and annual reports

In this study we have used secondary data in our quantitative analysis. Secondary data was used rather than primary data, since the information was already available and could be collected from LRF Konsult. LRF Konsult handles 25 % of the forest affairs in Sweden, which makes the company the largest mediator of forest in the country. The data consists of 254 sales, which are all the large sales over 300 hectares that have been mediated by LRF Konsult since 2005. We wanted to look at as large sales as possible to come as close to the size of the forest companies' properties as possible. At the same time, we needed to have a decent number of sales to get a reliable average without extreme values, where 300 hectares was a suitable level. The year 2005 is used since this is the year when the use of IFRS became compulsory for listed companies in Sweden (PWC, 2012). Each sale in the sales statistics is divided into forest, arable land and buildings. The statistics also shows from which region the sale

originates, its price and the number of hectares and cubic meters of forest included. The collected data was analyzed to be able to establish a market price for larger forest properties, both per hectare and per cubic meter for every year and region.

To be able to chart the book value of the forest and how it has changed between the years, we have used the four forest companies' annual reports since 2005. We have done this to be able to calculate a value of the forest per hectare and per cubic meter for each company every year. This examination also made it possible for us to establish a clear diagram over the value development and its fluctuations from 2005 to 2011. During our qualitative data collection, we were then able to put the primary focus on why the difference between the market price on the private market and the fair value appears. As a reason, the main focus during our interviews could be put on the technical part of the DCF-calculations, the choice of input values and the risk and value development.

### **2.2.2 Reliability**

LRF Konsult is the market leading organization within forest property transactions. Every year they are examined by independent credit institutions and analysts, who evaluate if their published data is reliable. Furthermore, the statistics is being secured both by the estate agents, who divide the values in each transaction by forest, arable land and buildings, and by statisticians who perform an additional quality check of the division when compiling the data (LRF Konsult, 2012). This ensures that the price statistics we use is reliable and of high quality. To have a sufficient basis for the price trend analysis, we have gathered data from 2005 until today. Since 2005, as previously mentioned, is the year when IFRS became compulsory for the companies examined in the study, this is the longest time period applicable for the gathered data. Although it is not a specifically long time, it is still possible to avoid short-term fluctuations and thereby extreme values.

### **2.2.3 Validity**

Since we have looked at large sales that have been made on the private market, which are rather unusual, there is lack of data for some regions in some years. This makes it difficult to establish a clear trend between the years. However, one can still see that the selling price is a lot higher than the book value of the forest companies' assets, and also that forest is more expensive in the southern parts of Sweden. This is something that has been established in previous research, which gives further credibility to our calculations. Furthermore, one can discuss whether the price per hectare or the price per cubic meter is the proper measure when calculating the value of the forest. The published price statistics from



LRF Konsult shows the price per cubic meter, and this is the most commonly expressed term. However, we also believe that it would be interesting to make a comparison with the price per hectares, since most forest companies also show this value. We have therefore chosen to compare both the prices per hectare and per cubic meter of forest.

## **2.3 Qualitative data collection**

### **2.3.1 Primary data – Personal interviews**

Four different forest companies have been interviewed for this study, namely Sveaskog, Bergvik, Holmen and SCA. These companies were chosen since they are the largest forest companies in Sweden that both possess their own biological assets and at the same time follow IFRS. To be able to establish and understand how these companies value their biological assets, qualitative, in-depth, face-to-face interviews were first conducted. We chose to make personal interviews since this makes it easier to clarify or explain the questions if there are any misunderstandings, and since we wanted the respondents to be able to show us calculations and input material for the DCF model. The interviews were aimed at clarifying how the companies use the discounted cash flow model and how they chose the input values for it. After the significant difference between the companies' fair values and the market value of the forest was established, the companies also answered why they think this difference appears. In a second phase, the head estate agent at LRF Konsult was interviewed to understand how he would explain the difference in value. In a third and final phase, two analysts at Carnegie and Danske Bank were interviewed to give their view on the matter. Interviewing them gave our study a more detailed market perspective, since Carnegie analyze the listed forest companies' stock development, and both Carnegie and Danske Bank look at other risk - and value drivers than what the forest companies do. The same types of qualitative interviews were used also in the last two phases.

The respondents at the forest companies are all CFOs who regularly are involved in the DCF calculations and in developing the models used. The head estate agent at LRF consult is working daily within the forest market and therefore has the latest knowledge and information concerning the field of study. The analysts at Carnegie and Danske Bank are both responsible for each bank's forest- and agricultural sector, implying that they are both competent and skilled.

### **2.3.2 Trustworthiness**

Instead of reliability and validity, trustworthiness together with authenticity are the two main concepts ensuring quality when doing a qualitative study. To be trustworthy, a study has to be reliable, transferable, dependable and possible to prove and confirm (Bryman & Bell, 2003, p. 306-307). The written material concerning the information gathered from the interviews has been sent to the respondents in order for them to approve and confirm that we have understood the information correctly. Our intention is also to be as descriptive as possible regarding how we have performed the interviews, in order for the research to be able to be replicated by someone else in another context or in the future. At the same time, we make a complete description of all the different stages in our research process, and have a close communication with our mentors to ensure the quality of the chosen procedure and to make it dependable. It is almost impossible for a study to be completely objective, but we have to the highest possible extent tried to avoid any personal opinions to make the essay free from bias. For example, the interview questions have been sent to both our mentors before conducting the interviews, in order to ensure that they do not reflect any personal opinions or are in anyway misleading.

### **2.3.3 Authenticity**

We do not consider the fact that we have only interviewed the CFOs at the forest companies as a problem, or something that would give an unfair view of the situation. An alternative would have been to interview other employees at the economic departments, but since the CFOs are utmost responsible for the valuation process, we believe that they were the most competent ones to answer our questions.

## 3 Theory

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*The theoretical framework will start with a background in which basic valuation theory is described and the development of different forest valuation theories is examined. This is followed by a description of the concept of fair value accounting and of the standard IAS 41. This section will work as a foundation for the following analysis and conclusion.*

---

### 3.1 Corporate valuation theory

In order to understand the valuation process within the forest industry, a more general understanding of valuation theory is needed. The valuation method used in corporate valuation, the discounted cash flow model (DCF) (Koller, Goedhart & Wessels, 2005, p. 103), has also characterized the forest valuation methods over time (Grege-Staltmane, 2010, p. 55). This section will therefore provide a summary of corporate valuation theory based on the DCF model, along with a description of how the input values for this model are estimated.

A company is profitable and creates value when it earns a return higher than its weighted average cost of capital (WACC), which means that the more it can invest on these premises, the more value is created. A company's value is equal to the sum of the discounted free cash flows, and the main goal for a company to become economically successful, is therefore to maximize the present value of these cash flows (Koller et al., 2005, p. 103,108,114). The free cash flows are the operating cash flows minus capital expenditures (Investopedia, 2012). According to the DCF model, these cash flows should be discounted with the WACC, which is the company's opportunity cost of funds, to generate the corporate value (Koller et al., 2005, p. 108). In other words, the company both has to make estimations concerning the future free cash flows and the WACC, before they can estimate the value of the firm.

To estimate the future free cash flows, the company first has to look at the drivers behind them, which are the revenue growth and the return on invested capital. Most companies adjust all lines in the financial statement, i.e. accounts receivable, selling expenses etc. with these drivers during the first five to ten years. After about ten years, individual items become too difficult to estimate, and the majority of companies therefore use a continuing-value formula after this time horizon (Koller et al., 2005, p. 103,108-113).

In order to take into account the risk and time value of money, the company will have to discount the free cash flows with the WACC. The WACC is calculated according to the following formula (Berk & DeMarzo, 2011, p. 397,398):

$$r_{wacc} = \frac{E}{E + D} r_E + \frac{D}{E + D} r_D (1 - T_C)$$

Based on the firm's capital structure, this formula represents the required rate of return for both equity and debt holders. The equity cost of capital ( $r_e$ ) is calculated with the CAP-M formula that consists of two parameters, the risk free interest rate and a risk premium, which is the beta value times the market risk premium. The formula is shown below:

$$r_e = r_f + \beta_i \times (E[R_{Mkt}] - r_f)$$

A company's beta value indicates how the securities fluctuate in relation to the market portfolio. The debt cost of capital, on the other hand, shows how much the company pays for its debt. Since interest is tax deductible, the cost of debt has been reduced with the marginal tax rate  $T_C$  (Berk & DeMarzo, 2011, p. 378, 383-390, 397,398), which implies that the tax shield is moved from the free cash flows to the WACC. The reason for this is that one should be able to compare operating performance between firms over time, independent of capital structure, which in turn leads to a more accurate forecasting. Finally, when all the free cash flows are discounted with the WACC, the result is the value of the firm (Koller et al., 2005, p. 114-115).

### 3.2 The evolution of forest valuation theories

In order to better understand how and why the theory of valuing forest has led to the situation of today, one has to look at the development of the valuation theories over time. One of the most well known researchers within the area of forest theory is the German forest economist Martin Faustmann, who already in 1849 came up with a theoretical solution on how to calculate the ground value of the forest. This value can either be derived from the market, or calculated with the Faustmann formula. The formula is used to calculate the present value of the future timber production when the ground is bare. To be able to do this, the formula requires a few input factors, namely time, rotation period, discount

rate and the present value of both the harvesting net and the construction and maintenance costs (Ekvall & Bostedt, 2009, p. 25). The formula is shown below:

Faustmann's formula

$$L_f = \frac{Y_n + \sum T_a (1+r)^{n-a} - \sum T_b (1+r)^{n-b} - C(1+r)^n}{(1+r)^n - 1} - \frac{e}{r}$$

$L_f$  = land expectation value in forestry

$Y_n$  = standing value of timber in year n

$\sum T_a$  = sum of value of thinning during rotation

$\sum T_b$  = sum of costs of pruning during rotation

$C$  = cost of establishment

$e$  = annual cost of management

$r$  = rate of interest

$n$  = rotation period

$a$  = year of thinning

$b$  = year of pruning

Since Faustmann's original model, several famous forest economists, such as Thorsten Streiffert and Einar Stridsberg, have tried to elaborate on the model in attempts to better explain the ground value of forest (Ekvall, 2005, p. 96). Bo Hektor (1974, section 2, p. 6) describes that the components within the Faustmann formula can differ depending on the use and the aim of the valuation. This can give rise to misunderstanding, as the method can lead to different ground values for the same forest. Also, soft values are not taken into consideration in the formula. Thorsten Streiffert (1971, p. 3-6) means that a forest property can have different values for different owners, since beneficial effects such as recreation value and the prestige of owning forest are subjective values, difficult to measure. Hektor (1974, section 3, p. 7 and section 4, p.2) therefore means that it is difficult to establish one single method suitable for all types of forest valuation, but instead describes a model where inputs should be chosen to be able to measure a desired output in a particular case. For a total, in-depth calculation, one should consider all input and output components, but when for example calculating on stem pruning, the input factors could be limited to the manpower force and the expenses. It is important that the model is adjusted to the specific situation and has a link to the reality in order for the result to be useful.

Not much have changed since the first valuation methods were established, although the application of them has somewhat changed over time due to social, economic, market and legal conditions, which

have enforced adjustments of the models. However, the importance of non-monetary values in the valuation of forest has gained interest considerably. One of the most commonly used methods today is the location price method, which takes soft values into account. It takes its place in the selling price of similar properties, within the same geographical area as the object to be valued. Both the monetary and non-monetary values are taken into account, but it can be difficult to determine which part of the price that can be assigned to what type of value, since they are not clearly separated (Åge , 1987, p. 30-38).

### **3.3 Valuation of biological assets**

#### **3.3.1 Fair value accounting**

Fair value is defined as the amount for which an asset or liability could be exchanged between knowledgeable, willing parties in an arm's length transaction (FAR SRS, IAS 21, 2010, point 8). It is considered to be especially suitable for biological assets, since they, apart from other material assets, can improve their physical performance over time, without influence from the owner (Marton, 2008, p. 44). This is the main reason for introducing fair value instead of historical cost, and the difference between these two models is especially great in the case of growing trees. Fair value is also considered to give a much better estimation of future economic benefits compared to cost-based models, and at the same time it increases transparency and enhances comparability. However, the concept of fair value also involves some negative effects since, as previously mentioned, companies can choose their input values subjectively in a way that suits their business, which leads to a loss of comparability (Penttinen & Rantala, 2008, p. 18).

#### **3.3.2 IAS 41**

The standard IAS 41 should be applied to all agricultural- and forestry items. However, a forest property can be divided into physical trees and the land that the trees are attached to. The standard does not include valuation of the land related to the agricultural activities, this is handled in IAS 16 *Property*, and neither does it include the processing of the agricultural produce after it has been harvested. The harvested timber before processed is handled by IAS 2 *Inventory* (Grege-Staltmane, 2010, p. 53-54).

The biological assets should be measured at fair value less point-of-sale costs at every balance sheet date, when the fair value can be reliably established. Point-of-sale costs include for example brokers' remuneration, commodity exchanges and transfer taxes, but costs associated with getting the asset to the market, such as transportation costs, are excluded (Grege-Staltmane, 2010, p. 53). The fair value

should mirror the price on the active market, and the market value should therefore primarily be used. However, for biological assets attached to land, like trees in a forest property, there is often no separate market, although there could exist an active market for the combined asset, i.e. the whole property. The company could use the value of the combined asset to calculate the value of the separate biological assets, by deducting the fair value of the land, calculated with IAS 16 (FAR SRS, IAS 41, 2010, point 25).

However, since there is often no active market for either the separate biological asset or the combined one, the company will have to use other methods to estimate the fair value. According to IAS 41, one of the following methods should primarily be used: I) the latest observed market price, II) the market price for similar assets or a comparison index for the industry, or III) the discounted cash flow model (FAR SRS, IAS 41, 2010, point 16-18). It is often difficult to find a market price for the standing timber in its present condition, since the market for it is limited and since it is practically impossible to find two identical forest properties. As a result, the discounted cash flow model is used, with the aim of estimating the value of the asset in its present location and condition (Grege-Staltmane, 2010, p. 53).

