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Value relevance of fair value estimates - The impact of ownership structures and increased disclosures

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ABSTRACT

This study investigates the effects ownership structures and actions by regulatory bodies (in the form of increased disclosures) have on investors' perceptions of fair value estimates. By taking a value relevance approach, the results from this study, generated from a sample of 223 European banks applying IFRS during a period between 2011-2014, indicate that all levels in the fair value hierarchy are value relevant. Further, the results suggest that investors seem to distinguish mark-to-market (level 1) and mark-to-model assets (levels 2 and 3) and perceive mark-to-market assets as more value relevant. We find that the ownership structure seems to have a significant effect on the value relevance of level 3 net assets; an increased ownership concentration implies a negative association between the fair values and the market value while the opposite condition prevails when increasing the presence of institutional owners. In contrast, the effect of increased disclosures on such securities cannot be demonstrated. We contribute with an understanding of the link between financing reporting and how this information is priced by the capital market. By examining a novel dimension of corporate governance, we yield new insights to the existing literature within this research field.

Keywords: Fair value hierarchy, value relevance, ownership structure, ownership concentration, institutional ownership, accounting disclosures.

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1. INTRODUCTION

In the International Accounting Standards Board's Conceptual Framework the general objective of financial reporting is described as "*to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions relating to providing resources to the entity*". To be considered useful, the information has to be both relevant and faithfully represented which constitutes the qualitative characteristics. (IAS Plus, 2018)

Standard setters claim that one way to provide more relevant information to investors is to measure assets at fair value (So & Smith, 2009). On the other hand, fair value opponents have blamed fair value accounting for the recent financial crisis and for causing financial statements to be more volatile and less reliable (LaCalamito, 2013). When an accounting standard focuses on relevance at the expense of verifiability, it becomes harder to ensure a shared interpretation of faithful presentation; an illustration of this is the HQ Bank case where different institutions had different views on what constitutes a faithful representation and thus what level in the fair value hierarchy¹ that should have been applied (Hartmann et al., 2018). In court, the Swedish financial supervisory authority (Finansinspektionen) claimed that the total measurement error was SEK 632 million which was a highly material amount and caused huge consequences which ultimately forced the bank into bankruptcy. As such, this case demonstrates how much volatility fair value accounting is capable of creating. Despite the fact that fair value measurement is considered to provide investors with more relevant and useful information, there is also undoubtedly a downside since more room for judgement increases the risk of managerial opportunism and errors when preparing the financial statements, which subsequently could lead to a less faithful representation. Although, accounting standards and strong corporate governance can be used as tools in order to mitigate management's opportunistic behavior and increase the reliability of fair value measurements (Barth, Landsman & Lang, 2008; Habib & Azim, 2008). As an arrangement to mitigate misinterpretation and managerial opportunism IASB issued IFRS 13, a more comprehensive standard requiring additional disclosures on fair value estimates, which became effective in January 2013 (Busso, 2018). Moreover, studies have examined whether the strength of

¹ The Fair Value Hierarchy categorizes the valuation techniques into three levels; (1) Quoted prices on an active market, (2) directly or indirectly inputs and (3) unobservable inputs (IAS Plus, 2019)

corporate governance affects investors' pricing of fair values estimates, i.e. the value relevance² of fair values; Song, Thomas and Yi (2010) and Siekkinen (2017) document a positive association between value relevance and corporate governance when focusing on auditing aspects and board characteristics from a U.S and European setting, respectively.

In this study we will investigate a novel dimension of corporate governance in the value relevance literature of fair values. By taking an ownership structure perspective, we intend to test whether different aspects of ownership, such as ownership concentration and institutional owners, have an impact on the value relevance of fair values. We will mainly focus on level 3 net assets since they are related to input with the highest degree of uncertainty, and theoretically, where corporate governance and regulation effects should be most distinguishable. Hence, we aim to study how well the information of fair value measurements are reflected in stock prices, and thus consider both the relevance for investors as well as how faithful they interpret the information based on different inputs and contexts. In addition to this, we perform a test to examine the effect of increased disclosures by using the introduction of IFRS 13 as a base. By using a modified Ohlson (1995) model, we investigate a sample of 223 European banks spread over 30 countries during the time period 2011-2014. Our results suggest that ownership structures have an impact on investors' pricing of fair value estimates. We document a positive association when institutional owners are present, and especially a remarkably negative effect when presence is non-existent. Meanwhile, higher ownership concentration is associated with a decrease in value relevance. Furthermore, when examining the effect of the introduction of IFRS 13, by comparing the time periods 2011-2012 and 2013-2014, we find that the new standard seems to have increased the overall value relevance. However, we find no significant difference in value relevance for level 3 net assets.

