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The Value Relevance of Fair Value Accounting to Market Returns

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Abstract

This thesis strives to investigate the value relevance of fair value accounting stipulated by the IFRS standards IAS 40 and IAS 41. This is done by using earnings level and change in earnings level as explanatory variables for share returns in the Swedish and Finnish Forestry and Real Estate industries. Aside from investigating on an aggregated level, we also divide the companies based on their business model to study potential differences in value relevance of fair value accounting.

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1. Introduction

1.1 Background IFRS

Around the world, financial statements are prepared to be interpreted by internal and external users. Traditionally, the view on accounting and its role differ around the world[1]. This variation can be due to culture, legal or economic reasons. Traditionally there is a difference between the Anglo-Saxon parts of the world and continental Europe. To generalize, accounting regulations in the Anglo-Saxon countries is focused on informing outside investors, giving grounds for investment decisions. The regulations in continental Europe is more focused on being precise and stabile, and to ensure the rights of creditors and governments[2].

The International Accounting Standards Board (IASB) aims at minimizing these differences[3]. To achieve this, the IFRS framework was introduced for listed companies within the European Union in 2005[4]. The implementation of IFRS 2005 posed several new things, such as fair value accounting for real estate and biological assets. The framework has been criticized for being too detailed in its recommendations, and for putting to much focus on market values. It has been argued that the fair value regulations are a movement towards a more Anglo-Saxon type of accounting, and that increased focus on market values could imply a risk of increased arbitrariness[5]. Critics also claim that the fair values stipulated in the framework was one of the reason for the sharp shift in the economy following the financial crisis during 2008[6].

Fair value accounting is described in the standards IAS 39 – Financial Instruments: recognition and Measurement, IAS 40-Investment Property and IAS 41- Agriculture. These prescribe the accounting treatment of financial, real estate and biological assets respectively. They state that assets recognized according to these standards should be measured at fair value, and that the fair value should reflect market conditions at the end of the reporting period[7]. Furthermore, the change

1 Alexander & Nobes. (2004). p.4.
2 Nobes & Parker. (2006). p. 31
3 International Accounting Standards Board (IASB). (2008) p.72.
4 Nobes & Parker.(2006).p.5
5 Nordstjernan Annual Report 2008.p2-3.
6 DI 09-05-27, Interview Caroline af Ugglas
7 International Accounting Standards Board (IASB).(2008) p.2245.

in fair values during the reporting period should be recognized as a profit or loss through the income statement[8].

1.2 Problem Area

Value relevance has been defined as the ability of accounting information to capture information that affects the value of the company[9]. The underlying objective of accounting is to give a "true and fair view" of the company[10]. If the implementation of fair value accounting is providing investors with a better view, the information should be value relevant to the market and be reflected in the share price. Thus, it is interesting to test if the value relevance, measured as price response in the share in relation to the information provided in the annual statements of the fair value item is relevant to the market.

A company has a spectrum of different ways to use its asset base to generate returns. This spectrum is limited by two extremes, one being holding the asset forever, and generating operating income through an efficient business model. The other extreme would be to actively trade the asset portfolio continuously, generating return through the value increase of the portfolio. In between these two extremes, there are as many variations as companies.

One way of interpreting "a true and fair view", would be to relate it to the business model of the company, since value creation of a company is dependent on successfully executing the business model. IFRS fair value regulations are dependent on asset classes rather than business model, thus the regulations are not considering if the value changes in the asset are reflecting the success of the business model.

1.3 Aim of study

This thesis strives to investigate the value relevance of the IFRS fair value regulations to the companies affected by it. Firstly, the value relevance of the fair value changes is investigated analogue to the reporting standards, not regarding the business models of the companies. Secondly, the business model of the company will be taken into consideration when investigating the value relevance of the fair value regulations. To contrast and compare, two groups of companies will be

[8] International Accounting Standards Board.(2008).p.2245.
[9] Hellström.(2006).p.114
[10] Alexander and Nobes (2006).p.102

examined. One group that is actively trading with the asset valued at fair value, and one group of companies that is not actively trading the asset. Thus, the aim of this thesis is:

Investigate if the IFRS fair values are value relevant for the pricing of shares of the companies owning assets reported in accordance with the fair value regulations of IFRS. Additionally, investigate the value relevance of the fair value reporting, to companies actively trading with the underlying asset and to companies not trading with the underlying asset.

1.4 Limitations

From a financial analysis point of view, the relevance and reliability of the financial information are important objectives[11]. The reliability of fair value accounting can be examined by assessing the quality of valuation of the fair values. The focus in this paper will be on the relevance of the fair value accounting, thus limiting ourselves from considering the difference in reliability of the fair value changes in the company selection.

The scope will be on the Swedish and Finnish market. The IFRS is implemented in a large number of countries, why it would have been interesting to investigate other markets as well. The constrain to look at only the Swedish and Finnish market is partly due to the time constraints of the thesis, but also to minimize the risk of disturbing factors that differs between the individual markets. Sweden and Finland has several similarities in terms of the importance of the forestry industry[12].

We have chosen to focus on IAS 40 and IAS 41 and the companies mostly affected by it; the real estate and forestry industry. The reason for not investigating IAS 39 and the companies mostly affected by it, such as banks and other financial institutions, is the complexity of the value drivers, differing substantial from other industries[13].

1.5 Dispositions

Following this introduction chapter, a presentation of previous research will be made in chapter 2. This chapter includes theories underpinning the aim and the test design of this thesis. In chapter 3, a description of the method is presented. Chapter 4 contains a description on how the empirical data has been collected and processed. Chapter 5 presents the results from the performed tests; these results are analyzed in chapter 6. The thesis is ended in chapter 7 with a concluding discussion.

[11] White, Sondi & Fried (2003).p.8.
[12] Suomen Pankki - Finlands Bank. 2007-06-20.
[13] Koller, Goedhart & Wessels.(2005).p.681.

2. Previous Research

This section will serve as a background to the research design of this study, covering the previous market based research of earnings/returns relationships. This is followed by a presentation of the theoretical relationship between accounting data and valuation models. The chapter is ended by an introduction to an empirical test model for investigating value relevance of accounting data.

2.1 Market Based research

Research of earnings return relationship has been affected by the view of the market. The two conflicting views have been efficient market hypothesis (EMH) and the mechanic hypothesis (MH). The EMH in its strongest form claims that all information, even privately held insider information, is reflected in the share price. The implication of this view is that the information contained in the financial statements is already included in the price of the share, thus no additional advantages will be to those who use the financial statements[14]. One the other end of the spectra is the MH meaning that users of financial statements do not access any additional information, thus the stock prices should react mechanically to presented earnings information. This hypothesis has been largely rejected in favor of the EMH, thus inspiring to additional questions such as: What, if any, accounting information does the market react to? This question led to the starting point of the return/earnings research by Ball and Brown (1968), examining the role of accounting information to the pricing of shares[15].

The Ball and Brown study aimed at documenting the relationship between the market return and accounting information. This was done by constructing god and bad portfolios; god if the result was above the market expectations bad if the result was below market expectations, then relating the sign of the difference between market expectations and outcome to the returns of the shares. Ball and Brown documented a clear empirical association between return and earnings, although most of the abnormal market performance[16] occurred prior to the publication of the annual report[17].

This documented association gave rise to further research regarding the returns/earnings relationship and inspired to information content studies, and studies examining the relationship between earnings

[14] Although the most commonly applied form of the EMH is the semi strong form, where all publicly available information is reflected in the share prices, thus an instantaneous correction to the price will appear when the annual report is published if it contains new information relevant to the share price.
[15] White, Sondi & Fried (2003).p.168.
[16] Measured as the return above the predicted return by CAPM.
[17] Ball & Brown (1968)

and stock returns[18]. Ball and Brown used the sign of the difference between the forecasted earnings per share and earnings per share. Following studies has also taken the strength of the difference[19], the use of quarterly information[20], definition of income[21], different components of earnings[22], and examined the requirements of disclosure of comprehensive income compared to net income[23].

The earnings forecast have also been a major field of research. Two main questions have been researched regarding earnings forecasting: Firstly, which forecasting model has the best predictability? Secondly, which forecasting model is most closely mirroring the market expectations? Previous studies have used the explicit response in stock returns to earnings through the earnings response coefficient (ERC)[24], defined as the explicit share return, relative to the difference between earnings and earnings expectation. ERC has been tested for different reactions across sectors and components of earnings, showing that risk and growth explains some of the cross sectional differences in ERC[25].

Ball and Brown used monthly returns over a full year in their study. Other has used daily or weekly returns. There is a trade off between a narrow time window and a long time window. The shorter time window is beneficial because it reduces the risk of capturing price changes caused by other factors then the tested. This short time window can on the other hand exclude the so called post announcement drifts[26].

Although heavily researched, no major breakthrough was done in increasing the understanding of the earnings/returns relationship after Ball and Browns study 1968 to the end of the 1980s[27]. This was criticized by Lev (1989) and Bernard (1989) on the basis that the previous research did not contribute to an understanding of how investors use information, or contribute to the deliberations of accounting policy makers. This was to a great extent attributed to a fixation on sophisticated

18 White, Sondi & Fried.(2003).p.172.
19 Beaver et al. (1979)
20 Foster (1977)
21 Such as operating income, net income, extra ordinary and non-reoccurring items impact on returns of shares.
22 Lipe (1986)
23 Dhaliwal, Subramanyam, Trezevant (1999).
24 White, Sondi & Fried (2003).p.172.
25 Collins & Kothari (1989)
26 Ball (1978), Joy & Jones (1979)
27 White, Sondi & Fried.(2003).p.172.

statistical techniques at the expense of model building and at the expense of fundamental valuation relationships. [28]

Both Lev and Bernard suggested that future research should incorporate the following:

- More emphasis on accounting earnings relation to valuation models
- That the earnings/returns relationships are measured on an individual, rather than portfolio basis.
- Averaging accounting earnings over time, to smoothen out accruals and manipulations.
- The earnings components used should be adjusted for all possible adjustments at the same time.

2.2 Relating Accounting Data to Valuation Models

The residual income model (RIV) is relating accounting data to the intrinsic value of a company. The RIV model is a restatement of the present value of future dividends model, and uses accounting measures as return on equity (ROE) and earnings and book value as variables in the valuation model[29]. The following text will examine the underlying assumptions for the RIV model, and describe the relationship between the present value of expected dividends (PVED) and the RIV model.

