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# Decision usefulness of fair value accounting for investment property: The impact of IFRS adoption on analyst forecast error and dispersion

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**Abstract**

The aim of this thesis is to study the impact of the 2005 IFRS/IAS 40 adoption on financial analyst forecast accuracy and dispersion in predicting earnings for Swedish listed real estate companies. A panel data regression with fixed effects and a paired two sample t-test are used to analyze the data. We find that there are no significant changes in forecast error or dispersion when comparing the periods before and after implementation. However, in the adoption year (2005) we find a significant increase in forecast error. The findings seem to support previous research questioning the decision usefulness of full fair value accounting for non-financial assets marked-to-model in general and investment property specifically.

*Keywords: IFRS and IAS 40, fair value, real estate, analysts' forecast accuracy, forecast error and dispersion*

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# 1. Introduction

The aim of this thesis is to study the decision usefulness and information asymmetry effects of fair value accounting (FVA) for investment property by evaluating the impact of the 2005 IFRS/IAS 40 adoption on financial analyst forecast accuracy and dispersion, in predicting earnings for Swedish listed real estate companies.

The adoption of International Financial Reporting Standards (IFRS) in more than 100 countries, the joint conceptual framework project of the International Accounting Standards Board (IASB) and the US Financial Accounting Standards Board (FASB) as well as the recent financial crisis have all contributed to an intensified debate on FVA, among scholars as well as policymakers (Laux and Leuz 2009a, Wittington 2008, Brown et al. 2012). Our review of previous research indicates that the evidence is mixed regarding the usefulness of FVA and in terms of whether or not the transition to IFRS had an effect on the information asymmetry. However, it also shows that proponents of FVA primarily stress benefits from increased relevance in measurement and recognition practices, whereas opponents lay emphasis on potential reliability problems, with reference in particular to FVA for non-financial assets mark-to-model. Nevertheless, relevance and reliability of accounting information should be reciprocally dependent to a certain extent.

On the subject of the FVA debate, Whittington (2008) concludes that: ”*In a realistic market setting, the search for a universal measurement method may be fruitless and a more appropriate approach to the measurement problem might be to define a clear measurement objective and to select the measurement method that best meets that objective in the particular circumstances that exist in relation to each item in the accounts.“* Cotter et al. (2010) further argue that the effect of adopting IFRS might differ depending on the jurisdiction and institutional features it is applied in. Following this line of reasoning our study is delimited to one specific accounting standard that treats the accounting for one specific asset type, in one industry and in a single country and securities market. The choice of IAS 40 and investment property provides our study with a non-financial asset where fair value has to be determined by the use of a valuation model and is essential to the business as well as substantial in the balance sheet of real estate companies. Thus, it is not only an industry where the financial statements should be fundamentally affected by IFRS adoption, but also one where theory suggests that the fair value estimates might suffer from reliability problems to such an extent that relevance is compromised as well (e.g. Lindsell 2005, Hitz 2007, Penman 2007, Nordlund 2004, Danbolt and Rees 2008).

Nevertheless, as emphasized by Scott (2003), accounting standard setters should be guided by decision usefulness and reduction of information asymmetry when issuing new standards, as these

criterions are both necessary conditions for a successful standard (however not sufficient ones). Hence, the 2010 IASB conceptual framework (OB2) insists that the primary objective of financial reporting is to provide users with financial information that is useful. Beyond any decision usefulness that a standard possesses, reduction of information asymmetry is believed to improve the operation of markets and is, according to Scott (2003): *"Undoubtedly the most important concept of financial accounting theory."*

Financial analysts are considered to be among the more advanced users of financial statements and are regarded as an important medium whereby investors acquire sophisticated information, without needing to fully understand it themselves (Scott 2003). Consequently, analyst forecast error and dispersion are used as a proxy for decision usefulness and information asymmetry effects of IFRS/IAS 40 implementation on the Swedish real estate company securities market. As stressed by Brown et al. (2012), analyst forecast error and dispersion are key attributes and commonly used to represent the information environment. As such, these variables should reflect the quality of the financial information available, since previous research indicates that forecast error and dispersion are lower when analysts have access to higher quality information (Brown et al., 2012).

As shown above, studying changes in forecast error and dispersion is an established way of evaluating the decision usefulness and information asymmetry of accounting standards, which however, has not to our knowledge been previously applied in an investment property or IAS 40 adoption context. Nevertheless, the underlying mechanisms should be equal to a general IFRS implementation environment. More precisely, if the new standard implies increased decision usefulness and thus allows analysts to better understand a firm's performance and prospects, we might expect analyst forecast accuracy and dispersion to improve after IFRS/IAS 40 adoption. Furthermore, if the standard provides analysts with more decision useful information than before, it should reduce the information asymmetries between the management of the reporting entities and analysts, represented by a reduction in forecast error and dispersion.

However, in spite of the above, if the expected reliability problem of the fair value estimates for investment property is material, it is reasonable to expect that both relevance and decision usefulness is affected negatively or unaltered. Assuming that the reliability problem is in fact material and depending on whether analysts apply such potentially delusive information in making their estimates or not, we might expect higher error and dispersion or no significant change in either. Consequently, the research question we aspire to answer is:

*Does the implementation of IFRS/IAS 40 have an effect on analyst forecast error and dispersion?*

## 2. Essential Background – Regulatory and Theoretical Framework

Before proceeding to our review of the previous research, there are a few practical and theoretical prerequisites and concepts that we would like to delineate for the reader's benefit. The presentation below does not claim to be a comprehensive account of the subjects covered; rather it is intended to be a relevance based introduction to them.

### 2.1 IAS 40 – Investment Property

In IAS 40 § 5, investment property is defined as land, building or part of a building held by the owner or by the lessee under a finance lease to earn rentals and/or for capital appreciation. Following the adoption of Regulation No 1606/2002/EC, public companies regulated by the law of an EU member state are obliged to prepare their consolidated accounts in conformity with IFRS as of 1 January 2005. Consequently, all Swedish listed companies account for investment property in accordance with IAS 40 from that point in time. Prior to financial year 2005, investment property in Sweden was accounted for as provided by Redovisningsrådet's recommendation (RR 24). This national standard states that investment property should be accounted for at acquisition value less accumulated depreciation. If market value is assumed to be lower than the carrying amount, the property should be written down to the lower estimated market value. Furthermore, fair values were mandatory to disclose (starting 1 January 2003), albeit not permitted to be included in the financial statements.

IAS 40, however, gives the reporting entity an option to choose the fair value or the cost model (comparable to RR 24) as its accounting policy, where the chosen policy as a cardinal rule must be applied to all of its investment property (§ 30).[1] Nevertheless, as provided by IAS 40 § 32: *"This Standard requires all entities to determine the fair value of investment property, for the purpose of either measurement (if the entity uses the fair value model) or disclosure (if it uses the cost model)."*

In IAS 40 § 5, fair value is defined as: *"The amount for which an asset could be exchanged between knowledgeable, willing parties in an arm's length transaction."* As such, it is intended to reflect current and expected future rental income and cash outflows related to the property (IAS 40 § 40).

The value should furthermore reflect market conditions at the end of the reporting period (IAS 40 § 38) and if possible, be given by: *"Current prices in an active market for similar property in the same location and condition and subject to similar lease and other contracts."* (IAS 40 § 45).

[1] Note that all Swedish listed real estate companies has chosen to apply the fair value method (Nordlund, 2008).

However, if such values are not available, IAS 40 § 46 provide that an entity should consider information from different sources, specifically identifying the following[2]:

a) Current prices in an active market for properties of different nature, condition or location (or subject to different lease or other contracts), adjusted to reflect those differences.
b) Recent prices of similar properties on less active markets, with adjustments to reflect any changes in economic conditions since the date of the transactions that occurred at those prices.
c) Discounted cash flow projections based on reliable estimates of future cash flows, supported by the terms of any existing lease and other contracts and (when possible) by external evidence such as current market rents for similar properties in the same location and condition, and using discount rates that reflect current market assessments of the uncertainty in the amount and timing of the cash flows.

For each period, unrealized gains or losses from changes in fair value of investment property assets in the balance sheet are recognized in the income statement as profit or loss (IAS 40 § 35). In the balance sheet, ceteris paribus, such changes affect the size of equity and in the income statement, the amount of net income. Figure 1 displays the line items of two fictional real estate companies' income statements, where the **bold** items illustrate the difference between accounting for investment property using the fair value model in accordance with IAS 40 and using the cost model RR 24 permits.

| **Consolidated income statement (IFRS)** |
|---|
| Rental income |
| -Property expenses |
| Net operating income |
| -Central administration and marketing |
| -Net interest expense |
| Operating profit/loss |
| +/- Share in profit/loss of associated companies |
| +/- Realised changes in value of properties |
| **+/- Unrealised changes in value of properties** |
| Profit/loss before tax |
| Current tax |
| Deferred tax |
| Profit/loss for period |

| **Consolidated income statement (Swedish GAAP)** |
|---|
| Rental income |
| -Property expenses |
| Net operating income |
| -Central administration and marketing |
| **-Depreciation of properties** |
| -Net interest expense |
| Operating profit/loss |
| +/- Share in profit/loss of associated companies |
| +/- Realised changes in value of properties |
| Profit/loss before tax |
| Current tax |
| Deferred tax |
| Profit/loss for period |

*Figure 1: Schematic income statement to illustrate the differences between IFRS (left) and Swedish accounting standards, Swedish GAAP (right), in regards to effects of IAS 40. Differences are marked with bold letters.*

[2] Note that the majority of investment property in Swedish listed real estate companies is valued using DCF models and should hence be categorized as level c (Nordlund, 2008).