Our aim is to contribute with a new perspective of corporate governance to the value relevance literature of fair values, as well as complementing the existing literature of the effect of regulatory bodies on fair values, i.e. Siekkinen (2017). As mentioned above, both Song et al. (2010) and Siekkinen (2017) investigate corporate governance and its impact on the value relevance of fair values by studying monitoring mechanisms in the form of mainly auditing aspects and board characteristics.

² Barth, Beaver and Landsman (2001) define value relevance as a way of operationalizing the concepts of relevance and reliability. That is, accounting information is value relevant if the information is incorporated into share prices, thus indicating that the information is relevant to investors and can be measured reliably.

However, according to Connelly, Hoskisson, Tihanyi and Certo (2010), ownership structure has emerged as an important monitoring mechanism. For this reason, ownership aspects could theoretically have an impact on investors' pricing of fair value estimates and potentially yield insights into the effects of a different perspective of corporate governance. Also, this study can serve as a complement to previous research, which gives standard setters additional insights on how the fair value measurement is perceived by investors and possibly discover improvement opportunities.

Further, Landsman (2007) argues that markets and institutional perspectives might differ between countries. A large proportion of previous value relevance studies has been performed in a U.S. setting, while fewer have focused on a European context (Siekkinen, 2017). Value relevance studies of SFAS No.157, the corresponding standard to IFRS 13 in U.S GAAP, have often been performed during, or closely after the financial crisis in 2008. As a consequence, results from such studies may be affected by the prevailing economic situation (Goh, Li, Ng & Yong, 2015). This study differentiates from prior research since it investigates how investors price European banks and whether corporate governance, in terms of ownership concentration and institutional ownership, has an impact on the value relevance of fair values. By studying from this perspective, both internal and external aspects of corporate governance are taken into consideration.

The remainder of this paper is structured as follows: Section 2 lays out the theoretical groundwork and the hypothesis development. Section 3 explains the methodology of the study as well as descriptive statistics. Section 4 presents the results from the regression models with a related discussion, as well as the conducted robustness tests. Finally, section 5 concludes the study and provides suggestions for future research.

2. THEORY AND HYPOTHESES DEVELOPMENT

2.1 Fair value and value relevance

Whether fair value as a measure is advantageous or not has been extensively discussed in earlier literature. So and Smith (2009) state that the proponents of fair value often argue that this kind of measure provides investors with more valuable and useful information than historical cost measures. They further bring forward arguments regarding the problematic nature of fair value accounting. One of these arguments is that in many cases there are no active markets to base the fair value on and as a result, the measurement made is likely to be unreliable. Dichev and Tang (2008) highlight another issue of fair value accounting which is its reduced informativeness of earnings. The authors claim that changes in fair value often are unpredictable, and their inclusion in the income statement makes it harder for investors to identify the recurring component of earnings. Furthermore, Marra (2016) raises an argument in favor of fair value accounting which is related to the definition of assets and liabilities in the Conceptual Framework, whose classification criteria focus on future in- and outflows of economic benefits. Since the fair value represents an exit price and thus a measure of these in- and outflows, the author argues that this is consistent with the objectives of financial reporting.

