

Cut to the Chase

A Study of the Usefulness of a Simplified Residual Income & Abnormal Earnings Growth Model

Axel Wingård[♣]

Emil Viklund[♣]

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Stockholm School of Economics

Abstract

This study explores the usefulness of two simplified accounting based valuation models; the simplified residual income and simplified abnormal earnings growth models. With a quantitative approach, the companies on the Stockholm Stock Exchange's Large Cap List have been used as a sample for two tests. First we have, by conducting a historical analysis, tried to find company characteristics that would imply better compatibility with the models. Further, we have applied the models on a holdout sample in order to test the observed patterns and the accurateness of the models. Our results show that the two models are applicable on companies that are; old, preferably large and operate in mature industries. In addition, we find that the simplified residual income valuation model is applicable on more companies than the simplified abnormal earnings model.

Tutor: Professor Kenth Skogsvik

Discussants: Martin Grund, Carl-Fredrik Danielson, John Gyllenhammar

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[♠]19790@student.hhs.se

[♣]19715@student.hhs.se

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1 Introduction

In the literature covering valuation techniques as well as in practice, two general trends can be observed. One is towards multiple valuation techniques whilst the other is towards fundamental valuation techniques including Free Cash Flow valuations and accounting based valuations such as the Residual Income Valuation and the Abnormal Earnings Growth model. In this study of 59 companies on the Stockholm Stock Exchange, we try to find a path in between these two trends by evaluating two alternatives; two quick accounting based valuation techniques using only a terminal value for an initial estimate of a company's market capitalization.

There are several advantages of multiple valuation techniques. First and foremost they are widely accepted methods for performing quick valuations of companies; as a reality check together with fundamental valuations and for getting a raw estimate of the company value. In addition they are based on observable variables, e.g. stock price and earnings. The multiple techniques are relying on that the market prices are correct; i.e. a semi strong market efficiency (Fama E. , 1970). The multiple valuation models have supporters both in practice and in research. For example, Liu, Nissim, & Thomas, (2002) finds that the Price to Earnings ratio outperforms other multiples as well as the more complex Residual Income Valuation model in explaining stock prices. However, a multiple valuation also has some inherent disadvantages. The primary one being that is based on industry average variables which overlooks that companies within an industry can have very different prospects which warrants different multiples. When multiplying earnings by an industry average, this "fair" valuation could be far from true (Goedhart, Koller, & Wessels, 2005).

So what if too much emphasis is put on market data and the market does not fulfil the criteria for semi strong market efficiency? If so, the multiples are based on information that is incorrect. There are a number of generally accepted methods for valuing a company where the valuation relies less on market data and more on accounting information. Two of these are the Residual Income Valuation Model and the Abnormal Earnings Growth Model. The accounting based models has gained supporters as they empirically has been found to explain stock prices better than cash flow and dividend based models (Francis, Olsson, &

Oswald (2000), Penman & Sougiannis (1996)). Both of these models are based on the idea that a company only adds value when it can earn returns above the required rate. However, properly applying the models in order to calculate the value of a company involves a number of time consuming tasks. To be able to build a credible model a profound knowledge of the company and the industry is needed. From this information an explicit forecast period is built. The forecasts of these models will by definition be uncertain since there are detailed assumptions for many years in the future. For every year added, more detail is put into the model. If one would have all necessary information, this would mean that the model would be very precise. However, because of information asymmetries and uncertain future, the model becomes more speculative and uncertain for every explicit year added. Thus, for everyday decision making it might be valuable to have a quick valuation technique that is based on accounting data but is less time consuming than the complete valuation models. These models will also contain less speculative information, something that might be an advantage in an uncertain environment.

To our knowledge, these two simplified valuation models have not been tested in previous research. The lack of previous empirical tests of the models makes our study more relevant and interesting since it will provide an indication of the practical usefulness of the models. Our results show that a rather clear pattern can be observed regarding what types of companies the models are more applicable on. Hence, in certain situations, it might be possible to “cut to the chase” by taking the quick route when valuing companies with accounting based models.

If nothing else is said in this paper, RI stands for the actual Residual Income for a year or number of years whilst RIV is the abbreviation for the actual Residual Income Valuation model. AEG stands for Abnormal Earnings Growth for a year or number of years. When referring to the model, this will be explicitly written out. When referring to the simplified versions, an “S” is added in front of the abbreviation; “SRIV” and “SAEG”. Other abbreviations should be explained throughout the text.

1.1 Purpose

In this paper, we would like to test the functionality of two simplified valuation models; a simplified RIV and a simplified AEG. As indicated by their names these versions are both quicker and easier to apply than the complete models. The general idea is that you skip the difficult and uncertain task of forecasting the future performance during the explicit forecast period. Instead you apply the continuing value calculation today. Thus, for the SRIV the value of a particular company is equal to the book value of equity plus the continuing value. For the SAEG the value is equal to next year's capitalized earnings and continuing value of eternal AEG. When applying the simplified version you only need to forecast earnings for one year ahead for the SRIV whilst the SAEG requires forecasts of earnings for two years ahead and next year's dividend. Assuming it works, this is a much more certain and easier task than forecasting earnings and dividends many years into the future. However, by applying these models you by definition assume that the residual incomes or abnormal earnings of the company being valued will grow at the same rate every year in eternity. This assumption does not hold true for many companies and for those companies the simplified valuation models will not produce correct values. However, these models could at least in theory generate a good approximation of the true value of a company.

This leads us to the purpose of this paper.

- 1) The primary purpose of this paper is to test the simplified residual income and abnormal earnings growth valuation models ability to generate good approximations of a company's value.
- 2) A secondary purpose is to make an attempt to draw some conclusions about on what type of companies and industries the models are more applicable. If such conclusions can be drawn an analysis of which type of characteristics those companies and industries possesses will be conducted.

Answering our primary purpose will be done by constructing a quantitative model in two parts. First an analysis sample¹ of companies from the Stockholm Stock Exchange will be studied with regard to the historical growth in residual income and abnormal earnings growth to give us an indication if the models theoretically would work and what characteristics the companies for which the models works for possess. In the second part of the study the models will be tested on a hold-out sample² to see how the model would work in practice. To answer our secondary purpose we will find quantitative and qualitative patterns in our sample by grouping the sample with regard to different characteristics. Possible explanations for our results will be given by comparing it with relevant research and literature. We will also test the sensitivity of our results to see what will happen if the assumption we have made change.

This paper is organized as follows. In the next part we will describe how we have chosen to limit our study. Section II describes the literature and the theoretical framework whilst Section III describes the methodology we have used including the characteristics of our sample and data selection. The results we have gathered from our data are presented in Section IV. Section V analyses the results of our study and test the sensitivity of our results. Section VI discusses the validity and reliability whilst Section 7 concludes and discusses the implications and possible further research to be made.

1.2 Delimitations

Since the analysis is dependent upon historical data which is readably available for publicly listed companies, the OMX Large Cap List is chosen. However, there are far more companies that are publicly listed in Sweden than those on the Large Cap List. The reason for focusing on the largest companies is to limit the scope of the study. They are also a well defined group large enough to draw statistically reliable conclusions from; they have generally been

¹ The analysis sample (sometimes referred to as an “estimation sample”) provides a test of the model’s predictive validity

² The holdout sample is used to see how well the results from the analysis sample works on a separate set of data to give a stronger validity than if tested on the same data

listed long enough to be able to get the necessary data; and they are also generally covered by more analysts which in turn gives more reliable average earnings forecasts. We have chosen to focus on Swedish Companies only since this will make comparability easier as accounting principles change across countries.

Trying to draw general conclusions on tests on two models on a sample of this size is difficult. For us to be able to draw any conclusions we have had to assume that the market is efficient, i.e. that the stock prices we test the model on are correct. Of course, it might as well be that the shares are over- or undervalued and that the model can show effects of that kind. However, it is out of the scope of this study to find imperfections in the market.

2 Theoretical Framework

2.1 Residual Income Valuation³

The basic feature of the Residual Income Valuation model is to calculate the value of owner's equity in a company by estimating the excess profit over the required rate of return. The model is based on the idea that a company only adds value when it can earn returns greater than the required rate. The excess returns are called residual incomes and are computed as described in equation 2-1:

Equation 2-1

$$\text{Residual Income}_t = (R_{e(t)} - \rho_{e(t)}) \times B_{(t-1)}$$

Where,

$R_{e(t)}$ = return on equity

$\rho_{e(t)}$ = required return on equity

$B_{(t-1)}$ = opening balance book value of owners equity

The RIV can be divided into three components; the accounting book value, the present value of the explicit period, and the present value of the expected value of owners' equity at the horizon point in time. These three components give equation 2-2:

Equation 2-2

$$V_0 = B_0 + \sum_{t=1}^T \frac{B_{t-1}(R_{e,t} - \rho_e)}{(1 + \rho_e)^t} + \frac{B_T \times (R_e - \rho_e)}{\frac{\rho_e - g_{ss}}{(1 + \rho_e)^T}}$$

Where:

V_0 = Value of owners' equity at $t = 0$

B_0 = book value of equity

³ The section on the RIV model is largely based on Kenth Skogsvik's "A Tutorial on Residual Income Valuation and Value Added Valuation" from 2002

$R_{e,t}$ = Return on equity accrued in period t

ρ_e = cost of equity

g_{ss} = steady state growth

The first part, the accounting book value is the actual accounting figure of equity in the company's balance sheet and can be regarded as unproblematic, at least as long as the clean surplus relation holds (Skogsvik 2002). The second component, which we call the explicit period, is expressed in equation 2-3:

Equation 2-3

$$\sum_{t=1}^T \frac{B_{t-1}(R_{e,t} - \rho_e)}{(1 + \rho_e)^t}$$

It is the sum of a number of years where actual assumptions and numbers are gathered for each year. The explicit period can last anywhere from a few years up to a very long period depending on where it is estimated that the company have reached steady state. As have been studied in research (Nissim & Penman (2001), Bergmark & Cecchini (2002), Fama & French (2000)), companies tend to revert to steady state in a process normally labeled as a mean reversion. Mean reversion will be described in more detail in section 2.7 but there is no general rule on when a company reaches steady state. This takes us to our last component, equation 2-4 which expresses the value for steady state:

Equation 2-4

$$\frac{B_T \times (R_e - \rho_e)}{\frac{\rho_e - g_{ss}}{(1 + \rho_e)^T}}$$

This variable expresses the continuing value which represents the residual income that the company will generate in eternity. By applying the continuing value formula one assumes that the company has reached steady state which is characterized by a constant year to year growth rate of residual income. At steady state one no longer needs to explicitly forecast each year's residual income as it will grow by a constant factor each year, g , which will be similar to that of the economy as a whole, and the Gordon Growth Formula is therefore

applicable. The calculated continuing value represents the value of owner's equity at the horizon point in time. In order to get the value of owner's equity at the valuation point in time the continuing value is discounted by $(1 + \rho_e)^T$.

2.2 Simplified Residual Income Valuation

As explained above applying the RIV model requires a detailed forecast period. However, there is a simplified version of the RIV model. The model is simply known as the Simplified Residual Income Valuation. The simplified version assumes that the company being valued already has reached steady state and the continuing value formula is therefore applied as of today. Hence, one only needs to forecast next year's earnings. Consensus forecasts⁴ are regularly published making the model quick and relatively easy to apply. As the explicit forecast period is omitted in the simplified model the formula for computing the value of owners' equity is defined as in equation 2-5:

Equation 2-5

$$V_0 = B_0 + \frac{B_0 \times (R_e - \rho_e)}{\rho_e - g_{ss}}$$

2.3 Abnormal Earnings Growth Model⁵

An alternative to the residual income valuation model is the abnormal earnings growth model. The two models are fundamentally very similar and are both based on the idea that a company adds value when it earns above the required rate of return. A testament to the similarity between the two models is that a restatement of the abnormal earnings growth formula shows that the abnormal earnings growth for a particular year is equal to the change in residual income between that particular year and the year before. If this is the case the two models will always produce identical company values. However, the models

⁴ A Consensus forecast is the average of the published research analysts' forecasts

⁵ The section on the Abnormal Earnings Growth model is, unless stated otherwise, based on Stephen H. Penman's Financial Statement Analysis and Security Valuation (2005)

are only restatements of each other under the assumption that the clean surplus relation holds. (Penman, 2005) The clean surplus relation states the change in equity from one year to the next is equal to net income less net dividends. In reality this is not often the case. Translation differences and other items do not flow through the income statement but still affects the book value of equity violating the clean surplus relation. These types of accounting effects are referred to as dirty surplus accounting.

Even though the residual income and the abnormal earnings growth models theoretically are very similar they have different focal points. The residual income model anchors the company value on the book value of equity and adds on the value of future earnings above the required level. In contrast the abnormal earnings model anchors the company value on future earnings. To focus on earnings has some inherent advantages. Users of financial information understand earnings, the model has a natural connection to the widely used price-to-earnings multiple and analysts regularly publish forecasted earnings. (Penman, 2007) In addition, a significant advantage of the AEG model is that it does not require clean-surplus accounting which RIV does. (Penman, 2005) Even when the clean-surplus relation holds on a total dollar basis it can still be violated on a per share basis through share transactions. When for example a company issues new shares at a price that differs from the book value per share the book value per share will be affected. Hence, as the RIV is dependent on clean-surplus accounting the model does not take share transactions into account. (Ohlson, 2005)

The abnormal earnings growth model is based on the idea that a company's value depends on its ability to produce earnings above a normal level. In order to calculate the abnormal earnings growth for a particular year the concept of cum-dividend earnings is applied. The abnormal earnings growth is equal to the difference between cum-dividend earnings and normal earnings. Equation 2-6 shows how AEG is defined:

Equation 2-6

$$\begin{aligned}
 AEG &= \text{cum dividend earnings}(t) - \text{normal earnings}(t) \\
 &= [\text{earnings}(t) + \rho_e \times \text{dividend}(t - 1)] - (1 + \rho_e) \times \text{earnings}(t - 1)
 \end{aligned}$$

Cum-dividend earnings are thus defined as actual earnings with last year's dividend reinvested at the required rate of return while normal earnings is equal to last year's earnings growing at the required rate of return.