## 2.2 Decision Usefulness According to IASB

In OB2 of the IASB's conceptual framework (CF) for financial reporting of 2010, the objective of financial reporting is defined as: *"To provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity. Those decisions involve buying, selling or holding equity and debt instruments, and providing or settling loans and other forms of credit."* Decisions about selling or holding such instruments are assumed to depend on the return these primary users expect from investing in them (CF OB3 & OB5). Consequently, users need information to help them assess the prospects for future net cash inflows to an entity (CF OB3). Furthermore, information about a reporting entity's financial performance is deemed useful in assessing the entity's future ability to generate net cash inflows by IASB (CF OB18).

Thus, financial statements provide information that should be useful in estimating the value of the reporting entity (CF OB7). However, IASB stresses (OB6) that: *"General purpose financial reports do not and cannot provide all of the information that existing and potential investors, lenders and other creditors need. Those users need to consider pertinent information from other sources, for example, general economic conditions and expectations, political events and political climate, and industry and company outlooks."*[3]

### *2.2.1 Relevance and Faithful Representation*

QC4 of the CF states that: *"If financial information is to be useful, it must be relevant and faithfully represents what it purports to represent"*, which are the fundamental qualitative characteristics of financial reporting according to IASB (CF QC5).

Relevant financial information is defined as Information that is: *"capable of making a difference in the decisions made by users."* (CF QC6), which it is regarded as having if it has predictive and/or confirmatory value (CF QC7). A predicative value is attributed to financial information that can be employed by users as an input for predicting future outcomes (CF QC 8) and a confirmatory value if it provides feedback about previous evaluations (CF QC9).

In CF QC 12, IASB admits that is unlikely to achieve a perfectly faithful representation of a phenomenon. Nevertheless, the goal is to maximize the quality of the characteristics that IASB believes such a depiction should have; complete, neutral and free from error (CF QC12). In short, Faithfull representation is not intended to mean accurate in all respects. Free from error is understood as no errors in the description of a phenomenon and the processes used to produce the

[3] Note that CF OB6 could be regarded as describing the "raison d'être" of financial analyst forecasts.

reported information (CF QC15). Neutral is described as without bias (CF QC14) and complete as including all information necessary to understand the depicted phenomenon (CF QC13).

Finally, QC 17 of the conceptual framework provides that: *"Information must be both relevant and faithfully represented if it is to be useful. Neither a faithful representation of an irrelevant phenomenon nor an unfaithful representation of a relevant phenomenon helps users make good decisions."* As the attentive reader might have observed, IASB uses the term *Faithful Representation* instead of *Reliability*. Regardless of this fact, in the remainder of this thesis we will use the term *Reliability*, as it is the term used in previous research. Furthermore, the assumption that information must not be relevant if it is not faithfully represented should be equally true if it is not reliable (cf. Scott, 2003).

## 2.3 Decision Usefulness in Financial Accounting Theory

In *Financial Accounting Theory*, Scott (2003) writes the following on the fundamental problem of accounting: "*Investors' interests are best served by information that provides a useful tradeoff between relevance and reliability, where relevant information is that which enables investors to assess the firm's future economic prospects, and reliable information is that which is precise and free of bias or other management manipulation.*" Scott (2003) identifies two major theoretical approaches to the concept of decision usefulness; the information perspective and the measurement perspective.

The information perspective on decision usefulness assumes efficient securities markets and thus, the form of disclosure of information is not relevant, given that there are enough rational and informed investors that will incorporate the information into the price of a security. Accepting the theory of efficient securities markets, value relevance studies on the usefulness of accounting information studies its association with market price (Scott, 2003).

Contrary to the assumptions of the information perspective, the measurement perspective on decision usefulness rests on more recent findings that security markets may not be as efficient as previously believed. The implication of that assumption should consequently be that investors need guidance in estimating the impact of information on future returns, suggesting the use of fair value accounting in the financial statements. Nevertheless, if a measurement perspective is to be useful, a greater use of fair values cannot be at the cost of a considerable reduction in reliability (Scott, 2003).

In conclusion, Scott (2003) contends that: "*Whether securities markets are or are not efficient is really not the right question. Instead, the question is one of the extent of efficiency*" and that: "*A*

*more important question for accountants is the extent to which a measurement perspective will increase decision usefulness, thereby reducing any securities market inefficiencies that exist*."

# 3. Previous Research

## 3.1 The Fair Value Accounting Debate

As emphasized by Laux and Leuz (2009a) *"The recent financial crisis has led to a vigorous debate about the pros and cons of fair-value accounting"*, involving not only academia and accounting regulators, but also the top political level such as the European Commission and the US Congress. However, the 2005 issuance of IFRS by the IASB as well as the systematical move towards market-based measures by the FASB and IASB since the mid-1980's put the discourse on FVA on the accounting research agenda prior to the crisis (Hitz 2007). Additionally, the IASB and FASB joint conceptual framework project has further spurred the debate on FVA (Wittington, 2008).

### *3.1.1 Mark-to-Model, Relevance and Reliability*

In a paper in Ernst & Young's IFRS Stakeholder Series named *"How fair is fair value?"* (Lindsell 2005) published at the abovementioned 2005 issuance of IFRS some of their major concerns regarding fair value accounting, as defined under IFRS, are highlighted. It is argued that while the changes in fair value of an asset or liability from one balance sheet to the next will result in corresponding performance gains and losses, the reliability of the measurement of the value is essential. More specifically, the concern is that IASB's strive for relevance seems to overshadow the need for reliability and that: *"reliability is a necessary precondition that must be met for information to be relevant"*. The reliability problem is believed to be of significance in particular where no market value is available (e.g. as a consequence of illiquidity) and the fair value thus has to be determined by the use of a valuation model, often referred to as mark-to-model, where the fair value is actually a hypothetical and subjective prediction based on internally generated assumptions and estimates about the future. Barth (2006), however, argues that the question is not if, but how estimates of the future should be included in financial statements, as including them should result in more useful information for making economic decisions. The possible reliability problems mentioned above could be mitigated by the use of disclosures in the notes, according to the author.

Although Barlev and Haddad (2003) recognize that mark-to-model based fair values and non-perfect markets are issues, they argue that FVA – in contrast to historical cost accounting (HCA) – is more value relevant. Given that FVA measures the current value of assets and liabilities and does not leave room for manipulation to the same extent as HCA, it is further suggested that reliability and transparency are increased. The point that is particularly accentuated is that the shareholders focus should be directed to the value of equity and its changes when reporting

market values of the assets and liabilities. This not only increases the stewardship function and decreasing agency cost, but also the effective management of the firm.

Hitz (2007) studies the decision usefulness of fair value based reporting systems from a theoretical perspective, primarily from a measurement or valuation perspective and an information perspective. His findings indicate that there is theoretical support not only for disclosing prices obtained from sufficiently liquid markets but for full fair value accounting of financial instruments, despite reliability problems when such are not publicly traded. However, the case is found to be particularly weak for the use of FVA for non-financial items, given that mark-to-model measurements do not give relevant information about consensus expectations. Furthermore, Hitz (2007) refers to the *"grave reliability concerns for fair values not taken from active markets"* that are supported by empirical evidence.

Kolev (2009), on the other hand takes a different perspective when evaluating the reliability of mark-to-model estimates. Studying the association between stock prices and fair values of net assets, he finds it to be significant and positive. The same applies to the relation between net gains on mark-to-model assets and liabilities and quarterly returns as well as market reactions around the 10-Q filing dates, suggesting that investors find mark-to-model estimates sufficiently reliable to be reflected in firm value.

In a case study on the use of FVA in the US energy company Enron prior to its bankruptcy, Gwilliam and Jackson (2008) find that, besides the unreliability of third-party valuation estimates, management seemed to have a strong desire to avoid recognizing FVA losses through the income statement, in order to achieve targets and forecasts. Put in contrast to the Barth and Clinch (1998) findings that only negative asset revaluations where value relevant to investors in a study of the Australian market, Gwilliam and Jackson's (2008) conclusions could be further enhanced.

Penman (2007) analyses the qualities of FVA in facilitating valuation and stewardship from a conceptual and a measurement or implementation perspective. He argues that FVA is superior to HCA on a conceptual level under ideal settings, where there is a one-to-one relationship between exit prices and value to shareholders. However, even when exit prices can be observed in an active market, the one-to-one relationship is not present as soon as a firm holds net assets where value is added in some way. When actual prices cannot be observed and mark-to-model values are introduced, FVA is deemed even more inappropriate and HCA earnings based valuation more adequate. In contrast to the above, Hermann et al. (2006) argue for using fair value measurements for property plant and equipment, which neither should satisfy the one-to-one nor the active market conditions.