The first assumption is that an asset is equal to the present value of the future cash flows[30]. Thus, the value of a share to its owner could thus be described through the present value of expected dividends:

$$P_t = \sum_{i=1}^{\infty} \frac{E_t(DIV_{t+i})}{(1 + r_e)^i} \qquad (2.1)$$

Where: $E_t(DIV_{t+i})$ = Expected dividend of year t+1 at time t

r_e = The required rate of return on equity

The second assumption is that of clean surplus relation[31]. The clean surplus relationship (2.2) is stating that changes in book value of a company are done through the income statement and through transactions with owners:

[28] White, Sondi & Fried.(2003).p.177
[29] Ohlson (1995)
[30] Hellström (2006).p.114

$$BV_t = BV_{t-1} + X_t - d_t \quad (2.2)$$

Where: BV_t = Book value at time t

X_t = Net Income at time t

d_t = Net dividend at time t

The net dividend is defined as net transactions with owners; both dividends paid out and capital paid to the company from investors[32].

The third underlying assumption is that the dividend payout is reducing book value in a 1:1 relationship, but not reducing NI. Thus the derivative of book value with regards to dividend is -1 (2.3), and the derivative of net income with regards to dividend is 0 [33]. (2.4)

$$\frac{\partial BV_t}{\partial d_t} = -1 \quad (2.3) \qquad and \qquad \frac{\partial X_t}{\partial d_t} = 0 \quad (2.4)$$

The fourth assumption that needs to be satisfied for the PVED and RIV to converge is: (2.5)[34]:

$$E_t \frac{P_{t+i}}{(1+r_e)^i} \to 0 \; as \; i \to \infty \quad (2.5)$$

Where: $E_t(.)$ = the expected value operator conditional on the information available at time t.

P_{t+i} = Price at time t+i

Further, the value driver of the model is abnormal earnings. Abnormal earnings are the earnings exceeding the required earnings level, due to the required return on capital[35] (2.6). Abnormal earnings is defined as:

$$X_t^a = X_t - r_e \times BV_{t-1} \quad (2.6)$$

If these conditions are satisfied, the PVED can be rewritten to a RIV valuation model stating the value of a company in terms of accounting data, instead of dividends paid to owners. The RIV model is stated as[36]:

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[31] Ohlson (1995)
[32] Ibid
[33] Ibid
[34] Ibid
[35] Ibid
[36] For further derivation see Ohlson (1995)

$$P_t = BV_t + \sum_{i=1}^{\infty} \frac{E_t(X^a_{t+i})}{(1+r_e)^i} \qquad (2.7)$$

2.2.1 Linear Information Model

The linear information model is an extension of the RIV model. It explains the stochastic time-series behavior of abnormal earnings in the sense that the expected abnormal earnings of period t+1, depends on the abnormal earnings in period t plus an additional variable reflecting other information regarding future abnormal earnings not included in earnings of period t[37]. This can be expressed as:

$$X^a_{t+i} = \omega X^a_t + V_t + \varepsilon_{1t+1} \qquad (2.8)$$

$$V_{t+1} = \gamma V_t + \varepsilon_{2t+1} \qquad (2.9)$$

Where:

V_t = Variable reflecting additional information of abnormal earnings not included in X^a_t

ω = The persistence parameter of abnormal earnings

γ = The persistence parameter of additional info not included in X^a_t

The parameters γ and ω are constrained to be non-negative and less than, or equal to one. The variables ε_{1t+1}, and ε_{2t+1} are unpredictable, zero mean variables, assumed to be fixed and "known" parameters. Combining formula 2.7 and 2.9, the price of a company can be expressed as[38]:

$$P_t = BV_t + \alpha_1 X^a_t + \alpha_2 V_t \qquad (2.10)$$

Where[39]:

$$\alpha_1 = \frac{\omega}{(1+r_e)-\omega} \qquad (2.11)$$

$$\alpha_2 = \frac{(1+r_e)}{[(1+r_e)-\omega][(1+r_e)-\gamma]} \qquad (2.12)$$

Thus, α_1 is the multiplier of the current abnormal earnings and α_2 is the multiplier for the variable reflecting other information, both variables are constrained: $\alpha_1 \geq 0$, and $\alpha_2 > 0$. Formula 2.10 implies that the market value of a company is the sum of book value, current abnormal earnings and other information not reflected in current accounting affecting future abnormal earnings. As implied by formula 2.11: The greater the persistence parameter ω, the larger the multiplier α_1 is, reflecting the fact that when abnormal earnings persist for a large number of years, the value of a company increases, all other things equal. When ω is equal to 0, the current level of abnormal earnings is

[37] Ohlson (1995)
[38] Ibid
[39] For further derivation, see Ohlson (1995)

irrelevant to future levels of abnormal earnings. Also implied by the formula 2.12: The greater the ω and γ, the larger the multiplier α_2, reflecting higher expectations of abnormal earnings not yet captured in current accounting.

2.3 Empirical Test Model

Empirical tests have been conducted for a model where level of earnings and the change in level of earnings are the explanatory variables for market return[40]. The economic reasoning behind the model is that both book value of owner's equity and the market value are indicators of the wealth of the shareholders, related in the following equation[41]:

$$P_t = BV_t + u_t \qquad (2.13)$$

Where: P_t= Price of the company at time t

BV_t= Book value at time t

u_t= parameter reflecting yet unobservable value drivers in the accounting variables.

The flow variables associated with formula 2.13 is:

$$\Delta P_t = \Delta BV_t + u'_t \qquad (2.14)$$

Where: $\Delta BV_t = X_t - d_t$ (2.15)

$\Delta P_t = P_t - P_{t-1}$ (2.16)

And: X_t = Net income of the period

d_t = net transactions with owners

The flow variable for price is the market return and the flow variable for book value is NI reduced by net dividend. The model is assuming that the clean surplus holds, expressed by formula 2.15. Changes in u are due to changes in expectations, not yet captured in the accounting. Using formula 2.14, and substituting changes in book value with the clean surplus relation (2.15), restating changes in price by (2.16) rearranging the dividend to the left hand side and deflating the equation with the price in the beginning of the period, the model specification will be:[42]

$$\left(\frac{P_t + dt - P_{t-1}}{P_{t-1}}\right) = \frac{X_t}{P_{t-1}} + u'' \qquad (2.17)$$

[40] Easton & Harris (1991)
[41] Easton & Harris (1991).p.21
[42] Easton & Harris (1991).p.22

The model could also be extended to include the change in earnings level, as an explanatory variable for price change. In line with the reasoning of the RIV model where the value of a company is dependent on both book values and expected future abnormal returns, the change variable could be interpreted as the change in expectations of future earnings. As mentioned in section 2.1, many studies on the relationship between earnings and return have used unexpected earnings as explanatory variable, but with an inherent problem of correctly measuring the market expectations. It has been suggested that the inclusion of both earnings levels as well as change in earnings levels might mitigate the measurements error in market expectations, thus also capturing value increase due the change in market expectations[43,44]. If incorporating change in level of earnings, the model specification is:

$$\left(\frac{P_t + dt - P_{t-1}}{P_{t-1}}\right) = \frac{X_t}{P_{t-1}} + \frac{\Delta X_t}{P_{t-1}} + u'' \quad (2.18)$$

Where: $\Delta X_t = X_t - X_{t-1}$ (2.19)

Empirical tests have suggested that both levels of earnings as well as changes in levels of earnings are relevant for explaining share returns[45]. The same tests have also contained mild colliniearity in the variables X_t and ΔX_tas well as mild heteroscedasticity in the error variables although not enough to influence the results[46].

3. Method

The model as specified in formula 2.17, as well as formula 2.18 will be used as a model for testing the value relevance of the IFRS fair value changes. The following section 3 will explain the execution and revisions of the models to investigate the aim of this thesis. We will explain in order of appearance, sample selection, dependent variable, independent variable, grouping of observations and time window. Section 3 will be ended with a full model specification adapted to the purpose of this thesis, also with a specification of the hypothesis formulated to answer the aim of the thesis.

[43] Easton & Harris 1991.pp.21-22
[44] This is consistent with the linear information model, where both current levels of abnormal earnings as well as parameters not yet reflected in accounting are reflected in future expected abnormal earnings. (See section 2.2.1.1).
[45] Easton & Harris 1991.p.31
[46] Ibid.

3.1 Sample of observations

We have chosen companies listed on the Swedish and Finnish NASDAQ OMX market. This excludes alternative trading platforms, among them OMX first north, due to the lack of regulatory requirements to comply with the IFRS accounting regulations[47]. We have chosen industries where the assets valued at fair value in accordance with IAS 40 and IAS 41 is commonly found in the balance sheet. The selection will thus be the real estate and forestry industries. A further criterion for inclusion in the sample is having an asset recorded on the balance sheet, valued in accordance with IAS 40 and IAS 41.

The time period for the sample is from 2005 to 2008. The start of the time period is due to the implementation of IFRS framework in 2005. The end of the period is the last annual report published at the point in time for the investigation.

3.2 The Dependent Variable

The dependent variable is defined as the share return adjusted for net dividend, measured over the time window period, divided by the starting price of the period, stated in formula 3.1.

$$RET = \frac{(P_t + d_t - P_{t-1})}{P_{t-1}} \quad (3.1)$$

Where: P_t = Price at time t

$$d_t = \frac{(Div_t - New_t)}{No\ Shares_t}$$

And: Div_t = Capital distributed to owners at time t

New_t = Capital paid to the company at time t

$No\ Shares_t$ = Number of shares outstanding at time t

The capital distributed to owners at time t is including dividends as well as share repurchases. A repurchase is assumed to be a value transfer equal to that of a distribution of dividends, in accordance with the Miller & Modigliani dividend irrelevance proposition[48]. The capital paid to the company is including new rights issues as well as non-cash issues. The number of shares is defined as the number outstanding shares at time t, meaning that treasury shares are deducted from the total amount of issued shares. If a split is conducted during the time period t-1 to t, the share price of time t is adjusted by multiplying the price by the split factor.

47 Internet: NASDAQ OMX
48 Brealey, Myers, Allen.(2006).pp.422-423.

The total amount of dividend paid out according to the equity statement divided by the number of outstanding shares at time t is not always equal to the dividend times the outstanding shares. To comply with the underlying assumption of clean surplus relation, the total reduction or increase in the equity statement due to capital paid in, or capital paid out from the company to the owners, is used when calculating net dividend.