As the abnormal earnings growth model theoretically is very similar to the residual income model the formula for valuing the owner's equity with AEG is also similar to the RIV formula. It consists of the three components in equation 2-7, defined in the following way:

Equation 2-7

$$V_0 = \frac{Earnings_1}{\rho_e} + \frac{1}{\rho_e} \left(\sum_{t=2}^{T+1} \frac{AEG_t}{(1 + \rho_e)^{t-1}} + \frac{AEG_{T+2}}{\rho_e - g_{ss}} \right) / (1 + \rho_e)^T$$

Where:

V_0 = calculated value of owners equity at the valuation point in time

$Earnings_1$ = forecasted earnings for one year ahead

AEG_t = abnormal earnings growth for period t

ρ_e = required return on equity

g_{ss} = steady state growth rate

The first component expresses the capitalized earnings for one year ahead. In the next step of the valuation one develops the same explicit forecast period as in the residual income valuation. Hence, one is faced with the same difficulties concerning the need for profound knowledge of the company being valued in order to make reliable assumptions about the future. The final component is the continuing value which expresses the value of owner's equity at the horizon point in time. At this point the company is assumed to have reached steady state making the Gordon Growth Formula applicable. The sum of the discounted abnormal earnings growths attributable to the explicit forecast period and continuing value is then capitalized by the required return on equity. Adding the capitalized earnings for period one gives the value of owners' equity at the valuation point in time.

2.4 Simplified Abnormal Earnings Growth

In the same way as for the Simplified RIV, the simplified version of the AEG model applies the Gordon Growth Model as of today and the explicit forecast period is thereby excluded (Penman, 2007). SAEG assumes the company being valued has reached steady state; hence the company will exhibit a constant growth in abnormal earnings growth. The only two variables that need to be forecasted in the simplified model are next year's earnings per share and dividend per share, making the model quick and easy to apply. The SAEG formula is presented as in equation 2-8.

Equation 2-8

$$V_0 = \frac{EPS_1}{\rho_e} + \frac{1}{\rho_e} \left(\frac{AEG_2}{\rho_e - g_{ss}} \right)$$

Where:

V_0 = Calculated per share value at the valuation point in time

EPS_1 = Forecasted earnings per share for one year ahead

AEG_2 = Forecasted abnormal earnings growth for two years ahead

ρ_e = required return on equity

g_{ss} = steady state growth rate

The value per share is thus found by capitalizing next year's earnings per share and the value of all future abnormal earnings growths.

2.5 Clean Surplus Relation

The clean surplus relation of accounting states that the changes in equity are dependent only on net income, dividends and new issues of share capital, see equation 2-9. For the RIV to work it is assumed that the clean surplus relation holds for every period.

Equation 2-9

$$B_t - B_{t-1} = NI_t - D_t + N_t$$

Where:

D_t = Dividend in period t

N_t = New issue of shares in period t

B_t = Book value of equity in period t

NI_t = Net income in period t

The AEG valuation model does not require the clean surplus relation to hold. However, when clean surplus relation holds the same value of owners' equity is generated by both the RIV and AEG model.

2.6 Capital Asset Pricing Model

Both valuation models applied in the thesis rely on measuring the cost of equity in a particular company. Ideally the cost of equity should be the expected return on that particular stock. However, the expected return is not observable so we turn to asset-pricing models which employ different measurements of risk that translates to expected returns. Three of the most popular asset-pricing models are; Capital Asset Pricing Model (CAPM), Fama-French three-factor model and the arbitrage pricing theory (APT). The primary difference between the models is their respective definition of risk (Goedhart, Koller, & Wessels, 2005).

We have chosen to apply the CAPM in the thesis because it is the most commonly used out of the three. (Goedhart, Koller, & Wessels, 2005) In CAPM the risk of a particular stock is defined as its sensitivity to a well-diversified stock portfolio, such as the S&P 500 or in our case the commonly used Swedish index, OMX 30.

Equation 2-10 shows how the formula for calculating the expected return according to CAPM is defined:

Equation 2-10

$$E(R_i) = r_f + \beta_i[E(R_m) - r_f]$$

Where:

$E(R_i)$ = The expected return on stock i

r_f = risk-free rate

β_i = Beta value of stock i

$[E(R_m) - r_f]$ = The market risk premium

Within the framework of CAPM the risk-free rate and the market risk premium is the same for all companies. The risk-free rate is defined as the interest rate on a risk free investment which normally is approximated with the interest rate on a default-free government bond. However, government bonds are issued with a wide variety of maturities. When valuing a company you should ideally choose a maturity that corresponds to the point in time when the cash-flow or earnings to be discounted will occur. It would however be an immense task to apply different interest rates for all the different discounting periods. Hence, the interest rate on a ten year government bond is often used. One could argue that a bond with a longer yield to maturity, e.g. 30 years, would be more suitable since you are discounting eternal cash flows. However, bonds with very long maturity tend to be rather illiquid causing stale prices and yields. Moreover, it is important to use a locally issued bond, i.e. a US government when valuing an American company, since the cost of capital and cash flows should be denominated in the same currency in order to ensure that inflation is handled consistently. (Goedhart, Koller, & Wessels, 2005)

Moving forward in the computation of the cost of equity you need the beta value of the particular stock. The beta value measures a stock's sensitivity to market movements. A stock with beta value 1 will move precisely as the market. A stock with beta value between 0 and 1 tend to move in the same direction as the market but not to the same extent. Beta value above 1 indicates that the stock will move in same direction as the market but to a greater extent. Finally, a stock with beta below 0 tends to move in the opposite direction to the

market. (Brealy & Myers, 2003) Beta values are not readily observable and therefore one needs to estimate them. This is done by performing a regression between the historical returns of the particular stock and a well diversified market portfolio.

Naturally, investing your wealth in stocks is riskier than buying government bonds and an investor therefore requires a return premium when investing in stocks. Within the CAPM framework this is referred to as the market's risk premium which is a measure of the difference between the expected return on a well diversified market portfolio and a risk-free investment, e.g. a government bond. Although there is plenty of research available discussing the appropriate level for the risk premium there is no definite answer. However, it has historically been shown that investments in stocks have been overcompensated, i.e. the risk premium has been too high compared to actual risk taken. The phenomenon of over compensation for risk is referred to as "The Equity Premium Puzzle". (Siegel & Thaler, 1997)

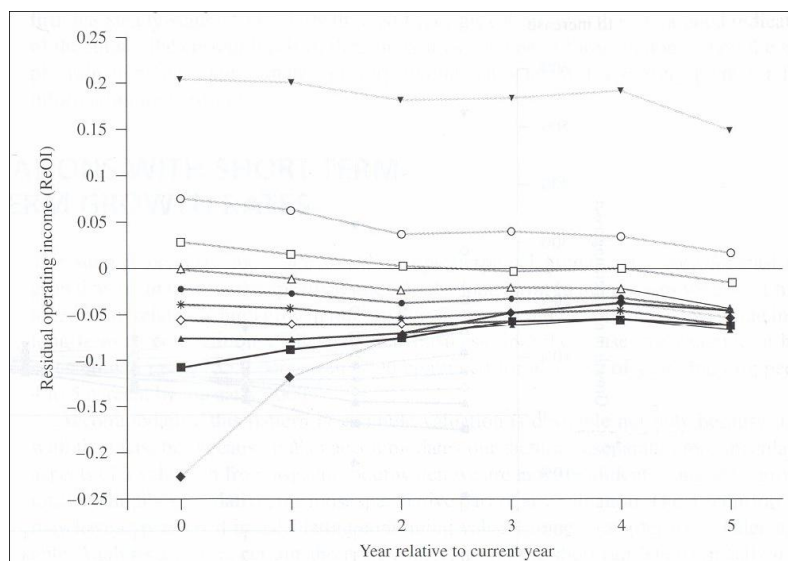
2.7 Mean Reversion and Steady State Assumption

There is extensive research available that shows that profitability and earnings for a particular company in the long run will revert to both an industry and economy mean level as shown in figure 2-1. For example, Fama & French (2000) showed that when forecasting profitability and earnings it is reasonable to assume a mean reverting pattern in both variables due to the competitive business environment. Dechow et al (1999) finds that residual income also follow a mean reverting process. They also find that the degree of mean reversion is associated with economic characteristics. The rate of mean reversion is for example correlated across firms in the same industry (Dechow, Hutton, & Sloan, 1999).

Consequently, it is reasonable to assume that whichever company one studies will eventually reach steady state. Steady state is characterized by constant growth rate in earnings. Hence, any given company will eventually exhibit a stable growth pattern in earnings meaning that a continuing value calculation is applicable. Fama & French (2000) studied profitability and earnings pattern over the period from 1964 to 1995, i.e. 31 years. Thus, randomly picking a company today and assume that it has reached steady state, i.e. that the SRIV and SAEG will produce accurate valuations of owner's equity, is not very

reasonable. This since a randomly chosen company can with the same probability be found anywhere on the mean reverting curve. However, Nissim and Penman (2001) tested mean reversion on American companies and found that in their sample, companies revert to a portfolio average within only around five years (Nissim & Penman, 2001). A study of mean reversion on Swedish companies found that the return on equity is converging already after four years (Bergmark & Cecchini, 2002). These studies indicate that more companies might reach steady state earlier than in the study by Fama & French (2000).

Figure 2-1 (Penman S. H., Financial Statement Analysis and Security Valuation, 2007)



2.8 Hypotheses

From a theoretical perspective it is reasonable to remain skeptical to models that are as simplified as those we propose since they assume a constant stable development of residual income and abnormal earnings growth respectively, i.e. they assume steady state. A full RIV or AEG model would capture fluctuations or growth patterns that do not follow steady state assumptions. Taking this “over simplicity” into account takes us to our first hypothesis:

- 1) Our first hypothesis is that the models will in general not produce good approximations of company values.

It is still reasonable to believe that some companies, as suggested by different studies, revert to steady state reasonably fast. As we have focused on large companies of which

many are relatively old and in mature industries, some companies might have reached a point close to or in steady state. This takes us to our second hypothesis:

- 2) Our second hypothesis is that the models will produce better approximations on companies that might have reached, or be close to reaching a steady state. Companies more likely to be in steady state operate in mature industries, are older and larger than the average company.

3 Method and Operationalization of Models

3.1 General Method

What we initially want to study is if the historical development of RI and AEG for the companies on the Stockholm Stock Exchange Large Cap List RI show a growth which is below the required rate of return on equity. If the historical growth is above the required return, that growth figure would be mathematically meaningless to apply in the Gordon Growth Formula since the denominator would be negative which would indicate that the simplified models not are applicable.

The second part of our study will test the two simplified models on the companies and compare the resulting values with stock prices for an indication on the accuracy of the models. However, when testing the models it would be unreasonable to plug in a growth rate that is higher than the forecasted long term growth rate of the economy. A company that in eternity grows faster than the economy will eventually be the only company left. This is an unreasonable assumption and we will therefore use the expected long term growth rate of the economy, 4 percent, and not the rate calculated in the historical study when applying the growth rates to the models in the second step of the study. Sweden's yearly real GDP growth has on average been around 2 percent during the period from 1990 to 2006 (Statistik: Konjunkturinstitutet, 2007). By adding the long term inflation target set by the Swedish Riksbank, 2 percent (Penningpolitik: Riksbanken, 2007), you arrive at a growth rate of around 4 percent. As the period from 1990 to 2006 covers both up- and downturns in the economy it is reasonable to assume that the long term future growth rate will be similar and we have therefore chosen to apply 4 percent when testing the models.

In order to analyze the hypothesis at issue a quantitative study of all the firms listed on the Swedish Large Cap List will be conducted. Historical data for the period from 1990 through to 2005 have been collected in order to enable an analysis of the development of the in the study included companies RI and AEG. A period of 15 years is chosen to get a sufficient sample. A longer period would exclude a large fraction of the companies whilst a shorter period would generate less statistically reliable results.

3.2 Sample Selection and Data Collection

Our initial sample consists of the 73 companies on the Stockholm Stock Exchange's Large Cap List. However, it has been necessary to reduce the initial sample of 73 companies as some companies do not meet the necessary basic requirements of available information to make the analysis. The data enabling the analysis is collected using Datastream⁶. The required data for the respective model will be specified in sections to come. When data is not available in Datastream alternative sources (e.g. company websites) is explored. Companies where data covering only nine years or less is found are omitted. The period of nine years is a compromise between getting a large enough sample and getting enough number of years to draw conclusions from. Requiring more years would reduce the sample drastically whilst a shorter period would give us a quite short time frame. All investment companies except for Investor are excluded from the second part of this study since no earnings forecasts are published. They are however included in the first part of the study. As shown in table 3.1, the analysis sample consists of 59 companies while the hold-out sample contains 52.

3-1 Sample selection process

	<i>No of companies</i>	<i>%</i>
OMX Large Cap List	73	100
Less than nine years of data	14	19
Analysis Sample	59	81
No published earnings forecasts	7	9,5
Holdout Sample	52	71,5

3.3 Part 1 – The Analysis Sample

A number of conditions have to be met in order for the SRIV and SAEG to generate a correct value of owner's equity of a particular firm. The most prominent one is, since both models include an application of the Gordon growth formula, that constant growth in RI and AEG is assumed. If one were to apply the models one would therefore normally plug in the long term growth rate of the economy into the models since a firm cannot grow more than

⁶ A widely known electronic database consisting of economic and financial information

economy as a whole in the long run. However, since both residual income and abnormal earnings growth is capitalized by the required rate of return less the long term growth rate the models can, at least theoretically, be applied on any firm which does not exhibit a growth rate that is greater than the required rate of return on owner's equity. A growth rate above the required rate of return would result in a negative denominator and the continuing value formula would hence be meaningless to apply.

Identifying those firms within the sample that had shown a yearly growth rate in RI and AEG respectively which was less than the corresponding required rate of return would give an indication on which firms the models could be applicable. For the first part of the study we will therefore calculate yearly RI and AEG for all companies in the analysis sample. The formulas applied to calculate yearly residual incomes and abnormal earnings growths are shown in equation 3-1 and equation 3-2 respectively.