### *3.1.2 FVA and the Financial Crisis*

Where Lindsell (2005) ascertains that implementation of IFRS will inevitably increase volatility in the financial statements, Penman (2007) is concerned that FVA will bring price bubbles into them. When reviewing the post financial crisis debate on FVA, Laux and Leuz (2009a) identify two extremes, where the critics argue that it not only significantly contributed to the outburst, but also intensified the severity of the crisis. They however suggest that FVA is neither to blame nor just the messenger. Primarily, Laux and Leuz (2009a) argue that while FVA in its pure form might contribute to procyclicality in boom and bust times and may even cause downward spirals in financial markets,[4] this does not apply in the same way to FVA as stipulated by the IFRS or US GAAP. Given that these standards allow for deviations from market prices under certain circumstances. Nevertheless, they acknowledge that allowing for such deviations creates an implementation problem. On the one hand, being too restrictive in allowing deviations does not mitigate the procylicality issue. On the other, should the standard setters not be very restrictive, the probability that managers can use it to avoid making (required) write-downs increases, a risk that is confirmed by the findings of Gwilliam and Jackson (2008) in their Enron case study mentioned above.

In another study, contemporary to the one above, Laux and Leuz (2009b) examine the role of FVA in the financial crisis based on descriptive and empirical evidence and find little evidence for the claim that downward spirals and excessive bank asset write-downs were the result of FVA. Their findings are supported by a similar study by Barth and Landsman (2010). Mangnan (2009), however, finds that FVA as it is used by regulators may have amplified the crisis by severely undermining the financial condition of institutions, in particular those holding assets in markets whose liquidity diminished.

## 3.2 IAS 40 – Investment Property

Our review of previous research on FVA in general indicates that the evidence is mixed. However, the relevance and reliability problems with mark-to-model measurements appear to be a common denominator, in particular with regard to non-financial assets. IAS 40 does give entities an option to choose fair value or the (historical) cost model as its accounting policy. Nevertheless, as Nordlund (2008) shows, all Swedish listed property companies apply the fair value method and the majority of the valuations are performed using discounted cash flow models.

[4] Consider the case where an entity is forced to sell assets at prices lower than its fundamental value in a market that suffers from decreased liquidity, thus making the price from that sale decisive for the valuation of assets in other entities holding similar assets marked-to-market.

### *3.2.1 Reliability of Investment Property Fair Values*

In a pre-IFRS/IAS 40 implementation paper, Nordlund (2004) expresses concerns that: "*The uncertainty of property valuations is probably of such a magnitude that the consistency of both the income statement and balance sheet may be questioned to a certain extent as a result of the application of the fair value model.*"

Dietrich et al. (2001) studied the reliability of fair value estimates for investment property in the UK during the period 1988-1996, when investment companies where required to report fair values of investment property on the balance sheet under UK GAAP. By comparing actual sales prices on realized sales to previous reported fair value estimates, they find that the estimates understate actual selling prices but are considerably less biased and more accurate measures of selling price than under HCA.

Nellessen and Zuelch (2010) state that the valuation of property companies and fair value accounting for investment property under IAS 40 are closely related to each other as this is such companies main asset type and consequently, reported at true fair value, the net asset value should give an adequate indication of company value. By studying the association between the net asset value and market prices for a set of 76 listed European property companies during the years 2005-2007, they find that the variables deviate from each other as a result of insufficient reliability of the fair value estimates reported, which is manifested in lower deviations for companies traded at a low bid-ask spread and vice versa. A lower bid-ask spread should express more reliable fair values. The reliability problems of the fair value estimates is further linked to the limitation of appraisals and the diversity of applied appraising approaches.

### *3.2.2 Value Relevance of Investment Property Fair Value Accounting*

Arguments based on the superior relevance of FVA is perhaps the most prominently used by fair value proponents and in most papers on that subject, relevance is appreciated by the correlation between accounting variables and stock market prices (Danbolt and Rees 2008). One of those is the So and Smith (2009) study on the value relevance of fair value accounting for investment property in Hong Kong. As Hong Kong implemented a new accounting standard parallel to IAS 40 (HKAS 40) in 2005, a sample of 92 listed real estate companies during the years 2004-2006 is used. Their analysis indicates that investors seem to value the changes implemented given that it confirms a significantly higher market price reaction and returns association to earnings announcements when changes in fair value of investment properties are presented in the income statement.

Danbolt and Rees (2008) also confirm that fair value income is more value relevant than income under HCA in a comparable study on the UK market. However, when comparing the value relevance of FVA in a real estate company sample to that in a sample of investment funds companies, it is considerably lower, which should reflect the higher subjectivity of investment property valuation. The evidence from the real estate sample is also consistent with earnings management and FVA may thus effect in biased accounting. Furthermore, the authors emphasize that when FVA changes are introduced in the balance sheet, income measures should be irrelevant, thus implying that: *"there is no obvious advantage from adopting FVA income accounting if FVA balance sheet values are available to the user."*

Bengtsson (2008) studies the value relevance of IAS 40 for Swedish listed property companies, using data from December 2002 to March 2007 in order to get a an equal number of observations before and after the implementation of IFRS in Sweden. The investigation shows that there is a dependency in the relationship between share price and reported equity in the short term after the implementation, where share price is dependent on the accounting information. In the long term however, the author finds reasons to believe that the stock prices are independent of the accounting policy for reported balance sheet equity, since fair value of investment property has been reported off-balance sheet in disclosures prior to 2005.

### *3.2.3 Published Theses on Decision Usefulness of IAS 40*

We have conducted a review of Swedish academic theses published before January 2012 on the subject of IAS 40 – investment property and decision usefulness. Despite the abundance of theses on the subject, to the best of our knowledge there is no other thesis (or research article) that uses analyst forecast errors and dispersion in this particular context. Rather, other theses can be categorized in qualitative studies, value relevance studies and studies investigating the reliability of investment property valuations.

## 3.3 Information Asymmetry

Healy and Palepu (2001) argue that demand for financial reporting and disclosure arises from information asymmetry and agency conflicts between managers and outside investors. Management typically has better information than investors about the value of the business' investment opportunities and also has incentives to overstate their value. Investors therefore face an information asymmetry problem when they make investments in companies. This, also known as the "lemons problem", can potentially lead to a breakdown in the functioning of the financial market (Akerlof, 1970).

A common hypothesis is that IFRS in general will decrease information asymmetries in the market because i) IFRS is more market-oriented; and ii) IFRS disclosure requirements are larger (Raffournier, 2008). Studying the bid-ask spread is a common way to test market efficiency. A low spread between what buyers and sellers are willing to buy or sell a security for implies low information asymmetries. Platikanova and Nobes (2006) findings when studying 3,907 companies in the EU suggest that the bid-ask spread on average declines after IFRS adoption. Parallel to that result, Leuz and Verrecchia (2000) reach the conclusion that companies using IFRS exhibit smaller bid-ask spreads than those using German GAAP in a study on German companies. These two papers are in line with the hypothesis that IFRS decreases information asymmetry. However, in a study on Swiss companies, Dumontier and Maghraoui (2006) show that the effect is limited to small companies.

Studying the bid-ask spread in an IAS 40 setting, Muller et al.'s (2008) findings suggest that FVA implementation did not reduce the relative information asymmetries between property companies. However, prior to IAS 40, firms disclosing fair values experienced lower bid-ask spread than those who did not, indicating lower information asymmetry.

As indicated by Raffournier (2008), no clear conclusion can be drawn from these studies on implications of IFRS on forecast accuracy since the empirical evidence is mixed. Also, many studies were conducted in a single country and most of the studies deal with voluntary adoption.

### 3.4 Analyst Forecasts

When evaluating fair value accounting, Penman (2007) takes a perspective on the practical task where the accounting information is demanded and concludes that equity valuation is the objective of the financial analyst. Thus an analysis of the decision usefulness of IAS 40 might benefit from studying the usefulness to analysts in their forecasting. Furthermore, as most recent research on IAS 40 is constituted by value relevance studies, Barlev and Haddad (2003) stress that: "*the value of financial reports does not depend on the statistical association between accounting and market returns.*"

As emphasized by Cotter et al. (2010): "*There is an extensive literature about factors affecting analyst forecast accuracy and dispersion, which is relevant to any predictions about the effect of adoption of IFRS on the properties of analysts' forecasts.*" In a study of companies voluntarily applying IFRS Ashbaugh and Pincus (2001) conclude that analyst forecast accuracy improves after IFRS adoption. The sample consisted of 80 non-US firms of which almost half came from Switzerland or France. Hodgdon et al. (2008) come to the same conclusion, that compliance with the disclosure requirements of IFRS reduces information asymmetry and enhances the ability of

financial analysts to provide more accurate forecasts. Unlike prior studies, which examine forecast accuracy using the consensus or mean forecast, Hodgdon et al. (2008) examine forecast accuracy at the individual analyst level. Hope (2003) finds that the level of accounting policy disclosures is negatively related to consensus forecast errors, after controlling for firm and country level variables that may affect analyst forecasts.

A study on German companies by Ernstberger et al. (2008) also suggests that the forecast accuracy is higher for estimates based on IFRS or US GAAP data compared to forecasts based on German GAAP data. Furthermore, in the year of transition of standard the forecast accuracy is significantly lower than in other years, i.e. forecast error is higher. Cotter et al. (2010) find results that suggest that IFRS adoption is related to a reduction in absolute forecast error for a sample of Australian companies. On the other hand, they also find that forecast dispersion increases in the post IFRS period, although the effect is not as strong as in the case of forecast error. Glaum et al. (2011) similarly find that forecast accuracy increases for firms changing from local GAAP to IFRS.

In another Australian paper, Brown et al. (2012) aim to extend similar studies by considering a larger sample of strictly mandatory 2005 IFRS adopting firms (11,220) from a wide set of countries (19) and over a longer period of time (2002-2009). The results support the studies above and further indicate that stronger enforcement of accounting standards is associated with better information environments.