### Fair value accounting according to IFRS

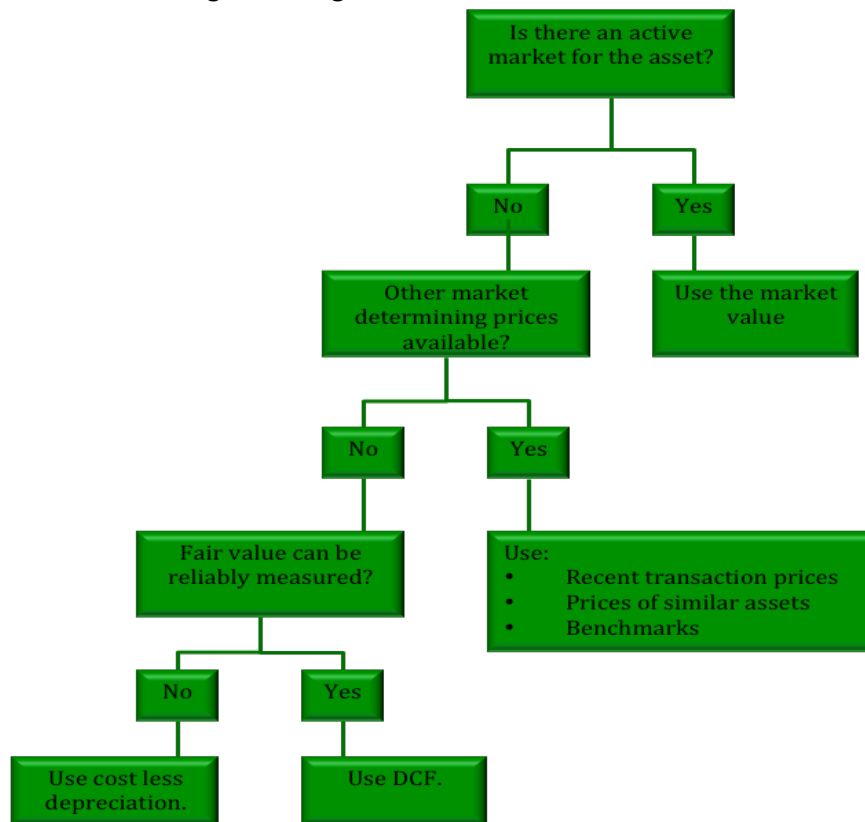


Figure 3.1 Fair value accounting according to IFRS

A biological asset's condition means, among other things, that it can be classified as either mature or immature, where mature ones are those that are ready for harvesting. Depending on this classification, other physical conditions of the asset and price changes in the market, unrealized gains or losses arise when the biological asset is revalued at each balance sheet date. These revaluation changes shall be included in the result for the accounting period from which it originates (FAR SRS, IAS 41, 2010, point 26, 45 and 51). This type of market valuation practice can give rise to heavy fluctuations in the result over time, even from one year to another. Equity analysts advocate market valuation, while critics mean that the fluctuations make it difficult to make earnings predictions, especially in the short run (Malmqvist, 2009, p. 6). Malmqvist (2009, p.6-7) argues that if the unrealized gains or losses would be taken to the statement of other comprehensive income instead, the result would not be affected in the same way and this problem would principally be solved.



### **3.4 The discounted cash flow model within the forest industry**

#### **3.4.1 Forecasting**

There are three different types of input values that one has to estimate and forecast for the coming 100 years when using the DCF model. These are volumes, costs and prices, and will be outlined below (Annual reports, 2010).

##### *-Volumes*

The company has to estimate how much of their forest they will be able to harvest each of the future 100 years. They have to take into account what types of trees they have and where in the country they are situated, since this affects the rotation period.

##### *- Costs*

When estimating the costs, the company has to include costs for both harvesting and silviculture, as well as overhead costs. Harvesting costs include costs for felling and transportation, silviculture means costs for preparing the land, seeding and replanting, and overhead costs include all fixed costs, such as administration.

##### *-Price*

The price for the harvested trees has to be estimated, and depending on the species of the trees and what type of good it will be transformed to, the price will differ.

#### **3.4.2 How the discount rate is chosen**

The previously mentioned input values in the discounted cash flow model are all important. However, the most crucial parameter determining the value in this model is the discount rate. This is especially true when it comes to forest valuation, due to the long production cycles for up to 100 years. An increase or decrease of the discount rate by only 0.1 percentage points would result in a value adjustment of the biological assets with hundreds of millions of Swedish crowns (Annual reports, 2005-2011). An imperfect capital market makes it impossible to assure a correct determination of the discount rate, and it is therefore common that the rate is composed by several different factors, such as the inflation or the alternative interest rate (Lindgren, 1982, p. 5,61). Lindgren (1982, p. 2,69,72) argues that the discount rate should not exceed the marginal borrowing rate, neither should it fall below the income rate for alternative investments on the capital market. But since it is difficult to know the future

interest rates, it is practically impossible to estimate a theoretical lowest or highest value of the investment, i.e. a reasonable fair value, with any high level of precision. Lindgren further states that because of these problems, it is of great importance to show the interval that has been chosen as reasonable for the discount rate and why, and also to show some different present value calculations when the discount rate is adjusted.

As shown, there are different ways to choose or estimate the proper discount rate. However, the cost of capital, i.e. the WACC, is the discount rate that is most commonly used today, and it is also considered to be the most accurate one when calculating the present value of investments (Koller et al., 2005, p. 103), also in the forest industry (Annual reports, 2005-2010). Below, the values that SCA, Sveaskog and Bergvik apply in their WACC calculations are described. Holmen calculates the discount rate in the same way, but with somewhat different values.

The input factors in the WACC-formula are, as previously mentioned, the debt and equity target ratios, the cost of equity and debt and the corporate tax rate. In the forest industry, it is common to have a debt ratio between 40-60 %. This is considered as the maximum level of debt for the forest companies to still be able to receive financing under favorable conditions, and to be able to handle their financial commitments even in the case of increased interest rates. The risk-free interest rate, which is applied in both the cost of equity and the cost of debt calculations, is derived from the interest rate on Swedish government bonds. There are government bonds with different maturities, but in the forest industry it is common to use the 10-year bond rate as a reference rate. During the last 20 years, this interest rate has fluctuated between 2.2- 13.2 %. Between 2005-2007, the rate was between 3.4- 4.2 %, but thereafter it increased somewhat due to a higher level of inflation, to then decrease again during the financial crisis in 2008. In 2009, the rate had reached a historically low level of 3.3 %, and has continued down during the last couple of years. However, this exceptionally low interest rate is not suitable to use as a basis in the discounted cash flow model for 100 years ahead in time (Carlsson, 2011, p. 13-15).

Apart from the risk-free interest rate, the forest companies also have to pay a credit margin. During 2005-2007, this margin was 0.85-1.0 %, but is now expected to increase to around 1.5- 2.0 %. This margin together with the risk-free interest rate constitutes the forest companies' cost of debt. However, the forest companies are also financed with equity, for which they also have to pay a risk premium. As previously mentioned, this premium is calculated with the CAP-M formula, in which you need three

parameters; the risk-free interest rate, the market risk premium and the company's beta value. A normal market risk premium is between 3- 5.25 %, and the last couple of years the expectations on the market have been estimated to a level of 4.5- 4.6 %. As mentioned before, the two listed forest companies in this study, Holmen and SCA, both own forest and pursue forestry, but also engage in the pulp and paper industry. The forestry business alone has a lower asset beta than the forest industry, between 0.4-0.55, while the combined forest industry has a beta of 0.6 in average. The last component in the WACC-formula is the tax shield, and the corporate tax rate used by all companies since 2008 is 26.3 %, before it was 28 %. All the values of these input variables result in a discount rate ranging between 5.5- 6.25 % for the forest industry (Carlsson, 2011, p. 15-17,20).

However, it is still worth noticing that the discounted value of the forest only in rare cases can be expected to correspond to the price of the property in a possible sale. The total value of the property can namely, as previously mentioned, also consist of several so-called soft values that are valued differently by different individuals (Lindgren, 1982, p. 3-6). Hultkrantz (1991, p. 380) found in his study regarding which factors that affect the price of the Swedish forest land, that as much as 35 % of the price can be assigned to an amenity value, but this will be further investigated later on.

### **3.5 IASB and its conceptual framework**

The International Accounting Standards Board (IASB) was founded in year 2001 as a reform of the former International Accounting Standards Committee (IASC). It then had 14 members, but this has now increased to 16, out of whom four each should come from North America, Europe, Asia/Oceania, one each from South America and Africa and the remaining two from an optional area. IASB adopted all the old IAS standards when it was founded, and now issues the new International Financial Reporting Standards (IFRS). In 2005, the EU made it compulsory for all listed companies to apply these standards for their consolidated statements (Nobes & Parker, 2010, p. 4,39,97-99). Since Sweden is a member of the EU, all listed companies in the country have to use IAS/IFRS for their group accounts, but it is also permitted for non-listed companies to use the standards for their consolidated statements (Artsberg, 2011).

According to IASB's conceptual framework, there are certain qualitative characteristics that need to be fulfilled for the accounting to be classified as usable. The four most important ones are understandability, relevance, comparability and reliability (FAR SRS, Föreställningsramen, 2010).

Understandability means that the information in the financial reports has to be easy to understand, although the users are expected to have decent knowledge regarding the business and accounting in general. It is not allowed to leave out more complicated information with the argument that it is too difficult for the users to understand. The second qualitative characteristic, relevance, means that the information should facilitate the decision making and judgments of the users, both concerning past, present and future incidents. The financial reports should also be comparable over time, which means that the same types of accounting principles need to be applied from year to year, both within a company and between companies in the same industry. Besides, companies have to include information regarding the accounting principles they use, if they have done any changes to them, and in that case what effects the changes might have. The fourth qualitative characteristic, reliability, means that the financial information cannot contain any errors and must be free from bias (FAR SRS, Föreställningsramen, 2010, point 24-32).

Reliability can be divided into two subheadings, namely validity and verifiability. Validity means that the financial information should be neutral, complete, essential and be made according to the principle “substance over form”, which means that the economic meaning, and not the legal form, of a business occurrence should be shown in the first hand. Verifiability means that the accounting information should be possible to verify with for example invoices and verifications. However, the measures used within accounting are often to some extent affected by subjective judgments, and this criterion has therefore been given a wider meaning. To achieve a high level of verifiability, it should be possible for several independent controllers to reach a level of accordance in the same estimations (Smith, 2006, p. 24-29). Finally, the prudence principle is also included in the concept of reliability. It means that if estimations have to be done in an uncertain environment, they have to be done with caution, so that assets and revenues are not overestimated and liabilities and expenses not underestimated (FAR SRS, Föreställningsramen, 2010, point 37). However, this does not mean that it is allowed to intentionally make over- and/or underestimations (Smith, 2006, p.30).

## 4. Empirical findings

The empirical part will start with an explanation of the book value of the forest, followed by a description of the observed price on the private market. The results from the interviews with the forest companies, the banks and the forest intermediary will then be presented.

### 4.1 The book value of the forest

When looking at the price on the private market, the value of the whole property is included, i.e. the value of both the biological assets and the ground value. Therefore, when comparing this market value to the value of the forest companies' properties, two comparisons will be made. In the first case, the value of the forest companies' biological assets and the ground value are included, but in the second case the ground value is excluded. This is done in a trial to understand the impact of the ground value on the total value of the companies' assets.

The forest companies all state in their annual financial reports what the value of their biological assets is. If the ground value of the forest is added to this value, and the deferred tax subtracted, the total value of the forest is received. If the total sum is divided by the total volume of productive forestland, one gets the value per hectare:

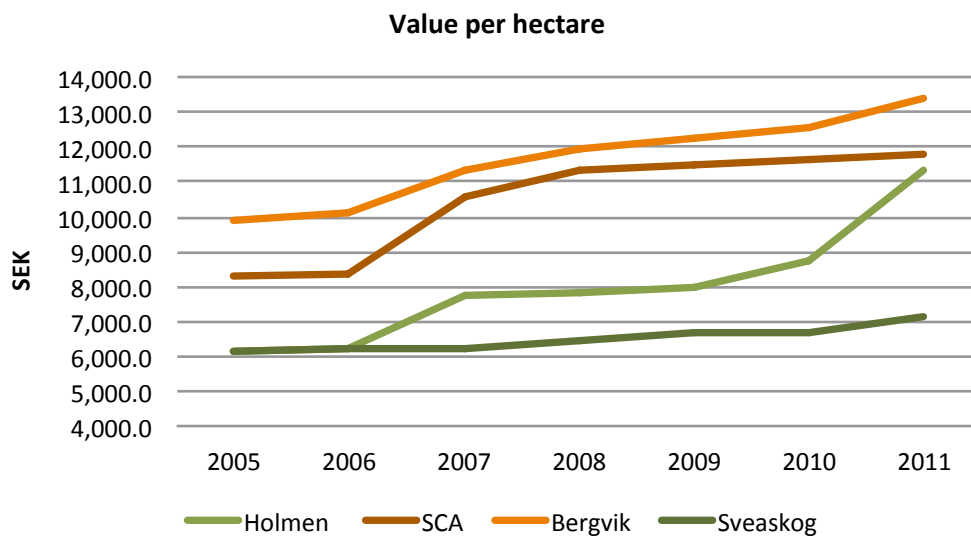


Diagram 3.1 Value per hectare

In the second table, the ground value is excluded and the value of the biological assets, minus the deferred tax, is divided by the number of hectares. The ground value is excluded to be able to show its contribution of the total value.