Equation 3-1

$$Residual\ Income_t = (R_{e(t)} - \rho_{e(t)}) \times B_{(t-1)}$$

Equation 3-2

$$\begin{aligned} AEG &= cum\ dividend\ earnings(t) - normal\ earnings(t) \\ &= [earnings(t) + \rho_e \times dividend(t-1)] - (1 + \rho_e) \times earnings(t-1) \end{aligned}$$

Where,

$R_{e(t)}$ = return on equity

$\rho_{e(t)}$ = required return on equity

$B_{(t-1)}$ = opening balance book value of owners equity

To compute the yearly growth rates in the two variables, year to year growths will be calculated from which the arithmetic average of the sum is taken. As many companies have a highly volatile year to year growth, an alternative method will instead be used to reduce the effect of extreme years. The alternative method uses the total growth between the average RI and AEG of the first and last three years of the observed period. To arrive at a yearly growth total growth is then raised to the power of $1/x$, where X denotes the

corresponding number of observed periods, in order to arrive at a yearly growth rate. As an example the yearly growth rate for a company, where data covering all 15 years is available, is calculated as shown in equation 3-3.

Equation 3-3

$$g_{90-05} = (1 + g_{tot})^{1/13} - 1$$

Where,

g_{90-05} = *yearly growth over the period*

g_{tot} = *total growth over the period*

This computed yearly growth rate will be compared with the corresponding average required return over the period to arrive at the conclusion for which type of companies the model is more applicable on.

3.4 Part 2 – Testing the SRIV & SAEG on the Hold-out Sample

In part two of our study the two simplified models are applied on the companies and the calculated values will then be compared with observed stock prices as of the 31st of December 2006 in order to test the validity of the patterns observed in the historical analysis. The value per share will be calculated in accordance with equation 3-4 for the SRIV test and equation 3-5 for the SAEG test.

Equation 3-4

$$SRIV \text{ Value Per Share}_{31-12-2006} = B_{2006} + \frac{E[EPS_{2007}] - (B_{2006} * \rho_{2007})}{\rho_{2007} - g}$$

Equation 3-5

$$SAEG \text{ Value Per Share}_{31-12-2006} = \frac{E[EPS_{2007}]}{\rho_{2007}} + \frac{1}{\rho_{2007}} \left(\frac{E[AE G_{2008}]}{\rho_{2007} - g_{ss}} \right)$$

Where,

B_{2006} = *closing book value per share 2006*

$E[EPS_{2007}] = \text{consensus forecasted earnings per share for 2007}$

$E[AEG_{2008}] = \text{Expected AEG per share for 2008}$

$\rho_{2007} = \text{required rate of return on equity 2007}$

$g = \text{expected long term growth of the economy}$

The resulting values are compared with the observed stock prices in order to evaluate the accurateness of the models. A good result is defined as a calculated per share value that lies within a range of plus/minus 25 percent of the observed stock price. The good results are analyzed with regard to industry, size and age in order to find patterns that would explain why the model works better on certain companies and to what extent those patterns are similar to results from the analysis sample. In the paper size is measured by turnover. The reason for choosing turnover over e.g. total assets is twofold. First, as the simplified models should be relatively quick and easy to apply you want a measure that is readily available. Further, turnover as opposed to e.g. total assets is not affected by differences in accounting policies.

3.5 Calculating the cost of equity

The historical analysis of the development of RI and AEG require calculations of each of the 59 companies cost of equity for every observed year. As stated earlier, we have chosen to use CAPM. To calculate the cost of equity by using CAPM, three variables must be decided upon; the risk-free rate, the beta value and the market risk premium⁷.

The first issue is to decide which risk-free rate to apply when performing the calculations. In line with what is suggested by theory, the rate on a 10 year Swedish government bond is used in this paper. Since the companies included in the study are listed on the Stockholm Stock Exchange choosing a Swedish bond would mean that both interest rate and earnings are denoted in same currency.

⁷ CAPM is presented in further detail in a later chapter.

The second variable we need to calculate is the beta value for every company in the sample. This is done by computing the weekly return less the corresponding weekly risk free interest rate over a two year period on a particular stock and the OMX 30 index. The beta value for a particular stock is found by measuring the slope between the stock and index returns over the two year period. As beta values are needed for every year in the 15 year period, the calculation is performed for every company for the years 1990, 1998 and 2005. The beta values for the years between 1990 and 1998 are computed through a linear interpolation between the 1990 and 1998 value. The corresponding computation is made for the years between 1998 and 2005. However, in order to calculate the beta values for 1990, 1998 and 2005 historical weekly stock prices covering two years prior to each of the three years are required. Depending on the time of listing this data is not available for all 59 companies. When data is not available to compute beta, the earliest calculable beta is used for all prior years. Finally when testing the models as of the 31st of December 2006 corresponding calculations will be performed to compute applicable beta values.

The final variable needed in order to calculate each company's cost of equity is the market's risk premium. The average market risk premium in Sweden over the period from 1900 to 2000 has been found to be around 7 percent. (Brealy & Myers, 2003) On the other hand a survey among different participants on the financial market shows that the risk premium on the Swedish stock market currently is around 4,3 percent. (Öhrlings PricewaterhouseCoopers, 2007) However, this is only a static figure representable for the year 2007. As both models that will be tested in this paper discounts eternal residual incomes and abnormal earnings growths respectively we need a more forward looking risk premium. We have assumed that the risk premium will go up but still be under the historical level of 7 percent and will therefore apply 5 percent throughout the analysis.

4 Presentation of results

4.1 Historical growth in RI

As an initial indicator of how the model would work, we studied the historical growth in RI for our 59 company sample. 24 of the companies included in this study, corresponding to 40 percent, had a RI growth lower than their average required return (see table 4.1). This shows that the model could in theory work for those companies.

Table 4-1 Companies with historical yearly growth rate in RI below average required return

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>Growth In RI</i>	<i>Average Required Return</i>
SWEDISH MATCH AB	Consumer Goods	90	13	3%	7%
ELECTROLUX AB	Durables	88	104	10%	12%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	-5%	11%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	9%	9%
INVEST AB KINNEVIK	Finance & Real Estate	71	6	-44%	9%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	2%	6%
LUNDBERGFÖRETAGEN AB	Finance & Real Estate	63	22	7%	9%
OMX AB	Finance & Real Estate	22	3	-186%	12%
ORESUND INVESTMENT	Finance & Real Estate	46	0	9%	9%
RATOS AB	Finance & Real Estate	74	16	10%	10%
AB VOLVO	Industrial Goods & Services	80	259	8%	11%
ABB LTD	Industrial Goods & Services	115	173	-11%	10%
NCC AB	Industrial Goods & Services	19	56	7%	9%
SAAB AB	Industrial Goods & Services	70	21	-1%	6%
SCANIA AB	Industrial Goods & Services	107	74	8%	10%
SKANSKA AB	Industrial Goods & Services	130	126	9%	11%
SKF AB	Industrial Goods & Services	100	53	8%	13%
TRELLEBORG AB	Industrial Goods & Services	102	27	6%	12%
ERICSSON AB	Information Technology	131	178	14%	15%
LAWSON SOFTWARE INC	Information Technology	32	3	-310%	6%
HOLMEN AB	Materials	132	19	7%	11%
STORA ENSO OYJ	Materials	660	136	0%	10%
SVENSKA CELLULOSA AB	Materials	78	101	11%	11%
TELE2 AB	Telecom	14	50	-207%	10%
24		101	60		

As demonstrated in table 4.1, the split between different industries added up to: 8 in Industrial Goods & Services (50 percent of the total of 16 companies in that industry), 8 in Finance & Real Estate (40 percent of 20 companies), 2 in Information Technology (50 percent of 4), 1 in Telecom (33 percent of 3), 3 in Materials (75 percent of 4), 1 in Durables (25 percent of 4) and 1 in Consumer Goods (50 percent of 2). There were only two industries which did not have any company where the model was applicable: Energy and Health Care.

By sorting the companies on different factors we have tried to find a pattern for which companies the model works better for than others. First we have sorted it according to turnover for 2005. The absolute turnover numbers are shown in table 4.1. The average

turnover is SEK 60 bn for the compatible group, compared SEK 35 bn for the companies that do not seem to be compatible with the model. This means that the compatible sample has on average 71 percent higher turnover than the rest. When looking at age, the average of the compatible sample is 101 against 54 for the companies that are incompatible with the model.

4.2 Historical growth in AEG

Doing the same analysis for the AEG and comparing it with the average required return, 22 of the 59 companies included (37 percent) are compatible with the model. The results are presented in table 4.2.

Table 4-2 Companies with historical yearly growth rate in AEG below average required rate of return

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>Growth In AEG</i>	<i>Average Required Return</i>
ELECTROLUX AB	Durables	88	104	-4%	12%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	-10%	11%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	-202%	9%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	-225%	9%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	-24%	6%
LUNDBERGFÖRETAGEN AB	Finance & Real Estate	63	22	-203%	9%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	7%	12%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	9%	11%
SWEDBANK AB	Finance & Real Estate	15	48	8%	11%
GETINGE AB	Health Care	75	13	7%	9%
Q-MED AB	Health Care	20	1	2%	9%
AB VOLVO	Industrial Goods & Services	80	259	11%	11%
NCC AB	Industrial Goods & Services	19	56	8%	9%
SAAB AB	Industrial Goods & Services	70	21	-20%	6%
SANDVIK AB	Industrial Goods & Services	145	72	10%	11%
SECO TOOLS AB	Industrial Goods & Services	75	5	10%	10%
SKANSKA AB	Industrial Goods & Services	130	126	8%	11%
SKF AB	Industrial Goods & Services	100	53	6%	13%
TRELLEBORG AB	Industrial Goods & Services	102	27	6%	12%
HOLMEN AB	Materials	132	19	4%	11%
SVENSKA CELLULOSA AB	Materials	78	101	4%	11%
TELIASONERA AB	Telecom	87	91	-2%	7%
22		83	55		

The 22 companies operate in the following industries: 8 in Finance & Real Estate (40 percent of 20), 8 in Industrial Goods & Services (50 percent of 16), 2 in Materials (50 percent of 4), 1 in Telecom (33 percent of 3), 1 in Durables (25 percent of 4), 1 in Information Technology (25 percent of 4) and 2 in Health Care (33 percent of 6).

When looking at the age factor, compared with RI, the results are less distinct but there is still a difference. Good companies are on average 22 percent older than bad ones; 83 years

versus 68 years. Concerning turnover, the average turnover for the companies that are compatible with the model is 41 percent over the rest of the sample with an average turnover of SEK 55 bn compared with SEK 39 bn.

4.3 Test of the models

4.3.1 Simplified Residual Income Valuation

To test the patterns found in the historical analysis we applied the SRIV on all the 59 companies as of the 31st of December 2006 and compared the calculated values with the corresponding observed stock price. The test produced 20 good values where good is defined as a calculated value that is between plus/minus 25 percent of the observed stock price. The companies with a good result are presented sorted by industry in Table 4.3⁸.

Table 4-3 Companies with calculated SRIV values within plus/minus 25 percent of observed stock price

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SRIV Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
ELECTROLUX AB	Durables	88	104	118	115	4	3%
HENNES & MAURITZ	Durables	60	68	384	344	40	12%
MODERN TIMES GRP	Durables	12	10	346	444	97	-22%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	132	145	13	-9%
OMX AB	Finance & Real Estate	22	3	136	125	11	9%
SKANDINAVISKA	Finance & Real Estate	147	101	221	218	4	2%
SWEDBANK AB	Finance & Real Estate	15	48	289	250	39	16%
ELEKTA AB	Health Care	35	4	119	143	23	-16%
GETINGE AB	Health Care	75	13	182	158	24	15%
AB VOLVO	Industrial Goods & Services	80	259	99	91	8	9%
ABB LTD	Industrial Goods & Services	115	173	105	122	18	-14%
ASSA ABLOY AB	Industrial Goods & Services	53	31	139	148	8	-6%
ATLAS COPCO AB	Industrial Goods & Services	134	51	83	97	13	-14%
HEXAGON AB	Industrial Goods & Services	15	13	86	95	9	-10%
SAAB AB	Industrial Goods & Services	70	21	234	214	21	10%
SECURITAS AB	Industrial Goods & Services	73	61	87	106	19	-18%
SKANSKA AB	Industrial Goods & Services	130	126	118	133	15	-11%
SKF AB	Industrial Goods & Services	100	53	138	119	19	16%
TRELLEBORG AB	Industrial Goods & Services	102	27	148	163	15	-9%
STORA ENSO OYJ	Materials	660	136	90	110	20	-18%
20		103	65			21	-3%

Again the Industrial Goods & Services industry has most companies with good results, 10 out of 16. The remaining 10 companies are spread between the industries as follows. Four in

⁸ A complete table with all companies tested can be found in the Appendix.

Finance & Real Estate (29 percent of 14), three in Durables (75 percent of 4), two in Health Care (33 percent of 6) and one in Materials (25 percent of 4). Consequently, the industries where no good results were found are: Consumer Goods, Telecom, Energy and Information Technology. The average difference between calculated and observed share price within the group of good results is -3 percent, equal to an absolute average difference of SEK 21. Moreover, a company with a good result is on average 103 years old compared to 60 years, which is the average age of a “bad” company. Thus, a “good” company is on average 72 percent older than a “bad” one. In terms of turnover there is also a noticeable difference as a “good” company has an average turnover of SEK 65 bn which is 62 percent higher than the average turnover of a “bad” company, SEK 40 bn.

4.3.2 Simplified Abnormal Earnings Growth Valuation

Conducting the same test with the SAEG model generated 12 companies with good results with an average difference between calculated and actual price of 5 percent and an absolute average difference of SEK 21. Table 4.4 summarizes the results of the AEG test.