However, there are a few papers that show the opposite compared to the abovementioned studies. Maghraoui (2008) suggests in a study on German companies that compliance with IFRS does not reduce the dispersion of analyst forecasts or forecast errors. These findings are supported by Daske (2005), who finds lower forecast accuracy as well as higher dispersion in a study of German firms, voluntarily adopting International Accounting Standards 1993-2002. Furthermore, Cuijpers and Buijink (2005) find that dispersion of analyst forecasts is higher for firms using IFRS than for those using local GAAPs. The study included non-financial firms in the EU and compared companies which voluntarily used non-local GAAP in 1999 with local GAAP companies.

Acker et al. (2002) study forecast accuracy in the first year of implementing UK Financial Reporting Standard 3 and finds that analyst forecast error increase, suggesting that unfamiliarity with new standards might decrease accuracy. Moreover, according to Ball (2006), IFRS implementation could result in increased earnings volatility due to its focus on FVA, an anticipation which is confirmed by Barth et al. (2008). In a setting where the FVA component is

substantial, increased volatility on account of IFRS might imply decreased forecast accuracy and higher dispersion (Cotter et al., 2010).

Assuming that IFRS adoption does effect in increased forecast accuracy, Horton et al. (2012) investigate potential causes for such improvements. Among other things they test whether improved accuracy might depend on increased opportunities for management in manipulating earnings to meet analyst forecast, but do not find evidence supporting that explanation.

Among FVA opponents, the disclosure of fair values are nonetheless often encouraged (e.g. Rayman 2007) and it could be argued that since fair values where already disclosed in most Swedish property companies before IAS 40 implementation in 2005, it should not make any difference having them on the balance sheet (e.g. Bengtsson, 2008). Research shows that analysts are more likely to cover firms that provide them with more and better information. Lang and Lundholm (1996) provide evidence suggesting that the quality of corporate disclosures affects analyst's coverage decisions and also the accuracy of the forecasts.

Several studies have tested whether classification issues affect the judgments of financial analysts. Hirst et al. (2004) evaluate whether classification of gains and losses on financial assets and liabilities affected experienced sell-side analysts covering the banking sector. The study manipulated two variables: the reporting of gains and losses due to interest rate risk and the bank's exposure to interest rate risk. The result of this study indicates that the analysts were only able to effectively adjust the valuation for the higher risk of exposed banks when the financial statements of those banks applied full fair value accounting and it was stated on the balance sheet. In the case when the information was disclosed in a footnote analysts did not fully adjust for this information.

A potential problem associated with our research design could arise if analysts face incentives discouraging forecast accuracy. Research, however, indicates that financial analysts have incentives to give as accurate earnings estimates as possible. The reward may be in the form of recognition, higher rankings or career advancement (Hong and Kubik, 2003). Mikhail et al. (1999) find that analysts are more likely to change brokerage firms or leave the profession altogether when their forecast accuracy is lower relative to their peers.

There are some further caveats that might have an impact on our results. It is shown that less experienced analysts are more likely to be fired for deviating from the consensus (Hong et al., 2000). Hence, less experienced analysts have incentives to trade off some accuracy and timeliness for the safety of being close to market consensus. Research furthermore establishes a linkage between analyst effort and optimism. McNichols and O'Brien (1997) find that analysts are more

likely to cover firms for which they genuinely have positive views. When analysts initiate coverage of a company their forecasts are relatively optimistic. Nevertheless, according to the study, that optimism is justified by actual results. Moreover, analysts put down more effort covering these firms which leads to that forecast accuracy improves with optimism. McNichols and O'Brien's (1997) evidence suggests that analysts' monetary incentives create an asymmetry that leaves companies for which analysts have unfavorable views with less analyst coverage, analyst scrutiny and accurate forecasts.

Previous research further shows that financial analysts tend to be rather optimistic in the way that the forecasts are systematically upward biased (Easterwood and Nutt, 1999) and in addition are revised rather slowly (Bartov et al. 2002). Moreover, other factors such as experience, workload or risk tolerance are commonly known to influence the quality of an individual analyst's forecasts. Management actions might also have a direct or indirect effect of forecast accuracy. By announcing its own earnings guidance, management influences analysts' expectations (Williams, 1996). Previts et al. (1994) mainly find evidence of substantial analyst effort to remove non-recurring items and focusing on what is often referred to as core or adjusted earnings as basis for forecasting. But the study also shows strong analyst reliance on management for information, which suggests that financial analysts have a role of intermediation.

# 4. Method and Data

## 4.1 Sample and Period

Using Datastream we have collected data from the available public Swedish real estate companies. The companies should be listed on Nasdaq OMX Stockholm Stock Exchange's Large Cap, Mid Cap or Small Cap lists and be followed by a minimum of two analysts. We have used Institutional Brokers' Estimate System (IBES) for earnings estimates. The IBES database, which is provided by Thomson Reuters, is a commonly used data provider for financial firms as well as for academic research. We have considered using the Swedish consensus provider SME Direkt, but as that database is missing data points for many of the companies we have chosen to use IBES.

The investigated period is 1998 to 2011. This time period was chosen as IFRS came into effect 2005 and we will therefore be able to study seven years with the Swedish accounting standards and seven years with IFRS. We are aware that the large time span will inevitably include some year specific noise and we will adjust for this by controlling for separate year differences. The benefit of having a larger time period is that potential benefits of IFRS adoption might take time to materialize, which was indicated by Cuijpers and Buijink (2005). We have checked that all companies primarily have revenues related to real estate. Consequently, we have excluded Klövern prior to 2004 and Fast Partner prior to 2003 when both companies consisted of non-real estate businesses. In addition, we have made sure that all companies have 31th of December as fiscal year end.

We have used the median forecast for the beginning of the year which is selected because at that time analysts will forecast the entire year without any help from published quarterly reports. In addition, in the very beginning of FY1 the full previous year's earnings (FY0) are not available. However, analysts have had published quarterly reports covering three quarters of FY0.

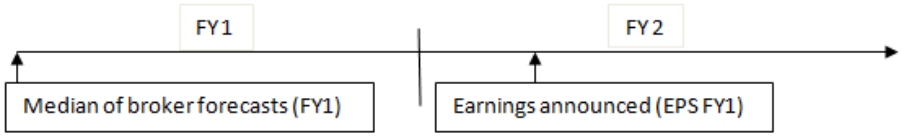


*Figure 2: Time period used in the study is the 1st of January for FY1 for forecasts which are matched with the earnings announcement which occur sometime in the beginning of FY2.*

## 4.2 Research Design

The study investigates the influence of different accounting regimes on the forecast accuracy and dispersion. Thus, we will first regress forecast error, which is a commonly used measure of

forecast accuracy, as dependent variable with accounting standard as research variable and a set of control variables.[5] We will also do a second regression to cover dispersion. The dependent variable in the second regression is analyst forecast dispersion which measures the spread of analyst estimates. Dispersion also reflects the difficulty in making forecasts. However, the focus is between analysts and can as well be seen as the level of disagreement among analysts. In addition, dispersion is used as a measure of non-disclosed information given by the company to one or a limited number of analysts. With more comprehensive disclosures after the transition to IFRS it is likely to believe that analysts will be more equal in terms of information flow from the company. Thus, decreasing analyst forecast dispersion would suggest that the information asymmetry between analysts decreased.

We will start by presenting a paired two sample t-test to see, for the companies that exist the entire period, if the mean analyst forecast error and dispersion before and after IFRS are different from each other.

Following Hodgdon et al. (2008) variables are winsorized at three standard deviations above mean to avoid extreme outliers to have an impact on the result.

### *4.2.1 Regression*

A panel data regression model will be used to test if IFRS has an impact on analyst forecast error and dispersion. Since some data points are missing we have unbalanced data panels. We will perform three different regressions for each of the two dependent variables. First, we will run a normal panel data regression with the previously mentioned variables. Secondly, we will exclude the years of transition (2004) and adaptation (2005) that in previous studies have been found to be very volatile in terms of both forecast error and dispersion. Consequently, we have modified the research variable (IFRS) to take the value 0 for year 1998-2003 and 1 for years 2006-2011. The new research variable is called IFRS2. In this way we can observe if the absolute forecast error is established on a different level after the implementation years, compared to the period before. Third, a regression with only the six companies[6] with data for the entire period included will be made to see if the result is changing. These steps are aimed at increasing the robustness of the results.

(1) Panel data regression

(2) Panel data regression with 2004 and 2005 excluded

(3) Panel data regression only including companies with data available all years

[5] When we write forecast error we always refer to the *absolute* forecast error if nothing else is stated.
[6] The six companies included are Atrium, Castellum, Fabege, Hufvudstaden, Kungsleden and Wallenstam.