3.3 The Independent Variable

Independent Variables Model 1: $\frac{X_t}{P_{t-1}} + \frac{\Delta X_t}{P_{t-1}}$ (3.2) Independent Variables Model 2: $\frac{X_t}{P_{t-1}}$ (3.3)

The variables stated in formula 3.2 and formula 3.3 will be our independent variables in accordance with the models specified in 2.17 and 2.18. To answer the aim of this thesis, the variables net income and change in net income will be split in two components NI_e and FV (3.4).

$$\frac{X_t}{P_{t-1}} = \frac{X_t - FV_t\,(1-t)}{P_{t-1}} + \frac{FV_t\,(1-t)}{P_{t-1}} \quad (3.4)$$

Where: FV_t = Is the fair value change at time t

t = Tax rate of the country

This split is done to investigate the marginal information effect of the fair value changes for each group of companies as well as for the industries in total. Net income is measured after tax, and fair value changes are measured before tax. The fair value change component is thus adjusted with the corporate tax rate to get a proper tax allocation between our variables, avoiding overstating the value of fair value relative to the other components in the income statement. Not adjusting the tax effect of fair value changes would mean placing the entire tax burden on all other income besides fair value changes, contributing to net income. We define the following variables NI_e and FV:

$$NI_e = \frac{X_t - FV_t\,(1-t)}{P_{t-1}} \quad (3.5) \qquad FV = \frac{FV_t\,(1-t)}{P_{t-1}} \quad (3.6)$$

The independent variables used in our models will thus be:

Model 1: $NI_e + FV + \Delta NI_e + \Delta FV$ Model 2: $NI_e + FV$

3.4 Grouping of observations

The first part of the aim of the study is to investigate how value relevant the fair value changes are to pricing of shares, independent of business model. To fulfill this aim, the full selection of firm year observations in forestry and property industry will be used when estimating a regression. This group is defined as G0.

G0 = Full selection of firm year observations.

The second part of our aim is to investigate the value relevance dependent on business model. To execute this investigation, the selected sample of firm year observations are grouped into two groups; one group actively trading with the asset (G1), and one group holding the asset to generate return (G2).

G1 = Group of company actively trading with the asset reported at fair value.

G2 = Group of company not actively trading with the asset reported at fair value.

3.4.1 Classification Criteria

3.4.1.1 Forestry Companies

These companies are all classified as G2 companies. Their business models are all based on the production of different products using forestry material as input, such as sawn-goods, pulp, paper, board or hygiene products. Furthermore, the turnover rate of their forest holdings is marginal or non-existing.

3.4.1.2 Real Estate Companies

To classify our selected real estate companies, a qualitative approach combined with an average turnover rate ranking is used to identify companies as belonging to group G1 or G2.

To qualitatively classify the companies, relevant parts of the annual report has been screened for words identifying the company's ways of presenting themselves. The following parts of the annual reports have been screened:

- The highlights of the past year
- The statement from the CEO and/or Chairman of the Board
- Strategy and mission of the company

All companies differ in presentation of the annual report, but these parts above have been available for every year. Screening these parts enables us to do a pre-classification of each company into one of three groups, *Trading, Non-Trading* or *Unclear*. Expressing the following key words classifies a trading company: Turnover of portfolio, transaction, risk adjusted return, divestments, rate of change, realizing added value. For classifying the *Non-Trading* companies, the following key words are used: long term view, focus on the tenant, administrating and supervising the properties. To classify companies in both these groups, the overall impression of the relevant parts from the screening is also taken into consideration, such as stringency of company mission and consistency. *Unclear* companies are defined as companies not giving a clear view on what their business model is, or in some cases emphasizing both extremes.

To perform a ranking of the turnover rate of each company's real estate portfolio, the acquired and sold properties are compared to the ingoing balance of the real estate portfolio (3.7).

$$Turnover\ rate = \frac{(B+S)}{P_{t-1}} \qquad (3.7)$$

Where: B = Bought property measured in square meters during time period t-1 to t

S = Sold property measured in square meters during time period t-1 to t

P_{t-1}= Property portfolio measured in square meters at time t-1

Square meters are used instead of market value in the turnover rate. This to get a measure not dependent on the value swings of the portfolio, and not affected by difference in value dependent on location. Square meter can thus be argued to be a more unbiased measure of transaction activity. In constructing the measurement, the net change in portfolio is not used as this can understate the transaction volume. The portfolio changes stemming from own development, i.e. changes not acquired or divested during the period, is disregarded[49]. The average turnover rate from 2005 to 2008 is then used as basis for the turnover ranking where this data is available.

To arrive at the final classification of the real estate companies into group G2 and G1, the qualitative classification is combined with the turnover ranking. The qualitative approach is the foundation for the classification, but is inconclusive since not all companies give a clear view. Thus, the qualitative approach is used to find a threshold in turnover rate between the groups of

[49] The aim of the classification is to isolate the companies actively trading with the underlying asset, to investigate the value relevance of value changes in the asset portfolio, thus own development is irrelevant.

companies. The company with the lowest turnover rate, giving a clear picture of a trading company according to the qualitative approach serves as a threshold, dividing the other companies into G1 and G2 by the turnover ranking. This is further presented in section 4.2 table 4-1 and 4-2.

3.5 Time Window

In line with previous studies, a time window of one year will be used[50]. This is to capture post announcement drifts[51], and to use the information imbedded in the annual report instead of quarterly reports[52]. The start date of the time window will be consistent to when the annual reports are published. For companies using calendar year as fiscal year, the market observations will be taken the 31st of March for the years the market was open that date. If the share was not traded on that day, the closest previous price to the 31st of March was used. If the company had another fiscal year than calendar year, the price was taken from the end of the month, three months after the closing of the books.

3.6 Model specification

In this section, the models will be specified. Following that, a section presenting the hypothesis used for investigating the aim of this thesis is presented.

3.6.1 Model 1

Model 1 is an earnings level and change in earnings level model as described in formula 2.13 and 2.14 in section 2.3. Three regressions will be estimated using model 1, one for each group of companies. The estimated regression (3.8) will show the value relevance of fair value and the change in fair value for G0. If the fair value and fair value changes are relevant information to the pricing of shares, the estimated coefficient $\hat{\beta}_2$and $\hat{\beta}_4$ should statistically significantly differ from 0. The variables $\hat{\beta}_1$ and $\hat{\beta}_3$ indicates the value relevance of NI_e excluding fair value changes, and should be significantly different from 0 for value relevance.

G0: $$R\hat{E}T = \hat{\beta}_0 + \hat{\beta}_1(NI_e) + \hat{\beta}_2(FV) + \hat{\beta}_3(\Delta NI_e) + \hat{\beta}_4(\Delta FV) + \varepsilon \qquad (3.8)$$

Where: $\hat{\beta}_0$= Estimated constant

$\hat{\beta}_1$= Estimated coefficient for NI_e

[50] Easton & Harris (1991), Ball & Brown (1968), Hellström (2006)
[51] Ball (1978), Joy & Jones (1979)
[52] Foster (1977)

$\hat{\beta}_2$= Estimated coefficient for FV

$\hat{\beta}_3$= Estimated coefficient for ΔNI_e

$\hat{\beta}_4$= Estimated coefficient for ΔFV

ε = Random error term

To answer the second part of the aim of the study, to investigate the value relevance dependent on business model, two additional regressions are formulated, one for G1 (3.9) and one for G2 (3.10).

G1: $$R\hat{E}T = \hat{\beta}_0 + \hat{\beta}_1(NI_e) + \hat{\beta}_2(FV) + \hat{\beta}_3(\Delta NI_e) + \hat{\beta}_4(\Delta FV) + \varepsilon \quad (3.9)$$

G2: $$R\hat{E}T = \hat{\beta}_0 + \hat{\beta}_1(NI_e) + \hat{\beta}_2(FV) + \hat{\beta}_3(\Delta NI_e) + \hat{\beta}_4(\Delta FV) + \varepsilon \quad (3.10)$$

The variables $\hat{\beta}_2$ and $\hat{\beta}_4$ should statistically significantly differ from 0 if the fair value levels and changes in fair value levels are relevant, for both groups of companies. The variables $\hat{\beta}_1$ and $\hat{\beta}_3$ indicates if the NI_e and changes in NI_e are relevant for both groups of companies, thus they should significantly differ from 0 if they are value relevant for both groups of companies.

3.6.1.1 Hypotheses model 1

As described in section 2.2, the value of a company is driven by its ability to generate return exceeding its cost of capital. The price of a share is a combination of the book value and the expected future abnormal returns (2.7). The future abnormal return is partly dependent on current levels of earnings as well as on the information not yet captured in the accounting (2.10). The value relevance of fair value changes can thus be two folded; it can be value relevant due to the change in book value, and due to the change of future expectations of abnormal earnings (2.10).

Referring again to the relation between accounting earnings and value of a company in formula 2.10, the price of a company should increase (decrease), all other things equal when book value increases (decreases) by a gain (loss) in the income statement due to fair value. If this is not the case, then there has to be a simultaneous negative (positive) change in the anticipated future abnormal earnings due to the expected persistence in current abnormal earnings, or by a negative change due to factors not yet reflected in accounting information. Since we can not measure things

not captured by accounting, in line with previous research, we assume this reflected by variable $\alpha_2 V_t$ in formula 2.10, to be held constant[53].

However, if the real estate market is expected to show a total cyclical price pattern, a positive (negative) fair value item in the income statement should indicate a simultaneous negative (positive) change in the persistence parameter of current abnormal earnings (see formula 2.10), when holding the asset valued at fair value in perpetuity. Thus, given the assumption of total cyclicality in asset prices and that the fair value gain is not realized, there should be no reaction in the share price. On the other extreme, continuously trading the asset, selling when prices are beneficial and buying when prices are low, the gain will be realized and a fair value increase (decrease) in the income statement is not necessarily offset by a negative (positive) change in the persistence parameter (2.10). It can even be argued that a positive (negative) fair value item in the income statement is increasing (decreasing) the persistence parameter, since this is revealing information regarding the success of the business model, i.e. how successful the company is at trading the underlying asset.

For all three company groups, the value relevance of fair value could either be positive or equal to 0, but there is no reason for expecting a negative price response in the share to a positive fair value item in the income statement. Thus, we have chosen to use a one sided hypothesis for the estimated coefficients of FV and ΔFV for all groups; reject the null hypothesis if $\hat{\beta}_2$ and $\hat{\beta}_4$ is statistically significantly larger than 0.

In line with above reasoning, the expectation are that the FV is relatively more important information for the trading companies in G1, than for the non trading companies in G2, since there should be no offsetting change in expectations of future abnormal returns for G1. Additionally, if the ΔFV could bee seen as a proxy for increased market expectations of future abnormal earnings, this variable should also be important for G1 companies. However, since the ΔFV neither reveals information regarding future abnormal returns, nor change the value of the company through an increase or decrease in book value, this is expected not to be value relevant information for G2 companies.