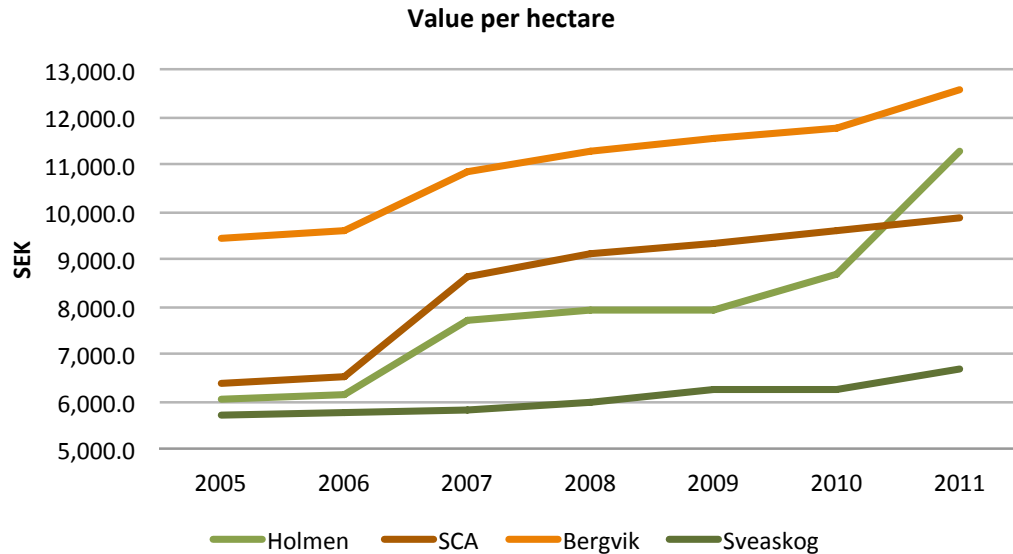


Diagram 3.2 Value per hectare

One can see that excluding the ground value does not result in any significant difference compared to the previous diagram (3.1). In both cases, Sveaskog value their forest the lowest, and Bergvik the highest. There is a rather noticeable increase in value between 2006 and 2007 for Holmen, SCA and Bergvik, which in Holmen's case can be described by a decreased discount rate, and for SCA by a revaluation of the forest, which led to an enhanced value by 5.2 MSEK. There is no explanation in Bergvik's annual report why the value of the forest per hectare has increased so drastically. Remarkable is also the 29.4 % increase in value per hectare that Holmen experienced between 2010 and 2011, which is explained in Holmen's annual report for 2011 by raised pulp and timber prices, and also by increased harvesting (Holmen's annual report, 2011, p. 2). However, the other companies do not seem to take these price increases into account, and therefore only show marginal increases in value.

The forest companies also state in their annual reports how many cubic meters of forest they own. If the value of their biological assets plus the ground value minus the deferred tax is divided by the amount of m<sup>3</sup> forest they possess, the value per m<sup>3</sup> forest is derived:

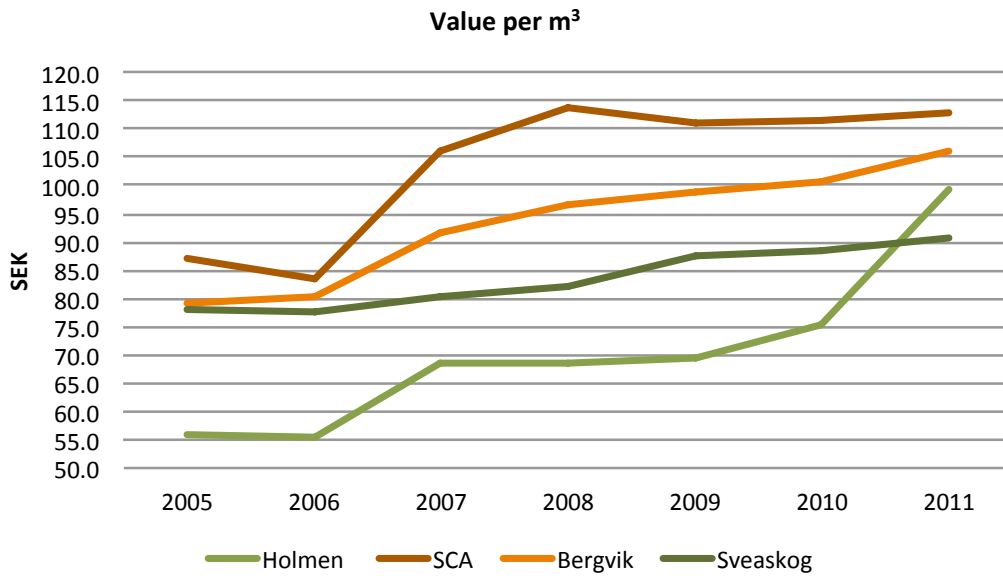


Diagram 3.3 Value per m<sup>3</sup>

In the second table, the ground value is excluded, which gives the following result:

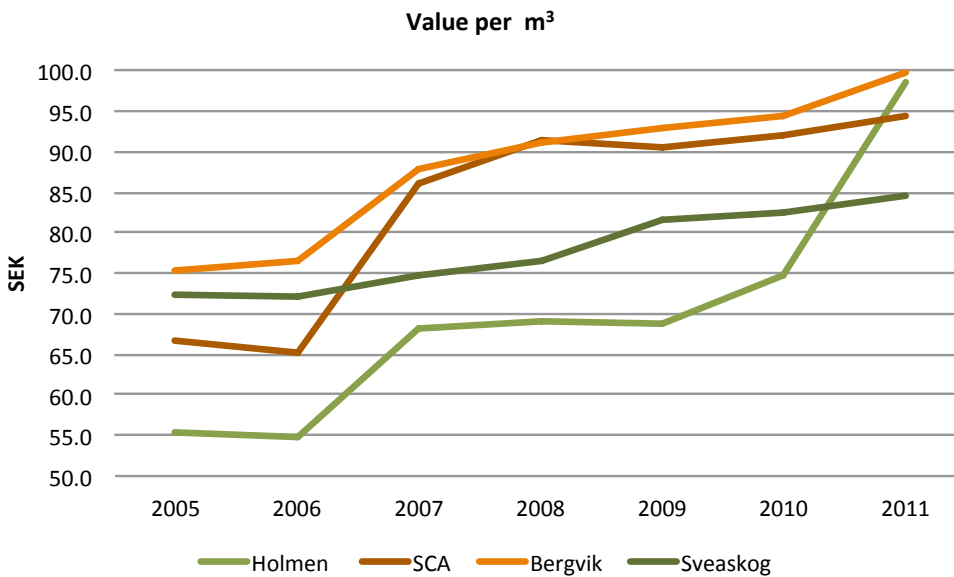


Diagram 3.4 Value per m<sup>3</sup>

In these last two diagrams (3.3 & 3.4), one can see that SCA and Bergvik have the highest value per m<sup>3</sup> forest. SCA shows a higher value in the m<sup>3</sup>-diagram than in the ha-diagram compared to Bergvik. The reason for this is that both companies have an equal number of hectares of forest, about 2 millions, meanwhile Bergvik has between 13-22 % more m<sup>3</sup> forest than SCA during these years. This results in an upward shift for SCA in the m<sup>3</sup>-diagram. Holmen and Sveaskog are also shifting places in the m<sup>3</sup>-diagram compared to the ha-diagram. The reason for this is that Sveaskog has about three times the amount of hectares, but only two times the amount of m<sup>3</sup> forest compared to Holmen. As the value of the biological assets remains the same for both companies, in both diagrams, it results in an upward shift for Sveaskog in the m<sup>3</sup>-diagram.

#### 4.2 The observed market price

By studying the data received from LRF Konsult regarding the sales over 300 ha that have been made between the years 2005-2012, one can calculate an average market price per hectare and per m<sup>3</sup>. The total average market price per hectare for sales in the whole of Sweden is 31,978 SEK for all properties over 300 ha, and 33,180 SEK when only looking at the properties sold over 500 hectares. The total average market price per cubic meter, which is also included in the sales, is 317 SEK for all properties over 300 ha, and 290 SEK when only looking at the properties sold over 500 hectares. When sorting the data by year, one gets the following result (see also Appendix 5 – Sales statistics):

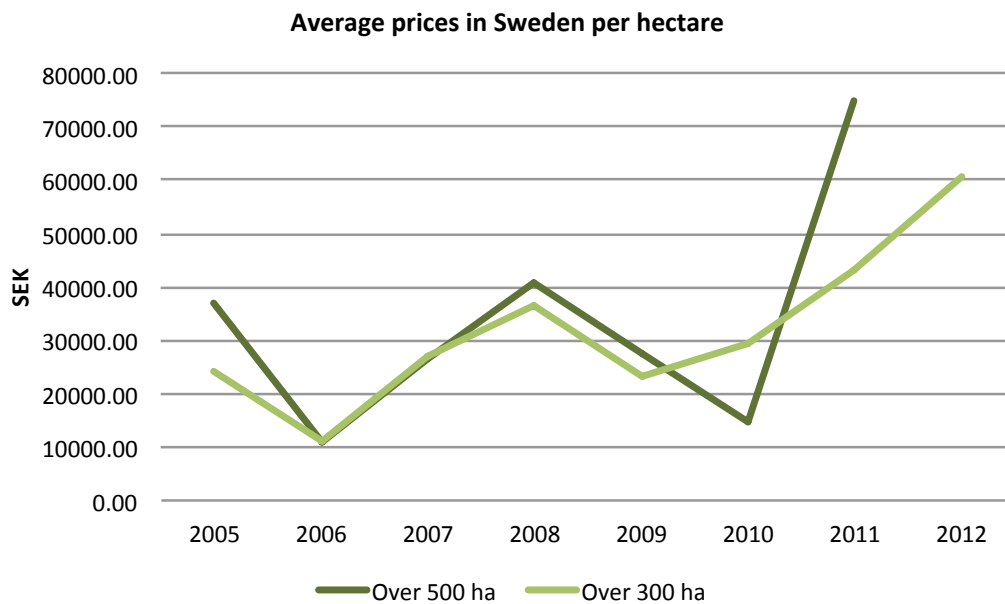


Diagram 3.5 Average prices in Sweden per hectare



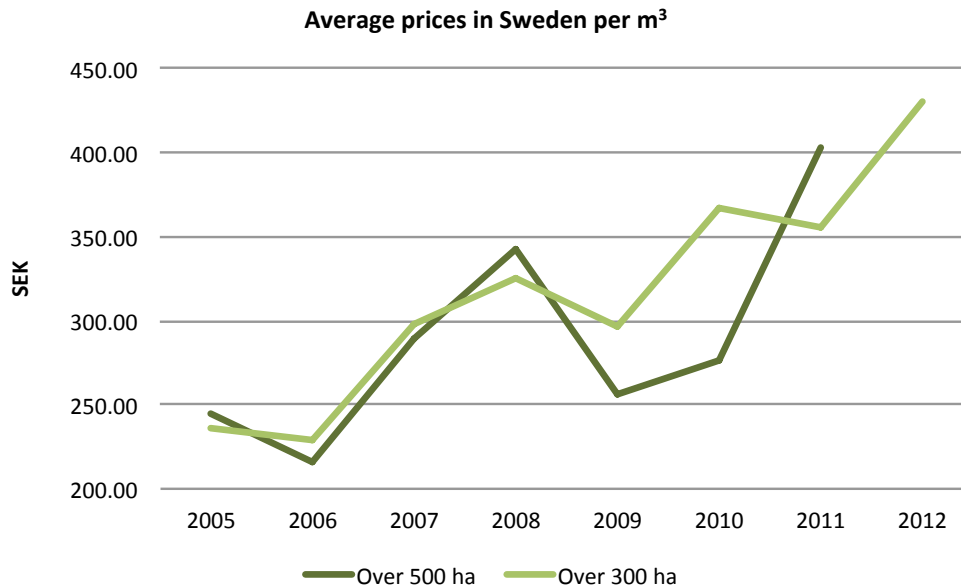


Diagram 3.6 Average prices in Sweden per m<sup>3</sup>

Our result does not completely follow the pattern of the price statistics from LRF Konsult, which can be explained by the fact that there for some years and for some regions only were a few sales of this size registered. It is therefore difficult to see a straightforward development of the prices between the years due to the uneven data. However, one can still see that the market price for properties over 500 hectares is considerably higher than the book value of forest for all companies in all years. One can also see that forest properties are more expensive in the southern and middle parts of Sweden, and cheaper in the north (see Appendix 5 – Sales statistics).

### 4.3 The Swedish Forest companies

#### 4.3.1 Sveaskog

*Sveaskog is one of the world's largest forest owners with around 14 % of the productive forestland in Sweden. The company only owns forest in Sweden, and its possession of productive forestland amounts to 3.1 million hectares. It is a state owned limited company, but since it should be possible to convert it into a public limited company at any time, it follows IFRS. The focus of the company is to generate value from the forest possession only, since it does not own any industrial business. The company has outsourced its transportation and logistics activities and therefore only has 700 employees, but all together there are almost 2,500 people involved in their business. In 2010 they had a turnover of 6,951 MSEK, where 50 % of it is derived from their own harvesting, and the other 50 % is pure trading with, among others, farmers in Sweden and importation from Russia and the Baltic countries (Anders*

*Jakobsson, Head of Finance, Treasury and Risk Management, Sveaskog, personal communication, 2012, March 7).*

Since there is no active market for such large forest properties that Sveaskog possess, they do not consider there to be a market value of the forest. Therefore, they use the third alternative that IFRS offers, the discounted cash flow model, to calculate the fair value. In this model one has to, as previously mentioned, estimate the harvesting volumes, the future prices and costs, and also the discount rate, all for a period of 100 years.

Sveaskog does not value its whole possession of forest, only the productive forestland with the biological assets belonging to it. This means that the productive forestland has to be distinguished from the total possession by deducting lakes, mines and unproductive forestland. The harvesting volumes depend on the rotation period of the trees, which is shorter in the southern parts of Sweden due to more favorable conditions, and longer in the north. Sveaskog uses five market areas right now, Norrbotten, Västerbotten, the southern part of Norrland, Bergslagen and Götaland, but is in the process of changing the division to only three areas, with a clearer division between the northern, southern and middle parts of Sweden. The board decides the harvesting volumes for ten years in advance, although more detailed plans are made for the future five years. Sveaskog has a policy of never exceeding the harvesting plans, which means that if more forest is harvested than planned one year, they have to compensate for this the following year. To calculate the exact volumes, Sveaskog hires an external expert, whose model, called BAS-AVB, is used at the end of every year to make an updated harvesting plan. This model calculates the exact volumes based on the harvesting decision made by the board, the established silvicultural plans and on Sveaskog's forestry register. The calculation works as the basis for the volume input in the discounted cash flow model.