The regressions will be as follows for forecast error (FE) and dispersion (DISP):

$$FE_{it} = \beta_0 + \beta_1\, IFRS_{it} + \beta_2\, MCAP_{it} + \beta_3\, NUM_{it} + \beta_4\, DEBT_{it} + \beta_5\, PFE_{it} + \beta_6\, YEAR_{it} + \varepsilon_{it}$$

$$DISP_{it} = \beta_0 + \beta_1\, IFRS_{it} + \beta_2\, MCAP_{it} + \beta_3\, NUM_{it} + \beta_4\, DEBT_{it} + \beta_5\, PDISP_{it} + \beta_6\, YEAR_{it} + \varepsilon_{it}$$

The two predominant and most applicable methods to study panel data are the fixed effects and random effects methods. The main difference between these two methods is that the fixed effects model allows the error term to correlate with the independent variables, whereas the random effects model does not (Gujarati, 2003). As a result, the fixed effects model finds the independent variables as non-random and therefore assumes individual intercepts. The random effects model on the other hand assumes that the intercepts does not vary between individuals. A Hausman test is commonly used to decide what model to use. The test evaluates the null-hypothesis, which assumes that the estimated coefficients from random effects are as efficient as the coefficients for fixed effects (Gujarati, 2003). The test includes running a regression with fixed effects and then random effects respectively in order to compare their respective estimates. If the null-hypothesis is accepted, the random effects model is preferred over the fixed effects model. The Hausman test[7] rejected the null-hypothesis for all of our three models using both forecast error and dispersion as independent variables. Hence, we will use the fixed effects model for our regressions.

For normal linear regressions it is assumed that all disturbances are homoscedastic or that the variance is equal (Gujarati, 2003). If this is not the case errors are commonly considered to have heteroscedasticity. This can be explained by extreme values or the existence of variables with high relevance being left out. In order to determine whether or not heteroscedasticity exists, for the variables, a Wald test is performed. The regression results also need to be tested for serial autocorrelation, which means that the residuals are tested for correlation from one period of time to another (Gujarati, 2003). Performing a Wooldridge test recognizes if autocorrelation are present in the residuals of the regression. Serial autocorrelation implies that an observed variable in the time-series resembles its former observation.

For all models and periods, the Wald[8] detected heteroscedasticity in the data set. In addition, the Wooldridge test[9] found auto/serial-correlation between the observations. Thus, we will run a robust regression model to take the impact of heteroscedasticity into account. The autocorrelation is difficult to adjust for with our choice of regression method, which we are aware of.

[7] Significantly different from zero (Chi2 < 0.01).
[8] Significantly different from zero (Chi2 < 0.01).
[9] Significantly different from zero (F < 0.01).

### *4.2.2 Dependent variables*

The dependent variable in the first regression is the absolute forecast error (FE). Actual EPS is defined as net income adjusted for extra-ordinary items divided by average number of shares outstanding during the year. Forecasted EPS is the median of all analyst estimates in the IBES database and also adjusted for extra-ordinary items. We are using median instead of mean for consensus forecasts. The reason is that median is less sensitive to outliers. Following Hodgdon et al. (2008) and Chang et al. (2000), we deflate absolute forecast error by actual earnings instead of for example stock price to ensure that changes in price during 2000-2001 and 2008-2009 do not disturb our results.

To be sure that the actual EPS is correctly matched with forecasted EPS we have double checked all data with the Thomson ONE database, which is a more sophisticated database with detailed forecast data from each analyst. However, Thomson ONE is only available from 2007 so we have not been able to look at individual forecasts before that year. We have searched in a large number of the full-size analyst research reports we have had access to via Thomson ONE and can conclude that most analysts treat unrealized value changes as an extra-ordinary item. As the majority of analysts do not forecast extra-ordinary items we have not been able to include them in this study.

$$Forecast\ error\ (FE) = \left|\frac{Actual\ EPS - Forecasted\ EPS}{Actual\ EPS}\right|$$

Analyst forecast dispersion is defined in the same way as in the majority of the other studies and in the same way as it is defined by IBES. The standard error of all estimates in the consensus is divided by the absolute value of the forecasted EPS consensus.

$$Dispersion\ (DISP) = \frac{Standard\ deviation\ of\ all\ estimates}{|Forecasted\ EPS|}$$

### *4.2.3 Research variables*

Our research variable in regression model (1) and (2) is a dummy (IFRS) that will take the value 1 for years where IFRS was used (2005-2010) and 0 for the years when Swedish accounting standards applied. In regression (3) the research variable (IFRS2) will take the number 1 for the years 2006-20011 and 0 for 1998-2003. The observations for 2004-2005 will be excluded as discussed in chapter 4.2.1.

### *4.2.4 Control variables*

Following Cotter et al. (2009) and Hodgdon et al. (2008), we include a set of control variables into the regression to control for the other factors influencing analysts' forecast error and dispersion. We have two modifications in comparison to the set of control variables that are commonly used. First, our study includes a measure of debt level to capture the risk which is explained below. Secondly, we leave out the control variable for loss years. The reason is that in the way that real estate analysts adjust EPS for extra-ordinary items loss years are very uncommon. Losses only occur in our data set for data points that are excluded because the company operates non-real estate businesses.[10]

We include the following control variables in our study:

| # | Variable | Short description |
|---|---|---|
| I | MCAP | Log(Market capitalization) |
| II | NUM | Number of analyst following |
| III | DEBT | Net debt to assets ratio |
| IV | PFE/PDISP | Forecast error/dispersion previous year (same as $FE_{t-1}$ and $DISP_{t-1}$) |
| V | YEAR | The year of the observation |

I. The logarithm of the firm's market capitalization at the beginning of the year is included (MCAP). Larger firms are more likely to provide additional disclosures than smaller firms and thus reduce the forecast error (Lang and Lundholm, 1996). Since this effect is likely to be decreasing when a company is large (non-linear relation) we choose to use the logarithm instead of the full market capitalization.

II. The number of analyst earnings forecasts included in the consensus forecast is a control variable (NUM). Because of more competition between analysts to accurately forecast earnings we predict a negative relationship between forecast error and analyst following. In addition, more is publicly known about large firms than small firms to the extent that they are more visible and have analyst and media following. Accordingly, we would expect the extent of information asymmetry between management and analysts to be greater for small firms (Scott, 2003). McNichols and O'Brien (1997) find that analysts are more likely to cover firms for which they genuinely have positive views and that analysts are more accurate in their estimates for such firms. This finding also provides support for the belief that a higher number of analysts following is related to higher forecast accuracy.

[10] Explained in the section "Sample and Period".

III. We include the net debt to assets ratio (DEBT) as a measure of risk. A firm financed with a high proportion of debt is assumed to be more difficult to forecast as the interest cost will have a direct effect on the income statement, whereas a company fully financed with equity will have more easily predicted income statement effects. Net debt is used instead of debt as the cash held by the firm can be used to pay off the debt and therefore counterbalancing the risk level.

IV. To adjust for company specific effects we include the previous year's absolute forecast error (PFE) in the first regression and previous year's dispersion (PDISP) in the second regression. The definition of the PFE and PDISP control variables are the same as for FE and DISP with the exception of the time period. These control variables have been shown to have an effect in previous studies (Lang and Lundholm, 1996 and Cotter et al., 2009).

V. We use dummy variables to test for year specific effects (YEAR 1998-2011)[11]. This is a common way to exclude the effect that single years might have on the regression. Since we have had two periods of large turbulence on the stock market, first the so called IT bubble in 2000-2001 and then the financial crisis 2008-2009, we find it necessary to include a set of year dummy variables into the regression.

As we are using a panel data regression we do not need any dummy variables for firm specific effects, since those effects are already excluded when we measure the result within the panels.

It might be valuable to include control variables for different types of real estate portfolios such as commercial and residential property. However, we have looked in the reports for the companies in the study and their categorization of the property is not always consistent or available which makes it risky to include such a variable. Most of the companies are primarily focused on commercial property or have a mixed portfolio.[12]

We have also checked where the property is located and found that almost all companies in the study earn their income in Sweden and in SEK.[13] The companies have different regional mix within Sweden but we assume that this does not have a substantial effect on the forecast error, mainly since this does not cause any unexpected currency effects.

[11] 2011 is omitted to avoid that perfect collinearity occurs (known as "the dummy variable trap").
[12] The only company with residential property as the dominant (>50% of assets) asset class is the company Heba.
[13] The only company that has a substantial part of properties outside of Sweden is Sagax with 27% of the rent income from Finland and Germany.

### *4.2.5 Paired Two Sample T-test*

A paired two sample t-test for means will be performed to test if the average analyst forecast error and dispersion before and after IFRS are different from each other. We only use the companies for which data is available for the entire period and the averages before and after IFRS have been calculated for each of the companies. As we have a match sample, firm specific effects that are constant will not influence the results. However, if a company is changing over time and becomes easier or harder to forecast it will have an effect on the result. We have, as previously mentioned excluded companies for the years when they have had a majority of the income from non-real estate businesses.

## 4.3 Descriptive Statistics

The data set is time-series cross-sectional, also known as panel data, and contains 103 observations from 16 companies during the years 1998-2011. The average market capitalization of the companies in our study was in the end of 2011 SEK 5,720 million and median was SEK 3,958 million. The number of analyst following the company reaches from 2 to 17 analyst with a mean of 6.8. Mean forecast error (with negative errors taken into account) is 0.250. This implies that for our data the consensus EPS forecast on average is 25% higher than actual EPS, which is in line with the findings of Easterwood and Nutt (1999). When we calculate the *absolute* forecast error the average value is 0.358, as seen in figure 3. PFE and PDISP has fewer observations, compared with the rest of the variables, as FE and DISP data for year 1997 need to exist in the data set to be able to calculate PFE and PDISP.