Table 4-4 Companies with calculated SAEG values within plus/minus 25 percent of observed stock price

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SAEG Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
SWEDISH MATCH AB	Consumer Goods	90	13	114	127	13	-10%
AUTOLIV, INC.	Durables	51	44	388	417	29	-7%
HENNES & MAURITZ	Durables	60	68	297	344	47	-14%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	161	145	16	11%
ASTRAZENECA PLC	Health Care	94	196	393	370	23	6%
AB VOLVO	Industrial Goods & Services	80	259	80	91	10	-11%
NCC AB	Industrial Goods & Services	19	56	161	188	27	-14%
SECO TOOLS AB	Industrial Goods & Services	75	5	124	109	15	14%
HOLMEN AB	Materials	132	19	251	303	52	-17%
STORA ENSO OYJ	Materials	660	136	115	110	5	4%
SVENSKA CELLULOSA	Materials	78	101	111	120	9	-8%
TELIASONERA AB	Telecom	87	91	47	57	11	-19%
12		125	83			21	-5%

The test of the SAEG did not generate any distinct pattern regarding the industry belongings of the “good” companies as these were quite evenly spread among the industries. Three were found in the Industrial Goods & Services sector (19 percent of 16), three in Materials (75 percent of 4), two in Durables (50 percent of 4) and one each in Consumer Goods (50 percent of 2), Health Care (17 percent of 6), Telecom (33 percent of 3) and Finance & Real Estate (7 percent of 14). Two industries did not have any companies with good results;

Information Technology and Energy. However, similar patterns were found regarding age and turnover in the SAEG test as in the SRIV test. The average company with a good result in the SAEG test is 125 years old, meaning that it is 102 percent older than the average “bad” company. In terms of turnover the difference is 106 percent, 83 compared with SEK 40 bn in turnover.

5 Analysis

5.1 Step 1 – Analysis Sample

Our first hypothesis stated that the models will in general not produce good approximations of company values. When analyzing the analytical sample we could also see that a majority of our companies exhibited historical growth rates in RI and AEG that was above their average required rate of return over the same period. This was an indication that the models were not applicable on a majority of the companies. However, our first hypothesis might have been too boldly stated. The historical analysis still shows a significant number of companies that are possibly compatible with SRIV and SAEG. 40 percent of the companies in the RI test are possibly compatible whilst 41 percent with AEG. After doing only the first step of the study we can of course only observe possible compatible companies and not actual compatibility, but it is still interesting to see what characteristics these companies possesses.

This takes us to our second hypothesis which stated that companies that are compatible with the SRIV and SAEG should show characteristics that indicate that they are in, or closer to, steady state than other companies. Our results from the first part of our study at least partially confirm our second hypothesis. The companies for which the model works for are substantially older than for those that it does not work for. In the RI analysis, the percentage difference in age between the good and the bad companies is 87 percent. For AEG the corresponding number is 23 percent. These numbers indicate that age is a possible determining factor as for which companies we can apply the models on.

When looking at turnover, we see less clear results for RI whilst AEG show more distinct results. For AEG, the “good” companies are on average 40 percent larger than the “bad” firms whilst the percentage difference for RI is 23 percent. This could have several reasons. Firstly, it might be that turnover is not a good determinant of if companies are reaching steady state. The turnover of a company could depend on many different factors, including the size of the industry, the trend of consolidation in the industry among others. A company that have a small niche where it operates can be small but yet be in, or close to, steady state

whilst a company that is large but operates in a growing industry can show significant growth. This leads us to say that size might not be as important as age when determining if a company is closer to steady state than others.

Another way of approaching how to find companies that are closer to steady state is to see what industry they operate in. An industry that is reduced to growing with the economy should give more companies closer to steady state than growth industries. If this is true industry should be a variable when finding compatible companies. When studying industry belongings of the good companies it is evident that two industry categories dominate. The results for these two industries are identical in the historical analysis of both RI and AEG with eight companies from each industry per model. 16 companies made up the total sample of industrial firms meaning that the model was applicable on 50 percent of the sample; the corresponding percentage for the 20 companies within finance & real estate is 40. These two industries made up two thirds of the companies in the AEG analysis. The rest of our sample is quite widely spread among several different industries. These industries and their companies have to be more individually examined to see if they show traits that would indicate that they are in, or close to, a steady state.

This first step of our study was made to give us an indication of for what company characteristics to look for when using the model in practice. From our analysis sample we could see that older companies from two more mature industries – Industrial Goods & Services and Financial & Real Estate show a significant hit rate. A difference, although less significant, was also observed regarding size as both the RI and AEG analysis show that compatible companies on average are larger than incompatible ones. However, the first analysis is based on historical data and is only meant to generate indications on which types of companies the models are more compatible with. In order to possibly confirm the patterns observed so far we will now analyze the results from the tests of the models.

5.2 Step 2 – Holdout Sample

In step 2, as described in previous sections, we tested the models by applying them as of the 31st of December 2006. If the patterns observed in the historical analysis were to be verified

by the tests, plausible conclusions can be drawn as to what types of companies the models are applicable on.

Regarding industry belonging as an explanatory variable for applicability different degree of confirmation was generated by the two tests. The SAEG test generated only a limited number of companies with good results, 12, which were rather evenly spread between the different industries. Thus, the SAEG test did not provide any confirmation regarding industry belonging. The contrary is true for SRIV, where 20 companies showed good results, as the results from the test are consistent with the observations from the historical analysis. Here, Industrial Goods & Services is even more dominant with 10 companies out of 16 tested. On the other hand, it is worth noting that only four companies from the Finance & Real Estate were found to have good results. This might however only be due to lack of earnings forecasts and not incompatibility with the models. Even so, we cannot know whether or not the SAEG/SRIV would have worked for them.

Moving to the patterns regarding age and size these are confirmed by both the SAEG and SRIV test. A company with a good result in the SAEG test is on average 102 percent older than a company with a bad result, 125 compared to 62 years. Regarding size the difference is even greater with an average turnover for a “good” company of SEK 83 bn compared to SEK 40 bn for a “bad” company, equivalent to a 106 percentage difference. Testing the SRIV, it is striking how close to the analysis sample we get. The average age among the companies with good results is 103 years versus 60 years among those with bad results. This corresponds to a percentage of 72 percent or an absolute difference of 43 years, which is close to the same as within the analysis sample (47 years or 87 percent). Regarding size, they are also very similar; 63 percent or SEK 25 bn higher in turnover in the actual test compared with 71 percent or SEK 25 bn in the analysis sample. Already here we can see that it is possible to see clear similarities between the analysis sample and the actual model test. Companies for which the model works are both quite larger and older than for those that it does not work for.

When studying the results from the analysis sample to those from the holdout sample one can conclude that industry belonging does not have great explanatory value as to which

companies the SAEG is more applicable on whilst the pattern is confirmed or even enforced by SRIV. On the other hand, the age and growth patterns indicated by the historical analysis were confirmed by the test of both models which tells us that age and turnover works cross the models.

What characteristics do old, large and, in the case of SRIV, industrial companies possess that make them more compatible with the models?

In general, sectors within the Industrial Goods & Services industry are characterized by heavy competition and maturity. Both these factors depress a company's possibility to earn returns on equity that are above the required rate. Possibilities to earn returns greater than the required rate attract competition in the form of companies seeking to take advantage of this possibility. Without high entry barriers, e.g. regulation and monopoly, these possibilities will diminish as the industry matures. This process has gone rather far in the industrial sector. The possibilities to earn returns greater than the required rate are therefore in general slim for companies within Industrial Goods & Services. Consequently, the SRIV and SAEG should be more applicable on these companies.

Moving to age as an explanatory variable the observations are not surprising since both a company's possibility to earn returns greater than the required rate and grow at a pace greater than the economy as a whole diminishes over time. When analyzing a company one studied parameter is where the company is positioned in terms of lifecycle. When doing this one talks about different stages of the lifecycle of the company. An old company is in general closer to what is referred to as the maturity and decline stage which, in line with mean reversion theory, are characterized by declining growth rate and returns closer to the required rate. Consequently, the models should work better on old companies which both our historical analysis tests of the models confirm. Regarding size, here measured as turnover, it might be too bold to say that this variable alone affects a company's ability to earn returns greater than the required rate. However, size is important in understanding a company's growth pattern. A successful start up company might be able to double its turnover in a year. For a large company, doubling the turnover in just one year is close to

impossible. The larger the company the likelier it is that its growth rate is close to the GDP growth rate.

A number of possible explanations were discussed above as to why old and large companies within Industrial Goods & Services would grow at a pace closer to that of the economy and earn returns similar to the required level. But what underlying economic characteristics do age, size and belonging to a mature industry bring? As we established above the companies with good results should have slim opportunities to grow faster than the economy and earn returns above the required rate. If this is true one would expect these companies to have greater difficulty finding investment opportunities with above zero net present value. In line with theory (Dechow, Hutton, & Sloan, 1999) this would in turn imply that one would expect them to have relatively high payout ratios. However, this is only partially confirmed by the companies in our sample. The average payout ratio over the last three years was for industrial companies with good results in the SRIV test 50 percent compared to 37 for companies with bad results; corresponding numbers for the SAEG test is 58 vs. 40. Thus, a difference is evident but not as great as one might have expected.

Another characteristic that one would expect to find in companies that are more compatible with the models is a level of return on equity that is relatively closer to the required rate. This is confirmed when studying the average difference, measured over the last four years, between ROE and the cost of equity in the companies in our sample. The companies with good results in the SRIV test or SAEG test have earned returns closer to the required rate than the companies with bad results.

5.3 Companies outside the pattern

Within our group of companies with good results in the holdout sample there are 12 companies that have calculated values within plus/minus 25 percent of observed stock price either in the SAEG or the SRIV test but does not fit the observed pattern regarding industry

belonging⁹, age and size. However, many of these share many characteristics with the companies within the pattern.

In order to categorize these twelve companies we grouped them according to size and age dependent on if they were over or close to the average in the two categories. Generally speaking they could be put into three categories; old and large (7 companies), old (3 companies), and small and young (2 companies). None of the twelve companies could be clearly categorized as large but young. These results confirm what we have seen earlier in the analysis of the companies that fit entirely into the pattern; age is the most important factor when trying to see if the model would be applicable. Size and age are dominant here, but, as we have discussed earlier in the analysis, size alone may not be a good indicator of if a company is close to or in steady state.

When looking at the industries that these companies belong to, they are generally characterized by high competition and as quite mature. As an example we can use Stora Enso, which is classified as Materials. Stora Enso shares all the characteristics with the larger group of industrials. It is one of the world's oldest companies, it is clearly over average in size and the Material industry is, as an industry, quite mature. Even though changes in the supply and demand of the basic products appear, the overall characteristics of the industry, in the case of Stora Enso pulp and paper, is not really what characterizes a growth industry. The paper and pulp products are also to a large extent characterized by being commodities. Companies that sell commodities are often so called price takers implying that the industry is characterized by heavy competition. As discussed above, heavy competition together with slim diversification possibilities depresses both the possibility to earn returns above required rate and grow faster than the economy.

We have only two companies in the "small and young" category; MTG and Elekta. They are more difficult to explain. They operate in industries where there are still a considerable growth and change. They are small and young compared to the entire sample. As they share

⁹ With the pattern for industry belonging defined as either Industrial Goods & Services or Finance & Real Estate

no common characteristics with any of the other companies with good results we assume that these two results are due to random factors.

5.4 Cross-Model Analysis

We have found that SRIV gives us more positive results than SAEG for the applicability of the simplified models. This is somewhat contradictory with theory. For the RIV model to work we have to assume clean surplus accounting. As clean surplus accounting is often violated by translation adjustments and other equity affecting items not flowing through the income statement, it would be reasonable to assume that the SRIV would generate less convincing results. SAEG on the other hand is not dependent on clean surplus accounting, and should thus give more accurate results. As we have stated earlier we are assuming that semi-strong market efficiency holds and thus that the market prices should reflect available information. So why does SAEG provide less strong results?

One possible reason could concern what the respective model actually measures. As stated by theory, for example Penman (2007), under the assumption that the clean surplus holds a restatement of the AEG model shows that the AEG in a particular period is equal to the change in RI between that and the prior period. Even when the clean surplus relation is violated AEG will probably be a fair approximation of the change in RI. When reflecting upon this fact more thoroughly one can identify a possible reason as to why our test of the SAEG generates less good results than the SRIV test. As one applies the SRIV one implicitly assumes constant growth in RI. That is, one assumes that RI will grow at a constant rate in every period in perpetuity. In contrast, applying the SAEG means implicitly assuming that the change in RI will grow at constant rate in perpetuity. Moreover, SAEG is more sensitive to earnings forecasts since the value generated by the model is only affected by EPS and DPS forecasts, disregarding required rate of return and long term growth as these variables are identical in both models. The value generated by the SRIV on the other hand is to a large extent attributable to the book value of equity. In our test this proportion on average amounts to 69 percent of the total value. Thus, our results imply that, in contrast what has been stated in previous research (Ohlson, 2005), book value per share in general better approximates market price than capitalized forecasted earnings per share. However, if the

earnings forecasts for 2007 to some degree were affected by irrationality this would have explanatory value as to why our SAEG test generated less successful results. So, was 2006 in any way a “special” year? The most noticeable aspect of last year is that many of the world’s economies were at a peak. Optimism about future prospects pervaded in many sectors including the financial industry which inhabits the analysts who produce earnings forecasts. Thus, earnings forecasts for 2007 may have been influenced by over optimism which would indicate that the values generated by our tests are based on relatively high EPS figures. Naturally, an EPS forecast during times of economic peak do not represent a level sustainable in the long run. The models assume that RI and AEG (i.e. change in RI) respectively will grow at a constant rate. As both RI and AEG is affected by EPS forecasts starting with an unsustainably high level will have a negative impact on our results. However, for reasons discussed above a SAEG generated value will be more affected than one generated by the SRIV.

In line with the reasoning above the SAEG test should in general generate higher equity values than the SRIV test but this is not confirmed by our results. In contrast, our result show that SAEG values on average are 45 percent lower than observed stock price while SRIV values on average only are 7 percent lower than actual price. There must be an effect present that works in the opposite direction from the effect of optimistic EPS forecasts. If the majority of the companies in our sample has not yet reached steady state they will be consequently under or overvalued depending on what the near future holds for the particular company. A company that is expected to grow at a rate below the long term growth rate of the economy during the years that would constitute the explicit forecast period in the complete valuation models will be overvalued by the simplified models. The converse is true for a company that is expected to experience growth above the long term rate of the economy. It is reasonable to assume that the latter case is more common. Hence, the majority of the companies in our sample will be undervalued by the simplified models. If the under valuing effect would have greater impact on SAEG values than on SRIV values we might have an explanation for our results. In line with previous reasoning SAEG values are more sensitive to assumptions about earnings. This would imply that under

valuing effect from assuming steady state will be greater on SAEG values than on SRIV values.