The expectation for NI_e is that it is value relevant for all companies, due to the increase (decrease) in book value. There is no reason to expect a negative reaction in share price, when NI_e is positive, all

[53] Hellström (2006).p.116

other things equal, why a one sided hypothesis is used for these variables as well. Analogue to the reasoning behind the importance of FV and ΔFV for G1 companies, the NI_e and ΔNI_e variable is indicating future abnormal returns for the non trading companies, why these variables should be relatively more important for G2 than G1. Additionally, there should be no value relevance for the trading companies in ΔNI, since this neither reveal information regarding future abnormal returns nor increase the value or the company through the book value. Thus the hypothesis for all groups for NI_e and ΔNI_e is; reject the null hypothesis if $\hat{\beta}_1$ and $\hat{\beta}_3$ are statistically significantly larger than 0.

3.6.2 Model 2

Due to the inherent risk of collinearity in model 1 between the levels variables, and change in levels variables, we have chosen to perform a model excluding the variables ΔNI_e and ΔFV. The choice to exclude the change variables is motivated by the stronger empirical association between levels of earnings as compared to change in the levels of earnings and market return, in previous studies[54]. Thus, model 2 is an earnings levels model as described in formula 2.13, in section 2.3. Analogue to model 1, three regressions will be estimated using model 2, one for each group of companies. The estimated regression (3.11) will show the value relevance of fair value for G0. The variable $\hat{\alpha}_1$ indicates the value relevance of NI_e, and should be significantly different from 0 for value relevance. If the FV are relevant to the pricing of shares, then the estimated coefficient $\hat{\alpha}_2$ should statistically significantly differ from 0.

G0: $$R\hat{E}T = \hat{\alpha}_0 + \hat{\alpha}_1(NI_e) + \hat{\alpha}_2(FV) + \varepsilon \qquad (3.11)$$

Where:
$\hat{\alpha}_0$= Estimated constant
$\hat{\alpha}_1$= Estimated coefficient for NI_e
$\hat{\alpha}_2$= Estimated coefficient for FV
ε = Random error term

To answer the second part of the aim of the study, to two additional regressions are formulated, one for G1 and one for G2.

G1: $$R\hat{E}T = \hat{\alpha}_0 + \hat{\alpha}_1(NI_e) + \hat{\alpha}_2(FV) + \varepsilon \qquad (3.12)$$

G2: $$R\hat{E}T = \hat{\alpha}_0 + \hat{\alpha}_1(NI_e) + \hat{\alpha}_2(FV) + \varepsilon \qquad (3.13)$$

[54] Easton & Harris (1991).p.27

3.6.2.1 Hypothesis model 2

The sign for the coefficients of FV and NI_e is expected to be positive for all three groups, in line with the reasoning of section 3.6.1.1, why a one sided hypothesis is used for $\hat{\alpha}_1$ and $\hat{\alpha}_2$; reject if significantly larger than 0.

The expectations are also in line with the reasoning in 3.6.1.1; the FV is relatively more important for G1 companies than for G2 companies, and the NI_e is relatively more important for G2 companies than G1 companies.

4. Empirical Data

The collection of empirical data is presented in order of appearance; data selection of companies, classification data, dependent variable and independent variable. Due to the highly manual data collection we have also included an integrity check of data in section 4.5. After that follows a presentation of the quality of data in section 4.6 including a presentation of reasons for excluding non applicable firm year observations.

4.1 Data Selection of Companies

To get the full population of companies classified as real estate and forestry industry, the selection is based on the Global Industry Classification Standard (GICS)[55]. The selection group consists of companies classified as GICS level three "Paper and Forest Products" and GICS level two "Real Estate". This search yields all listed companies in Sweden and Finland, why only the companies listed on NASDAQ OMX small-, mid- and large cap are included, thus excluding alternative trading platforms (see section 3.1). To establish which firm year observations that have an asset valued in accordance with IAS 40 and IAS 41, each balance sheet of the population of GICS sector "Paper and Forestry" and "Real Estate" listed in small-, mid- or large cap of NASDAQ OM have manually been scanned for biological assets and investment properties.

4.2 Classification Data

The classification data is collected from the annual reports for each firm year observation. The transaction data of the quantitative measurement is collected from the company's own description of transactions during the year from the annual report. When this was not stated, the data was collected from the Report of the Directors part of the annual report, where material property transactions

55 Internet: NASDAQ OMX

during the year were stated. If the transactional data was not described in the annual report, the specification of the properties has been compared between years. When using the list of properties, a sale is defined as the properties in $T_{0,}$ not in $T_{1.}$ An acquisition is defined as properties in T_1, not in $T_{0.}$

Comparing the turnover rate, starting from the lowest turnover shown by the company Dagon, to the highest turnover rate by Kungsleden, the lowest turnover rate for a clearly classified G2 company according to the qualitative classification is Wihlborgs (Appendix 1). This will then serve as a divider in the turnover rate ranking, dividing the companies into G1 and G2 companies (Table 4-1).

Company	Average Turnover	Qualitative	Gruop
Dagon	2%	Non Trading	G2
Heba Fastigheter	3%	Non Trading	G2
Hufvudstaden	4%	Non Trading	G2
Catena	6%	Non Trading	G2
Castellum	6%	Unclear	G2
Din Bostad	9%	Non Trading	G2
Wallenstam	11%	Unclear	G2
Atrium Ljungberg	13%	Non Trading	G2
Technopolis	14%	Non Trading	G2
Wihlborgs	**16%**	**Trading**	**G1**
Fast Partner	19%	Unclear	G1
J Tallberg	21%	Trading	G1
CityCon	28%	Non Trading	G1
Klövern	32%	Unclear	G1
Brinova	36%	Unclear	G1
Sagax	43%	Trading	G1
Sponda	45%	Unclear	G1
Balder	52%	Non Trading	G1
Fabege	53%	Trading	G1
Diös	53%	Unclear	G1
Kungsleden	79%	Trading	G1
Average	**26%**		

Table 4-1: Turnover Ranking

Group 1 - 12 Companies	Group 2 - 15 Companies
12 Real Estate Companies	*9 Real Estate Companies*
Balder	Atrium Ljungberg
Brinova	Castellum
CityCon	Catena
Diös	Dagon
Fabege	Din Bostad
Fast Partner	Heba Fastigheter
J Tallberg	Hufvudstaden
Klövern	Technopolis
Kungsleden	Wallenstam
Sagax	*6 Forestry Companies*
Sponda	Bergs Timber
Wihlborgs	Holmen
	M-real
	SCA
	Stora Enso
	UPM

Table 4-2: Classification of Companies

Balder and CitiCon would qualitative be considered a G2 company, but will according to this classification be G1 companies due to their high turnover rate. The final classification including the forestry companies are shown in table 4-2. The total population of companies in the samples for group 1 is 12 real estate companies and the total population for group 2 is 15 companies whereas 9 are real estate and 6 are forestry companies.

4.3 Dependent Variable

The price data for each company year is collected from NASDAQ OMX website[56]. The website has both price information adjusted for splits and reversed splits. The unadjusted price is used as input data, adjusted with the split factor, gathered from each annual report. This because some data was not adjusted by NASDAQ OMX, even though a split was conducted.

The net dividend is collected from the equity statement in the annual report for each firm year observation. Information was collected regarding dividend paid to shareholders, new issues, and distributions to shareholders through share repurchases or similar activities. The number of outstanding shares and corporate actions are gathered from the chapter in the annual reports describing the share development for each year. The number of outstanding shares are used in the calculations, thus shares held in treasury are disregarded.

4.4 Independent Variable

Net income and fair value for each firm year observation are collected from the income statement in the annual report. For real estate companies, the fair value is gathered as the unrealized changes in real estate property. For forestry companies the fair value is the change in fair value of biological assets.

4.5 Description and quality of data

The data selected was originally a total of 113 firm year observations (table 4-3). A number of these observations were excluded; 11 observations were excluded due to the fact that we only could find annual reports or other relevant information in Finnish. 8 observations were excluded since the company was unlisted during the year, or during parts of the year. This does also take into account the fact if the firm during the year changed listing place after being listed on another market place than the NASDAQ OMX small-, mid- and large cap lists. 3 observations were excluded since no information was to be found regarding previous year's earnings for our NI_e and FV variables. Thus, 91 observations were after this left to perform the research.

Excluded firm year observations	No of observations
Total no of observations	113
- Reason for excluding	
Information in Finnish	11
Not listed at OMX t-1	8
No information regarding prev. year	3
Number of firm year observations	91

Table 4-3: Excluded Observations

[56] Internet: NASDAQ OMX

4.5.1 Integrity Check of Data Collection

Since there is an operational risk attached to the manual procedure of gathering data from the annual statement, we have chosen to perform two integrity checks to minimize the errors in the data. We have calculated the clean surplus relation for each firm year observation to validate the net income data and the net transactions with owners. To integrity check the fair value change of each firm year, we have calculated the relationship of ingoing balance, fair value change and outgoing balance of the asset base valued at fair value. Where these relationships have been violated, the reason for it has been investigated.

$$BV_t = BV_{t-1} + X_t - d_t \quad (4.1)$$

Where: BV_t = Book value at time t

X_t = Net Income at time t

d_t = Net dividend at time t

$$\mathrm{CB}_{\mathrm{Asset}} = \mathrm{IB}_{\mathrm{Asset}} + \Delta\mathrm{FV} \quad (4.2)$$

Where: $\mathrm{IB}_{\mathrm{Asset}}$ = Ingoing balance of the Asset measured at fair value

$\Delta\mathrm{FV}$ = Change in fair value

$\mathrm{CB}_{\mathrm{Asset}}$ = Closing balance of the asset valued at fair value

5. Results

This section will be split in a presentation of the results of model 1 followed by a presentation of the results of model 2. The estimated coefficients as well as the strength of the estimated regression will be presented for each model. The models will then be tested for multicollinearity as well as heteroscedasticity to evaluate the reliability of the estimated regressions.

5.1 Results of Model 1

The presented summarizing table 5-1 is based on extracts from SPSS (Appendix 2). The table presents the coefficients of the estimated regressions presented in section 3.6.1. When the estimated coefficients are showing an opposite sign of the expected, as stated in section 3.6.1.1, the significance levels are irrelevant and thus not shown.