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| FE | 103 | 0.358 | 0.302 | 0.003 | 1.265 |
| Company | 103 | 7.893 | 4.648 | 1 | 16 |
| Year | 103 | 2005 | 4.178 | 1998 | 2011 |
| MCAP | 103 | 6.649 | 0.415 | 5.581 | 7.242 |
| DEBT | 103 | 0.534 | 0.143 | 0.149 | 0.841 |
| NUM | 103 | 6.864 | 4.415 | 2 | 17 |
| DISP | 103 | 17.264 | 15.378 | 1.119 | 63.397 |
| IFRS | 103 | 0.612 | 0.490 | 0 | 1 |
| PFE | 90 | 0.379 | 0.298 | 0.003 | 1.273 |
| PDISP | 82 | 16.224 | 11.335 | 1.119 | 49.148 |

*Figure 3: Descriptive data of the observations used in the tests.*

The Pearson correlation matrix (figure 4) with the regression variables shows no signs of variables correlated to the extent that we might have a problem with multicollinearity. All correlation numbers are in absolute values below 0.5 except for MCAP and NUM (0.5099), MCAP and IFRS (0.5027), and MCAP and DEBT (-0.5015).

| | FE | MCAP | DEBT | NUM | DISP | IFRS | PFE | PDISP |
|---|---|---|---|---|---|---|---|---|
| FE | 1 | | | | | | | |
| MCAP | 0.2182 | 1 | | | | | | |
| DEBT | -0.2117 | -0.5015 | 1 | | | | | |
| NUM | 0.1252 | 0.5099 | -0.1625 | 1 | | | | |
| DISP | 0.1150 | 0.0984 | 0.0541 | 0.0007 | 1 | | | |
| IFRS | 0.0397 | 0.5027 | -0.3176 | 0.2940 | -0.0522 | 1 | | |
| PFE | 0.2818 | 0.2474 | -0.1828 | 0.0616 | 0.0217 | 0.1582 | 1 | |
| PDISP | 0.0067 | 0.1056 | 0.0233 | -0.0009 | 0.226 | -0.0973 | 0.1109 | 1 |

*Figure 4: Pearson's correlation between the dependent variables, the research variables and the control variables.*

In figure 5 we can see how the dependent variables FE and DISP are distributed for each year 2008-2011. Outliers have been winsorized at three standard deviations. Two FE and two DISP variables have been treated as outliers and winsorized. This means that the outlier have received the value 1.265 (FE) and 63.397 (DISP).[14]

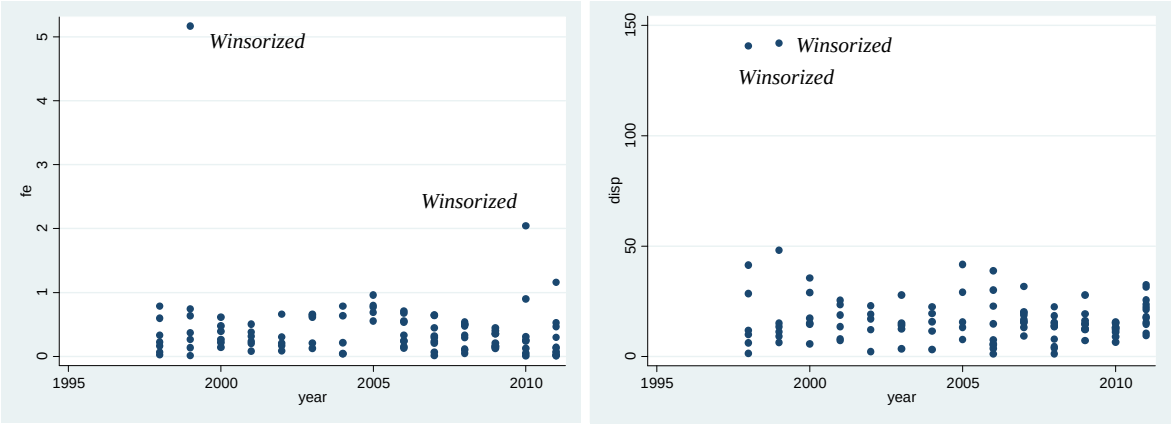


*Figure 5: In the first graph there are all observations of forecast errors (FE) and in the second dispersion (DISP). We have marked the four observation that has been treated as outliers as the observations exceed mean by more than three standard deviations.*

[14] Calculation: Mean + (3*Std. Dev.)

# 5. Results

## 5.1 Paired Two Sample T-test Results

The paired two-sample t-test checks for equality of the population means underlying each sample. Looking at figure 6, the mean for FE is 0.390 before IFRS and 0.382 after IFRS; and the mean for DISP is 19.357 before IFRS and 16.371 after IFRS. The p-values for double sided tests are 0.898 for the test with FE and 0.429 for DISP. The p-values are above what we need to reject the null-hypothesis (H0: no difference between the pairs) on at least a 90% confidence level. Consequently, for our data set the test shows that the mean differences are not statistically separated from zero. The paired two sample t-test does not suggest that IFRS had an effect on forecast error nor dispersion when we look at the six companies that have been listed during the full period.

| | **Forecast error** | | **Dispersion** | |
|---|---|---|---|---|
| | *Before IFRS* | *After IFRS* | *Before IFRS* | *After IFRS* |
| Mean | 0.390 | 0.382 | 19.357 | 16.371 |
| Variance | 0.023 | 0.006 | 85.756 | 7.629 |
| Observations | 6 | 6 | 6 | 6 |
| Pearson correlation | 0.089 | | 0.131 | |
| Hypothesized Mean Difference | 0 | | 0 | |
| t Stat | 0.133 | | 0.848 | |
| P(T<=t) | 0.898 | | 0.429 | |
| t Critical | 2.447 | | 2.447 | |

*Figure 6: Paired two sample t-test for means of average analyst forecast error and dispersion before and after IFRS. The p-values are for a two-sided test.*

## 5.2 Regression Results

The three regression models (figure 7) with forecast error as the dependent variable do not imply that IFRS has significant effects on forecast error. The coefficients for the IFRS dummy variable are negative in model (1), (2) and (3). However, none of the models show that the result is statistically significant. The only variable that is significant ($p < 0.10$) in all three regressions is PFE. Number of analysts, firm size and net debt to asset ratio are not significant explanatory variables. Except for 2005 none of the year dummy variables were significant. The coefficients of the dummy variables for year 2005, 0.521 in model (1) and 0.543 in model (3), are both significant on the one percent level. The 2005 dummy variable was not used in model (2) as the model was design not to include the transition years. Adjusted $R^2$ is 22.7% in model (1), 17.6% in model (2) and 28.3% in model (3). Hence, when we only include the companies that have data all years the model has the largest explanatory effect on forecast error.

| | Models with Forecast error (FE)[15] | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| *Intercept* | *-0.046* | *0.660* | *-1.102* |
| | *(-0.04)* | *(0.54)* | *(-0.87)* |
| IFRS[16] | -0.332 | -0.184 | -0.876 |
| | (-0.86) | (-0.50) | (-1.51) |
| NUM | 0.044 | 0.047 | 0.055 |
| | (1.64) | (1.64) | (1.32) |
| MCAP | 0.090 | -0.027 | 0.258 |
| | (0.45) | (1.64) | (1.05) |
| DEBT | -0.715 | -0.678 | -0.903 |
| | (-0.82) | (-0.75) | (-0.80) |
| PFE | 0.260 | 0.189 | 0.277 |
| | (2.10)** | (1.36)* | (1.95)** |
| *N* | *90* | *81* | *68* |
| *Adj. $R^2$* | *22.7%* | *17.6%* | *28.3%* |

*Figure 7: FE (dependent variable) is the absolute value of the difference between actual EPS and median forecasted EPS by analysts, deflated by actual EPS. Year dummies have been included in all regressions. All regression variables are winsorized at three standard deviations to avoid extreme outliers to have an impact on the result. The value presented for each variable is the coefficient and t-statistics (in parenthesis). Regression model: Panel data regression with fixed effects and robust standard errors adjusted for heteroscedasticity. * = P-value <0.1, ** = P-value <0.05, *** = P-value <0.01*

The results in figure 8, with dispersion as dependent variable, do not support that IFRS have significant effects on dispersion. The coefficient for the research variable (IFRS) is negative in all three models, yet not significant. The only significant variable in all regressions is MCAP (p <0.10). NUM is significant in two regressions and DEBT in one regression. The previous year's dispersion (PDISP) has no significant effect in the regression. Hence, there seems to be no correlation between dispersion between years. Two of the year dummies were significant in all regressions (p <0.10), year 2005 with positive coefficient and 2010 with negative coefficient. These results suggest that forecast dispersion increased in 2005 and decreased in 2010. Adjusted $R^2$ is slightly higher compared to our model explaining forecast error. Model (2) shows the largest explanatory effect on analyst dispersion where $R^2$ is 33.5%.