The costs and prices were previously based on a seven-year average, but since the costs increase in line with the inflation, Sveaskog believed that they did not calculate with enough costs when using this method. As a result, they will this year start to use a standard cost, which is based on the last three years' cost structure in a trial to find a cost closer to the real market value. Due to this shift, the costs have increased from the previous average used. When it comes to the price, however, one still uses an average, but is planning on extending the time series to a rolling ten-year average. Anders Jakobsson explains that bio fuel today accounts for 10 % of the turnover, although the contribution margin is only

about 5 % due to lower prices, but this is not taken into consideration in the model. This means that the company today only accounts for the pulp and timber prices, but they are planning on including biofuel in the model in the near future.

Sveaskog use a discount rate of 6.25 %, with 2 % inflation included. Their target ratio is 60 % debt and 40 % equity. They use an external expert as help to find the proper range for the discount rate. The value 6.25 % is in the higher range of this span, but Anders Jakobsson explains that the low interest rates that we have seen during the last couple of years could indicate a shift in the span towards a lower interest rate.

In the beginning, when Sveaskog started to use fair value, they used the interest rate directly from the market instead of analyzing the proper discount rate within a range. The result of this was that the value of the forest, and thereby the net income, fluctuated rather drastically between the quarters, which was indefensible since they could not explain the shifts in value between the short periods of time. This led to a more conservative and long-term way of calculating the input values in the discounted cash flow model. As Anders Jakobsson explains, the main idea with the valuation today is to avoid large fluctuations. For example, Sveaskog do not use the actual prices, costs and interest rates of today, since they argue that they do not know what will happen tomorrow. The assumptions are instead based on historical trends and the valuation is made with prudence. If they were to revalue their forest to be worth more, it does not affect the actual annual cash flows, even if the net income is increased.

The large difference between the market price on the private market and the fair value established by the forest companies can partially be explained by soft values, especially when it comes to the smaller forest properties between 100-200 hectares. Soft values can include the satisfaction of owning forest, but also hunting- and fishing rights, which are not taken into account when valuing the large forest properties. This can, to some extent, explain why private persons are willing to pay such enormous sums for forest holdings. However, Anders Jakobsson states that, in the long run, this is not defensible from a cash flow perspective, since the forest historically only yields around 3-4 % per year. Another explanation for the large difference between the market value on the private market and the fair value established to the forest companies is simply the size of the properties. Anders Jakobsson means that there has to be some kind of quantity discount when it comes to properties of more than 1000 hectares.

Finally, although IFRS is a set of rules and regulations, Anders Jakobsson believes that there is still some room for subjectivity since IFRS often offers alternatives. Furthermore, what is correct from an IFRS-perspective might not be right from the market perspective of forest. He underlines that the standard IAS 41 was not written for forest, but for crops and cattle, and that it is not really suitable for their properties.

#### **4.3.2 Bergvik Skog**

*Bergvik Skog is one of the largest forest owning companies in Sweden, with 1,9 million hectares of productive forestland. It was founded in 2004 when Bergvik acquired the forest properties that Stora Enso and Korsnäs previously owned. It is an unlisted private limited company, and two of the largest owners are Stora Enso and Länsförsäkringar. Bergvik Skog AB does not own any industry, but its main business activities are to pursue forestry and to manage the forest properties of their subsidiaries (Bergvik's annual report, 2010, p. 4).*

Bergvik Skog, as all the other large forest companies, do not consider there to be a market value of the forest, and therefore also use the discounted cash flow model to calculate the value of their biological assets. Juhani Toivonen (CFO Bergvik, personal communication, 2012, March 7) explains that they have used external experts who are educated in forestry to calculate the harvesting plans every tenth year, and that these plans have then been revised once in a while. Now, however, they are changing to a new system called Heureka, which is a tool for making the establishment of the harvesting plans easier and better. Since framing the harvesting plans will be easier with this system, it will be made approximately every fifth year instead of every tenth. Bergvik has a policy of never reducing the harvesting volume from one year to another, but at the same time it has to be sustainable in a long-term perspective. The fact that the company owns forest in different parts of Sweden, where it is more or less favorable for the forest to grow, is considered to some extent in the harvesting calculations, although the rotation period is 90 years for all their properties.

Bergvik Skog estimate the costs for their forestry with their best knowledge and with the help of their budget and the current prices. But since it is difficult to estimate the future, and since they do not have any other information, the costs are inflated with 2 % each year. When it comes to the revenues on the other hand, they know rather precisely how much they will be able to sustainably harvest during the future 100 years, but it is more difficult when it comes to estimating the price. They therefore use an

external consultancy firm approximately every fifth year, called Pöyry, to help them estimate the price curve. This curve shows the expected future prices, and takes the global demand, where biofuel is included, into consideration.

Bergvik Skog also use the external expert Björn Carlsson to come up with a proper discount rate. Just like Sveaskog, they use 6.25 %, which is not their own cost of capital, but a theoretical forest WACC according to the norm. Juhani Toivonen explains that their own financing of the company should not be the guidance in how much the forest is worth, instead there are made theoretical assumptions on how a company with this type of asset could reasonably be financed. This means that Bergvik's discount rate is based on the same assumptions as for Sveaskog. Therefore, in conclusion, their discounted cash flow model is built on three main building blocks, namely the WACC, the price estimations made by Pöyry and the harvesting calculations which have been made by external parties, but which in the future will be made with the help of the new system Heureka.

Juhani Toivonen further explains that he believes that there is room for subjectivity in the estimations, since they are made for such a long time in the future. In the end it is also the assessments of the management and the opinions of the board that determine the outcome. But he also states that there are a lot of people involved in the valuation process, and it is important to discuss the different views with one another to see that they are in line. When Bergvik Skog sell properties, it is often small areas around 500-1000 hectares that are not of interest for them. These properties are sold for three to four times the book value, which Juhani Toivonen says could be explained by the fact that private persons buy this type of forest with another purpose of owning forest than what companies have. They do not plan to make a living out of performing forestry and selling the pulp and timber, and therefore do not make any industrial calculations. It has to do more with recreational benefits, such as hunting and fishing, together with the feeling and social status of owning forest. This is the reason why Bergvik can carve out small parts of their huge properties and sell, and get much more for them than what they were accounted for. It also has to do with the fact that the industrial analysis that Bergvik make is based on the logic that the cash flows from the investment must cover the initial investment, and therefore it is reasonable to land at the fair values that we can see today.

In conclusion, Juhani Toivonen believes that there are many drawbacks of IAS 41, it is very subjective and it makes it possible to shift the large numbers up and down. It is therefore of great importance to be

descriptive in the explanations of how the valuation has been made, and to show the figures to the reader so that he or she can make his or her own judgment about where the value originates from.

### 4.3.3 Holmen

*Holmen AB is one of the largest forest owners in Sweden with a main focus on forest management, wood procurement and timber trading. The company is a public limited company listed on the Swedish stock exchange and owns one million hectares of productive forestland, primarily in the north part of Sweden. It has five different lines of business: paper, paperboard and timber as well as forest and energy, and Holmen forest is responsible for the forest and timber procurement to their Swedish subunits. The company's net income in 2011 was 18,656 MSEK, of which 3,502 MSEK was derived from Holmen forest alone (Anders Jernhall, CFO Holmen AB, personal communication, 2012, March 9).*

Holmen made their first DCF valuation in 2004, and by that time the forest was worth 8.5 MSEK. Today, this value has increased by almost 100 %, to 16 MSEK. Holmen starts the DCF prognosis by making a volume prognosis, a harvesting plan. The prognosis is based on statistical measurements and classifications, made every tenth year, in a trial to identify how much the forest has grown. Like Bergvik, Holmen also has a policy saying that the amount of harvesting shall never decrease from one year to another. Based on the fertility of the ground and the type of trees in the geographical region, the amount of harvesting is increased with a certain percentage between the ten-year measurement intervals. Holmen should, according to their old prognosis, harvest 2.5 million cubic meters of forest annually between 2011 and 2020. However, after the statistical measurements in 2010, they realized that they could increase this amount to 3 million cubic meters per year. The reason for this was a new silvicultural program introduced in 2010, with the ambition to get the trees to grow faster. After 2020, the amount of harvesting will grow with 0.4 % every year until 2110.

The price in Holmen's DCF-model is since 2005 based on a trend price. The price in 2005 was considered to be quite normal, and this price has since then been increased by 1 % per year until 2010. The annual increase was based on an average of how much the real price had increased during the last 15 years. In 2011, this number was changed to 2 % per year, which means that the price is now following the level of inflation. Despite the high timber prices in 2011, Anders Jernhall says that he thinks the price of timber is going to decrease in the future, at least until 2020. The real price has actually been relatively unchanged since the 90s, and this trend is expected to maintain, which is the reason for not applying

2011's high price as an input value in the long-term perspective. The model of today is therefore somewhat conservative, and there is often tardiness in the change of the input values, since forest companies like Holmen often have to see a long-term change before they adjust them.

Out of Holmen's total costs, 60 % is harvesting costs, 25 % silviculture and the remaining 15 % is overhead costs. All costs, except the salaries, are increased by 2 % per year. The salaries are increased with a higher rate, since people over time are demanding a real increase in salary and not just a nominal one. Biofuel is not included in the model.

Holmen applies a discount rate of 5.5 %, which is 0.75 percentage units lower than the rate that the other three large forest companies in Sweden use. In 2005, however, Holmen also applied a WACC of 6.25 %, but lower inflation and government bond rates in the last couple of years led to a decrease in 2007. Holmen calculate the discount rate themselves, and it is based on a prognosis concerning future long-term government bond rates, prices, costs etc. Anders Jernhall underlines that one has to overlook the short cycles to focus on the long-term perspective when one makes the WACC calculation. The ten-year government bond rate today is 1.5 %, however, this is not a sustainable level to use as an input value since the rate over time has been in line with the growth of the real GDP, around 2-2.5 %. Together with the Swedish Central Bank's inflation goal of 2 %, this would result in a long-term interest rate of 4 %. Holmen has a target ration of 66 % equity and 33 % debt in their capital structure. They calculate with a risk premium of 5 % for equity and a beta of 0.8, and the debt risk premium is estimated to be 1-1.5 %. All these input values, together with the tax shield, result in a WACC of 5.5 %. Anders Jernhall states that 5.5 % is a reasonable rate since Holmen's share price fluctuates less compared to for example SCA's.

Although IAS 41 is based on theory, the DCF-model requires judgments by the companies, and as a result, there is naturally room for subjectivity in the standard. Like Anders Jakobsson at Sveaskog, Anders Jernhall also mentions that the standard is written for crops and cattle, and not for assets with a life span of 100 years. He further underlines that this is not the only error within IAS 41. The standard states that the companies should use the free cash flows and the WACC before tax, but all valuation experts use a rate after tax. Holmen calculates both their free cash flows and their discount rate after tax.

Looking at soft values, Anders Jernhall means that these values to some extent could explain the extreme prices in the transactions of smaller forest properties. Another explanation could be the tax incentive for private forest owners, i.e. sole traders, who can deduct 50 % of the purchase sum against future revenue, whereas companies can only deduct 25 %. Besides, the value of the forest companies' assets depends primarily on the free cash flows that the forest will generate, while private owners might have other purposes with their ownership, besides cultivating the forest. It is therefore not reasonable for Holmen to base their value on private forest transactions. In 2007, Holmen bought a piece of land for 53 MSEK, which they actually valued much lower, resulting in a loss the same year. Anders Jernhall explains that the market is not perfectly priced, and Holmen can therefore not use the purchase price of small forest areas in their accounting, it would not be a relevant way to follow IFRS like it is written today. Anders Jernhall says that it would have been a blessing to account for the valuation changes in the statement of other comprehensive Income, instead of reporting them as a profit or loss in the income statement. Valuation changes do not affect how much money the company earns, and thereby not how much they can dispense to the shareholders. However, it might affect the stakeholders' perception about Holmen, and also their willingness to purchase shares. Anders Jernhall finishes by saying that IAS 41 therefore is a very good standard from a balance sheet perspective, but not from an income statement perspective.

#### **4.3.4 SCA**

*With over 2 million hectares of productive forestland, SCA is Europe's largest private forest owner. The company was founded in 1929 and was listed on the Swedish stock exchange in the 1950s. SCA's group head office is located in Stockholm. Their unit for Forest Operations is located in Sundsvall and is a part of the business unit Forest Products, which has approximately 3500 employees in Sweden. SCA Forest's main obligation is to ensure SCA's pulp-, paper- and hygiene industry with a stable flow of raw material of good quality (SCA, 2012b).*

SCA introduced their DCF-model in 2005, and they have applied the same method since then. Since the majority of their forest is located in the northern parts of Sweden, they apply the same rotation period, 100 years, for all their properties. When estimating the harvesting volumes, SCA looks at the growth and harvesting calculations made by Skogsförvaltningen. A forest tax assessment is made every eighth year, and no adjustments concerning the volumes are made in between the periods. SCA has a long-term harvesting plan and therefore a policy saying that they should harvest as much as possible, but at the



same time never decrease the volumes from one year to another. This means that it would be possible for an outsider part to estimate a higher value of SCA's forest by applying a more generous harvesting policy at the beginning of the rotation period (Göran Fridh, CFO SCA, personal communication, 2012, March 27).