The introduction of IFRS 13 in 2013 formalized the intention of the IASB to increase the consistency and comparability when applying fair values (IAS Plus, 2019). The standard provides a single basis for using fair value accounting under IFRS, while also requiring additional disclosures and a clear definition of fair values. It is used as a complement to other IFRS standards and acts like a guidance when other standards allow fair value as a measurement. Furthermore, IFRS 13 sets out a fair value hierarchy, containing three different levels. These levels differ depending on the input data used to measure the specific security. The first level refers to input data that is identical to the assets which are subject to the valuation. As such, valuations of assets and liabilities measured at the first fair value level are done by using observable market prices of identical assets and liabilities. The second level is related to market prices as well, but incorporates values of similar assets and liabilities when performing the valuation. The third and last fair value level incorporates unobservable inputs when valuing balance sheet items. Such input can, for instance, be firm-specific information such as the discount rate, which is then used by the reporting entity to value specific items. (IAS Plus, 2019) Consequently, the levels provide valuations with different degrees of uncertainty since moving down the hierarchy opens up for subjectivity and firm specific input.

As a result, by introducing IFRS 13 the IASB intended to improve users' possibility of interpreting fair value accounting by enhancing disclosures (ACCA, 2019).

In order to examine investors' perception of firms' fair value estimates, Kolev (2008) examines whether fair value estimates for assets and liabilities not traded in an active market (level 2 and 3) are too unreliable for financial reporting. He uses the net assets of all three fair value levels and documents a positive association between the share price and each level. Song et al. (2010), Goh et al. (2015) and Siekkinen (2016, 2017) also study whether the fair value measurement provides investors with value relevant information. Song et al. (2010) and Goh et al. (2015) perform their studies in a U.S. context during a period after the financial crisis, while Siekkinen (2016) looks from an international perspective and Siekkinen (2017) is doing his investigation from a European context. All find results that generally indicate that the fair value measurements provide investors with value relevant information, as assets measured at fair value can be seen to be priced into the market value. The first hypothesis is thus:

H₁: All levels in the fair value hierarchy are value relevant

The studies above also investigate whether there is a decreasing valuation of fair value assets and liabilities when moving down the fair value hierarchy. Kolev (2008) finds higher coefficients for mark-to-market assets (level 1) while the coefficients for mark-to-model (level 2 and 3) assets are consistently lower; however, this difference is only statistically significant between levels 1 and 3. Song et al. (2010) find that the value relevance is greater when the fair value is determined by using level 1 or level 2 inputs compared to the value relevance when using level 3 fair values. Furthermore, the results of Goh et al. (2015) indicate that investors price levels 1, 2 and 3 differently.

Siekkinen (2016) extends the study by Song et al. (2010) by investigating the effect of institutional aspects in an international context. His results indicate that the value relevance is not decreasing by each level, but rather, level 2 and level 3 fair value assets are valued higher than level 1 assets. Siekkinen (2017) further studies the value relevance of fair values in a European context. However, these results cannot support the proposition that investors value the fair value levels different from each other. Thus, the empirical literature provides somewhat conflicting evidence regarding the value relevance of the different levels in the fair value hierarchy.

Despite of this, since there is a risk of decreased verifiability when moving down the fair value hierarchy, and when having the results of Kolev (2008), Song et al. (2010) and Goh et al. (2015) in mind, our second hypothesis is stated as follows:

H₂: The value relevance of the net fair value assets decreases when moving down the fair value hierarchy

2.2 The effect of accounting disclosures

In the accounting disclosure literature, studies have investigated the effects disclosures have when it comes to providing investors with relevant and reliable information. Healy and Palepu (2001) argue that information asymmetry between parties, and agency related problems, are core causes for the existence of financial reporting and disclosures. The authors base their argument on the “Lemon theory” developed by Akerlof (1970). They state that when buyers and sellers have different information (dis)advantages, their valuation of a certain asset will differ. For instance, buyers with less information than the seller will rationally base their valuation on the average market price of this asset. If the asset is better than average it will be undervalued, while if it is worse than average it will be overvalued. Song et al. (2010) argue that an increased use of level 3 fair values could result in larger information asymmetry due to the fact that when input information is less observable, investors will not know whether the information provided is reliable or not. Healy and Palepu (2001) argue that this informational difference between buyers and sellers can be overcome in different ways, of which one example is disclosures related to financial reporting.