[15] (1) Panel data regression
(2) Panel data regression with 2004 and 2005 excluded
(3) Panel data regression only including companies with data all years

[16] Variable IFRS2 in regression (2)

**Models with Dispersion (DISP)[17]**

| | (1) | (2) | (3) |
|---|---|---|---|
| *Intercept* | *-163.426* | *-212.211* | *-159.623* |
| | *(-1.85)** | *(-3.32)**** | *(-2.32)*** |
| IFRS[18] | -16.617 | -14.743 | -19.166 |
| | (-1.52) | (-1.61) | (-1.51) |
| NUM | 1.024 | 1.313 | 1.048 |
| | (2.16)* | (1.96)* | (1.36) |
| MCAP | 24.833 | 30.751 | 24.440 |
| | (2.16)* | (3.27)*** | (2.42)** |
| DEBT | 25.222 | 42.892 | 21.561 |
| | (0.76) | (1.89)* | (0.84) |
| PDISP | 0.104 | 0.061 | 0.143 |
| | (0.66) | (0.57) | (1.06) |
| *N* | *82* | *74* | *66* |
| *Adj. $R^2$* | *29.1%* | *33.5%* | *30.3%* |

*Figure 8: DISP (dependent variable) is the standard error of all estimates in the consensus is divided by the absolute value of the forecasted EPS consensus. Year dummies have been included in all regressions. All regression variables are winsorized at three standard deviations to avoid extreme outliers to have an impact on the result. The value presented for each variable is the coefficient and t-statistics (in parenthesis). Regression model: Panel data regression with fixed effects and robust standard errors adjusted for heteroscedasticity. * = P-value <0.1, ** = P-value <0.05, *** = P-value <0.01*

Overall, our results do not suggest that the IFRS adaptation had an effect for analysts. Neither FE nor DISP are significantly different ($p < 0.10$) when we compare the years with and without IFRS. The regression models suggest that both FE and DISP increase in the first year with IFRS (2005). This finding corresponds with the results in similar studies (e.g. Ernstberger et al., 2008). When we look at the years including the last financial crisis (2008-2009) we do not find any significant effect on our two dependent variables in the regressions. However, the financial crisis could have had an effect on the forecast error and dispersion for the companies in the study but the effect has not been large enough to be significant in our results.

Our models have a bit lower explanatory value (adj. $R^2$) than previous studies. For the FE model Cotter et al. (2009) had an adjusted $R^2$ of 60.0% and 47.3% for DISP. Hodgdon et al. (2008) had 17.0% and Ernstberger et al. (2008) had 26.5%-29.75% for their FE model. However, we are confident that the explanatory value is sufficient for this type of determinant study. For example, Daske (2005) only had adjusted $R^2$ between 5.2%-8.3% depending on model. The fact that we

[17] (1) Panel data regression (fixed effects)
(2) Panel data regression with 2004 and 2005 excluded
(3) Panel data regression only including companies with data all years

[18] Variable IFRS2 in regression (2)

only include real estate companies as well as different regions and methodologies might explain the differences.

### 5.3 Sensitivity Analysis

We have tested a number of modifications of the model and the variables to assess the robustness of the regression results. First, we have tried to exclude control variables one by one to check if the research variable becomes significant. We have also run different regression models (fixed effects without robust; random effects).[19] These two alterations have however not led to any other results as for the effect of IFRS on forecast error or dispersion.

To assess the sensitivity of the results with regards to the dependent variables we have re-estimated all models using mean instead of median consensus forecasts. As suspected by the small differences between median and mean, the regression result did not change. Fourth, we have performed the regressions winsorizing the depending variables more tightly for outliers with similar results.[20]

Finally, 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 (Newbold et al., 2003). To test for possible multicollinearity we have performed a variance inflation factor (VIF) test and found that that multicollinearity is not a worrying issue for the robustness of the regression results.[21] In addition, multicollinearity is foremost considered to be a problem in large time series and our time series (t=14) is relatively small.

To conclude, the robustness and sensitivity analysis indicates that the findings are not driven by the type of regression model, dependent variable or definition of outliers.

[19] As explained in the section "Method".
[20] Winsorized at two instead of three standard deviations from mean.
[21] The VIF test reaches from 1.14 to 7.71 for all the variables with a mean of 2.20-2.44. Values above 10 indicated a possible problem with multicollinearity (Gujarati, 2003).

## 6. Discussion and Conclusions

In summary, our results indicate that the adoption of IFRS/IAS 40 in 2005 has not had a significant long run impact on financial analysts' forecast error or dispersion, in predicting earnings for listed Swedish real estate companies. However, it might be appropriate to further consider the possible causes and implications of that result.

As our review of previous research provides, there is a considerable body of literature that lays emphasis on the subjectivity and reliability problems of FVA for non financial assets marked to model in general (e.g. Lindsell 2005, Hitz 2007, Penman 2007) and for investment property in particular (e.g. Nordlund 2004, Danbolt and Rees 2008, Nellessen and Zuelch 2010). As argued by Scott (2003): *"The decision usefulness of fair-value based financial statements will be compromised if too much reliability is sacrificed for greater relevance."* Given that reliability should be a necessary precondition for information to be relevant and hence decision useful and that the fair values of investment property suffer from particularly low reliability, it might be plausible to assume that the information provided to financial analysts by IAS 40 adoption is not considered useful and thus not affecting forecast error or dispersion. This conclusion is further enhanced by Danbolt and Rees (2008), who find evidence consistent with earnings management and hence concludes that FVA for investment property may effect in biased accounting.

Nevertheless, prudence must be advised when applying these findings to our results, given that they might not be directly applicable to the Swedish setting. There are, however, theses from the Stockholm School of Economics published on the subject of the reliability of investment property valuations in Swedish real estate companies applying IAS 40. These papers support the conclusions above as their findings show that the reliability of fair values for investment properties is low as well as indications of earnings management in the timing of asset sales and recognition of unrealized changes in value (Bengtsson and Johansson 2009, Dal et al. 2009, Lantto and Lundström 2008). As there seems to be considerable room for manipulation, decision usefulness should be affected negatively and if this is appreciated by analysts, there should be no effect on forecasts. High quality standards are not a guarantee for high quality financial statements, if management has incentives and opportunities to manipulate them (Leuz, 2003).

Despite that – to the best of our knowledge – there is no previous research that studies IFRS adoption using analyst forecast error or dispersion in an investment property context, our review of the previous research shows that there are a substantial amount of studies using these variables in a general IFRS adoption context. Contrary to our findings, the majority of these studies find that analyst forecast error and/or dispersion is negatively related to IFRS adoption (Ashbaugh and

Pincus 2001, Hodgdon et al. 2008, Hope 2003, Ernstberger et al. 2008, Glaum et al. 2011, Cotter, et al. 2010, Brown et al. 2012). A plausible explanation for the difference might be the general IFRS application and multi-industry setting, implying that the abovementioned studies are not limited to companies with a majority of non-financial assets accounted for at mark-to-model fair value. If that explanation is true, our results do not contradict these findings. Rather, they may confirm Wittingtons (2008) conclusion that the adequacy of a measurement method should be evaluated in the particular circumstances that exist in relation to specific items in the financial statements.

In line with Bengtsson's (2008) findings, another possible explanation for the non significant impact of IFRS/IAS 40 adoption might be that having fair values on the balance sheet and value changes in the income statement should not make any difference, given that such values were already disclosed in most Swedish real estate companies prior to the 2005 implementation. That would nevertheless imply that considerable attention has been devoted by academia, professionals and regulators to debating an issue to which users are indifferent. Such an explanation would be in line with the concept of full disclosure that follows from the theory of efficient securities markets and the information perspective on decision usefulness, which according to Scott (2003) implies that: *"it is the information content of disclosure, not the form of disclosure itself that is valued by the market. Thus, information can be released as easily in notes and supplementary disclosure as in the financial statements proper."*

However, such an explanation would challenge the accumulated theory and evidence of inefficiency that supports a measurement perspective on decision usefulness, where improved financial reporting is expected to reduce such inefficiencies and thus improve operation of securities markets (Scott, 2003). Furthermore, it would be contrary to the findings of Hirst (2004), where it was shown that analysts were only able to effectively adjust their forecasts for information when full fair value was applied, as opposed to when the information was disclosed in the notes.

Notwithstanding the above, our results do not necessarily contradict either the concept of full disclosures or a measurement perspective or Hirst's (2004) findings. Given that it has been indicated that the information provided by adopting FVA for investment property suffers from low reliability, which would imply that our results depend on the information not being decision useful. Thus, users should be indifferent to the information itself, rather than to how it is reported. Such a conclusion is further enhanced by our review of analyst reports, showing that they neither forecast the line item value changes in investment property, nor include it in their EPS forecasts. It should not be unreasonable to assume that it is a rather challenging task to forecast a value that

has not only been shown hard to estimate on a reliable basis, but also seems likely to be determined on a subjective basis and biased by management's intentions.

Further support for this interpretation of our results is given by the findings of a thesis published at Uppsala University (Kihlberg and Nordfors, 2008), in which financial analysts covering the Swedish real estate company securities market are interviewed on their perception of the decision usefulness of fair value accounting of investment property according to IAS 40. The main conclusion the authors draw from the study is that the subjectivity inherent in the reported valuations results in low decision usefulness for financial analysts. Studying the interview responses show that most analysts perceive the accounting for unrealized value changes in the income statement as neither useful nor having a significant impact on their work. In addition, analysts would prefer if fair values of investment property were disclosed in the notes, as opposed to the financial statements.

Regardless of the above, it should be noted that it is not possible to establish that the information produced by accounting according to IAS 40 does not fulfill the decision usefulness criterion. Indications that analysts do not perceive the information as useful, due to low reliability and subjectivity inherent in it and thus omit it when making their forecasts, might explain why our results show a non-significant impact. However, it is not necessarily true that the analysts are right in omitting it. On the other hand, as they were not less accurate or dispersed in their forecasts when such values were disclosed in the notes, it seems that our results might at least confirm that accounting for fair values in the balance sheet and unrealized gains in the income statement does not increase decision usefulness or decrease information asymmetries between reporting entity and analysts. Furthermore, according to the research showing that the reliability should be low for investment property valuations, analysts actually do appear to be right in omitting them.