We now have two effects that affect calculated values in opposite directions. First, the optimistic EPS forecasts for 2007 over values the companies while the steady state assumption generally will have a negative effect on value. In addition, it is probable that both effects will have greater implications for SAEG than for SRIV. Our results imply that the effect of assuming steady state is larger than the EPS effect since the SAEG generated values on average is significantly lower than those calculated with the SRIV.

5.5 Sensitivity Analysis

As discussed previously the only two variables that we have made assumptions about when testing the SRIV and SAEG is long term growth and risk premium. The choice of appropriate levels of these has been made based on both theory and previous research. However, these variables are unobservable and there is no method available to estimate them with absolute certainty. Therefore, our results have been tested with regard to their sensitivity to long term growth rate and risk premium. Each variable has been varied +/- one percent compared to their original level. Complete tables of the results from the sensitivity analysis can be found in the Appendix. What is evident is that our results regarding how many good results the models generate and their industry belonging, average age and average size do not vary to any significant extent when applying different long term growth rates and levels of risk premium. Thus, the sensitivity of our results is limited to minor changes which do not affect the analysis of our results.

6 Validity and Reliability

6.1 Validity

As mentioned already in the introduction, research on these simplified models is an unexplored territory. Validity deals with if what we wanted to measure actually been measured (Strömquist, 2003). We have constructed an analysis sample and tried to draw conclusions on characteristics that would be applicable in real life as well as a holdout sample on which the models were tested. Following that, a large part of our paper have been spent recognizing and analyzing patterns seen in our tests. As our analysis is devoted to that we would like to recognize some aspects that limit the validity of our thesis.

Firstly, as this is the first paper written about these simplified models, we have had no previous research to compare our results with. Also, ideally, we would have wanted to examine a larger sample of as many companies as possible. Our sample is representative to large, Swedish companies. But as our results are limited to 59 large companies in Sweden, we cannot claim that our results are universal for all companies with the characteristics we have found should work for our sample. With only 59 companies it is also difficult to draw conclusions on several of the industries that had too few companies in the sample so our thesis is limited to draw conclusions on industries with a larger number of participating companies.

6.2 Reliability

If a validity test tells us whether we have actual measured what we wanted to measure, reliability tells us whether our results are reliable and if they could be repeated (Strömquist, 2003). There are several items that affect the reliability of our paper. Firstly, we might have done errors or simply forgot certain aspects that we are not aware of. We have of course done our best to control our calculations and models and hope that we have minimized the effect on reliability from that perspective. Further, in our tests we have made assumptions for the risk premium and growth which have been tested in our sensitivity analysis. We have also assumed that CAPM is the best available tool for calculating the required rate of return.

However, all our assumptions are what might be called standard valuation assumptions and follow what has been said in the literature and in practice within the financial sector.

Further, even though the data in our analysis sample covers up to 15 years, we only tested the models on the holdout sample at one point in time. Testing the models at several points in time and on different samples would increase the reliability of our study. The point in time we have chosen to test our holdout sample on is the 31st of December 2006. The date chosen will have an impact on the results. During a recession, earnings forecasts are generally more negative and the overall state of the economy is bad. On the other hand, in a boom, profits and forecasts are up and the outlook of companies is generally good. The year of 2006 was one of the strongest for a long time and was characterized by a great deal of optimism. By the end of 2006, the Stockholm Stock Exchange had nearly recovered from the IT boom¹⁰. Growth in GDP¹¹ was high and the economy was in general viewed as strong. It is therefore important to remember that our calculations are made in a boom. When thinking of future research, it would be useful to test the models not only on a larger sample but also on several time periods in different stages of the economy. This would provide us with an answer on if the results would be stable over time or not. In addition, no statistical testing of the results in this paper has been carried out. We therefore cannot say if our results are statistically significant or not. However, the patterns observed are in line with previous research and theory. We therefore believe that the general pattern holds true but future research should perform statistical testing in order to verify the results.

Finally, the stock exchange is volatile. In theory, every change in share price should be motivated by a change in expectations, which in turn should reflect the earnings forecasts and the models. In practice, this correlation might not be perfect and then a change in share price might move companies outside the good/bad results limit. This effect would also be reduced if we would have done tests for several points in time.

¹⁰ Based on the Stockholm All share index which can be found, for example, on <http://www.di.se>

¹¹ From Statistics Sweden. Statistics Sweden is a central government authority for official statistics. <http://www.scb.se/NR>

7 Conclusions and further research

The primary purpose of this paper was to test the usefulness of two simplified accounting based valuation models; Simplified Residual Income Valuation and Simplified Abnormal Earnings Growth. Since both models are simplified we expected, as stated in our first hypothesis, that they in general would not be applicable. However, our results show that the SRIV and the SAEG are applicable on more companies than expected; 20 companies in SRIV and 12 in SAEG where applicable on the models. Applicable was defined as companies with a calculated value of +/- 25 percent from the market share price. This can be compared with a study by Liu, Nissim and Thomas (2007) where they defined their results as “remarkably well” when they had almost 50 percent of their sample within +/- 20 percent of the observed prices. (Liu, Nissim, & Thomas, 2007). To be a first test of the two simplified models, close to 40 percent of the companies in the SRIV and close to 25 percent in the SAEG is a result that cannot be neglected.

From the historical analysis we found that old companies generally fit better for the models than younger ones. If companies also are large and from mature industries the results are even stronger. If one would, instead of comparing companies with good results to the entire sample, compare the number of companies with good results within the general pattern of old companies in mature industries with total number of old companies in mature industries the percentage would be close to 50 percent.

SRIV seems to be more applicable than SAEG as it is anchored on the book value of equity which, with only a terminal value, gives the valuation a less volatile base. SRIV should be applied on companies with the characteristics discussed above. This will give a reasonable approximation of the company value. However, it is not sufficient in order to make a well-founded investment decision but more as a quick and dirty valuation to estimate a firm's value. Other valuation methods should complement SRIV.

As this is the first test as we know of simplified accounting based valuation models, future research need to test the models on larger samples and at different points in time. Further, the points in time should be chosen with regard to the state of the economy, i.e. boom,

recession and “normal” to see if the trends we have seen will be confirmed. Tests on different markets should also be helpful in testing the models.

We hope that the relative success of these first tests have created an interest for further research on the applicability of simplified accounting based models.

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9 Appendices

9.1 Sample of Companies

Table 9-1 All companies in the initial sample

<i>Company</i>			
AB VOLVO	HENNES & MAURITZ AB	MEDA AB	SECO TOOLS AB
ABB LTD	HEXAGON AB	MELKER SCHORLING	SECURITAS AB
ALFA LAVAL AB	HOLMEN AB	MILlicom CELL.	SKANDINAVISKA ENSK
ASSA ABLOY AB	HUFVUDSTADEN AB	MODERN TIMES GRP MTG	SKANSKA AB
ASTRAZENECA PLC	HUSQVARNA	NCC AB	SKF AB
ATLAS COPCO AB	INDUSTRIVARDEN AB	NIBE INDUSTRIER AB	SSAB SVENSKT STAL AB
AUTOLIV, INC.	INVEST AB KINNEVIK	NOBEL BIOcare HLDG	STORA ENSO OYJ
AXFOOD AB	INVESTMENT AB LATOUR	NOBIA AB	SV. HANDELSBANKEN AB
AXIS AB	INVESTOR AB	NORDEA BANK	SWEDBANK AB
BOLIDEN AB	JM AB	OMX AB	SWEDISH MATCH AB
CASTELLUM AB	KAUPTHING BANK	ORESUND INVESTMENT	SVENSKA CELLULOsa AB
D. CARNEGIE & CO AB	KUNGSLEDEN AB	ORIFLAME	TELE2 AB
ELECTROLUX AB	L. WALLENSTAM BYGGN.	PEAB AB	TELIA SONERA AB
ELEKTA AB	LAWSON SOFTWARE INC	Q-MED AB	TIETOENATOR OYJ
ENIRO AB	LINDAB INTER	RATOS AB	TRELLEBORG AB
ERICSSON AB	LJUNGBERGGRUPPEN AB	SAAB AB	VOSTOK GAS LTD
FABEGE AB	LUNDBERGFORETAGEN AB	SANDVIK AB	
GETINGE AB	LUNDIN MINING CORP	SAS AB	
HAKON INVEST	LUNDIN PETROLEUM AB	SCANIA AB	
			73

Table 9-2 Companies excluded from the analysis sample due to insufficient available data

<i>Company</i>		
ALFA LAVAL AB	HUSQVARNA	MELKER SCHÖRLING
AXIS AB	KAUPTHING BANK	NOBIA AB
BOLIDEN AB	LINDAB INTER	ORIFLAME
ENIRO AB	LUNDIN MINING CORP.	SAS AB
HAKON INVEST	LUNDIN PETROLEUM AB	
		13

Table 9-3 Companies excluded from the holdout sample due to lack of earnings forecasts

<i>Company</i>	
INDUSTRIVARDEN AB	ORESUND INVESTMENT
INVEST AB KINNEVIK	RATOS AB
INVESTMENT AB LATOUR	VOSTOK GAS LTD
LUNDBERGFORETAGEN AB	
	7

9.2 Results for the Entire Sample

Table 9-4 Historical yearly growth in RI for all companies in the analysis sample

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>Growth In RI</i>	<i>Average Required Return</i>
AXFOOD AB	Consumer Goods	44	29	34%	4%
SWEDISH MATCH AB	Consumer Goods	90	13	3%	7%
AUTOLIV, INC.	Durables	51	44	31%	8%
ELECTROLUX AB	Durables	88	104	10%	12%
HENNES & MAURITZ AB	Durables	60	68	30%	10%
MODERN TIMES GRP MTG	Durables	12	10	14%	12%
VOSTOK GAS LTD	Energy	11	1	36%	7%
CASTELLUM AB	Finance & Real Estate	14	2	19%	5%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	-5%	11%
FABEGE AB	Finance & Real Estate	83	2	21%	9%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	9%	9%
INDUSTRIVARDEN AB	Finance & Real Estate	63	12	20%	11%
INVEST AB KINNEVIK	Finance & Real Estate	71	6	-44%	9%
INVESTMENT AB LATOUR	Finance & Real Estate	23	5	26%	10%
INVESTOR AB	Finance & Real Estate	91	32	23%	13%
JM AB	Finance & Real Estate	62	12	37%	9%
KUNGSLEDEN AB	Finance & Real Estate	10	3	32%	7%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	31%	9%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	2%	6%
LUNDBERGFÖRETAGEN AB	Finance & Real Estate	63	22	7%	9%
NORDEA BANK	Finance & Real Estate	33	126	15%	9%
OMX AB	Finance & Real Estate	22	3	-186%	12%
ORESUND INVESTMENT	Finance & Real Estate	46	0	9%	9%
RATOS AB	Finance & Real Estate	74	16	10%	10%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	31%	12%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	19%	11%
SWEDBANK AB	Finance & Real Estate	15	48	13%	11%
ASTRAZENECA PLC	Health Care	94	196	16%	10%
ELEKTA AB	Health Care	35	4	23%	8%
GETINGE AB	Health Care	75	13	16%	9%
MEDA AB	Health Care	16	5	17%	8%
NOBEL BIOCARE HLDG	Health Care	26	1	39%	10%
Q-MED AB	Health Care	20	1	80%	9%
AB VOLVO	Industrial Goods & Services	80	259	8%	11%
ABB LTD	Industrial Goods & Services	115	173	-11%	10%
ASSA ABLOY AB	Industrial Goods & Services	53	31	28%	9%
ATLAS COPCO AB	Industrial Goods & Services	134	51	17%	12%
HEXAGON AB	Industrial Goods & Services	15	13	23%	9%
NCC AB	Industrial Goods & Services	19	56	7%	9%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	30%	7%
PEAB AB	Industrial Goods & Services	48	30	38%	10%
SAAB AB	Industrial Goods & Services	70	21	-1%	6%
SANDVIK AB	Industrial Goods & Services	145	72	31%	11%
SCANIA AB	Industrial Goods & Services	107	74	8%	10%
SECO TOOLS AB	Industrial Goods & Services	75	5	23%	10%
SECURITAS AB	Industrial Goods & Services	73	61	18%	11%
SKANSKA AB	Industrial Goods & Services	130	126	9%	11%
SKF AB	Industrial Goods & Services	100	53	8%	13%
TRELLEBORG AB	Industrial Goods & Services	102	27	6%	12%
ERICSSON AB	Information Technology	131	178	14%	15%
LAWSON SOFTWARE INC	Information Technology	32	3	-310%	6%
TIETOENATOR OYJ	Information Technology	8	15	43%	11%
HOLMEN AB	Materials	132	19	7%	11%
SSAB SVENSKT STAL AB	Materials	29	31	12%	11%
STORA ENSO OYJ	Materials	660	136	0%	10%
SVENSKA CELLULOSA AB	Materials	78	101	11%	11%
MILLICOM CELL.	Telecom	17	12	24%	13%
TELE2 AB	Telecom	14	50	-207%	10%
TELIA SONERA AB	Telecom	87	91	14%	7%
59		74	45		

Table 9-5 Historical yearly growth in AEG for all companies included in the analysis sample