Leuz and Verrecchia (1999) empirically study whether increased disclosures have any effect on information asymmetry. Their results indicate that firms providing more disclosures are subject to a bid-ask spread that is lower than for firms providing less disclosures. Moreover, Zhou (2007) studies the effect of the introduction of new auditing standards in an emerging economy earlier characterized as having a low level of disclosures. The results of Zhou (2007) indicate that the information asymmetry, proxied by the bid-ask spread, was lower for firms adopting the new standards. Furthermore, Siekkinen (2017) studies the value relevance of fair values in relation to the introduction of IFRS 13. He concludes that the introduction of IFRS 13 can be seen as successful since there are less differences between the three levels in the fair value hierarchy post IFRS 13. The results of Goh et al. (2015) indicate that there is no statistical significance when they test whether an increase in level 3 fair value gains results in investors

discounting the price of equity. They further suggest that a potential reason for this is the increased disclosures required when applying SFAS No.157. By providing more information regarding how level 3 fair values have been calculated, investors are given insight into the actions of management, and thus reducing potential manipulation of the information (Goh et al., 2015). Thus, information asymmetry related to level 3 fair values can reasonably decrease by the introduction of IFRS 13, resulting in an increased value relevance. As such, we anticipate our third hypothesis:

H₃: The value relevance of Level 3 net fair value assets has increased after the introduction of IFRS 13

2.3 Corporate governance and value relevance

As stated by Song et al. (2010), when input information is less observable, in form of level 3 fair values, investors may find it difficult to discern whether the information is reliable or not. As a result, the information asymmetry between the firm and its current and potential owners may increase. Habib and Azim (2008) highlight the importance of strong monitoring mechanisms and its impact on the value relevance of accounting numbers. They argue that the disadvantage of weak corporate governance is higher than the potential benefit of having strong corporate governance. The absence of strong monitoring mechanisms will eventually hurt shareholders due to the increased risk of management's opportunistic behavior (Habib & Azim, 2008). Penman (2007) further underlines competence and independence of monitors as important aspects in order to minimize biases in estimates of level 3 fair values. Moreover, Aboody, Barth and Kasznik (2006) study the relationship between option valuation and the strength of corporate governance and they find an association indicating that firms with stronger corporate governance are less likely to understate option value estimates.

In the study performed by Song et al. (2010), they test whether the strength of corporate governance has an impact on the value relevance. The corporate governance variable is mainly constructed of data regarding audit committees and board characteristics. The empirics suggest that the strength of corporate governance has a significant effect on the value relevance on mainly level 3 fair values, but also on level 2. In contrast, weaker corporate governance may imply a reduction of value relevance of these measures. Siekkinen (2017) performs a similar study with a particular focus on board characteristics as a measure of corporate governance. His results indicate that board independence and board diversity have a positive effect on the

value relevance of fair value estimations (level 3). Also, the results suggest that the information quality is decreasing as the board size increases, when level 3 has been applied. The results of Song et al. (2010) and Siekkinen (2017) support the view that investors value information higher when they are more comfortable that the accounting figures have been calculated by monitored managers.

Siekkinen (2016) also examines another dimension of monitoring by investigating whether the value relevance of fair value varies across different degrees of investor protection environments. He concludes that all fair values, regardless of level, are value relevant in countries where the investor protection environment is either medium or strong. He further documents that when the investor protection environment is weak, the only relevant measures to investors are those with level 1 input. Additionally, the results suggest that the difference in value relevance between level 1 and level 3 decreases as the quality of investor protection increases.

Prior research regarding corporate governance and value relevance has to a large extent been related to internal mechanisms such as the board and the audit committee's effect as a monitoring function on management. External aspects like investor protection and institutional environments have also played a central role when investigating the reliability of accounting information. According to Connelly et al. (2010) the ownership structure of firms has become increasingly more important when considering tools used to mitigate agency problems in firms, and constitutes both an internal and external control mechanism for corporate governance. They further argue that there are different types of ownership, which differ in regard to how and with who they do business, their legislative and judicial environments, and their capability of managing information. One of these types of owners is blockholders. They are often defined as owners controlling more than five percent of a firm's outstanding shares. Blockholders are thus relatively large owners who according to Connelly et al. (2010) both have the ability to enhance or worsen the quality of corporate governance. Large owners may have a positive effect on corporate governance since they can be assumed to have a relatively large stake in a particular firm, they have incentives to control managerial actions that are not in their interest; however, with this concentrated control, blockholders also have the opportunity to affect managerial actions in their own favor. As a result, actions taken by managers may be in the interest of the blockholder, but not necessarily in the interest of other owners (ibid). Also, Harris, Lang and Möller (1994) highlight blockholders' ability to receive a substantial amount

of information through direct communication with management, rather than via public information. As a consequence, information asymmetry might arise between blockholders and other investors since the former can be assumed to have more insight than the latter due to their availability of first-hand information.