The cost and the price inputs are based on trend prices and costs on a ten-year average. When updating the inputs at the end of every year, SCA looks at the current costs and prices and adjusts these values so that they meet the trend price within a period of six years. After six years, the costs and prices are increased with the level of inflation. All the calculations are made before tax, and then a deferred tax of 26.3 % is accounted for in the balance sheet. SCA applies the same WACC, 6.25 %, as Sveaskog and Bergvik. The most difficult value to estimate in these calculations is the beta value, since there are not enough values to compare with on the market to estimate an exact beta. Göran Fridh explains that SCA looks at the other forest companies' values, but also on companies with tangible assets and a similar risk rating as SCA, in a trial to estimate an accurate beta value.

There is room for subjectivity in the DCF model since it is applied for such long rotation periods. Even a small adjustment will make a huge difference on the result. However, SCA applies the DCF model with consistency and only makes a few adjustments to the input factors, which brings stability in the calculations. Göran Fridh further explains that there are natural explanations to the difference in price between the private- and corporate market; one is the size of the objects. Most of the objects that are out for sale today are very small, and they are often priced high due to a lack of raw material in the geographical area. Private persons are also willing to pay a high price for recreational or soft values, such as hunting rights and status. A corporate valuation only includes the actual return that the forest is able to yield and does not take these values into account, resulting in a much lower total value. Important to take into consideration is also the yield requirement, which differs between private persons and companies. For a private person, a return of 4-5 % is a good return since they compare with the return they would receive by putting the money in the bank, which is not more than maximum 2-2.5 %. For a company, on the other hand, a return between 6-7 % is necessary for a profitable investment. A private person therefore has a much higher capacity to pay, since they compare this investment with their marginal investment, meanwhile companies require a higher return.

The change to fair value has been positive for the forest industry, according to Göran Fridh. Historical cost did not say anything about the actual value, and the estimation of the real value was handed over to the stock market. Today, however, despite the fact that the calculations are based on a lot of assumptions, SCA consider themselves to make a serious and detailed valuation, and it is then up to the shareholders to conclude whether they have a high or low value of their assets. Göran Fridh thinks the DCF model is a good model, and that it would be absurd to base the valuation on market prices of smaller assets sold on the private market. In that case, the value of SCA's assets would increase to maybe the double. If the real value was that high, the forest would generate a very bad return, and for most of the forest companies it would then be more profitable to sell their properties.

Since forest properties are assets generating stable cash flows, the value development of the forest industry looks good over time. But one shall remember that the value of the forest is dependent on what it is used for. If the forest industry shall remain profitable, other industries must demand its products. In case of a collapse of the demanding industries, the value of the forest would also decrease, since the value of the industry and the value of the forest are dependent on each other. There is definitely a symbiosis between the industry and its requirements that is important. The greatest risk today is therefore the risk of lower competitiveness in the saw- and paper mills. The paper pulp is today used in three sectors: the printed-paper sector, the packaging sector and in the hygiene sector. The printed-paper sector today has a very bad profitability, and if this trend would continue downwards, the value of the forest would be dependent on a higher demand in the package- and the hygiene sector. Göran Fridh states that he does not think this is going to be the case, although the risk definitely exists.

## **4.4 Bank analysts**

### **4.4.1 Carnegie**

*Carnegie is one of the market leading investment banks, engaged in stockbroking, corporate finance and private banking. Its main business is located in the Scandinavian countries as well as in New York, London and Luxemburg, and financial institutions and private-equity companies are their primary customers. In their head office in Stockholm, they have pulp and paper (P&P) research focused on analyzing Scandinavian P&P companies, in Sweden particularly Holmen and SCA (Johan Sjöberg, head analyst of the P&P research, Carnegie, personal communication, 2012, March 26).*

Carnegie estimates the stock development over time by making buy- and sales prognoses. They have a time horizon of two years, but release their prognosis to the market every fourth month. Johan Sjöberg explains that Carnegie estimate the stock development by looking at price-, volume- and cost trends, but also exchange rates within the particular industry. They also take external events into account, such as trade barriers, mergers and acquisitions.

When estimating the value of the forest holdings that the P&P companies possess, Carnegie takes the basis in the forest companies' financial reports. However, normally they do not apply this value, but instead use a higher value based on transaction multiples. Johan Sjöberg states that one has to ask oneself what the companies' forest holdings actually could be worth. For example, one could argue that Holmen's forest holdings are worth between 16 and 32 BSEK, depending on the chosen perspective. The fair value accounting rules according to IFRS are actually somewhat strange, since it does not tell you much about the company's real value. Holmen would not be willing to sell their entire forest holdings for 16 BSEK, which today is the value of their holdings according to the balance sheet. Then, one cannot talk about a fair value, or a market value. However, Holmen could still motivate this value by looking at their EBIT of 1 BSEK, since their return of 6.25 % ( $1/16 = 0.0625$ ) is actually quite good and provide Holmen with stable earnings and cash flows both in good and bad times. But if one were to increase the value of Holmen's forest holdings to 32 BSEK, the return would be much worse. However, an investment in the forest industry is often said to be almost risk free, and in comparison with other risk-free bonds, a 6.25 % return is actually quite good. At the same time, the size of the properties has a huge influence on the price. If Holmen were to sell a property of 100 hectares, they would receive a much higher price per hectare than if they were to sell their entire forest holdings at once. This means that there today, due to a demand shortage, exists an opportunity for arbitrage operations, although the market will become saturated very quickly. In conclusion, the forest industry is hard to value, and it is impossible to say where in the enormous span between 16-32 BSEK (in Holmen's case) the correct value can be found.

There could be several reasons explaining the difference between the market value and the fair value of the forest, as established by the forest companies. One reason has to do with the companies being very conservative when making their estimations. They are applying a 100-year DCF model, which means that they cannot use the actual prices and costs of today, since these values would not be defensible. Another reason is that the forest is a strategic asset, since the industry and the forest are dependent on each other. When the forest is located close to a paper-mill, it is worth much more, since the access to

raw material is very important within this industry, but this is not accounted for in the DCF model. A third reason is the soft values, which are really hard to estimate since they could differ a lot from one sale to another. These values are also much lower in the north part of Sweden than in the south, and as a result, one cannot use multiples from smaller sales in the south part of Sweden when valuing the forest of SCA and Holmen. If one applies multiples from a sale in Skåne on SCA's whole possession of forest, it would be worth more than 100 BSEK. A final reason explaining the difference in value is the investors' perceptions about the company. When investing, they both look at the return on equity (ROE), and on the leverage ratio. An increased value will always result in a higher equity and thereby a lower ROE. If the equity increases, the leverage ratio will decrease, although the forest companies do not have more cash to distribute.

There is definitely room for subjectivity in the fair value accounting following IFRS. The forest companies can increase the value of the forest by changing four different parameters: the price, the cost, the volume and the WACC. One can change the last two parameters without problems; however, an increased value based on higher wood prices often results in lower profits from the paper operations as their input costs rise. The value of the paper industry would decrease with the same amount, since the companies have no self-sufficient wood supply. Johan Sjöberg explains that the timber prices have increased from year 2000 until today. The reason is a wider range of applications, such as biofuel, which he thinks is going to be a good business, and also a parameter that the P&P companies have to consider when valuing the forest in the future.

#### **4.4.2 Danske Bank**

*Danske Bank in Sweden is a branch of the parent company in Denmark. Apart from regular banking activities, they also provide special services within their forest and agricultural department. They focus on private persons who already own or are planning on buying a forest property, and help them to economically manage their property in the best possible way (Johan Freij, Head of the Forest and Agricultural department, Danske Bank, personal communication, 2012, March 28).*

The forest and agricultural department of Danske Bank in Sweden works mainly with private property owners, which is their main target group. When they value the forest properties of their customers, they use a valuation model based on different key ratios to get a price per m<sup>3</sup>. These input values are gathered from the forestry plan, and concern the division of the age and cutting classes. Danske Bank

also use the price statistics from LRF Konsult together with other sources. Although these market areas are too rough, they know approximately what the average price in a district smaller than the ones from LRF Konsult is. The location price method is also used to estimate the average price for a certain area, but this price is then adjusted for the quality of the biological assets, and the age and cutting classes, since a bank has to estimate the future cash flows. However, Johan Freij means that the forest market is far from a perfect market when it comes to pricing matters, since one usually does not calculate cash flows. From the key ratios, location prices and the situation and quality of the forest, Danske Bank tries to reach a carefully estimated market value. However, this value does not have to correspond to the actual selling price, most often it is somewhat lower. This can partly be explained by the fact that the bank cannot use forest that is ready to harvest as a collateral.

Johan Freij states that the forest companies demand a return around 5 % and use discount rates between 5.5-6.25 %, but private forest owners, on the other hand, have a lower return requirement. Since the prices are a lot higher on the private market, one has to apply a discount rate of around 2 % to make both ends meet. The question is whether this is more correct than what the forest companies do. When these companies value their properties, it has to do with huge coherent areas, which have to be valued from a company perspective. Therefore, Johan Freij means that there has to be large difference between the interest rates on the private market and the ones the forest companies use, and although it is difficult to say what the correct interest level is, there should be a difference. He further states that it happens quite frequently that journalists covering the forest market write that for example Holmen is undervalued, because the journalists have looked at the price statistics from LRF Konsult and translated it on Holmen's assets. Johan Freij means that some people do not understand that this is a result of misperception, and Holmen's share price therefore rise for a day or two. Holmen can namely not sell their possessions for these prices, especially not their properties in the north of Sweden.

Furthermore, the statistics shows that approximately 60 % of the forest properties that are bought on the private market are bought from neighbors. This is one of the main reasons why we have seen such high prices in recent years. If the forest companies would have had forest properties where private owners had small plots adjacent to their, they would have had more possible buyers if they were to carve out parts of their forest and sell. But it has to do with two totally different markets. The market would be saturated very quickly if the forest companies started to sell small plots of their huge properties, which actually happened when Norske Skog sold their possessions in the western part of

Sweden. The first properties had a price per cubic meter that was twice as high as the last ones, since there simply were not enough neighbors. Johan Freij believes that the market would be more difficult to saturate the more south in Sweden one goes, since there are more people competing over the properties there. Sveaskog experienced this during their extremely successful process of selling small plots of forest to private forest owners, since they had some difficulties selling their properties up north. It is therefore important to be careful when selling carved out plots, so that the market does not become saturated.

The so called soft values are most likely one part driving the prices, but Johan Freij means that a private person buying a forest property cannot answer how much of the price that corresponds to the value of the amenity values. It is, as previously mentioned, not a very intelligent market, and the private persons do not make any advanced calculations. The fact that there are other tax conditions for private people is also an explanation for the high prices on the private market, and the fact that private people experience other investment opportunities than companies is another. A person who wants to buy his or her neighbor's property does not consider the stock market as an alternative, while for example SCA has to decide whether to invest in the tissue industry in Asia or buy or sell more forest, but these alternatives do not exist for a private person. In Finland, the price of forest properties is considerably lower than in Sweden, although we have almost the same tax situation and infrastructure, which indicates that Swedes include more feelings when investing in forest.

Johan Freij believes that the drastic price increase we have seen in recent years might become weaker, much depending on the general economic development. The price has actually decreased by 3 % the last six months, and it is not totally unlikely that it can continue down, but in the long run it will at least follow the inflation. Biofuel will have a greater impact on the forest companies' earnings, although the main income will still be derived from the timber.

Furthermore, Johan Freij believes that the fair value that the forest companies calculate today is at least fairer than the historical value they used before. However, to be able to find out what the proper, actual value is, one has to turn to the fund market where really large possessions are bought, as the private market is not suitable for this purpose. Only the small, marginal properties that can be carved out and sold from the companies' large possessions can be compared with the private market, but not the rest. One can therefore say that the forest companies partly have an institutional investment value, and

partly a partition value of maybe 10 % during a ten-year period. Both Holmen and Bergvik should have a higher value per cubic meter of forest in this perspective, since they own more forest in the south of Sweden than for example SCA, and therefore have a better potential for partition.

## **4.5 Forest mediator**

### **4.5.1 LRF Konsult**

*LRF Konsult is the largest out of eight completely owned subsidiaries of LRF, the Swedish national federation of farmers. The company has 1600 employees, and can be found on 135 different places in Sweden. LRF Konsult is active in four different fields, namely finance and accounting, law, management consulting and estate agency. The estate agency field employs 160 people, out of whom 94 are brokers and the other 66 work with valuation and estimations of the forest as well as change of generations. LRF Konsult is the largest intermediary of land and forest properties in Sweden, with around 1300 objects every year (Carl-Johan Jürss, head broker, LRF Konsult, personal communication, 2012, March 27).*

LRF Konsult works almost exclusively with people on the private market, apart from a few commissions from Sveaskog. The general trend is that people selling forest properties are at the age of 65-70, whereas the people buying them are around 55-60 years old, a financially strong group. This means that it is difficult for the younger generation to enter the market if you do not have a lot of capital or inherit a property. However, the share of young people who wants to take over a family property is drastically decreasing, it is more common that people want to educate themselves, travel or move to the city.

When LRF Konsult value a forest property that is about to be mediated on the open market, they often proceed from the location price method based on their own price statistics. Even though they only publish their price statistics divided by five large market areas, they have detailed information down to municipality level where they can see very large local differences. They also look at the forestry plan of the property, but if this is not up to date, they update it by letting employees visit the forest and make new estimations and calculations.

The forest properties are valued by cubic meter, and even though there is no explicit value of the ground, there is a ground value included in the price. However, the ground value often consists of the value of hunting licenses, which gradually decrease the more north in Sweden the object is located. The ground value can also consist of other parameters; it is for example dependent on how much of the

forest that is harvested and how much impediment there is on the property. Furthermore, other soft values than hunting licenses are also included in the price, such as the existence of mushrooms and berries, the attractiveness of the property, if the property has a good road network etc. All parameters that affect the price are taken into consideration, which means that two properties with the exact same amount of m<sup>3</sup> forest can differ in value if one property is mismanaged or contain less soft values.