Group	Results Model 1	Constant	NI_e	FV	ΔNIe	ΔFV	N	R^2
Group 0	Estimated Coefficients	-0,11	1,18	0,32	-0,23	0,84	91	0,215
	Significance level	-	0,06	0,68	-	0,18		
Group 1	Estimated Coefficients	-0,14	1,91	-1,32	-1,39	1,94	39	0,201
	Significance level	-	0,37	-	-	0,09		
Group 2	Estimated Coefficients	-0,11	1,10	1,34	0,00	0,43	52	0,296
	Significance level	-	0,11	0,16	1,00	0,60		

Table 5-1 Estimated Coefficients Model 1

For group 0, the estimated coefficient of NI_e is positive in line with expectations, and the null hypothesis can be rejected on a 10% level of significance. The estimated coefficient for FV is positive in line with expectations, but the null hypothesis of FV cannot be rejected. The change in NI_e is negative, not in line with expectations. The change in FV is positive in line with expectations, but the null hypothesis cannot be rejected. The R^2 of the estimated regression for group 0 is 0.215, meaning that the estimated regression model explains 21.5% of the market return in the sample of observations.

For group 1, the estimated coefficient of NI_e is positive, in line with expectations, but the null hypothesis of this coefficient cannot be rejected. The estimated coefficient for FV is negative, not in line with expectations. The estimated coefficient for the change in NI_e is also negative, not in line with expectations. The estimated coefficient for change in FV is positive, in line with expectations and the null hypothesis can be rejected on a 10% level of significance. The R^2 of the estimated

regression for group 1 is 0.201, meaning that the estimated regression model explains 20.1% of the market return in the sample of observations.

For group 2, the estimated coefficients for; NI_e, FV, change in NI_e, and change in FV are positive in line with our expectations. The null hypothesis cannot be rejected for any of the variables. R^2 of the estimated regression is 0,296, thus the estimated regression model explains 29.6% of the market return in the sample of observations.

The counter intuitive signs of the estimated coefficients, and the relatively high explanatory power without significant variables in the estimated regression for group 2, can be due to violations of the underlying assumptions of the regression model. Two underlying assumptions are uncorrelated independent variables and homoscedasticity in the error terms. To verify these results, the model will be tested for multicollinearity in section 5.1.1. The model will also be tested for heteroscedasticity, presented in section 5.1.2.

5.1.1 Tests for Multicollinearity Model 1

If there is multicollinearity among the dependent variables, the estimated coefficients might be distorted and not statistically significant even though there is a strong relationship[57]. Below, the correlation tables for group 0, 1 and 2 are presented.

Coefficient Correlations[a]

Model			ChangeFV, G0	NIe, G0	FV, G0	ChangeNIe, G0
1	Correlations	ChangeFV, G0	1,000	,274	-,816	-,367
		NIe, G0	,274	1,000	-,321	-,835
		FV, G0	-,816	-,321	1,000	,324
		ChangeNIe, G0	-,367	-,835	,324	1,000

Table 5-2: Correlation Group 0

Coefficient Correlations[a]

Model			Change FV, G1	ChangeNIe, G1	FV, G1	NIe, G1
1	Correlations	Change FV, G1	1,000	-,230	-,841	-,061
		ChangeNIe, G1	-,230	1,000	,284	-,834
		FV, G1	-,841	,284	1,000	-,167
		NIe, G1	-,061	-,834	-,167	1,000

Table 5-3 Correlation Group 1

Coefficient Correlations[a]

Model			Change FV, G2	NIe, G2	FV, G2	ChangeNIe, G2
1	Correlations	Change FV, G2	1,000	,246	-,726	-,275
		NIe, G2	,246	1,000	-,311	-,854
		FV, G2	-,726	-,311	1,000	,297
		ChangeNIe, G2	-,275	-,854	,297	1,000

Table 5-4 Correlation Group 2

[57] Newbold et al.(2003) p.506

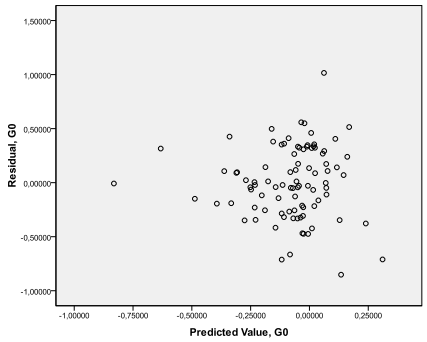
As shown in the tables 5-2, 5-3, 5-4, the correlation in the variables FV and change in FV are high for all three groups. The correlation is also high in NI_e and change in NI_e for all three groups. This is distorting the reliability of the model, since the marginal effect of each coefficient will be hard to isolate.

5.1.2 Tests for Heteroscedasticity Model 1

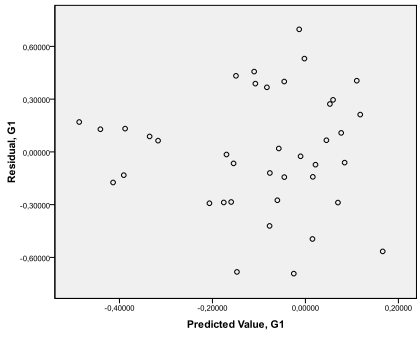
Another underlying assumption of the regression model is homoscedasticity, meaning a constant variance of the error terms, and a variance of the error terms not dependent on the variance of the independent variables. To evaluate the results of the test, the estimated regression is also tested for heteroscedasticity. If the error variables are heteroscedastic, this will affect the estimated coefficients as well as the T-test statistics in the estimated regressions[58].

If the variance of the residuals is correlated to the variance of the independent variables, this systematic relationship can be detected graphically. The residuals have been graphically plotted against the variables NI_e, FV, change in NI_e and change in FV for all three groups, presented in Appendix 3, graph 1-15. The results are indicating heteroscedasticity.

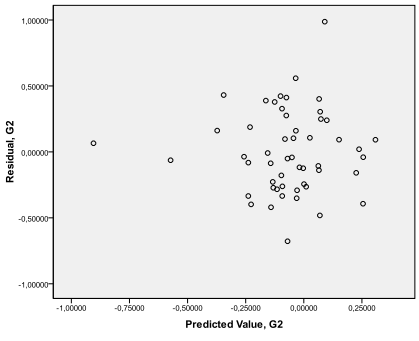
The table below is showing the relation between the predicted variable for RET, and the residuals. For G0, the scatter plot is showing a systematic relationship, where the residuals are increasing as the predicted results increases (graph 5-1). The scatter plots for G1 and G2 are indicating a mild heteroscedasticity (graph 5-2, 5-3). Since there is evidence of systematic relationships between the error term and predicted results, a formal test of heteroscedasticity to investigate the problem further is performed.



Graph 5-1: Error Term vs RÊT G0



Graph 5-2: Error Term vs RÊT G1



Graph 5-3: Error Term vs RÊT G2

[58] Newbold et al. (2003) p.508

The formal test for heteroscedasticity is done by using the squared residuals as dependent variable, and using the predicted variable estimated by the regression model as the independent variable (5.1)[59].

$$e_i^2 = a_0 + a_1 \hat{y}_i \quad (5.1)$$

Where: $e_i^2 = y_i - \hat{y}$

$\hat{y}$ = estimated RET

y_i = actual observations of RET

The formulated hypothesis will in this test be:

H_0: The residuals are homoscedastic

H_1: The residuals are heteroscedastic

The test statistics is the number of observations times the R^2 of formula 5.1. The null hypothesis is that the regression model has a uniform variance. The null hypothesis will then be rejected if the test statistics is larger than the chi square limit of 10% with one degrees of freedom[60]= 2.71. Thus, reject H_0 if:

$$nR^2 > 2.71$$

When estimating a new regression as described in (5.1) using the unstandardized predicted value as independent variable, and the squared residuals as the dependent variable, the results from SPSS are presented in Appendix 4, summarized in table 5-5 below.

Model 1	R^2	Observations	Test statistic
Group 0	0,071	91	6,46
Group 1	0,066	39	2,57
Group 2	0,010	52	0,52

Table 5-5: Test statistics Heteroscedasticity

The null hypothesis can be rejected for group 0, thus the model show signs of heteroscedasticity, and the assumption of homoscedasticity is violated. The test statistic for G1 is also high, but not high enough to reject the null hypothesis.

[59] Newbold et. al. (2003).p.508.
[60] Newbold et. al. (2003).p.511.

5.2 Results of Model 2

The results of model 2 are presented in the table below, summarizing the output from SPSS found in Appendix 5.

Group	Results Model 2	Constant	NI_e	FV	N	R^2
Group 0	Estimated Coefficients	-0,143	1,026	1,152	91	0,198
	Significance level	-	0,003	0,009		
Group 1	Estimated Coefficients	-0,187	1,261	0,674	39	0,122
	Significance level	-	0,236	0,346		
Group 2	Estimated Coefficients	-0,124	1,091	1,677	52	0,291
	Significance level	-	0,003	0,009		

Table 5-6: Estimated Coefficients Model 2

For group 0, the estimated coefficients of NI_e and FV are positive. The null hypothesis can be rejected on a 1% significance level or better, for both coefficients. The R^2 are 19.8% as compared to the R^2 of 21.5% for regression model 1. The drop in R^2 is marginal, thus the regression model 2 has not lost a large amount of explanatory power when excluding change in NI_e and change in FV.

For group 1, the estimated coefficients for both NI_e and FV are positive in line with expectations, but not significant. The R^2 for the second regression for group 2 is 12.2% as compared to the 20.1% in regression 1. For group 2, the estimated coefficients for both NI_e and FV are positive, and the null hypothesis can be rejected on a 1% or better significance level for both coefficients.

The results of model 2 will also be tested for multicollinearity and heteroscedasticity, in line with the tests performed on regression model 1. These will be presented in the following sections 5.2.1 and 5.2.2.