Finally, albeit no significant effects on analyst forecast accuracy and dispersion over the long run, our result show a significant increase in forecast error in the adoption year, 2005. This suggests that there might have been a transition effect, comparable with the conclusions in Bengtsson's (2008) value relevance study. As Acker et al. (2002) argue, an increase in forecast error in the first year of implementation could depend on unfamiliarity with the new standard. Although we cannot determine the cause of this result, it does support Cuijpers and Buijink's (2005) findings that the potential effects of a new accounting standard should demand some time to materialize and thus, a longer time period is beneficial in studies similar to ours.

## 6.1 Concluding Remarks

Even though our results indicate that the potential benefits or drawbacks of IFRS/IAS 40 adoption do not seem to be significant to financial analysts, one could argue that there are other, less sophisticated users for whom the change of accounting standard might have an impact on decision usefulness and information asymmetry. On the one hand, such users could potentially benefit from fair values reported on the balance sheet, as it might give them a more relevant picture of fundamental value than historical acquisition costs less depreciation. On the other, having the unrealized value changes in the income statement might give a naive user an impression of precision, which is not necessarily true. Furthermore, the reliability problem of investment property valuations would be present to at least the same extent for a less sophisticated user as for a financial analyst, if not more. Nevertheless, as our review of previous research shows, analyst forecast accuracy is commonly used to study the quality of financial information and less sophisticated users might be expected to use mediums such as financial analysts to acquire sophisticated accounting information (Scott, 2003).

In the Dumontier and Maghraoui's (2006) study on the effect of IFRS adoption on information asymmetry, they show that positive effect is limited to small companies. This finding could have an implication for our results as data covering the entire period of study is available only for larger companies in our sample. Looking at our data set, all six companies that have been listed during the whole period have market capitalizations higher than the mean/median of all companies in the study.

As mentioned in the review of the previous research, Cotter et al. (2010) argues that, where the FVA component is substantial, increased volatility on account of IFRS adoption may cause increased analyst forecast error and dispersion. Our results do not challenge this line of reasoning, as it could hold true in a setting where analysts do not fully adjust for unrealized gains. Considering the bottom line in the annual reports of the real estate companies in our sample, there seems to be no doubt that the volatility in net income is significantly higher after IFRS/IAS 40 adoption.

## 6.2 Limitations

Forecast accuracy is influenced by numerous factors and low forecast errors do not necessarily imply high accounting standard quality. We want to stress that even if our method is commonly used in academic research, the real world is much more complex. Further limitations in this study include the small sample size. Nevertheless, the sample reflects the listed Swedish real estate

companies that we intend to study and we included all firms which had data available at the time of the study.

We cannot be sure that the data from Thomson Reuters is completely free of error and bias. To mitigate this risk we have performed a number of checks to ensure that the data is correct. We have sorted the data for extreme values and double checked with information from other sources, such as reports from analysts and annual reports. In these random samples we have not found any systematic or significant errors in the data.

The significant increase of forecast error and dispersion in 2005 might be related to wrongly matched data in IBES. As we are not able to check the input data we cannot judge if this is the case. Nevertheless, other studies (e.g. Ernstberger et al., 2008) have also reported large fluctuations and increases of forecast error in and around the transition years so the result is not unexpected. As discussed in the Method section, analysts might treat one-off items in different ways which could possibly influence the results of our study. In addition, it might also be that there are errors in the information collected by IBES. However, we have been in contact with IBES numerous times to fully comprehend how they are collecting and sorting the forecasts in order to make sure that we are using the correctly matched data.

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### Databases

Datastream (IBES), Thomson Reuters, used 2012-04-15 - 2012-05-08

Thomson ONE, Thomson Reuters, used 2012-04-28 – 2012-05-02

# Appendix

| # | Company | Market capitalization (MSEK) |
|---|---|---|
| 1 | Atrium | 9 240 999 |
| 2 | Brinova | 2 466 770 |
| 3 | Castellum | 13 989 200 |
| 4 | Catena | 664 959 |
| 5 | Corem | 1 493 391 |
| 6 | Fabege | 8 743 932 |
| 7 | Diös | 2 129 780 |
| 8 | Fastpartner | 2 030 720 |
| 9 | Heba | 2 229 120 |
| 10 | Huvudstaden | 13 869 260 |
| 11 | Klovern | 4 164 794 |
| 12 | Kungsleden | 6 279 095 |
| 13 | Sagax | 3 662 000 |
| 14 | Wallenstam | 9 813 925 |
| 15 | Wihlborgs | 6 993 962 |
| 16 | Balder | 3 752 188 |
| | *Average* | *5 720 256* |
| | *Median* | *3 958 491* |

*Figure 9: Companies in the study marked with the number used to classify each company. The market cap is from last of December 2011 and in million SEK.*


*Figure 10: Forecast errors for each of the 16 companies. Company #13 is totally excluded because of missing data while companies #5, #8 and #16 are excluded due to excluded data (other businesses, outliers etc).*

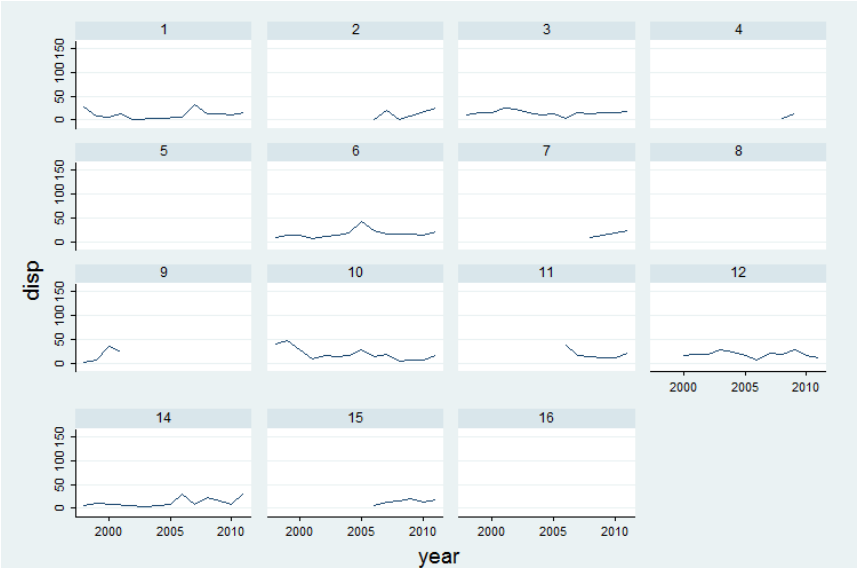


*Figure 11: Analyst forecast dispersion for each of the 16 companies. Company #13 is totally excluded because of missing data while companies #5, #8 and #16 are excluded due to excluded data (other businesses, outliers etc).*

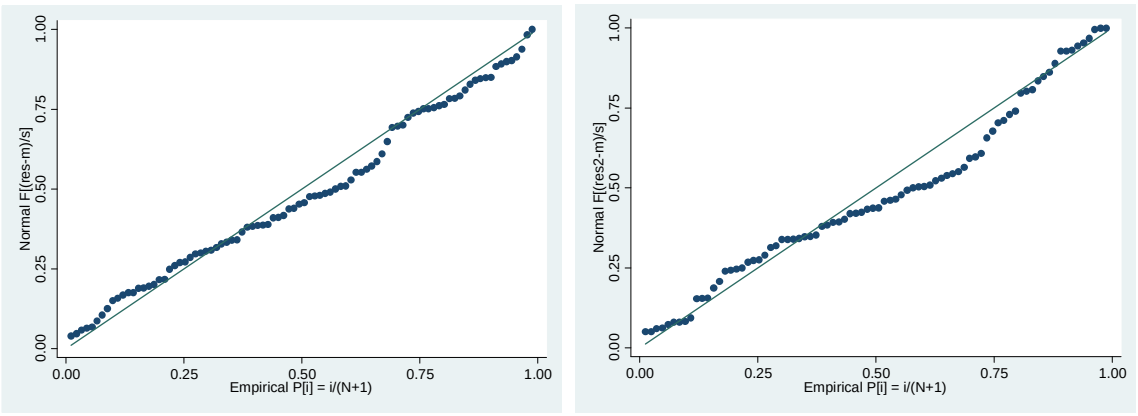


*Figure 12: Standardized normal probability plot of error terms. The first graph shows Model (1) for FE and the second shows Model (1) for DISP. We can conclude that the error terms are not perfectly fitted along the normal distribution line.*

| Code | Description |
|---|---|
| F0EPS | Reported annual EPS for the last fiscal year (FY0) |
| EPS1MD | Median value of all FY1 estimates for a company |
| EPS1N | Total Number of estimates in the mean associated with FY1 forecast |
| EPS1CV | Coefficient of variation of all the FY1 estimates. A measure of the spread of the estimates in terms of the standard deviation. Calculated according to the equation:<br>CV = (EPS1SD/Absolute value of EPS1MN) |
| AFO1NE | Total number of estimates in the mean associated with FY1 forecast |
| EPS1SD | Standard deviation of all the FY1 estimates that make up the consensus |
| W08001 | Market capitalization, share price divided by number of shares outstanding |
| X(WC18199) | Net debt, total debt minus cash and cash equivalents |
| X(WC02999) | Total assets |

*Figure 13: Datastream codes and descriptions of each variable*