A forest property does not yield more than 2-3 %, which is not very much compared to many other investments. Carl-Johan Jürss means, however, that the market value of forest includes a lot more than the return. If one were to do make a calculation where both ends meet only based on the yield, it would be very difficult to justify the prices of today. But there are other factors driving the price statistics. If for example an old person owning a well-managed forest property with good hunting-grounds suddenly has to move to a nursing home, and his or her neighbor now for the first time ever has the possibility to buy the property, it would most likely be sold for a price a lot higher than the one calculated only based on the yield.

Although the so-called soft values constitute a part of the high prices that we can see today, Carl-Johan Jürss believes that the importance of them is rather boosted. He means that soft values are often explained as the reason why people from big cities buy forest, to escape from their stressful lives and relax in the country. However, only 25 % of all the objects that are mediated are bought by this group of people, who did not own any forest property before. This means that 75 % of the mediated objects are bought by people who already own a forest property, and one can therefore ask how big of a role the soft values play for them. Carl-Johan Jürss argues that the high prices we have seen in recent years to a large extent can be explained by the fact that forest properties are goods that are bought very seldom. When a property that has not been out for sale for maybe 200 years suddenly is possible for you to acquire, the price may soar. Therefore, the soft values only constitute maybe around 10 % of the purchase price.

If the forest companies were to carve out small parts from their huge properties and sell, there would definitely exist a possibility of arbitrage operations. However, this would saturate the market rather quickly and thereby affect the market price. Therefore, Sveaskog, who has done this in a small scale, have had to wait a long time between their sales so that they do not affect the market too much. But there is a huge interest in Sweden in owning forest, and forest companies could benefit a lot from selling



parts of their properties. The last few years it has also shown that the forest has yielded more than investing in the stock market, and the forest properties are considered to have stable cash flows and a stable value increase. Carl-Johan Jürss states that there has been an exceptional price increase the last 10 years, but that it will probably become weaker concurrently with the increasing supply of forest properties. He also believes that biofuel will affect the price in a positive direction and play a larger role in the future.

## 5. Analysis

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*This chapter aims at analyzing the empirical findings, with the price statistics and the theory as a basis, and will work as a foundation for the following conclusion.*

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### 5.1 The importance of soft values

The empirical findings from our interviews show that the question concerning the importance of soft values is not unequivocal. These values certainly constitute one part of the large difference in value, but it is difficult to say to what extent. The forest companies seem to assert that they play a larger role than what the analysts and the head broker at LRF Konsult think, which could be interpreted as if they want to hide something. By giving the soft values a greater meaning than what they actually have, it is less obvious that there are other, less acceptable, reasons why the difference in value appears. However, it is important to be clear on what is meant by soft values, since it can mean several things. As the head broker at LRF Konsult stated, what is often meant by soft values is the feeling of owning forest and the recreational value that it has for people living in the city, and it is often these values that make the price run up. But since only around 25 % of the people buying forest are people from this segment, it is difficult to argue that these values can explain such a large part of the difference that the forest companies seem to think. Other things that are often meant by soft values are hunting rights and the existence of berries and mushrooms, but as the head broker at LRF Konsult further stated, these values often do not constitute more than maximum 10 % of the purchase price. This means that there has to be other factors explaining the difference in value, since the price statistics compared to the forest companies' fair value shows a greater difference than 10 %.

It is clear that the forest companies do not take soft values into consideration, since they only include factors affecting the free cash flows in their calculations, but that these values can play a very large role for private persons. However, it is impossible to say how much the private persons pay specifically for these values, since they most likely cannot answer that themselves. This is also what Åge (1987) found in his study concerning the location price method, which is most often used on the private market, that both the monetary and non-monetary values are included in the price, but that it is difficult to separate them. This is also supported by Streyffert (1971), who means that soft values are very subjective and difficult to measure, and that a forest property therefore can have different values for different people.

What Hultkrantz (1991) found in his study, that as much as 35 % of the price can be assigned to an amenity value, is probably true in some cases, but far from all. Once again, it also has to do with what is meant by soft values.

## 5.2 Conservatism by the forest companies

All forest companies use a classic corporate valuation method, the DCF model, with the same type of input variables as are used in the Faustmann formula. However, the question is whether the application of the model has changed. Even though not all forest companies explicitly state that they are conservative in the valuation of their forest, our findings show that they more or less are. Since the estimations are made for a period of as long as around 100 years, the companies seem to be unwilling to realize future cash flows higher than absolute necessary already today. Furthermore, all companies except Bergvik use historical trend prices in their DCF models, and they do not include biofuel in their calculations, which Bergvik does. The fact that Bergvik take biofuel into consideration means that they are at the forefront when it comes to finding new fields of application for the biological assets. It is therefore interesting to notice that Bergvik AB is the company with the highest value per hectare and the next highest value per m<sup>3</sup> forest.

The use of actual, current prices would in other words result in a much higher value of the forest, but the companies argue that this would create fluctuations that would be impossible to defend. They have to have some stability in their calculations, and therefore mean that long-term trends have to be experienced before they are able to change any parameters, since they mean that it otherwise would be difficult to explain the revaluations. The fact that the changes in value do not affect how much the companies are able to distribute to the shareholders, is one of the main reasons why they are unwilling to make revaluations unless they see a far-reaching shift in value. As Malmqvist (2009) argues, it might be that these companies would be more willing to make revaluations if the unrealized gains and losses were taken to the statement of other comprehensive income instead of to the income statement, since the result would not be affected in the same way. However, the CFO at Holmen stated that it would not affect their valuation, although he would prefer to have it like that, but one can only speculate in the possible effects of such a technical change in accounting.

In general, it is common that companies use a WACC that is derived from the market, but the forest industry is an exception. There are very few companies to compare with, and not really any comparable

industries, which means that the forest companies have to come up with their own WACC. Three of the forest companies in the study use the same external expert to come up with an industry specific discount rate, but Holmen use their own. The discount rate that these three companies use is based on the same calculations, despite the fact that their own capital structures differ from the one used in the calculations. This proves that since there is no comparable discount rate, the forest companies could basically adjust the WACC the way they want, without anyone being able to really question it. When Holmen changed their discount rate to 5.5 % from 6.25 %, which is actually a rather big change, they did not give any further explanation than stating that the government bond rates that they base their calculations on had been lower for a few years, which motivated a lower discount rate. However, no further explanation to why they changed the rate but not the other three forest companies was given by them or Bergvik, Sveaskog and SCA, who kept their rate at 6.25 %. But the low interest rates that have been observed in recent years could indicate that also these companies should lower their discount rates, and the fact that they still have not done this is proof of the conservatism. As Koller et al. (2005) describes, a company is profitable when they earn a return higher than their WACC, which means that the forest companies must have a yield exceeding 6.25 %. At the same time, a higher WACC gives a lower value of the forest, which results in a higher yield and hence a more profitable investment. This could be yet another reason why the forest companies are unwilling to lower their discount rates, since this would result in a higher value of the forest, and thereby a lower yield.

The fact that the forest companies are conservative in their valuations is actually quite contradictory to the attractiveness of owning forest. All respondents, both from the forest companies and from the banks and LRF Konsult, stated that forest properties are very attractive and secure investments, and they all believe that the value development of the forest is positive. This gives further reason to question why the forest companies are being so reluctant to take on any risk in their calculation, since there is really nothing pointing at a decline of the forest market.

Another proof of the forest companies being conservative in their valuations, is the fact that the head analyst of the P&P research at Carnegie states that they most often do not use the fair value in the forest companies' balance sheets, but instead a higher value. For example, since Holmen would not be willing to sell their forest holdings for what it is valued at in their balance sheet, it actually cannot be considered as a fair value. On the other hand, they can motivate this value through a yield perspective,

which is a third explanation to the difference in value between the price on the private market and the fair value established by the forest companies.

### **5.3 Different purposes of owning forest**

It is clear from the interviews that all respondents agree that the private market and the forest industry are two separate, different markets, where the purpose of owning forest differs considerably. This means that it is almost impossible to establish one single method for valuing forest that is suitable for all types of ownership, which is also what Hektor (1974) found in his study. As previously mentioned, the forest companies make industrial calculations where both ends have to meet, which means that the yield from the forest must cover the initial investment. This could be a reason why they are being conservative in their valuations, since a higher value of the forest would result in a lower return. Holmen's return of 6.25 % is actually quite good, and can be motivated through this yield perspective, since the return would be unacceptably low if Holmen was upgraded. As the CFO of SCA stated, a profitable investment for a company has to have a return between 6-7 %, which is more than what private people require. Private people might compare investing in a forest property to putting the money in a bank account, with a return on perhaps around 2 %. This gives private persons a much higher capacity to pay and it is therefore natural to end up with the prices we can see today. The price that the private persons pay also includes much more than the return of the forest property. As the head broker at LRF Konsult stated, it would be difficult to justify the prices we can see today by only looking at what the forest yields. However, it does not have to do so much with soft values, as the fact that forest properties are seldom out for sale on the market.

The CFO at SCA explained that the value of the biological assets is much dependent on the demand from the forest industry. This means that a decline of the industry is an obvious risk for the forest companies, but probably not something that private persons owning forest take into account, unless they sell large amount of timber to the pulp and paper industry. This could therefore be one part of the explanation to the difference in value between the price on the private market and the fair value established by the forest companies, since more risk naturally makes the companies more conservative and prudent in their calculations.

#### **5.4 The “neighbor effect” and the potential for partition**

If a person owning a forest property has a neighbor who also owns a forest property adjacent to his or her, it is logic that this plot has a higher value for him or her than any other property in the country. It is strategically beneficial to own a larger coherent area and it is likely that this plot includes more amenity values than other properties. Since it can take hundreds of years before a certain forest property is out for sale on the open market, one can understand why people are willing to pay an overprice for them. That is why this so called “neighbor effect” can, to a large extent, explain the high prices on the private market. One can argue that the more neighbors there are, the higher the price will rise. However, the theory is not watertight, because if there is only one neighbor to a certain property, the price would not necessarily have to rise at all. Hence, since Sweden is rather sparsely built, especially up north, this theory cannot possibly be applied to all cases where neighbors are involved.

Even though for example Bergvik and Sveaskog sometimes sell small carved out plots, for which they get up to four times the book value, they do not include this potential for partition in their calculations. But all the respondents seem to agree that there is an opportunity for arbitrage operations, if the forest companies were to regularly sell small, carved out plots. However, it would saturate the market rather quickly, and it would therefore only be possible to do this with a small percentage of their total holdings over a long period of time. How much they would get for these plots would be dependent on the number of people competing over the properties, but even though there are fewer potential buyers up north, the price would probably still be a lot higher than the book value of these plots. One could therefore argue that the valuation of the forest companies’ holdings could be divided into two parts, one for the part of the forest that has a partition value, and one for the regular industrial calculations.

#### **5.5 Other possible explanations**

Apart from the above-mentioned explanations to the difference in value between the price on the private market and the fair value as established by the forest companies, there are a few more, less significant, reasons why this difference appears.

First of all, as a few of our respondents mentioned, there is a tax incentive for private persons who buy forest, since sole traders are allowed to deduct 50 % of the purchase sum, whereas the forest companies can only deduct 25 %. It is impossible to appreciate how much this affects private persons’ willingness to pay a higher price for the forest; it might not even be something that they are aware of.

However, it is still a rather noticeable difference between these two markets that affects the comparability between them.

Second of all, several of our respondents also mentioned that there must be some sort of quantity or size discount for such large forest holdings that the forest companies possess. This reason might sound a bit strange at first when talking about forest properties, but it is at least worth thinking about if the very large size difference between the plots sold on the private market and the forest companies' holdings is yet another reason why these markets cannot be compared.

Thirdly, many of our respondents pointed out that the standard IAS 41 was not actually written for forest properties, and that it therefore is not suitable for this type of asset. This means that by following the standard, the forest companies are doing what is correct from an IFRS-perspective, but it might not be right from a market perspective. Therefore, the fair value that they establish might be considered as less relevant for a possible investor, since it is difficult to say that it in fact is a market value. On the other hand, one can argue that they follow the rules and regulations set up by IFRS, and the fact that they are conservative in their valuation can be justified by saying that they follow the prudence principle. However, since the forest companies do not use current prices, one can argue that they make a systematic undervaluation, which would be in breach of the conceptual framework of IASB. But nevertheless, the fact that the forest companies have to follow the standard IAS 41 is per se a reason why there is such a difference between the price on the private market and the fair value as established by the forest companies, since the standard allows them to use the DCF model and to be conservative in their estimations. In other words, the difference first appears because the forest companies use another method than private persons when valuing the forest, and the difference increases further because of the fact that the DCF model in itself is subjective and used in a conservative way.

### **5.6 Could the market price on the private market be used instead?**

If the forest companies were to use the price on the private market instead of the current DCF model, they would have to adjust for soft values and the so-called "neighbor effect". But since it is clear from both recent studies and from our empirical findings that these values can differ greatly and are almost impossible to determine, it would most likely lead to an even bigger issue than what establishing a fair value already is today. It might be that by using the price on the private market we will come closer to the right fair value, but there are too many differences between these two markets to make this

possible. Neither one of the above mentioned reasons for the big difference in value can solely explain the gap, let alone is it possible to give an exact percentage on how much of the difference each reason represents. It is clear that the forest companies are very conservative in their calculations, but as mentioned in the interviews, the private forest market in Sweden is not perfectly priced and not a very intelligent market. The fact that the price of forest properties is considerably lower in Finland, with almost the exact same conditions as the Swedish market, is proof of the imperfection. This gives rise to the question whether the private forest market in Sweden is actually incorrectly priced, since the high prices that can be observed are somewhat difficult to explain.

The study shows that even though it might at first seem possible to use the price on the private market when valuing the forest companies' biological assets, it is not suitable since it has to do with two separate, different markets. This leads to a conclusion that is applicable also on other industries using the DCF model when estimating the fair value of their assets; even though the fair value is supposed to be a market value, one has to be aware of the fact that this does not necessarily correspond to the price on a similar or related market, which at first can seem relevant.