Several empirical studies have investigated whether blockholders act as efficient monitors in practice. For instance, Zhong, Gribbin and Zheng (2007) study the effect of outside blockholders on earnings management. They find a positive relation between outside blockholders and discretionary accruals. The authors further argue that their results indicate that outside blockholders are not effective when it comes to monitoring managerial discretion. Further, Fan and Wong (2002) study a sample of East Asian companies in order to investigate the information provided by earnings, and how this is affected by ownership concentration. The authors document that ownership concentration negatively affect the informational aspect of earnings. They claim that these results stem from large controlling owners who have incentives to report information that is in their best interest, leading to other investors relying on accounting numbers less. Hence, with these views in mind, the fourth hypothesis is stated as follows:

***H₄**: The degree of ownership concentration is negatively associated with the value relevance of Level 3 net fair value assets*

Dai (2007) states that another group of owners, institutional investors, has evolved into being active owners who use their influence in order to mitigate improper managerial discretion. This type of group has a history of often confronting managers and directors who do not act in line with the interests of shareholders, and are typically known for seeking to replace poor management (Connelly et al., 2010). In cases when institutional investors hold a relatively large stake in a particular firm, they consequently have a strong need of insight into the financial position and performance of the firm. Information provided in the financial statements make such insight possible, and as a result, institutional investors have an interest in ensuring that the accounting information provided is correct and relevant (Velury & Jenkins, 2006). Furthermore, the authors state that the magnitude of resources available to this kind of owners puts them in a prevalent position to accomplish this. One example of such a resource is their relative ability to better analyze the financial statements and identify flaws in the reporting practices.

Chung, Firth and Kim (2002) find that when managers have incentives to opportunistically affect earnings, they will do so using discretionary accruals. However, the authors also find that when there is a presence of institutional investors owning a large part of the outstanding shares, managers are deterred from opportunistically using accruals in order to affect accounting information. Zhong, Chourou and Ni (2017) investigate the association between institutional ownership and earnings quality. Their results indicate a positive relation between strategic institutional ownership and earnings quality. They also find this relationship more significant for firms in countries with stronger investor protection. The authors' interpretation of this is that the monitoring role by institutional investors is shaped by the degree of investor protection at the country level. Finally, Hsieh, Shiu, and Chang (2019) study the effect of the level of institutional ownership in relation to the connection between accounting quality and the cost of capital. The authors observe that accounting quality increases when institutional ownership is present, resulting in a decrease in cost of capital. This result is suggested to be a consequence of the monitoring role played by institutional investors. Taking it all together, we state our fifth and last hypothesis as follows:

***H₅**: The degree of institutional ownership has a positive association on the value relevance of Level 3 net fair value assets*

3. METHOD

3.1 Sample selection

Since the study concerns the different levels in the fair value hierarchy, with a particular focus on level 3, an identification of industries heavily characterized by fair value estimates is of necessary importance. In accordance with prior research, the sample firms in this study are selected from the banking industry since these firms typically have a significant amount of fair value assets and liabilities, including level 3 estimates (Siekkinen, 2017).

Our sample consists of listed European banks and relies on a broad industry classification from the database Compustat where companies classified under the global industry classification (GIC) codes 4010 and 4020 are included. This generates an initial sample of 819 banks. Furthermore, in order to ensure the quality of the study, certain selection criteria were taken into consideration. These criteria are in line with and follow the same process as previous studies within the field (e.g. Song et al., 2010; Goh et al., 2015; Siekkinen, 2016, 2017). First, all firms with a book value below EUR 5 million are removed from the initial sample³ which leaves 681 banks. Also, all companies with a share price below EUR 0.1 as well as above EUR 1000 are removed in order to avoid noise⁴. Firms traded less than 25% of the trading days during the sample period are also removed in order to avoid illiquid stocks and thereby miss out desirable reactions on the stock market. In addition, firms with inadequate data during 2011-2014 or only partially listing status are deselected. Our final sample ends up with 223 firms and 885 observations⁵. For our fourth and fifth hypotheses we end up with a total 844 observations for ownership concentration and 851 observations concerning institutional ownership. Tables 1 and 2 provide descriptive statistics of the sample selection.