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>Growth In AEG</i>	<i>Average Required Return</i>
AXFOOD AB	Consumer Goods	44	29	23%	4%
SWEDISH MATCH AB	Consumer Goods	90	13	20%	7%
AUTOLIV, INC.	Durables	51	44	16%	8%
ELECTROLUX AB	Durables	88	104	-4%	12%
HENNES & MAURITZ AB	Durables	60	68	14%	10%
MODERN TIMES GRP MTG	Durables	12	10	56%	12%
VOSTOK GAS LTD	Energy	11	1	201%	7%
CASTELLUM AB	Finance & Real Estate	14	2	9%	5%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	-10%	11%
FABEGE AB	Finance & Real Estate	83	2	16%	9%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	-202%	9%
INDUSTRIVARDEN AB	Finance & Real Estate	63	12	27%	11%
INVEST AB KINNEVIK	Finance & Real Estate	71	6	58%	9%
INVESTMENT AB LATOUR	Finance & Real Estate	23	5	15%	10%
INVESTOR AB	Finance & Real Estate	91	32	25%	13%
JM AB	Finance & Real Estate	62	12	23%	9%
KUNGSLEDEN AB	Finance & Real Estate	10	3	19%	7%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	-225%	9%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	-24%	6%
LUNDBERGFÖRETAGEN AB	Finance & Real Estate	63	22	-203%	9%
NORDEA BANK	Finance & Real Estate	33	126	45%	9%
OMX AB	Finance & Real Estate	22	3	18%	12%
ORESUND INVESTMENT	Finance & Real Estate	46	0	10%	9%
RATOS AB	Finance & Real Estate	74	16	13%	10%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	7%	12%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	9%	11%
SWEDBANK AB	Finance & Real Estate	15	48	8%	11%
ASTRAZENECA PLC	Health Care	94	196	92%	10%
ELEKTA AB	Health Care	35	4	12%	8%
GETINGE AB	Health Care	75	13	7%	9%
MEDA AB	Health Care	16	5	19%	8%
NOBEL BIOCARE HLDG	Health Care	26	1	21%	10%
Q-MED AB	Health Care	20	1	2%	9%
AB VOLVO	Industrial Goods & Services	80	259	11%	11%
ABB LTD	Industrial Goods & Services	115	173	25%	10%
ASSA ABLOY AB	Industrial Goods & Services	53	31	19%	9%
ATLAS COPCO AB	Industrial Goods & Services	134	51	19%	12%
HEXAGON AB	Industrial Goods & Services	15	13	32%	9%
NCC AB	Industrial Goods & Services	19	56	8%	9%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	8%	7%
PEAB AB	Industrial Goods & Services	48	30	15%	10%
SAAB AB	Industrial Goods & Services	70	21	-20%	6%
SANDVIK AB	Industrial Goods & Services	145	72	10%	11%
SCANIA AB	Industrial Goods & Services	107	74	16%	10%
SECO TOOLS AB	Industrial Goods & Services	75	5	10%	10%
SECURITAS AB	Industrial Goods & Services	73	61	20%	11%
SKANSKA AB	Industrial Goods & Services	130	126	8%	11%
SKF AB	Industrial Goods & Services	100	53	6%	13%
TRELLEBORG AB	Industrial Goods & Services	102	27	6%	12%
ERICSSON AB	Information Technology	131	178	25%	15%
LAWSON SOFTWARE INC	Information Technology	32	3	36%	6%
TIETOENATOR OYJ	Information Technology	8	15	21%	11%
HOLMEN AB	Materials	132	19	4%	11%
SSAB SVENSKT STAL AB	Materials	29	31	13%	11%
STORA ENSO OYJ	Materials	660	136	14%	10%
SVENSKA CELLULOSA AB	Materials	78	101	4%	11%
MILLICOM CELL.	Telecom	17	12	139%	13%
TELE2 AB	Telecom	14	50	36%	10%
TELIASONERA AB	Telecom	87	91	-2%	7%
59		74	45		

Table 9-6 SRIV calculated values of all companies included in the holdout sample

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SRIV Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
AXFOOD AB	Consumer Goods	44	29	402	276	127	46%
SWEDISH MATCH AB	Consumer Goods	90	13	315	127	188	149%
AUTOLIV, INC.	Durables	51	44	685	417	268	64%
ELECTROLUX AB	Durables	88	104	118	115	4	3%
HENNES & MAURITZ AB	Durables	60	68	384	344	40	12%
MODERN TIMES GRP MTG	Durables	12	10	346	444	97	-22%
CASTELLUM AB	Finance & Real Estate	14	2	55	93	38	-41%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	132	145	13	-9%
FABEGE AB	Finance & Real Estate	83	2	16	88	72	-81%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	4	77	73	-95%
INVESTOR AB	Finance & Real Estate	91	32	120	165	45	-27%
JM AB	Finance & Real Estate	62	12	280	166	114	69%
KUNGSLEDEN AB	Finance & Real Estate	10	3	25	108	83	-76%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	-32	143	174	-122%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	231	87	144	165%
NORDEA BANK	Finance & Real Estate	33	126	-18	107	125	-116%
OMX AB	Finance & Real Estate	22	3	136	125	11	9%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	221	218	4	2%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	287	209	78	37%
SWEDBANK AB	Finance & Real Estate	15	48	289	250	39	16%
ASTRAZENECA PLC	Health Care	94	196	18	370	352	-95%
ELEKTA AB	Health Care	35	4	119	143	23	-16%
GETINGE AB	Health Care	75	13	182	158	24	15%
MEDA AB	Health Care	16	5	72	131	59	-45%
NOBEL BIOCARE HLDG	Health Care	26	1	846	2018	1172	-58%
Q-MED AB	Health Care	20	1	60	111	51	-46%
AB VOLVO	Industrial Goods & Services	80	259	99	91	8	9%
ABB LTD	Industrial Goods & Services	115	173	105	122	17	-14%
ASSA ABLOY AB	Industrial Goods & Services	53	31	139	148	8	-6%
ATLAS COPCO AB	Industrial Goods & Services	134	51	83	97	13	-14%
HEXAGON AB	Industrial Goods & Services	15	13	86	95	9	-10%
NCC AB	Industrial Goods & Services	19	56	316	188	128	68%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	71	112	41	-37%
PEAB AB	Industrial Goods & Services	48	30	77	54	23	42%
SAAB AB	Industrial Goods & Services	70	21	234	214	21	10%
SANDVIK AB	Industrial Goods & Services	145	72	122	97	24	25%
SCANIA AB	Industrial Goods & Services	107	74	167	115	52	45%
SECO TOOLS AB	Industrial Goods & Services	75	5	213	109	104	95%
SECURITAS AB	Industrial Goods & Services	73	61	87	106	19	-18%
SKANSKA AB	Industrial Goods & Services	130	126	118	133	15	-11%
SKF AB	Industrial Goods & Services	100	53	138	119	19	16%
TRELLEBORG AB	Industrial Goods & Services	102	27	148	163	15	-9%
ERICSSON AB	Information Technology	131	178	19	28	9	-32%
LAWSON SOFTWARE INC	Information Technology	32	3	39	52	13	-26%
TIETOENATOR OYJ	Information Technology	8	15	125	219	94	-43%
HOLMEN AB	Materials	132	19	200	303	103	-34%
SSAB SVENSKT STAL AB	Materials	29	31	291	148	143	96%
STORA ENSO OYJ	Materials	660	136	90	110	20	-18%
SVENSKA CELLULOSA AB	Materials	78	101	157	120	37	31%
MILLICOM CELL.	Telecom	17	12	739	429	310	72%
TELE2 AB	Telecom	14	50	16	100	84	-84%
TELIASONERA AB	Telecom	87	91	72	57	14	25%
52		77	50			92	-2%

Table 9-7 Calculated SAEG values for all companies included in the holdout sample

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SAEG Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
AXFOOD AB	Consumer Goods	44	29	367	276	91	33%
SWEDISH MATCH AB	Consumer Goods	90	13	114	127	13	-10%
AUTOLIV, INC.	Durables	51	44	388	417	29	-7%
ELECTROLUX AB	Durables	88	104	59	115	55	-48%
HENNES & MAURITZ AB	Durables	60	68	297	344	47	-14%
MODERN TIMES GRP MTG	Durables	12	10	157	444	286	-65%
CASTELLUM AB	Finance & Real Estate	14	2	56	93	37	-40%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	161	145	16	11%
FABEGE AB	Finance & Real Estate	83	2	61	88	27	-31%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	30	77	48	-62%
INVESTOR AB	Finance & Real Estate	91	32	78	165	87	-53%
JM AB	Finance & Real Estate	62	12	85	166	81	-49%
KUNGSLEDEN AB	Finance & Real Estate	10	3	161	108	53	49%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	81	143	62	-43%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	340	87	253	290%
NORDEA BANK	Finance & Real Estate	33	126	8	107	99	-92%
OMX AB	Finance & Real Estate	22	3	93	125	32	-26%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	86	218	131	-60%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	156	209	52	-25%
SWEDBANK AB	Finance & Real Estate	15	48	131	250	119	-48%
ASTRAZENECA PLC	Health Care	94	196	393	370	23	6%
ELEKTA AB	Health Care	35	4	32	143	111	-78%
GETINGE AB	Health Care	75	13	72	158	86	-54%
MEDA AB	Health Care	16	5	11	131	121	-92%
NOBEL BIOCARE HLDG	Health Care	26	1	505	2018	1513	-71%
Q-MED AB	Health Care	20	1	24	111	87	-78%
AB VOLVO	Industrial Goods & Services	80	259	80	91	10	-11%
ABB LTD	Industrial Goods & Services	115	173	22	122	100	-82%
ASSA ABLOY AB	Industrial Goods & Services	53	31	59	148	89	-60%
ATLAS COPCO AB	Industrial Goods & Services	134	51	29	97	68	-70%
HEXAGON AB	Industrial Goods & Services	15	13	25	95	70	-74%
NCC AB	Industrial Goods & Services	19	56	161	188	27	-14%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	28	112	85	-75%
PEAB AB	Industrial Goods & Services	48	30	28	54	27	-49%
SAAB AB	Industrial Goods & Services	70	21	109	214	104	-49%
SANDVIK AB	Industrial Goods & Services	145	72	53	97	44	-45%
SCANIA AB	Industrial Goods & Services	107	74	68	115	47	-41%
SECO TOOLS AB	Industrial Goods & Services	75	5	124	109	15	14%
SECURITAS AB	Industrial Goods & Services	73	61	67	106	39	-37%
SKANSKA AB	Industrial Goods & Services	130	126	75	133	58	-44%
SKF AB	Industrial Goods & Services	100	53	63	119	55	-47%
TRELLEBORG AB	Industrial Goods & Services	102	27	84	163	79	-49%
ERICSSON AB	Information Technology	131	178	8	28	19	-70%
LAWSON SOFTWARE INC	Information Technology	32	3	0	52	52	-100%
TIETOENATOR OYJ	Information Technology	8	15	107	219	112	-51%
HOLMEN AB	Materials	132	19	251	303	52	-17%
SSAB SVENSKT STAL AB	Materials	29	31	71	148	77	-52%
STORA ENSO OYJ	Materials	660	136	115	110	5	4%
SVENSKA CELLULOOSA AB	Materials	78	101	111	120	9	-8%
MILLICOM CELL.	Telecom	17	12	0	429	429	-100%
TELE2 AB	Telecom	14	50	49	100	50	-50%
TELIASONERA AB	Telecom	87	91	47	57	11	-19%
52		77	50			102	-36%

9.3 Sensitivity Analysis

Table 9-8 SRIV values when long term growth set to 3 percent, grouped according to good and bad results respectively.

Company	Industry	Age	Turnover	SRIV Value	Actual Price	Absolute diff.	Percentage diff.
AXFOOD AB	Consumer Goods	44	29	319	276	43	16%
ELECTROLUX AB	Durables	88	104	109	115	6	-5%
HENNES & MAURITZ AB	Durables	60	68	312	344	32	-9%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	118	145	27	-18%
INVESTOR AB	Finance & Real Estate	91	32	133	165	32	-19%
OMX AB	Finance & Real Estate	22	3	119	125	6	-5%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	206	218	12	-5%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	257	209	48	23%
SWEDBANK AB	Finance & Real Estate	15	48	266	250	16	6%
GETINGE AB	Health Care	75	13	145	158	13	-8%
AB VOLVO	Industrial Goods & Services	80	259	91	91	0	0%
ABB LTD	Industrial Goods & Services	115	173	93	122	29	-24%
ASSA ABLOY AB	Industrial Goods & Services	53	31	124	148	24	-16%
ATLAS COPCO AB	Industrial Goods & Services	134	51	76	97	21	-22%
HEXAGON AB	Industrial Goods & Services	15	13	79	95	16	-17%
PEAB AB	Industrial Goods & Services	48	30	66	54	12	22%
SAAB AB	Industrial Goods & Services	70	21	205	214	9	-4%
SANDVIK AB	Industrial Goods & Services	145	72	107	97	10	10%
SKANSKA AB	Industrial Goods & Services	130	126	108	133	25	-19%
SKF AB	Industrial Goods & Services	100	53	124	119	5	5%
TRELLEBORG AB	Industrial Goods & Services	102	27	143	163	20	-13%
STORA ENSO OYJ	Materials	660	136	90	110	20	-18%
SVENSKA CELLULOSA AB	Materials	78	101	141	120	21	18%
TELIASONERA AB	Telecom	87	91	62	57	5	9%
24		107	70			19	-4%

Company	Industry	Age	Turnover	SRIV Value	Actual Price	Absolute diff.	Percentage diff.
SWEDISH MATCH AB	Consumer Goods	90	13	219	127	93	73%
AUTOLIV, INC.	Durables	51	44	557	417	140	34%
MODERN TIMES GRP MTG	Durables	12	10	299	444	144	-33%
CASTELLUM AB	Finance & Real Estate	14	2	56	93	37	-40%
FABEGE AB	Finance & Real Estate	83	2	23	88	65	-74%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	12	77	65	-84%
JM AB	Finance & Real Estate	62	12	242	166	76	46%
KUNGSLEDEN AB	Finance & Real Estate	10	3	31	108	77	-71%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	6	143	136	-95%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	115	87	28	32%
NORDEA BANK	Finance & Real Estate	33	126	-7	107	114	-107%
ASTRAZENECA PLC	Health Care	94	196	13	370	357	-96%
ELEKTA AB	Health Care	35	4	95	143	47	-33%
MEDA AB	Health Care	16	5	63	131	69	-52%
NOBEL BIOCARE HLDG	Health Care	26	1	703	2018	1315	-65%
Q-MED AB	Health Care	20	1	51	111	60	-54%
NCC AB	Industrial Goods & Services	19	56	273	188	86	46%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	60	112	52	-46%
SCANIA AB	Industrial Goods & Services	107	74	145	115	30	26%
SECO TOOLS AB	Industrial Goods & Services	75	5	164	109	55	51%
SECURITAS AB	Industrial Goods & Services	73	61	76	106	30	-28%
ERICSSON AB	Information Technology	131	178	17	28	10	-38%
LAWSON SOFTWARE INC	Information Technology	32	3	37	52	16	-30%
TIETOENATOR OYJ	Information Technology	8	15	116	219	103	-47%
HOLMEN AB	Materials	132	19	199	303	104	-34%
SSAB SVENSKT STAL AB	Materials	29	31	259	148	110	74%
MILICOM CELL.	Telecom	17	12	587	429	158	37%
TELE2 AB	Telecom	14	50	26	100	73	-74%
28		51	33			130	-24%

Table 9-9 SAEG values when long term growth set to 3 percent, grouped according to good and bad results respectively.