5.2.1 Tests for Multicollinearity Model 2

Coefficient Correlationsa

Model			FV, G0	NIe, G0
1	Correlations	FV, G0	1,000	-,241
		NIe, G0	-,241	1,000

Table 5-7: Correlation Group 0

Coefficient Correlations[a]

Model			FV, G1	NIe, G1
1	Correlations	FV, G1	1,000	-,531
		NIe, G1	-,531	1,000

Table 5-8: Correlation Group 1

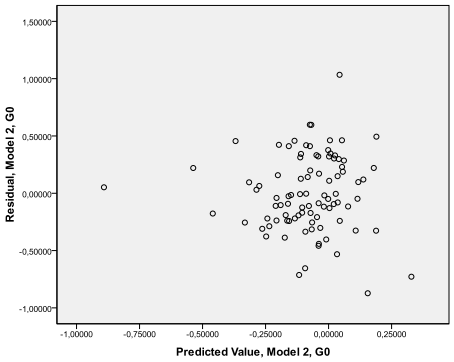
Coefficient Correlations[a]

Model			FV, G2	NIe, G2
1	Correlations	FV, G2	1,000	-,138
		NIe, G2	-,138	1,000

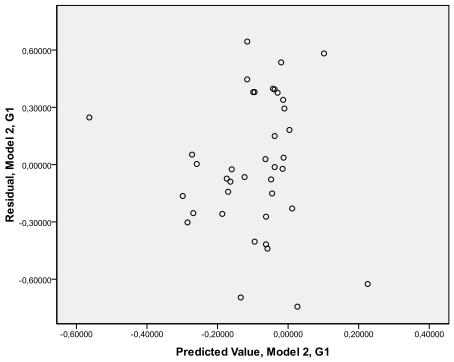
Table 5-9: Correlation Group 2

The correlations of the independent variables in model 2 are presented in the tables 5-7, 5-8 and 5-9. The results are indicating mild correlation between the independent variables in G0 and G2. However, the correlation between the variables is higher in G1 than for G0 and G2, possibly high enough to distort the test results of model 2.

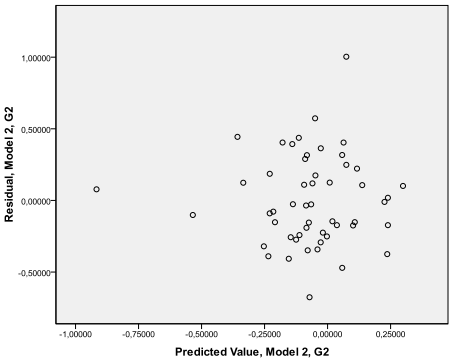
5.2.2 Tests for Heteroscedasticity Model 2



Graph 5-4: Error Term vs RÊT G0



Graph 5-5: Error Term vs RÊT G1



Graph 5-6: Error Term vs RÊT G2

A graphical scan for heteroscedasticity is shown in the graphs 5-4, 5-5 and 5-6. Enclosed in Appendix 6, are graphical tables for each independent variable and the residual for the estimated regression. Group 0 shows a systematic pattern, in the sense that the residual increases as the predicted value increases.

The heteroscedasticity is formally tested by the model as specified in 5.1.2. The formulated hypothesis will in this test be:

H_0: The residuals are homoscedastic

H_1: The residuals are heteroscedastic

Thus, reject H_0 if:

$$nR^2 > 2.71$$

Estimating a new regression, using the unstandardized predicted value as independent variable, and the squared residuals as the dependent variable, the results from SPSS are presented in Appendix 7, summarized in table 5-10. The results are that the null hypothesis of homoscedastic residuals can be rejected for both group 0 and group 1 on a 10% level of significance.

Model 2	R^2	Observations	Test statistic
Group 0	0,059	91	5,37
Group 1	0,130	39	5,07
Group 2	0,006	52	0,31

Table 5-10: Test statistics Heteroscedasticity

6. Analysis

6.1 Comparing the Models

The primary aim of the study is to investigate the value relevance of the fair value item for companies affected by the IFRS regulations. We have chosen to have two models for ensuring the reliability of the results.

For group 0 the results for model 1 are less reliable than the results for model 2, considering the stronger correlation in the independent variables. There is evidence of heteroscedasticity in both models for group 0, possibly distorting the results.

For group 1 both models are showing high correlation between the independent variables. In model 1, the tests of the model showed no apparent heteroscedasticity, as compared to model 2 where heteroscedasticity could be found. There was a drop in the adjusted R^2 level between model 1 and model 2, as compared to an increase in the adjusted R^2 for G2. (Appendix 2 and Appendix 5). This might be indicating that the change variables are important for group 1. For group 2, there is strong correlation in the independent variables in model 1, but only mild correlation in model 2 and no apparent heteroscedasticity in either of the models.

Model 1 is showing greater weaknesses in terms of violating the underlying assumptions for estimating a multiple regression model for all three groups, why the results of model 2 can be seen as more reliable.

6.2 Analyzing the results by groups

6.2.1 Value relevance of fair value on an aggregated level

For model 1, the null hypothesis of FV changes and FV could not be rejected. The null hypothesis of NI_e could be rejected on a 10% level of significance. Model 2 is showing that the null hypothesis of NI_e as well as FV can be rejected on 1% level of significance or better. This should be interpreted in the light of the strong heteroscedasticity, possibly disturbing the results. However, there is evidence that both levels of FV and levels of NI_e are value relevant for the industry as a total. The explanatory power of model 2 is 29.1%, indicating high association between the variables and market return for the real estate and forestry industry as a total.

6.2.2 Value relevance of fair value for trading companies

For model 1 the null hypothesis of the change in levels of fair value could be rejected on a 10% level, this variable showing as the only variable that could be rejected on a reasonable level of significance in both models for the trading companies. On the other hand, the results of this model should be interpreted with care due to the high correlation between the variables. For model 2, none of the null hypotheses could be rejected. The correlation between the independent variables is high in model 2 as well, why the results could be distorted in the sense that we cannot reject FV even though it is value relevant to the market. It is notable that the correlation between NI_e and FV for model 2, is substantially higher in group 1 as compared to group 0 and 2. A reason behind this could be that the realized part of fair value changes is included in the NI_e variable. For G1 companies having a high turnover rate of their property portfolio, a large portion of net income will consist of realized fair value gains. Thus, the part of positive value change that is realized will directly decrease the level of fair value gains, why the high negative correlation in the variables is logical.

Thus, the result for the trading companies is that there is an indication that the change in levels of FV are value relevant as to explaining share returns. This is in line with theory when considering the higher expectations of future abnormal returns when fair value is seen as a signal of successfully executing the business model. However, levels of FV and NI_e could be value relevant for the explaining stock returns, but the models can not capture this due to the high correlation and heteroscedasticity.

6.2.3 Value relevance of fair value for non trading companies

For model 1, none of the variables could be rejected on a 10% level of significance. The variable showing the most significant results was NI_e, which could be rejected on an 11% level of significance. The results of this model should also be interpreted keeping in mind the high correlation between the independent variables, why the variables could be value relevant even though the null hypothesis could not be rejected.

For model 2, the null hypothesis for the level of NI_e and FV can be rejected on a 1% significance level or better indicating value relevance for both variables as to explaining market returns. The correlation between the independent variables for group 2 is low in model 1. The R^2 decrease between the models was marginal when excluding the change variables. Furthermore, there is not

any obvious heteroscedasticity shown for group 2, why these results can be interpreted as rather strong.

6.3 Test of Result Robustness

To test the robustness of the test results, the threshold for dividing the companies in G1 and G2 are varied. The choice to only vary the results of model 2 is due to the high correlation in the independent variables of model 1, as compared to the results in model 2, why the results in model 2 are more reliable. The original threshold was the company Wihlborgs at 16% (see section 4.2). The new thresholds are set changing the turnover rate 5 percentage points in each direction. This means reclassifying the companies Wallenstam, Atrium Ljungberg and Technopolis from group G2 to G1 when lowering the threshold to 11%, and reclassifying the companies Wihlborgs, Fast Partner and J Tallberg from G1 to G2 when raising the threshold to 21%. The results from SPSS are presented in Appendix 8, summarized in the table 6-1.

		Threshold 11%				Threshold 16%				Threshold 21%			
Group	Result Model 2	NIe	FV	N	R2	NIe	FV	N	R2	NIe	FV	N	R2
Group 1	Estimated Coefficients	1,017	1,002	50	0,137	1,261	0,674	39	0,122	0,566	0,990	28	0,112
	Significance level	0,289	0,100			0,236	0,346			0,630	0,293		
Group 2	Estimated Coefficients	1,141	1,659	41	0,310	1,091	1,677	52	0,291	1,156	1,304	63	0,250
	Significance level	0,003	0,034			0,003	0,009			0,002	0,017		

Table 6-1: Estimated Coefficients varying Turnover threshold

When changing the threshold to 21% turnover rate, the null hypothesis for group 1 can still not be rejected. The R^2 for the estimated regression of group 1 is lower than in the original threshold of 16%, which could be a result of a smaller sample. For group 2, the higher threshold means marginally stronger results as to rejecting the null hypothesis for NI_e, but weaker results in terms of rejecting the null hypothesis for FV. However, both null hypotheses can still be rejected on a 5% level of significance for group 2. Additionally, R^2 is decreasing for G2 as compared to the original threshold, even though the sample is larger.

When changing the threshold to an 11% turnover rate, the null hypothesis for FV can be rejected on a 10% level of significance for group 1. However, the null hypothesis of NI_e can still not be rejected on a reasonable level of significance for group 1. The results for rejecting the null hypothesis of both variables in group 2 is the same as in the original threshold, but the results are marginally weaker in FV. The R^2 has increased for both groups of companies, possibly indicating a better classification and more unison groups.

6.4 Conclusions

The results are indicating that the fair value item is value relevant for the entire selection of companies. When broken down to trading and non-trading companies, there is strong evidence of value relevance for both levels of NI_e and level of FV, when explaining share returns for the non-trading companies. The change in levels of fair value for the trading companies is showing as the most significant in model 1, in clear contrast to the estimated coefficient for change in fair value of the non trading companies. The adjusted R^2 is also decreasing when removing this variable in model 2 for trading companies, as compared to an increased adjusted R^2 for the non trading companies when excluding the change levels. When lowering the turnover threshold there is an indication of value relevance of the level of fair value for trading companies as well. As the hypothesis for NI_e, is still not rejected for the trading companies when lowering the threshold, this is indicating a relative importance of the fair value item over NI_e for the trading companies.

6.4.1 Inferences and Generality

So what kind of inferences can be made from these conclusions? It is important to keep in mind to what extent the selected data is representative for the population of companies affected by IFRS fair value regulations. By excluding IAS 39, the results can not be representative for IFRS fair value regulations as a whole. The selection consists to a high degree of real estate companies, giving the results a bias towards the conditions of the real estate market.

The results are also conditional on the time period chosen. The IFRS was introduced in 2005, limiting the number of firm year observations for each company to four years. Time period from 2005 until 2008, can not be said to be representative for a normal business cycle, taking the financial crisis of 2008 into consideration. We had too few observations excluding 2008 to perform meaningful tests, why we are constrained to the time period given. This is naturally decreasing the possibility to make inferences and to generalize these results.