³ According to Siekkinen (2016), micro firms are typically less transparent regarding disclosing fair value information.

⁴ Siekkinen (2017) argues that minor changes in stocks with low values may have a large relative effect. Consequently, a minor change in such a stock price may add noise to the estimations. In contrast, it may be hard to discern any effect of fair value estimates for abnormally large stocks, which also would add noise to the results.

⁵ Before running the regressions, a final action is taken in order to generate as accurate results as possible by avoiding effects from extreme outliers. In accordance with earlier studies (e.g. Song et al., 2010; Goh et al., 2015; Siekkinen, 2016, 2017), 36 observations with an absolute studentized residual above 2 are eliminated. This generates a sample of a total of 223 firms and 849 firm year observations for our first three hypotheses and 808 and 815 observations for our fourth and fifth hypothesis, respectively.

Table 1 Sample selection process

Category	Number of observations
GIC codes 4010-4020	3276
Micro firms	552
Abnormal stocks	436
Illiquidity	651
Insufficient data	752
Final sample for hypotheses 1-3	885
Final sample for hypothesis 4	844
Final sample for hypothesis 5	851

The table presents the sample selection process. GIC codes 4010 and 4020 cover the financial industry. Micro firms are firms with a book value of assets below EUR 5 million. Abnormal stocks are stocks above EUR 1000 and below EUR 0.1. Illiquidity is when a stock is traded less than 25% of the trading days. Insufficient data is when fair value information is inadequate.

Table 2 Distribution across countries

Country	Number	Country	Number	Country	Number
UK	46	Denmark	6	Romania	2
France	28	Russia	5	Cyprus	2
Italy	21	Netherlands	5	Croatia	2
Poland	12	Greece	5	Lithuania	2
Switzerland	12	Luxembourg	5	Portugal	1
Sweden	12	Austria	4	Czech Republic	1
Norway	11	Malta	3	Slovakia	1
Spain	10	Belgium	3	Turkey	1
Germany	10	Bulgaria	2	Hungary	1
Finland	7	Liechtenstein	2	Ireland	1

The table illustrates the distribution of the sample across different countries. There are totally 223 firms, distributed over 30 European countries⁶.

⁶ Our sample consists of both EU members and non-EU members. Since IFRS is mandatory mainly for EU countries, our sample consider mandatory as well as voluntarily adopters, which might affect our results. In order to control for this potential problem, a robustness test was conducted considering banks based in EU countries which generated similar results as the main sample.

3.2 Data collection

The initial information concerning company name, industry classification and reporting standard is retrieved from Compustat database. Data regarding assets as well as prices and trading volume is collected from the same source. Since detailed fair value asset specification only was available for U.S firms in Compustat, the collection procedure of fair value data was carried out through S&P Global Market Intelligence. For most firms, large parts of this information was directly observable from the database. However, for firms that were not, further information gathering was done via annual reports on a manual basis. In cases where annual reports were not available in English, translations were made in order to avoid loss of information. Data regarding ownership concentration as well as institutional ownership is retrieved from S&P Capital IQ database.

3.3 Model design

Similar to other value relevance studies, the model in this study relies on the fundamental Ohlson (1995) model. The model estimates how well book value of equity (BVE) and net income (NI) reflect the market value (MVE).