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SAEG Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
AXFOOD AB	Consumer Goods	44	29	281	276	5	2%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	139	145	6	-4%
ASTRAZENECA PLC	Health Care	94	196	292	370	77	-21%
AB VOLVO	Industrial Goods & Services	80	259	69	91	22	-24%
SECO TOOLS AB	Industrial Goods & Services	75	5	93	109	16	-14%
STORA ENSO OYJ	Materials	660	136	89	110	20	-18%
6		171	105			24	-13%

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SAEG Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
SWEDISH MATCH AB	Consumer Goods	90	13	78	127	48	-38%
AUTOLIV, INC.	Durables	51	44	285	417	132	-32%
ELECTROLUX AB	Durables	88	104	52	115	63	-55%
HENNES & MAURITZ AB	Durables	60	68	236	344	108	-31%
MODERN TIMES GRP MTG	Durables	12	10	130	444	314	-71%
CASTELLUM AB	Finance & Real Estate	14	2	47	93	46	-50%
FABEGE AB	Finance & Real Estate	83	2	52	88	36	-41%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	25	77	52	-68%
INVESTOR AB	Finance & Real Estate	91	32	66	165	99	-60%
JM AB	Finance & Real Estate	62	12	71	166	95	-57%
KUNGSLEDEN AB	Finance & Real Estate	10	3	141	108	32	30%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	61	143	81	-57%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	110	87	23	26%
NORDEA BANK	Finance & Real Estate	33	126	7	107	100	-93%
OMX AB	Finance & Real Estate	22	3	77	125	48	-38%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	76	218	142	-65%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	131	209	78	-37%
SWEDBANK AB	Finance & Real Estate	15	48	113	250	137	-55%
ELEKTA AB	Health Care	35	4	24	143	118	-83%
GETINGE AB	Health Care	75	13	54	158	104	-66%
MEDA AB	Health Care	16	5	9	131	123	-93%
NOBEL BIOCARE HLDG	Health Care	26	1	476	2018	1543	-76%
Q-MED AB	Health Care	20	1	19	111	91	-82%
ABB LTD	Industrial Goods & Services	115	173	19	122	104	-85%
ASSA ABLOY AB	Industrial Goods & Services	53	31	50	148	98	-66%
ATLAS COPCO AB	Industrial Goods & Services	134	51	25	97	71	-74%
HEXAGON AB	Industrial Goods & Services	15	13	21	95	74	-77%
NCC AB	Industrial Goods & Services	19	56	134	188	54	-29%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	22	112	90	-80%
PEAB AB	Industrial Goods & Services	48	30	22	54	32	-59%
SAAB AB	Industrial Goods & Services	70	21	87	214	127	-59%
SANDVIK AB	Industrial Goods & Services	145	72	46	97	51	-53%
SCANIA AB	Industrial Goods & Services	107	74	57	115	58	-50%
SECURITAS AB	Industrial Goods & Services	73	61	55	106	51	-48%
SKANSKA AB	Industrial Goods & Services	130	126	65	133	68	-51%
SKF AB	Industrial Goods & Services	100	53	55	119	64	-54%
TRELLEBORG AB	Industrial Goods & Services	102	27	73	163	90	-55%
ERICSSON AB	Information Technology	131	178	7	28	21	-74%
LAWSON SOFTWARE INC	Information Technology	32	3	0	52	52	-100%
TIETOENATOR OYJ	Information Technology	8	15	88	219	132	-60%
HOLMEN AB	Materials	132	19	207	303	96	-32%
SSAB SVENSKT STAL AB	Materials	29	31	62	148	87	-58%
SVENSKA CELLULOSA AB	Materials	78	101	87	120	33	-28%
MILLICOM CELL.	Telecom	17	12	0	429	429	-100%
TELE2 AB	Telecom	14	50	39	100	61	-61%
TELIASONERA AB	Telecom	87	91	37	57	20	-35%
46		65	43			121	-56%

Table 9-10 SRIV values when long term growth set to 5 percent, grouped according to good and bad results respectively.

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SRIV Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
ELECTROLUX AB	Durables	88	104	130	115	16	14%
MODERN TIMES GRP MTG	Durables	12	10	418	444	25	-6%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	150	145	5	3%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	242	218	24	11%
ELEKTA AB	Health Care	35	4	166	143	23	16%
AB VOLVO	Industrial Goods & Services	80	259	111	91	20	22%
ABB LTD	Industrial Goods & Services	115	173	121	122	1	-1%
ASSA ABLOY AB	Industrial Goods & Services	53	31	162	148	14	10%
ATLAS COPCO AB	Industrial Goods & Services	134	51	93	97	3	-3%
HEXAGON AB	Industrial Goods & Services	15	13	95	95	0	0%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	89	112	23	-20%
SECURITAS AB	Industrial Goods & Services	73	61	103	106	2	-2%
SKANSKA AB	Industrial Goods & Services	130	126	131	133	2	-1%
TRELLEBORG AB	Industrial Goods & Services	102	27	154	163	9	-5%
ERICSSON AB	Information Technology	131	178	21	28	7	-24%
LAWSON SOFTWARE INC	Information Technology	32	3	43	52	9	-18%
STORA ENSO OYJ	Materials	660	136	90	110	19	-18%
17		114	76			12	-1%

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SRIV Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
AXFOOD AB	Consumer Goods	44	29	559	276	283	103%
SWEDISH MATCH AB	Consumer Goods	90	13	570	127	444	351%
AUTOLIV, INC.	Durables	51	44	957	417	540	130%
HENNES & MAURITZ AB	Durables	60	68	506	344	162	47%
CASTELLUM AB	Finance & Real Estate	14	2	53	93	40	-43%
FABEGE AB	Finance & Real Estate	83	2	7	88	81	-92%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	-8	77	86	-111%
INVESTOR AB	Finance & Real Estate	91	32	102	165	63	-38%
JM AB	Finance & Real Estate	62	12	337	166	171	103%
KUNGSLEDEN AB	Finance & Real Estate	10	3	18	108	91	-84%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	-106	143	249	-175%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	-96	87	183	-210%
NORDEA BANK	Finance & Real Estate	33	126	-32	107	139	-130%
OMX AB	Finance & Real Estate	22	3	161	125	36	29%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	331	209	122	59%
SWEDBANK AB	Finance & Real Estate	15	48	322	250	72	29%
ASTRAZENECA PLC	Health Care	94	196	27	370	343	-93%
GETINGE AB	Health Care	75	13	257	158	99	62%
MEDA AB	Health Care	16	5	86	131	45	-34%
NOBEL BIOCARE HLDG	Health Care	26	1	1085	2018	934	-46%
Q-MED AB	Health Care	20	1	75	111	36	-32%
NCC AB	Industrial Goods & Services	19	56	379	188	192	102%
PEAB AB	Industrial Goods & Services	48	30	94	54	40	74%
SAAB AB	Industrial Goods & Services	70	21	284	214	70	33%
SANDVIK AB	Industrial Goods & Services	145	72	142	97	45	46%
SCANIA AB	Industrial Goods & Services	107	74	199	115	84	73%
SECO TOOLS AB	Industrial Goods & Services	75	5	308	109	199	183%
SKF AB	Industrial Goods & Services	100	53	157	119	38	32%
TIETOENATOR OYJ	Information Technology	8	15	138	219	81	-37%
HOLMEN AB	Materials	132	19	201	303	102	-34%
SSAB SVENSKT STAL AB	Materials	29	31	336	148	187	126%
SVENSKA CELLULOSA AB	Materials	78	101	185	120	65	54%
MILLICOM CELL.	Telecom	17	12	1003	429	574	134%
TELE2 AB	Telecom	14	50	-3	100	102	-103%
TELIA SONERA AB	Telecom	87	91	87	57	30	53%
35		59	38			172	16%

Table 9-11 SAEG values when long term growth set to 5 percent, grouped according to good and bad results respectively.

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SAEG Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
HENNES & MAURITZ AB	Durables	60	68	400	344	56	16%
FABEGE AB	Finance & Real Estate	83	2	73	88	15	-17%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	119	143	23	-16%
OMX AB	Finance & Real Estate	22	3	117	125	8	-7%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	194	209	14	-7%
AB VOLVO	Industrial Goods & Services	80	259	97	91	6	6%
NCC AB	Industrial Goods & Services	19	56	201	188	14	7%
SECURITAS AB	Industrial Goods & Services	73	61	85	106	20	-19%
HOLMEN AB	Materials	132	19	317	303	14	4%
TELIAISONERA AB	Telecom	87	91	63	57	6	10%
10		76	64			18	-2%
<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SAEG Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
AXFOOD AB	Consumer Goods	44	29	528	276	252	92%
SWEDISH MATCH AB	Consumer Goods	90	13	208	127	82	65%
AUTOLIV, INC.	Durables	51	44	608	417	191	46%
ELECTROLUX AB	Durables	88	104	70	115	45	-39%
MODERN TIMES GRP MTG	Durables	12	10	199	444	245	-55%
CASTELLUM AB	Finance & Real Estate	14	2	69	93	24	-25%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	189	145	44	31%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	36	77	41	-53%
INVESTOR AB	Finance & Real Estate	91	32	94	165	71	-43%
JM AB	Finance & Real Estate	62	12	104	166	62	-37%
KUNGSLEDEN AB	Finance & Real Estate	10	3	189	108	81	75%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	-309	87	396	-454%
NORDEA BANK	Finance & Real Estate	33	126	10	107	97	-90%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	101	218	117	-54%
SWEDBANK AB	Finance & Real Estate	15	48	155	250	95	-38%
ASTRAZENECA PLC	Health Care	94	196	598	370	228	62%
ELEKTA AB	Health Care	35	4	47	143	96	-67%
GETINGE AB	Health Care	75	13	107	158	51	-32%
MEDA AB	Health Care	16	5	14	131	118	-90%
NOBEL BIOCARE HLDG	Health Care	26	1	793	2018	1225	-61%
Q-MED AB	Health Care	20	1	32	111	79	-71%
ABB LTD	Industrial Goods & Services	115	173	26	122	97	-79%
ASSA ABLOY AB	Industrial Goods & Services	53	31	71	148	76	-52%
ATLAS COPCO AB	Industrial Goods & Services	134	51	34	97	63	-65%
HEXAGON AB	Industrial Goods & Services	15	13	29	95	66	-70%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	36	112	76	-68%
PEAB AB	Industrial Goods & Services	48	30	36	54	18	-34%
SAAB AB	Industrial Goods & Services	70	21	147	214	66	-31%
SANDVIK AB	Industrial Goods & Services	145	72	64	97	33	-34%
SCANIA AB	Industrial Goods & Services	107	74	84	115	31	-27%
SECO TOOLS AB	Industrial Goods & Services	75	5	184	109	75	69%
SKANSKA AB	Industrial Goods & Services	130	126	89	133	44	-33%
SKF AB	Industrial Goods & Services	100	53	76	119	43	-36%
TRELLEBORG AB	Industrial Goods & Services	102	27	97	163	66	-40%
ERICSSON AB	Information Technology	131	178	10	28	18	-64%
LAWSON SOFTWARE INC	Information Technology	32	3	0	52	52	-100%
TIETOENATOR OYJ	Information Technology	8	15	136	219	83	-38%
SSAB SVENSKT STAL AB	Materials	29	31	85	148	63	-43%
STORA ENSO OYJ	Materials	660	136	160	110	50	45%
SVENSKA CELLULOSA AB	Materials	78	101	153	120	33	27%
MILLICOM CELL.	Telecom	17	12	0	429	429	-100%
TELE2 AB	Telecom	14	50	67	100	32	-32%
42		77	47			123	-39%

Table 9-12 SRIV values when risk premium set to 4 percent, grouped according to good and bad results respectively.

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SRIV Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
MODERN TIMES GRP MTG	Durables	12	10	427	444	16	-4%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	163	145	18	12%
INVESTOR AB	Finance & Real Estate	91	32	149	165	16	-10%
ELEKTA AB	Health Care	35	4	146	143	4	3%
ABB LTD	Industrial Goods & Services	115	173	130	122	7	6%
ASSA ABLOY AB	Industrial Goods & Services	53	31	172	148	24	17%
ATLAS COPCO AB	Industrial Goods & Services	134	51	103	97	6	7%
HEXAGON AB	Industrial Goods & Services	15	13	106	95	11	12%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	88	112	25	-22%
SECURITAS AB	Industrial Goods & Services	73	61	107	106	1	1%
SKANSKA AB	Industrial Goods & Services	130	126	146	133	13	10%
TRELLEBORG AB	Industrial Goods & Services	102	27	183	163	20	12%
ERICSSON AB	Information Technology	131	178	23	28	4	-16%
LAWSON SOFTWARE INC	Information Technology	32	3	48	52	5	-9%
HOLMEN AB	Materials	132	19	246	303	57	-19%
STORA ENSO OYJ	Materials	660	136	111	110	1	1%
16		116	55			14	0%
Company	Industry	Age	Turnover	SRIV Value	Actual Price	Absolute diff.	Percentage diff.
AXFOOD AB	Consumer Goods	44	29	493	276	218	79%
SWEDISH MATCH AB	Consumer Goods	90	13	383	127	256	203%
AUTOLIV, INC.	Durables	51	44	837	417	420	101%
ELECTROLUX AB	Durables	88	104	146	115	32	28%
HENNES & MAURITZ AB	Durables	60	68	472	344	128	37%
CASTELLUM AB	Finance & Real Estate	14	2	68	93	25	-27%
FABEGE AB	Finance & Real Estate	83	2	20	88	68	-77%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	5	77	73	-94%
JM AB	Finance & Real Estate	62	12	346	166	180	109%
KUNGSLEDEN AB	Finance & Real Estate	10	3	32	108	77	-71%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	-39	143	181	-127%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	256	87	168	193%
NORDEA BANK	Finance & Real Estate	33	126	-22	107	129	-120%
OMX AB	Finance & Real Estate	22	3	168	125	43	34%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	274	218	57	26%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	354	209	146	70%
SWEDBANK AB	Finance & Real Estate	15	48	358	250	108	43%
ASTRAZENECA PLC	Health Care	94	196	22	370	348	-94%
GETINGE AB	Health Care	75	13	223	158	65	41%
MEDA AB	Health Care	16	5	89	131	43	-32%
NOBEL BIOCARE HLDG	Health Care	26	1	1042	2018	977	-48%
Q-MED AB	Health Care	20	1	74	111	37	-33%
AB VOLVO	Industrial Goods & Services	80	259	123	91	32	35%
NCC AB	Industrial Goods & Services	19	56	390	188	202	108%
PEAB AB	Industrial Goods & Services	48	30	95	54	40	74%
SAAB AB	Industrial Goods & Services	70	21	288	214	74	35%
SANDVIK AB	Industrial Goods & Services	145	72	151	97	53	55%
SCANIA AB	Industrial Goods & Services	107	74	206	115	91	80%
SECO TOOLS AB	Industrial Goods & Services	75	5	260	109	151	139%
SKF AB	Industrial Goods & Services	100	53	171	119	52	44%
TietoEnator Oyj	Information Technology	8	15	154	219	66	-30%
SSAB SVENSKT STAL AB	Materials	29	31	360	148	212	143%
SVENSKA CELLULOSA AB	Materials	78	101	193	120	73	61%
MILLICOM CELL.	Telecom	17	12	908	429	479	112%
TELE2 AB	Telecom	14	50	19	100	80	-81%
TELIA SONERA AB	Telecom	87	91	88	57	31	54%
36		60	48			150	30%

Table 9-13 SAEG values when risk premium set to 4 percent, grouped according to good and bad results respectively.