6.4.2 Reliability

The reliability, i.e. the ability for someone else to perform this research again and get the same results, would be considered high. In chapter 3 we explained the model used to analyze the material, followed by an introduction to the material in chapter 4. The risk of operational mistakes due to the highly manual data collection is dealt with through integrity checks of the material.

6.4.3 Validity

The validity of the study, i.e, if the study design is measuring what is intended is considered high. We have described how and why we have executed the investigation, keeping the aim of the study in focus. We have answered the aim through two models to increase the validity of the study.

7. Discussion and suggestion for future research

The reasoning behind the models mirrors a simplistic view of the world. The results are thus conditional on the assumptions made, one of them being clean surplus relation. We found in our integrity check, that very few complied with the assumption of clean surplus relation. It is unclear however, as to which extent this is influencing the result and the theoretical model underpinning our reasoning in this thesis. It would be interesting to investigate the implications of dirty surplus accounting for valuation models, and the empirical testing models using levels of earnings as explanatory variable for market returns.

The reasoning behind the possible irrelevance of fair value items for explicit non trading companies holding the asset in perpetuity is a simplistic view. The expected zero reaction in share price is conditional on a total cyclicality of asset prices, so that what is gained in current fair value changes eventually will be lost. This has not been the case, neither for real estate property nor for forestry holdings, where market values over time have been increasing. Also, very few companies are clearly trading or non trading companies; rather they are placed on a scale in between the two extremes.

To compare earnings returns relationship taking the business model into account we also see an interesting angle of future research. Standard setters have, at least in the fair value regulations, not considered the business model of the individual companies, but rather emphasized the importance of standardization in accounting, possibly at the expense of the perceived relevance for the market. The results in this thesis show that there is an indication of value relevance to the market returns, even though the business model is not in line with the accounting. However, it is possible that the same underlying forces are driving both share prices and fair values changes. The state of the economy and the interest rate are examples of value drivers for both fair value changes and share prices. It is unlikely that fair value accounting information is driving share price, rather it is more likely that they capture the same information.

If this is desirable or not depends on the view one take on the underlying objectives of accounting. If the objectives are that the accounting should reflect the market prices, then the results of this thesis are in line with the underlying objectives. This seems to be the current development for accounting, introducing market values and comprehensive income measures. The use of these measures are highly interesting, and are not captured in this thesis. It can be shown that there is an increased association taking the fair values of the income statement into account, but further research should conclude if this information is useful to investors, or if they are just measuring the same underlying conditions.

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Billerud	Annual Report 2005 – 2008	LjungbergGruppen	Annual Report 2005
Brinova	Annual Report 2005 – 2008	M-real	Annual Report 2005 – 2008
Castellum	Annual Report 2005 – 2008	Nordstjernan	Annual Report 2008
Catena	Annual Report 2006 – 2008	Rottneros	Annual Report 2005 – 2008
CityCon	Annual Report 2005 – 2008	Rörvik Timber	Annual Report 2005 – 2008
Dagon	Annual Report 2007 – 2008	Sagax	Annual Report 2005 – 2008
Din Bostad	Annual Report 2006 – 2008	SCA	Annual Report 2005 – 2008
Diös	Annual Report 2005 – 2008	Sponda	Annual Report 2005 – 2008
Fabege	Annual Report 2005 – 2008	SSK S Sääst.kint	Annual Report 2005 – 2008
Fast Partner	Annual Report 2005 – 2008	Stora Enso	Annual Report 2005 – 2008
Heba Fastigheter	Annual Report 2005 – 2008	Technopolis	Annual Report 2005 – 2008
Holmen	Annual Report 2005 – 2008	UPM	Annual Report 2005 – 2008
Hufvudstaden	Annual Report 2005 – 2008	Wallenstam	Annual Report 2005 – 2008
		Wihlborgs	Annual Report 2005 – 2008

9. Appendix

Appendix 1

Excerpt from Annual Report Wihlborgs

”Aktivt förbättra fastighetsportföljen genom köp, förädling och försäljning av fastigheter. Realisering av förädlingsvinster skall utgöra en central del av verksamheten.” - 2005

“Där skapar vi värden genom att förvärva och förädla fastigheter som vid ett senare tillfälle säljs vidare till andra seriösa förvaltare” – 2006

Appendix 2

Table 1 – Estimated coefficients Model 1, Group 0.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,112	,052		-2,158	,034
	NIe, G0	1,181	,608	,348	1,942	,055
	FV, G0	,315	,753	,071	,418	,677
	ChangeNIe, G0	-,226	,627	-,066	-,361	,719
	ChangeFV, G0	,840	,614	,237	1,368	,175

a. Dependent Variable: RET, G0

Table 2 – Model Fit, Model 1, Group 0.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,464[a]	,215	,178	,3369901	1,976

a. Predictors: (Constant), ChangeFV, G0, NIe, G0, FV, G0, ChangeNIe, G0

b. Dependent Variable: RET, G0

Table 3 - Estimated Coeffficients, Model 1, Group 1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,137	,176		-,780	,441
	NIe, G1	1,912	2,108	,337	,907	,371
	FV, G1	-1,323	1,301	-,346	-1,017	,316
	ChangeNIe, G1	-1,393	1,598	-,308	-,872	,389
	Change FV, G1	1,935	1,093	,666	1,771	,086

a. Dependent Variable: RET, G1

Table 4 – Model Fit, Model 1, Group1

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,448[a]	,201	,107	,3549022	2,017

a. Predictors: (Constant), Change FV, G1, ChangeNIe, G1, FV, G1, NIe, G1

b. Dependent Variable: RET, G1

Table 5 – Estimated Coefficients, Model 1, Group 2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,109	,057		-1,922	,061
	NIe, G2	1,095	,674	,386	1,626	,111
	FV, G2	1,337	,924	,263	1,447	,155
	ChangeNIe, G2	,000	,708	,000	,000	1,000
	Change FV, G2	,431	,813	,095	,530	,599

a. Dependent Variable: RET, G2

Table 6 – Model Fit, Model 1, Group 2

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,544[a]	,296	,236	,3252212	1,790

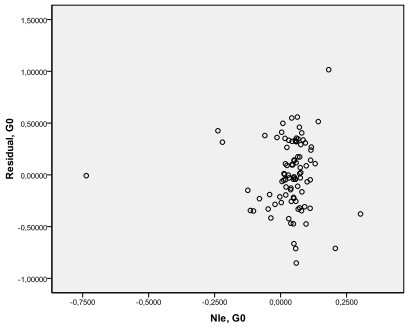
a. Predictors: (Constant), Change FV, G2, NIe, G2, FV, G2, ChangeNIe, G2