## 7 Conclusion

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*This chapter will present the conclusions that can be drawn from our analysis. The chapter will then end by presenting our suggestions for further research.*

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### 7.1 Conclusion

There are many factors creating the large difference in value between the price on the private market and the fair value established by the forest companies. The main reasons behind this difference have to do with conservatism by the forest companies, that the companies ignore the soft values, the “neighbor effect” and the fact that there are different purposes of owning forest. Apart from this, there are several other more or less significant reasons for this difference in value. However, all through the analysis the conclusion can be drawn that neither one of these factors can be given an exact value nor a percentage of how much of the difference they answer to, since it differs significantly from case to case.

Soft values have in recent years been said to be of great importance when trying to explain the difference in value, but it is clear that they alone cannot account for the whole difference, and in some cases not even a significant part. As with the so-called “neighbor effect”, the impact of the soft values can differ between sales, and it depends on what is meant by soft values. The “neighbor effect” can probably explain some of the high prices that have been observed in recent years, but the theory fails as soon as there are less than two neighbors. There is no obvious or clear reason explaining the difference in value that is applicable in all cases. This, together with the fact that one can experience much lower prices only when turning to the Finnish market, give reason to suspect that the private forest market in Sweden is imperfectly priced.

The Swedish forest companies are very conservative in their estimations, but as long as they continue to make their calculations with the same purpose as today, and as long as the standard IAS 41 allows them to be conservative, they will most likely not change their way of applying the DCF model. It is difficult to argue that the fair value they establish actually is a market value, but the right value will not be found on the private market. Therefore, to return to our original question whether the price on the private market can be used instead of the DCF model, the answer must be no. There are too many differences between these two markets to make it possible to find a suitable system for applying the price on the

private market on the forest companies' biological assets. One can also draw the conclusion that all these differences show that it has to do with two completely different markets, and comparing them is like comparing apples and oranges.

However, one part of the forest companies' holdings could be said to have a market value similar to the one on the private market, due to the potential for partition. These small, carved out plots that for example Bergvik sometimes sell, are exposed to the market forces on the private market and can therefore be valued accordingly. But this only applies to a small percentage of the forest companies' holdings during a long period of time; the correct market price for the majority of the properties must be searched for somewhere else.

## **7.2 Suggestions for future research**

We have been able to identify several explanations to the difference in value between the price on the private market and the fair value established by the forest companies. However, we have not been able to state how many percentage of the difference each explanation could be responsible for. Future research could therefore focus on making a survey in which individual buyers are asked how much they consider themselves to pay for the soft values we have been able to identify, including the neighbor effect, in order to clarify the importance of these factors. Unfortunately, we were not able to do this since the data we received from LRF Konsult was confidential, and as a result we were not able to contact individual private persons about their purchases.

Both previous research and our study have shown that the fair value that the forest companies establish cannot be considered as a correct market value. However, since we have drawn the conclusion that this value cannot be found on the private market, one has to search for it somewhere else. Future research could therefore focus on finding this value, for example on the American bond or pension market.

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## Appendix 1 – Value per hectare – ground value included

The tables show the value of the forest per hectares and year. The values are gathered from the companies' annual reports and calculated as the value of the biological assets plus the ground value minus the deferred tax (for both the biological asset and the ground value). This value is then divided with the number of hectares that each company owns to receive the value per hectares.

Forest value per year (MSEK)							
<i>Biological asset + Land - Tax</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	6338.9	6429.6	8044.6	8092.3	8261.0	9036.4	11696.9
SCA	16609.0	16675.2	21229.2	22610.4	23023.1	23290.7	23629.0
Bergvik	18445.0	18836.6	21658.3	22773.3	23282.6	23818.4	25400.0
Sveaskog	20859.8	20726.6	20596.3	21220.4	22140.2	22098.9	22116.6

Productive forest land (MHA)							
	2005	2006	2007	2008	2009	2010	2011
Holmen	1.037	1.037	1.037	1.033	1.032	1.0321	1.0328
SCA	2	2	2	2	2	2	2
Bergvik	1.863	1.863	1.907	1.906	1.9	1.9	1.9
Sveaskog	3.4	3.35	3.3	3.3	3.3	3.3	3.1

Value per hectare (MSEK)							
<i>(Biological asset + Land - Tax) / HA</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	6112.7	6200.2	7757.5	7833.7	8004.9	8755.3	11325.5
SCA	8304.5	8337.6	10614.6	11305.2	11511.6	11645.3	11814.5
Bergvik	9900.7	10110.9	11357.3	11948.2	12254.0	12536.0	13368.4
Sveaskog	6135.2	6187.1	6241.3	6430.4	6709.2	6696.7	7134.4

Change in value (%)							
<i>(t-(t-1))/(t-1)</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	-	1.4%	25.1%	1.0%	2.2%	9.4%	29.4%
SCA	-	0.4%	27.3%	6.5%	1.8%	1.2%	1.5%
Bergvik	-	2.1%	12.3%	5.2%	2.6%	2.3%	6.6%
Sveaskog	-	0.8%	0.9%	3.0%	4.3%	-0.2%	6.5%

## Appendix 2 – Value per hectare – ground value excluded

The tables show the forest value per hectares and year. The value of each company's biological assets is gathered from the annual reports. This value is then subtracted with the deferred tax (for the biological asset only), and the ground value is excluded. To receive the value per hectares, this value is then divided with the number of hectares that each company owns.

Forest value per year (MSEK)							
<i>Biological asset - Tax</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	6266.9	6357.6	7972.6	8166.0	8187.3	8962.7	11623.2
SCA	12755.5	13019.0	17211.6	18212.0	18717.6	19212.9	19699.3
Bergvik	17547.8	17912.2	20715.1	21483.6	21961.9	22365.0	23859.6
Sveaskog	19369.4	19257.8	19145.5	19753.8	20656.6	20638.2	20632.3

Productive forest land (MHA)							
	2005	2006	2007	2008	2009	2010	2011
Holmen	1.037	1.037	1.037	1.033	1.032	1.0321	1.0328
SCA	2	2	2	2	2	2	2
Bergvik	1.863	1.863	1.907	1.906	1.9	1.9	1.9
Sveaskog	3.4	3.35	3.3	3.3	3.3	3.3	3.1

Value per hectare (MSEK)							
<i>(Biological asset - Tax) / HA</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	6043.3	6130.8	7688.1	7905.1	7933.5	8683.9	11254.1
SCA	6377.8	6509.5	8605.8	9106.0	9358.8	9606.4	9849.6
Bergvik	9419.1	9614.7	10862.7	11271.5	11558.9	11771.1	12557.7
Sveaskog	5696.9	5748.6	5801.7	5986.0	6259.6	6254.0	6655.6

Change in value (%)							
<i>(t-(t-1))/(t-1)</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	-	1.4%	25.4%	2.8%	0.4%	9.5%	29.6%
SCA	-	2.1%	32.2%	5.8%	2.8%	2.6%	2.5%
Bergvik	-	2.1%	13.0%	3.8%	2.5%	1.8%	6.7%
Sveaskog	-	0.9%	0.9%	3.2%	4.6%	-0.1%	6.4%



### Appendix 3 – Value per m<sup>3</sup> – ground value included

The tables show the value of the forest per m<sup>3</sup> and year. The values are gathered from the companies' annual reports and calculated as the value of the biological assets plus the ground value minus the deferred tax (for both the biological asset and the ground value). This value is then divided with the number of cubic meters that each company owns to receive the value per m<sup>3</sup>.

Forest value per year (MSEK)							
<i>Biological asset + Land - Tax</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	6339.0	6430.0	8045.0	8092.0	8261.0	9036.0	11697.0
SCA	16609.0	16675.0	21229.0	22610.0	23023.0	23291.0	23629.0
Bergvik	18445.0	18837.0	21658.0	22773.0	23283.0	23818.0	25400.0
Sveaskog	20860.0	20727.0	20596.0	21220.0	22140.0	22099.0	22117.0

Productive forest land (m3)							
	2005	2006	2007	2008	2009	2010	2011
Holmen	113	116	117	118	119	120	118
SCA	191	200	200	199	207	209	209
Bergvik	233	234	236	236	236	237	239
Sveaskog	268	267	256	258	253	250	244

Value per cubic meter (MSEK)							
<i>(Biological asset + Land- Tax) / m3</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	56.1	55.4	68.8	68.6	69.4	75.3	99.1
SCA	87.0	83.4	106.1	113.6	111.2	111.4	113.1
Bergvik	79.2	80.5	91.8	96.5	98.7	100.5	106.3
Sveaskog	77.8	77.6	80.5	82.2	87.5	88.4	90.6

Change in value (%)							
<i>(t-(t-1))/(t-1)</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	-	-1.2%	24.0%	-0.3%	1.2%	8.5%	31.6%
SCA	-	-4.1%	27.3%	7.0%	-2.1%	0.2%	1.5%
Bergvik	-	1.7%	14.0%	5.1%	2.2%	1.9%	5.7%
Sveaskog	-	-0.3%	3.6%	2.2%	6.4%	1.0%	2.5%

## Appendix 4 – Value per m<sup>3</sup> – ground value excluded

The tables show the value of the forest per m<sup>3</sup> and year. The value of each company's biological assets is gathered from the annual reports. This value is then subtracted with the deferred tax (for the biological asset only), and the ground value is excluded. To receive the value per m<sup>3</sup>, this value is then divided with the number of cubic meters that each company owns.

Forest value per year (MSEK)							
<i>Biological asset - Tax</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	6266.9	6357.6	7972.6	8166.0	8187.3	8962.7	11623.2
SCA	12755.5	13019.0	17211.6	18212.0	18717.6	19212.9	19699.3
Bergvik	17547.8	17912.2	20715.1	21483.6	21961.9	22365.0	23859.6
Sveaskog	19369.4	19257.8	19145.5	19753.8	20656.6	20638.2	20632.3

Productive forest land (m3)							
	2005	2006	2007	2008	2009	2010	2011
Holmen	113	116	117	118	119	120	118
SCA	191	200	200	199	207	209	209
Bergvik	233	234	236	236	236	237	239
Sveaskog	268	267	256	258	253	250	244

Value per cubic meter (MSEK)							
<i>(Biological asset - Tax) / m3</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	55.5	54.8	68.1	69.2	68.8	74.7	98.5
SCA	66.8	65.1	86.1	91.5	90.4	91.9	94.3
Bergvik	75.3	76.5	87.8	91.0	93.1	94.4	99.8
Sveaskog	72.3	72.1	74.8	76.6	81.6	82.6	84.6

Change in value (%)							
<i>(t-(t-1))/(t-1)</i>	2005	2006	2007	2008	2009	2010	2011
Holmen	-	-1.2%	24.3%	1.6%	-0.6%	8.6%	31.9%
SCA	-	-2.5%	32.2%	6.3%	-1.2%	1.7%	2.5%
Bergvik	-	1.6%	14.7%	3.7%	2.2%	1.4%	5.8%
Sveaskog	-	-0.2%	3.7%	2.4%	6.6%	1.1%	2.4%

## Appendix 5 – Sales statistics

These tables show the average prices of forest properties in Sweden per hectares and per m<sup>3</sup> over a period of eight years. The numbers are based on LRF Konsult's sales statistics.

Average prices in Sweden per hectare		
Total value of sales per year / HA		
Year	Over 500 HA	Over 300 HA
2005	37153.8	24353.1
2006	10900.9	11116.2
2007	26491.8	27195.2
2008	40706.5	36689.7
2009	27620.8	23197.2
2010	14660.3	29520.0
2011	74723.8	43199.7
2012	n/a	60554.6

Average prices in Sweden per m3		
Total value of sales per year / m3		
Year	Over 500 HA	Over 300 HA
2005	244.7	235.6
2006	215.6	229.0
2007	289.4	297.7
2008	342.6	325.4
2009	256.1	296.2
2010	276.9	367.0
2011	403.1	355.1
2012	n/a	430.7

Average prices in Sweden per region and hectare								
Over 300 HA								
Region	2005	2006	2007	2008	2009	2010	2011	2012
I	38313.3	n/a	42385.2	31733.4	1474.0	n/a	42017.1	110599.1
II	n/a	n/a	n/a	n/a	52250.8	n/a	61538.5	n/a
III	n/a	n/a	57797.2	n/a	42162.7	78941.4	28905.2	n/a
IV	7555.3	13633.5	14104.2	36511.4	11179.7	15950.6	n/a	48056.3
V	32096.7	10268.7	25940.9	37334.7	21874.3	26829.2	43048.4	n/a

Average prices in Sweden per region and m3								
Over 300 HA								
Region	2005	2006	2007	2008	2009	2010	2011	2012
I	318.1	n/a	328.9	367.7	32.5	n/a	391.4	595.6
II	n/a	n/a	n/a	n/a	558.7	n/a	507.9	n/a
III	n/a	n/a	388.0	n/a	365.5	497.0	341.6	n/a
IV	127.7	222.0	253.7	324.8	227.2	282.5	n/a	371.5
V	225.6	232.2	290.7	321.8	270.0	337.4	327.2	n/a

Regions	
Gotland	I
Jönköping	I
Kalmar	I
Östergötland	I
Västergötaland	I
Stockholm	II
Uppsala	II
Dalarna	III
Gävleborg	III
Västerbotten	IV
Västernorrland	IV
Jämtland	V
Norrbottn	V

## **Appendix 6 - Interview questions to forest companies**

### **Sveaskog, Holmen, Bergvik and SCA**

#### **Part 1 – How the forest companies use and interpret IAS 41**

**1** Your company estimates the value of the forest according to the DCF-model. Do you apply any certain company specific models for the valuation? How is the valuation accomplished?

**2** How are the free cash flows estimated?

**2.1** What assumptions are made concerning the price-, and cost developments and what are these assumptions based on?

**2.2.** Do you deduct the corporate tax rate (26.3%) from the cash flows?

**3** How is the harvesting plan established?

**3.1** Is it common that adjustments to this plan are made during one rotation period (10 years)?

**4** Sveaskog/Holmen/Bergvik/SCA, you own forest in the whole of Sweden and it is well known that the forest is worth more in the south of Sweden than up north. Do you take this into account in your calculations and in that case how?