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SAEG Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
SWEDISH MATCH AB	Consumer Goods	90	13	138	127	12	9%
AUTOLIV, INC.	Durables	51	44	474	417	57	14%
HENNES & MAURITZ AB	Durables	60	68	365	344	21	6%
FABEGE AB	Finance & Real Estate	83	2	75	88	13	-15%
OMX AB	Finance & Real Estate	22	3	114	125	11	-8%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	193	209	16	-7%
AB VOLVO	Industrial Goods & Services	80	259	100	91	9	10%
NCC AB	Industrial Goods & Services	19	56	198	188	11	6%
SECURITAS AB	Industrial Goods & Services	73	61	82	106	23	-22%
HOLMEN AB	Materials	132	19	309	303	6	2%
SVENSKA CELLULOSA AB	Materials	78	101	136	120	16	13%
TELIASONERA AB	Telecom	87	91	57	57	0	0%
12		76	66			16	1%

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SAEG Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
AXFOOD AB	Consumer Goods	44	29	450	276	174	63%
ELECTROLUX AB	Durables	88	104	73	115	41	-36%
MODERN TIMES GRP MTG	Durables	12	10	194	444	250	-56%
CASTELLUM AB	Finance & Real Estate	14	2	69	93	24	-26%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	199	145	54	37%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	37	77	41	-53%
INVESTOR AB	Finance & Real Estate	91	32	96	165	69	-42%
JM AB	Finance & Real Estate	62	12	104	166	61	-37%
KUNGSLEDEN AB	Finance & Real Estate	10	3	200	108	91	85%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	99	143	43	-31%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	376	87	289	331%
NORDEA BANK	Finance & Real Estate	33	126	10	107	97	-90%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	107	218	110	-51%
SWEDBANK AB	Finance & Real Estate	15	48	162	250	88	-35%
ASTRAZENECA PLC	Health Care	94	196	481	370	111	30%
ELEKTA AB	Health Care	35	4	39	143	103	-73%
GETINGE AB	Health Care	75	13	88	158	70	-44%
MEDA AB	Health Care	16	5	13	131	118	-90%
NOBEL BIOCARE HLDG	Health Care	26	1	732	2018	1287	-64%
Q-MED AB	Health Care	20	1	30	111	81	-73%
ABB LTD	Industrial Goods & Services	115	173	27	122	95	-78%
ASSA ABLOY AB	Industrial Goods & Services	53	31	72	148	75	-51%
ATLAS COPCO AB	Industrial Goods & Services	134	51	36	97	61	-63%
HEXAGON AB	Industrial Goods & Services	15	13	30	95	65	-68%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	34	112	78	-70%
PEAB AB	Industrial Goods & Services	48	30	34	54	20	-37%
SAAB AB	Industrial Goods & Services	70	21	134	214	79	-37%
SANDVIK AB	Industrial Goods & Services	145	72	66	97	31	-32%
SCANIA AB	Industrial Goods & Services	107	74	84	115	31	-27%
SECO TOOLS AB	Industrial Goods & Services	75	5	152	109	43	39%
SKANSKA AB	Industrial Goods & Services	130	126	93	133	40	-30%
SKF AB	Industrial Goods & Services	100	53	79	119	40	-34%
TRELLEBORG AB	Industrial Goods & Services	102	27	104	163	59	-36%
ERICSSON AB	Information Technology	131	178	10	28	17	-63%
LAWSON SOFTWARE INC	Information Technology	32	3	0	52	52	-100%
TIETOENATOR OYJ	Information Technology	8	15	131	219	88	-40%
SSAB SVENSKT STAL AB	Materials	29	31	88	148	60	-40%
STORA ENSO OYJ	Materials	660	136	141	110	31	28%
MILLICOM CELL.	Telecom	17	12	0	429	429	-100%
TELE2 AB	Telecom	14	50	61	100	39	-39%
40		77	45			116	-28%

Table 9-14 SRIV values when risk premium set to 6 percent, grouped according to good and bad results respectively.

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SRIV Value</i>	<i>Actual Price</i>	<i>Absolute diff</i>	<i>Percentage diff.</i>
AXFOOD AB	Consumer Goods	44	29	339	276	64	23%
ELECTROLUX AB	Durables	88	104	99	115	16	-14%
HENNES & MAURITZ AB	Durables	60	68	323	344	21	-6%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	110	145	35	-24%
OMX AB	Finance & Real Estate	22	3	114	125	11	-9%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	186	218	32	-15%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	241	209	32	16%
SWEDBANK AB	Finance & Real Estate	15	48	243	250	7	-3%
GETINGE AB	Health Care	75	13	154	158	4	-3%
AB VOLVO	Industrial Goods & Services	80	259	83	91	8	-8%
ASSA ABLOY AB	Industrial Goods & Services	53	31	117	148	31	-21%
HEXAGON AB	Industrial Goods & Services	15	13	72	95	23	-24%
PEAB AB	Industrial Goods & Services	48	30	65	54	10	19%
SAAB AB	Industrial Goods & Services	70	21	197	214	16	-8%
SANDVIK AB	Industrial Goods & Services	145	72	102	97	5	5%
SCANIA AB	Industrial Goods & Services	107	74	140	115	25	22%
SKF AB	Industrial Goods & Services	100	53	116	119	3	-3%
TRELLEBORG AB	Industrial Goods & Services	102	27	124	163	39	-24%
SVENSKA CELLULOSA AB	Materials	78	101	132	120	12	10%
TELIASONERA AB	Telecom	87	91	60	57	3	5%
20		77	61			20	-3%
Company	Industry	Age	Turnover	SRIV Value	Actual Price	Absolute diff	Percentage diff.
SWEDISH MATCH AB	Consumer Goods	90	13	267	127	141	111%
AUTOLIV, INC.	Durables	51	44	580	417	163	39%
MODERN TIMES GRP MTG	Durables	12	10	291	444	153	-34%
CASTELLUM AB	Finance & Real Estate	14	2	46	93	47	-51%
FABEGE AB	Finance & Real Estate	83	2	14	88	74	-84%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	3	77	74	-96%
INVESTOR AB	Finance & Real Estate	91	32	101	165	64	-39%
JM AB	Finance & Real Estate	62	12	235	166	69	42%
KUNGSLEDEN AB	Finance & Real Estate	10	3	21	108	87	-80%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	-27	143	169	-119%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	211	87	124	142%
NORDEA BANK	Finance & Real Estate	33	126	-15	107	122	-114%
ASTRAZENECA PLC	Health Care	94	196	15	370	355	-96%
ELEKTA AB	Health Care	35	4	101	143	42	-29%
MEDA AB	Health Care	16	5	61	131	71	-54%
NOBEL BIOCARE HLDG	Health Care	26	1	713	2018	1306	-65%
Q-MED AB	Health Care	20	1	50	111	60	-55%
ABB LTD	Industrial Goods & Services	115	173	88	122	34	-28%
ATLAS COPCO AB	Industrial Goods & Services	134	51	70	97	27	-28%
NCC AB	Industrial Goods & Services	19	56	265	188	78	42%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	60	112	52	-47%
SECO TOOLS AB	Industrial Goods & Services	75	5	180	109	71	65%
SECURITAS AB	Industrial Goods & Services	73	61	73	106	33	-31%
SKANSKA AB	Industrial Goods & Services	130	126	99	133	34	-26%
ERICSSON AB	Information Technology	131	178	16	28	12	-43%
LAWSON SOFTWARE INC	Information Technology	32	3	33	52	19	-37%
TIETOENATOR OYJ	Information Technology	8	15	105	219	114	-52%
HOLMEN AB	Materials	132	19	168	303	135	-45%
SSAB SVENSKT STAL AB	Materials	29	31	244	148	96	65%
STORA ENSO OYJ	Materials	660	136	76	110	34	-31%
MILLICOM CELL.	Telecom	17	12	623	429	194	45%
TELE2 AB	Telecom	14	50	13	100	86	-87%
32		77	43			129	-26%

Table 9-15 SAEG values when risk premium set to 6 percent, grouped according to good and bad results respectively.

<i>Company</i>	<i>Industry</i>	<i>Age</i>	<i>Turnover</i>	<i>SAEG Value</i>	<i>Actual Price</i>	<i>Absolute diff.</i>	<i>Percentage diff.</i>
AXFOOD AB	Consumer Goods	44	29	309	276	34	12%
SWEDISH MATCH AB	Consumer Goods	90	13	97	127	30	-24%
AUTOLIV, INC.	Durables	51	44	328	417	89	-21%
D. CARNEGIE & CO AB	Finance & Real Estate	75	5	135	145	10	-7%
KUNGSLEDEN AB	Finance & Real Estate	10	3	135	108	27	25%
ASTRAZENECA PLC	Health Care	94	196	332	370	38	-10%
SECO TOOLS AB	Industrial Goods & Services	75	5	105	109	4	-4%
STORA ENSO OYJ	Materials	660	136	97	110	13	-12%
SVENSKA CELLULOSA AB	Materials	78	101	93	120	27	-22%
9		131	59			30	-7%
Company	Industry	Age	Turnover	SAEG Value	Actual Price	Absolute diff.	Percentage diff.
ELECTROLUX AB	Durables	88	104	50	115	65	-57%
HENNES & MAURITZ AB	Durables	60	68	250	344	94	-27%
MODERN TIMES GRP MTG	Durables	12	10	132	444	311	-70%
CASTELLUM AB	Finance & Real Estate	14	2	47	93	46	-50%
FABEGE AB	Finance & Real Estate	83	2	51	88	37	-42%
HUFVUDSTADEN AB	Finance & Real Estate	92	1	25	77	52	-68%
INVESTOR AB	Finance & Real Estate	91	32	65	165	100	-61%
JM AB	Finance & Real Estate	62	12	71	166	95	-57%
L. WALLENSTAM BYGGN.	Finance & Real Estate	63	1	68	143	74	-52%
LJUNGBERGGRUPPEN AB	Finance & Real Estate	34	1	311	87	224	256%
NORDEA BANK	Finance & Real Estate	33	126	7	107	100	-93%
OMX AB	Finance & Real Estate	22	3	78	125	47	-38%
SKANDINAVISKA ENSK	Finance & Real Estate	147	101	72	218	145	-67%
SV. HANDELSBANKEN AB	Finance & Real Estate	136	79	131	209	77	-37%
SWEDBANK AB	Finance & Real Estate	15	48	110	250	140	-56%
ELEKTA AB	Health Care	35	4	27	143	116	-81%
GETINGE AB	Health Care	75	13	61	158	97	-61%
MEDA AB	Health Care	16	5	9	131	122	-93%
NOBEL BIOCARE HLDG	Health Care	26	1	501	2018	1518	-75%
Q-MED AB	Health Care	20	1	20	111	90	-82%
AB VOLVO	Industrial Goods & Services	80	259	68	91	23	-26%
ABB LTD	Industrial Goods & Services	115	173	18	122	104	-85%
ASSA ABLOY AB	Industrial Goods & Services	53	31	49	148	99	-67%
ATLAS COPCO AB	Industrial Goods & Services	134	51	24	97	72	-75%
HEXAGON AB	Industrial Goods & Services	15	13	21	95	74	-78%
NCC AB	Industrial Goods & Services	19	56	135	188	52	-28%
NIBE INDUSTRIER AB	Industrial Goods & Services	58	5	23	112	89	-79%
PEAB AB	Industrial Goods & Services	48	30	23	54	31	-57%
SAAB AB	Industrial Goods & Services	70	21	92	214	121	-57%
SANDVIK AB	Industrial Goods & Services	145	72	45	97	52	-54%
SCANIA AB	Industrial Goods & Services	107	74	57	115	57	-50%
SECURITAS AB	Industrial Goods & Services	73	61	56	106	49	-47%
SKANSKA AB	Industrial Goods & Services	130	126	63	133	70	-53%
SKF AB	Industrial Goods & Services	100	53	53	119	66	-55%
TRELLEBORG AB	Industrial Goods & Services	102	27	70	163	93	-57%
ERICSSON AB	Information Technology	131	178	7	28	21	-75%
LAWSON SOFTWARE INC	Information Technology	32	3	0	52	52	-100%
TIETOENATOR OYJ	Information Technology	8	15	90	219	130	-59%
HOLMEN AB	Materials	132	19	211	303	92	-30%
SSAB SVENSKT STAL AB	Materials	29	31	60	148	88	-60%
MILLICOM CELL.	Telecom	17	12	0	429	429	-100%
TELE2 AB	Telecom	14	50	42	100	58	-58%
TELIAISONERA AB	Telecom	87	91	39	57	18	-31%
43		66	48			128	-53%