b. Dependent Variable: RET, G2

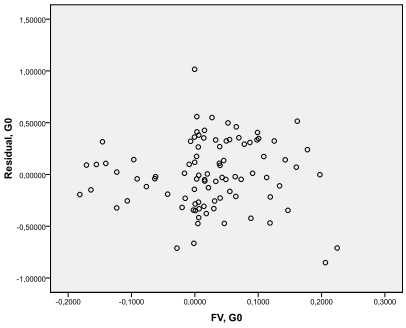
Appendix 3

Scatterplots - Error term versus independent variables Model 1, Group 0

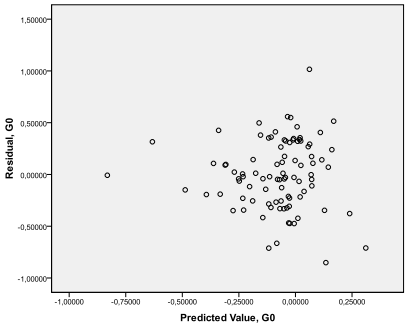
Graph 1: Error term – NIe



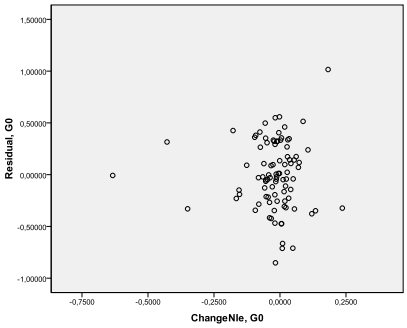
Graph 2: Error term – FV



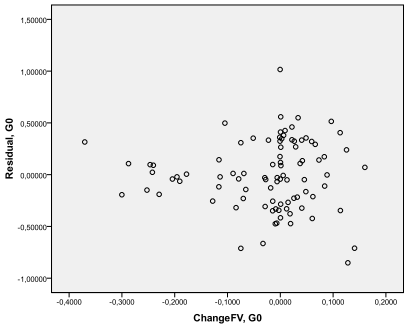
Graph 3: Error term - R$\hat{E}$T



Graph 4: Error term - ΔNI_e

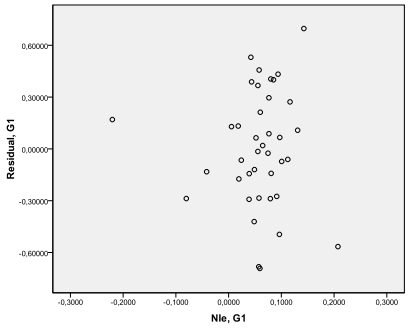


Graph 5: Error term - $\Delta\ FV$

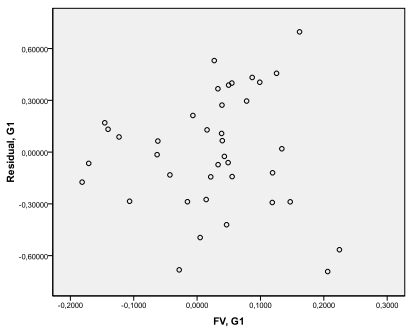


Scatterplots - Error term versus independent variables Model 1, Group 1

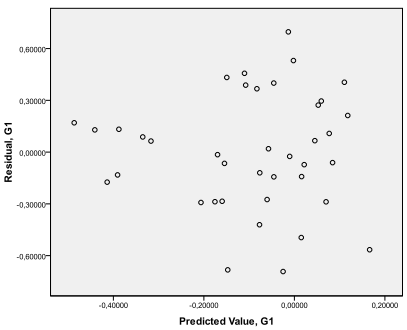
Graph 6: Error term – NI_e



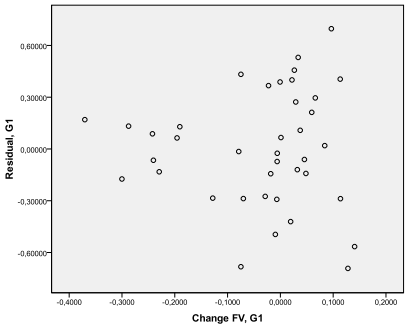
Graph 7: Error term – FV



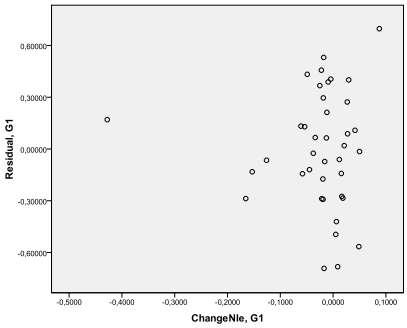
Graph 8: Error term - R$\hat{E}$T



Graph 9: Error term - ΔNI_e

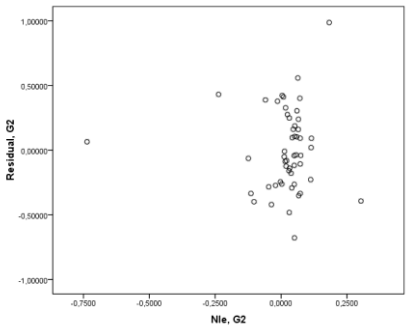


Graph 10: Error term - $\Delta\ FV$

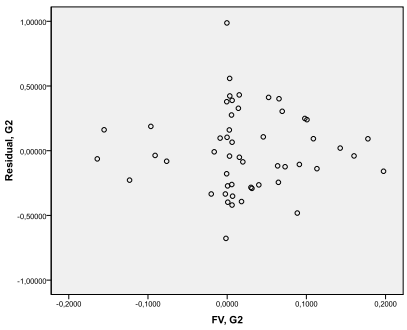


Scatterplots - Error term versus independent variables Model 1, Group 2

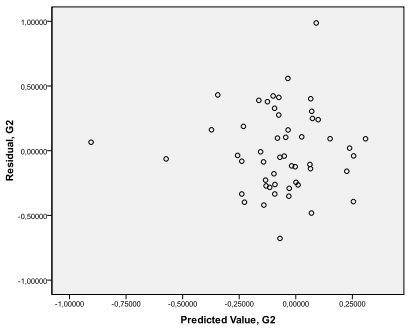
Graph 11: Error term – NI_e



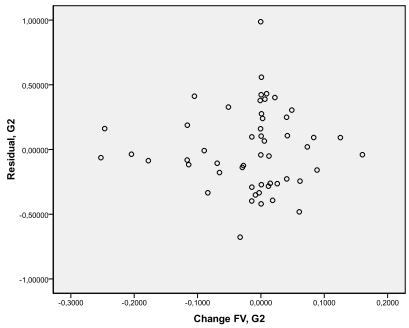
Graph 12: Error term – FV



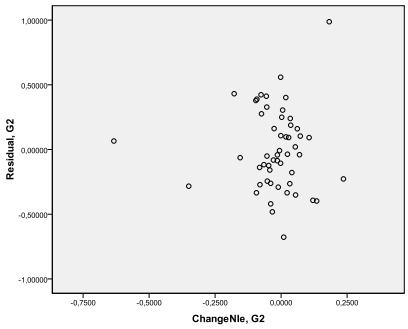
Graph 13: Error term - R$\hat{E}$T



Graph 14: Error term - ΔNI_e



Graph 15: Error term - $\Delta\ FV$



Appendix 4

Tests for Homoscedasticity Model 1

Table 1 – Group 0

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,266[a]	,071	,060	,15373664

a. Predictors: (Constant), Predicted Value, G0

Table 2 – Group 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,257[a]	,066	,041	,13383094

a. Predictors: (Constant), Predicted Value, G1

Table 3 – Group 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,098[a]	,010	-,010	,15389

a. Predictors: (Constant), Predicted Value, G2

Appendix 5

Table 1 – Estimated Coefficients, Model 2, Group 0

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,143	,038		-3,787	,000
	NIe, G0	1,026	,334	,302	3,074	,003
	FV, G0	1,152	,434	,261	2,653	,009

a. Dependent Variable: RET, G0

Table 2 – Model Fit, Model 2, Group 0

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,445[a]	,198	,179	,3367872	1,980

a. Predictors: (Constant), FV, G0, NIe, G0

b. Dependent Variable: RET, G0

Table 3 – Estimated Coefficients, Model 2, Group 1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,187	,079		-2,386	,022
	NIe, G1	1,261	1,045	,222	1,206	,236
	FV, G1	,674	,706	,176	,955	,346

a. Dependent Variable: RET, G1

Table 4 – Model Fit, Model 2, Group 1

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,349[a]	,122	,073	,3615643	1,884

a. Predictors: (Constant), FV, G1, NIe, G1

b. Dependent Variable: RET, G1

Table 5 – Estimated Coefficients, Model 2, Group 2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,124	,047		-2,660	,011
	NIe, G2	1,091	,345	,384	3,166	,003
	FV, G2	1,677	,617	,330	2,717	,009

a. Dependent Variable: RET, G2

Table 6 – Model Fit, Model 2, Group 2

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,540[a]	,291	,263	,3195416	1,792

a. Predictors: (Constant), FV, G2, NIe, G2

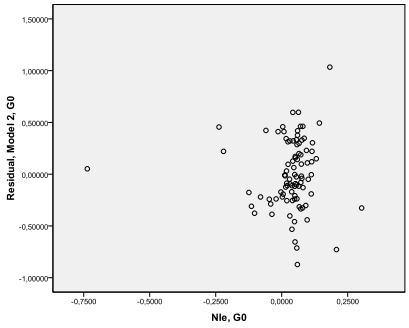
b. Dependent Variable: RET, G2

Appendix 6

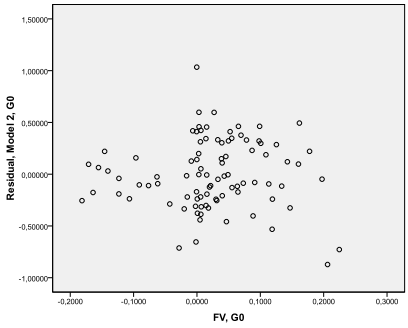
Scatterplots - Error term versus independent variables Model 2

Group 0

Graph 1: Error Term - NI_e

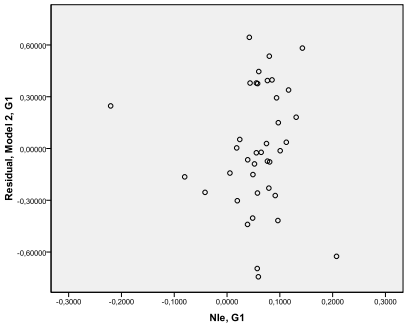


Graph 2: Error Term - FV

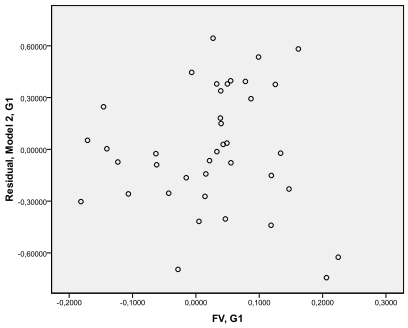


Group 1

Graph 3: Error Term - NI_e

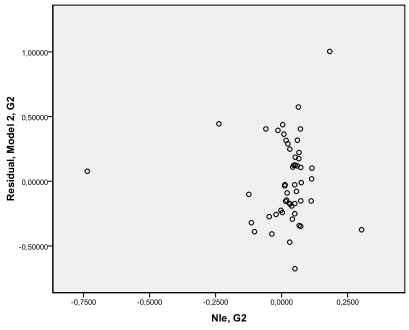


Graph 4: Error Term - FV

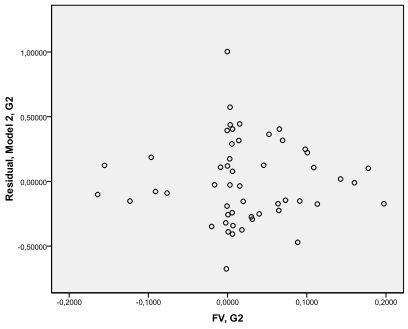


Group 2

Graph 5: Error Term - NI_e



Graph 6: Error Term - FV



Appendix 7

Table 1 – Test Heteroscesticity, Model 2, Group 0

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,243[a]	,059	,049	,16053

a. Predictors: (Constant), Predicted Value, Model 2, G0

Table 2 – Test Heteroscedasticity, Model 2, Group 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,360[a]	,130	,106	,13637

a. Predictors: (Constant), Predicted Value, Model 2, G1

Table 3 – Test for Heteroscedasticity, Model 2, Group 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,077[a]	,006	-,014	,15742

a. Predictors: (Constant), Predicted Value, Model 2, G2

Appendix 8

Table 1 - Estimated Coefficients, Turnover threshold 21%, Group 1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,168	,089		-1,881	,072
	NIe, G1	,566	1,162	,115	,487	,630
	FV, G1	,990	,922	,253	1,074	,293

a. Dependent Variable: RET, G1

Table 2 – Model Fit, Turnover threshold 21%, Group 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,335[a]	,112	,041	,3643507

a. Predictors: (Constant), FV, G1, NIe, G1

Table 3 – Estimated Coefficients, Turnover threshold 21%, Group 2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,127	,044		-2,865	,006
	NIe, G2	1,156	,348	,376	3,320	,002
	FV, G2	1,304	,533	,277	2,449	,017

a. Dependent Variable: RET, G2

Table 4 – Model Fit, Turnover threshold 21%, Group 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,500[a]	,250	,225	,3283179

a. Predictors: (Constant), FV, G2, NIe, G2

Table 5 – Estimated Coefficients, turnover threshold 11%, Group 1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,179	,068		-2,626	,012
	NIe, G1	1,017	,949	,166	1,071	,289
	FV, G1	1,002	,597	,260	1,679	,100

a. Dependent Variable: RET, G1

Table 6 – Model Fit, turnover threshold 11%, Group 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,370[a]	,137	,100	,3479444

a. Predictors: (Constant), FV, G1, NIe, G1

Table 7 – Estimated Coefficients, Turnover threshold 11%, Group 2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,101	,052		-1,945	,059
	NIe, G2	1,141	,355	,436	3,212	,003
	FV, G2	1,659	,755	,298	2,199	,034

a. Dependent Variable: RET, G2

Table 8 – Model Fit, Turnover threshold 11%, Group 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,557[a]	,310	,274	,3255878

a. Predictors: (Constant), FV, G2, NIe, G2