**5** You are applying a discount rate of 6.25% (Holmen 5.5%). We have understood that you use the WACC formula to calculate this, but how do you estimate the cost of equity including the beta value, the risk free rate and the return on the market portfolio?

**5.1** How do you estimate the cost of debt?

**6** Do you cooperate with any external parties in order to calculate the value of the biological assets?

**6.1** Why these parties and what influence do they have?

**7** Do you think that there is room for subjectivity in the estimations of: I) the free cash flows, II) the harvesting volumes and III) the discount rate?

**Part 2 – The difference between the fair value, as established by the forest companies, and the market value of the forest.**

**1** After looking at the selling prices of large forest properties in recent years, we have been able to establish a market price that is significantly higher than the book value of your company's biological assets. What do you think is the reason for this?

**2** When you are selling and buying biological assets, how large areas are in average involved in these purchases/sellings?

**2.1** Do you simply believe that the size of the objects can explain some part of the difference in value between the fair value, as established by the forest companies, and the market value? (In the same way as with apartment prices - where the price per square meter is lower on larger apartments).

**3** Some of the estimated future free cash flows are not realized until far in the future. Could it be that you therefore consciously do not want to realize too high values in the accounting today?

**4** Non-monetary values are not taken into consideration in your valuation process. Do you believe that this can explain the difference in value?

**4.1** Which non-monetary values are there according to your opinion?

**5** What do you personally think about the value development of the forest in a perspective of 5 to 20 years?

**6** What are the most important risks within the forest industry? How do these differ from today and ten years into the future?

7 Do you have any other comments concerning the valuation and accounting of biological assets according to IAS 41?

8 Which analysts of the forest industry do you believe are the best?

### Part 3 – Company specific questions

#### Sveaskog

1 You take into account the geographical location when estimating the rotation period. How many different regions do you apply in your calculations and where do you draw the geographical lines?

2 We have understood that the harvesting and forest management plans are calculated by a so called “Breakdown package”, can you tell us more about this?

#### Holmen

1 In 2007 you changed your discount rate from 6.25% to 5.5%, what was the reason for this? Why do you think the other forest companies, Sveaskog, SCA and Bergvik, remain at a rate of 6.25%?

2 Your beta value has differed between 1.0 in 2006 and 0.5 in 2008, what is the reason for this?

3 In 2007, you bought a forest property for a much higher price than what it then was valued at in your balance sheet (53 MSEK), and as a result you reported a loss the same year. Why did you do this and is it a common procedure?

#### SCA

1 In 2007, you revalued your biological assets resulting in a value increase by 5173 MSEK. One of the reasons for this was increased timber prices, but one could also see an increase in SCA’s future harvesting volumes. Were there any other explanations to the large increase in value?

#### Bergvik

1 Between 2006 and 2007, the fair value of your biological assets increased with about 13%, what was the reason for this?

## Appendix 7 – Interview questions Danske Bank

**1** Do you work exclusively with private forest owners or also with forest companies?

**2** How do you value your customers' forest holdings?

**2.1** In those cases when existing balance sheets are to be found, do you only look at these or do you make further calculations?

**2.1** Do you apply any specific internal model for the calculations?

**3** We have read that the forest is priced per m<sup>3</sup> and that the price statistics shows that the sales price is a lot higher than the net price you receive from harvesting. Why is that?

**3.1** What do you get in average per m<sup>3</sup> from a sale?

**4** If you look at the sales that Danske Bank has mediated since 2005, have these properties been sold for a higher or lower price than what they were accounted for?

**5** How familiar are you with IAS 41?

**5.1** Do you think the transition from historical cost to fair value has helped you in your work?

**5.2** Do you think it is a fair value that the forest companies establish today?

**6** What role do you think the so-called soft values play in the valuation of forest on the private market?

**7** When you create a new forest management plan before a sale, how do you proceed?

**8** There is a tendency showing that the forest companies have increased the value of the forest when the industry has declined. Do you have any comments on this?

**9** Several analyzes indicate that the price of forest land and the profit of the forest industry have a low correlation with the stock market development; some analyzes even show that there might be a negative correlation. Do you have any comments on this?

**10** What do you think about the value development of forest in the future, in a perspective of 5 to 20 years?

**11** What are the most important risks within the forest industry? How do these differ from today and ten years into the future?

**12** What effect do you think that bioenergy has on forest valuation?

**13** Do you have any other comments?



## Appendix 8 – Interview questions Carnegie

**1** Could you start by describing your position and assignments? Do you invest in the forest companies, or do you only analyze its performance?

**2** When you risk rate the forest companies, do you simply look at the already established balance sheets, or do you make any further calculations?

**2.1** Do you use any specific internal models for your calculations? Which input factors do you take into consideration?

**3** How familiar are you with IAS 41?

**3.1** Do you think the transition from historical cost to fair value has helped you in your work?

**3.2** Do you think it is a fair value that the forest companies establish today?

**4** The forest companies want to avoid short-term fluctuations in their valuation, and they therefore choose to only change the input factors after they have been able to see a long-term change in value. Do you think this would be different if the forest companies were able to bring the change in value to the statement of other comprehensive income rather than to the income statement?

**5** The forest companies do not take into account the so called soft values in their valuation. Do you think these values could explain the large difference in value between the forest companies' fair value and the price on the private market?

**6** There is a tendency showing that the forest companies have increased the value of the forest when the industry has declined. Do you have any comments on this?

**7** Several analyzes indicate that the price of forest land and the profit of the forest industry have a low correlation with the stock market development; some analyzes even show that there might be a negative correlation. Do you have any comments on this?

**8** Do the average values among equity analysts at the major banks differ from the forest companies own values?

**8.1** Do the analysts at the major banks differ in their valuation of the forest?

**10** What do you think about the value development of forest in the future, in a perspective of 5 to 20 years?

**11** What are the most important risks within the forest industry? How do these differ from today and ten years into the future?

**12** What effect do you think that bioenergy has on forest valuation?

**13** Do you have any other comments?

## Appendix 9 - Interview questions LRF Konsult

**1** Could you start by describing your position and assignments?

**2** Do you work exclusively with private forest owners or also with forest companies?

**3** How do you value your customers' forest holdings?

**3.1** In those cases when existing balance sheets are to be found, do you only look at these or do you make further calculations?

**3.1** Do you apply any specific internal model for the calculations?

**4** If you instead were to value the forest by price per hectares, do you think one should include both the land value and the value of the biological assets or the value of the biological assets only?

**4.1** Do you think that one should take into account the tax effect in the valuation of forest?

**5** When you want to compare the value of the forest on the private market with the forest companies' estimated fair value, do you think that it is more suitable to use the price per m<sup>3</sup> or the price per hectares?

**6** How important do you think that the soft values are in the value assessment of forest on the private market?

**6.1** When valuing the forest per cubic meter, how do you include the soft values?

**7** We have read that the forest is priced per m<sup>3</sup> and that the price statistics shows that the sales price is a lot higher than the net price you receive from harvesting. Why is that?

**8** If you look at the sales that LRF Konsult has mediated since 2005, have these properties been sold for a higher or lower price than what they were accounted for?

**9** What do you think about the value development of forest in the future, in a perspective of 5 to 20 years?

**10** What are the most important risks within the forest industry? How do these differ from today and ten years into the future?

**11** What effect do you think that bioenergy has on forest valuation?

**12** Do you have any other comments?

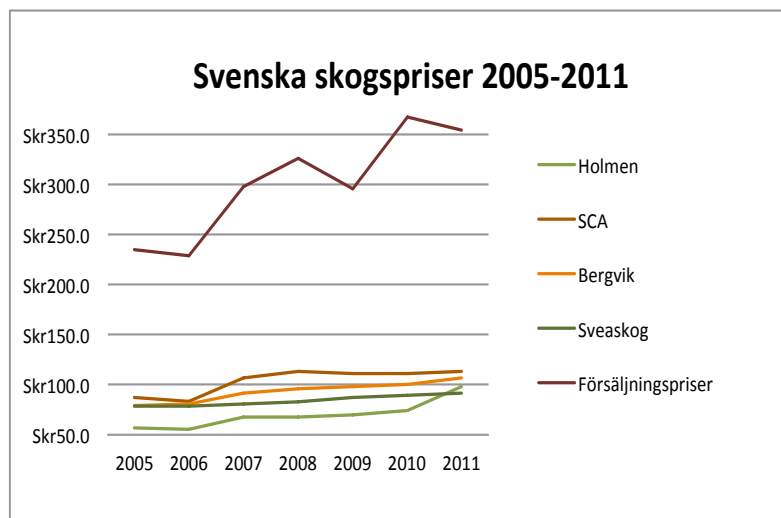
# Skogsbolagens fair value

## - Därför kan man inte använda privatmarknadens priser

Det har länge debatterats huruvida skogsbolagens fair value visar ett korrekt marknadsvärde eller inte. Många analytiker har uttalat sig om att skogsbolagens tillgångar är undervärderade, och det har diskuterats huruvida man kan använda sig av priserna på privatmarknaden istället. Dock visar det sig att det finns alltför stora skillnader de två marknaderna emellan för att privatmarknadens priser ska kunna appliceras på skogsbolagens tillgångar.

De fyra stora skogsbolagen i Sverige, Holmen, SCA, Bergvik och Sveaskog, äger alla sin egen skog och redovisar sedan 2005 sina biologiska tillgångar till fair value, vilket ska motsvara marknadsvärdet. Men då dessa bolag inte anser att det finns någon aktiv marknad för så stora tillgångar som de innehar, och därmed inget rådande marknadsvärde, använder de i stället diskonterade kassaflöden för att räkna ut värdet på tillgångarna. Dock har flera av skogsbolagen sedan införandet av fair value värderat upp sina tillgångar markant, särskilt då industrin givit vika, vilket har gjort att man börjat ifrågasätta om det verkligen är ett fair value som skogsbolagen redovisar.

Då man har kunnat observera försäljningspriser på privatmarknaden som är upp till fem gånger högre än skogsbolagens fair value, har man försökt översätta dessa priser till skogsbolagens tillgångar, och hävdade att detta ger ett mer rättvisande värde. Det man dock inte har tagit hänsyn till är huruvida dessa marknader faktiskt går att jämföra, då det finns mycket som tyder på att detta inte är lämpligt.



Källa: LRF Konsult och skogsbolagens årsredovisningar

Betydelsen av icke-monetära värden, eller så kallade mjuka värden, så som jaktlicens, bär-och svamplockning samt känslan av att äga skog, har länge diskuterats. Exakt hur stor betydelse dessa värden har för privatpersoner är ytterst svårt att avgöra, då det varierar kraftigt från fall till fall och då det inte är helt entydigt vad som menas med mjuka värden. Vår studie visar dock att dessa värden endast i en liten andel av fallen kan förklara de extremt höga priserna, men de gör ändå att en jämförelse mellan marknaderna blir svår. Skulle skogsbolagen använda privatmarknadens pris skulle de behöva justera för de mjuka värdena, vilket med största sannolikhet skulle leda till ännu större problem än den nuvarande diskonteringsmodellen.

En annan teori som har nämnts som förklaring till den stora skillnaden i värde mellan skogsbolagens fair value och priset på privatmarknaden, är den så kallade

”granneffekten”, som kan sägas vara en variant av ett mjukt värde. Denna förklaring handlar om att skogsfastigheter är en sällanköpsvara, då en viss skogsfastighet kanske kommer ut på marknaden endast vart 200e år. Den här fastigheten har då ett mycket högt värde, både strategiskt och sentimentalt, för eventuella grannar, vilket gör att priset skjuter i höjden.

-60 % av skogsfastigheterna som säljs på privatmarknaden köps av grannar, vilket förklarar de höga priserna, menar Johan Freij, affärsområdeschef för Skog & Lantbruk på Danske Bank.

**Det har också visat sig** att skogsbolagen är oerhört konservativa i sina beräkningar av fair value, vilket bland annat speglas i deras användande av historiska trendpriser i stället för aktuella priser.

- Huvudsyftet med värderingen idag är att undvika stora fluktuationer, eftersom en uppvärdering av skogen inte påverkar de årliga kassaflödena, förklarar Anders Jakobsson, economichef på Sveaskog.

Det faktum att skogsbolagen är konservativa i sina bedömningar har även att göra med att de har ett annat syfte med sitt skogsägande än vad privatpersoner har, och gör därmed andra kalkyler. Skogsbolagen gör industrikalkyler där avkastningen från skogen måste täcka den ursprungliga investeringen, medan privatpersoner i många fall inte gör någon kalkyl alls.

-Det här är inte någon särskilt intelligent marknad, privatpersoner som köper skog gör ingen avancerad kalkyl, förklarar Johan Freij.

Privatpersoner upplever även andra investeringsmöjligheter än företag, och jämför kanske att investera i en skogsfastighet med att placera pengarna på banken, som ger en avkastning runt 2 %. Detta gör att de har en betydligt starkare betalningsförmåga jämfört

med skogsföretagen, som kräver en avkastning runt 6 %.

**Det händer att skogsföretagen** säljer små, avstyckade plottar av sina tillgångar, för vilka de får betalt upp till fem gånger så mycket som de var bokförda till. Här finns alltså en arbitragemöjlighet, men skulle den utnyttjas mer än i dagsläget skulle det mätta marknaden fort. Dock finns det alltså utrymme för skogsbolagen att sälja av en liten andel av sitt totala innehav under en längre period, och denna del skulle kunna värderas med hjälp av privatmarknadens pris.

**För den stora andelen** av skogsbolagens tillgångar gäller dock inte detta. De ovan nämnda förklaringarna gör det svårt att rättfärdiga användandet av privatmarknadens priser för skogsbolagens tillgångar. Med detta sagt betyder det inte att skogsbolagen redovisar ett korrekt fair value utifrån ett marknadsperspektiv, men det rätta värdet finner man inte på den privata skogsmarknaden.



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