$$MVE = \beta_0 + \beta_1 BVE_{it} + \beta_2 NI_{it} + \varepsilon_{it}$$

In order to test the respective value relevance of the different levels in the fair value hierarchy, earlier studies have used a modified Ohlson model where book value of equity is expressed as total assets less liabilities (Song et al., 2010; Goh et al., 2015; Siekkinen, 2016; Siekkinen 2017). Furthermore, assets are broken down to fair value level 1, 2 and 3, representing total assets measured and carried at fair value. Additionally, the variable NFVA symbolizes all remaining assets not carried at fair value. Similarly, the corresponding variables apply for the liabilities. This generates the following equation:

$$Price_{it} = \beta_0 + \beta_1 FVA1_{it} + \beta_2 FVA2_{it} + \beta_3 FVA3_{it} + \beta_4 NFVA_{it} + \beta_5 FVL1_{it} \\ + \beta_6 FVL2_{it} + \beta_7 FVL3_{it} + \beta_8 NFVL_{it} + \beta_9 EPS_{it} + \varepsilon_{it}$$

However, after initially testing this model, it appeared that the variables on each side of the balance sheet correlate to an excessively high degree, making it difficult to measure the

variables' individual effects on the share price⁷⁸. In order to avoid this multicollinearity problem, a model is used that is based on the net between assets and liabilities at each level as well as the net assets not measured at fair value. Kolev (2008) uses the same model with the intention to increase the power of the tests since the liabilities measured at fair value on a recurring basis in his sample accounted for a small portion of the balance sheet. Kolev (2008) further argues that another advantage with the net assets model is that since many firms present their net derivatives, a model separating assets and liabilities may add noise to the results. Since similar conditions prevail for us, for example, fair value liabilities measured at level 3 consists of merely 28.4% non-zero values (see table 3), we thus consider this model suitable for this study, giving the following equation:

Eq (1):

$$Price_{it} = \beta_0 + \beta_1 nFVA1_{it} + \beta_2 nFVA2_{it} + \beta_3 nFVA3_{it} + \beta_4 nNFVA_{it} + \beta_5 EPS_{it} + \varepsilon_{it}$$

Price is the dependent variable and represents the closing price of a stock one month after filing date, with the desire to capture the effect from the reports and still assume that it takes some time for investors to absorb new information (Siekkinen, 2017). The independent variables nFVA1, nFVA2, nFVA3 and nNFVA are composed as the residuals of assets and liabilities at respective fair value category (as well as non-fair value assets and liabilities) at the end of the fiscal year. In sum, this is equivalent to the book value of equity for the reporting period. The variables are subsequently divided by the number of outstanding shares in order to mitigate scale effects (Barth & Clinch, 1998)⁹. Finally, the last variable in our model explaining the share price is earnings per share, EPS, which shows the net income divided by the same number of shares as for last-mentioned variables.

When running the test measuring the effect of the introduction of IFRS 13, we introduce a dummy-variable, IFRS13, that takes the value 0 or 1 depending on whether the observations belong to the years 2011-2012 or 2013-2014. This gives equation 2:

⁷ When performing the correlation test, we find a pairwise correlation above 0.9 for six variables; FVA2-FVL2, FVA3-FVL3 and NFVA-NVFL. In addition to this, FVA1-FVL1 has a correlation coefficient above 0.85.

⁸ Performing a VIF test (untabulated) shows that six of nine variables exceed the threshold of a VIF of 10; FVA1, FVA2, FVL1, FVL2, NFVA and NFVL. Further, the variables NFVA and NFVL have VIF values that exceed 500.

⁹ The choice of using number of outstanding shares as a deflator is consistent with previous research within the field (e.g. Kolev, 2008; Song et al., 2010; Goh et al., 2015; Siekkinen, 2017). Further, Barth and Clinch (1998) find that the use of per share as a deflator is more adequate than, for example, total assets.

Eq (2):

$$\begin{aligned} Price_{it} = & \beta_0 + \beta_1 nFVA1_{it} + \beta_2 nFVA2_{it} + \beta_3 nFVA3_{it} + \beta_4 nNFVA_{it} \\ & + \beta_5 nFVA1_{it} * IFRS13 + \beta_6 nFVA2_{it} * IFRS13 + \beta_7 nFVA3_{it} * IFRS13 \\ & + \beta_8 nNFVA_{it} * IFRS13 + \beta_9 IFRS13_{it} + \beta_{10} EPS_{it} + \varepsilon_{it} \end{aligned}$$

Finally, we test the first regression again but consider the potential ownership effects. Since we aim to test two different aspects of ownership, we test these variables in two separate regressions, generating the following two equations:

Eq (3):

$$\begin{aligned} Price_{it} = & \beta_0 + \beta_1 nFVA1_{it} + \beta_2 nFVA2_{it} + \beta_3 nFVA3_{it} + \beta_4 nNFVA_{it} \\ & + \beta_5 nFVA1_{it} * OC + \beta_6 nFVA2_{it} * OC + \beta_7 nFVA3_{it} * OC \\ & + \beta_8 nNFVA_{it} * OC + \beta_9 OC_{it} + \beta_{10} EPS_{it} + \varepsilon_{it} \end{aligned}$$

Eq (4):

$$\begin{aligned} Price_{it} = & \beta_0 + \beta_1 nFVA1_{it} + \beta_2 nFVA2_{it} + \beta_3 nFVA3_{it} + \beta_4 nNFVA_{it} \\ & + \beta_5 nFVA1_{it} * IO + \beta_6 nFVA2_{it} * IO + \beta_7 nFVA3_{it} * IO \\ & + \beta_8 nNFVA_{it} * IO + \beta_9 IO_{it} + \beta_{10} EPS_{it} + \varepsilon_{it} \end{aligned}$$

3.4 Ownership variables

For the last hypotheses (H4 and H5) we test if ownership concentration and institutional ownership affect the value relevance for each level in the fair value hierarchy. Both variables are expressed as percentages, ranging from 0-1. For institutional ownership, the variable displays the total common shares held by institutional investors in relation to total shares outstanding. Ownership concentration, on the other hand, is measured as all owners owning more than 5% of the outstanding shares are classified as blockholders, which is in accordance with earlier literature (e.g. Connelly et al., 2010; Fan & Wong, 2002). OC and IO are coded as dummy variables, where the variables take the value of 1 for the specific interval. For instance, when ownership concentration up to 25% is tested, the interval 1-25% takes the value of 1, while the rest of the sample takes the value of 0. For a summary of all the variables used in the regressions, see Appendix.

3.5 Descriptive statistics

Table 3 displays the descriptive statistics for each of the variables used in the models. As can be seen, the minimum value of all the fair value variables equals 0. This implies that all firms in the sample do not hold assets and liabilities in each of the fair value categories. Furthermore, level 2 assets and liabilities incorporate most fair value estimates while level 3 assets and liabilities are less frequently used. Also, the liabilities for level 1 and 3 have median values of 0, and compared to assets measured at level 1 and 3, low values at the 75th percentile. This implies that a high proportion of the sample firms do not account for any securities in these categories. This is further strengthened by the non-zero values, where fair value liabilities measured at level 2 and level 3 only have non-zero values of 42.2% respectively 28.4%.

Table 3 Descriptive statistics

	Observations	Mean	Median	Minimum	Maximum	Std. Dev	25th perc.	75th perc.	Non-zero (%)
Share Price	849	15.796	6.726	0.131	174.200	21.853	2.300	19.899	100.0
nFVA1	849	15.871	4.7019	-14.753	364.568	31.848	0.141	17.539	92.2
nFVA2	849	4.289	0.223	-185.650	227.157	28.080	0.000	3.823	84.3
nFVA3	849	2.525	0.114	-29.158	132.958	10.261	0.000	1.162	78.9
nNFVA	849	2.094	0.304	-294.591	407.741	46.566	-7.263	2.467	100.0
EPS	849	1.345	0.416	-12.933	27.371	3.367	0.048	1.339	100.0
OC	808	0.642	0.670	0.000	1.000	0.285	0.410	0.915	99.5
IO	815	0.302	0.231	0.000	1.000	0.277	0.068	0.444	96.0
FVA1	849	21.483	5.517	0.000	996.190	65.001	0.218	19.976	92.1
FVA2	849	27.072	1.794	0.000	1401.727	111.371	0.038	17.103	83.0
FVA3	849	4.569	0.153	0.000	479.414	25.862	0.002	1.705	77.9
NFVA	849	170.171	28.589	0.000	3304.921	382.094	3.443	138.901	99.9
FVL1	849	5.612	0.000	0.000	989.303	56.110	0.000	0.225	42.2
FVL2	849	22.783	0.242	0.000	1430.042	106.090	0.000	8.248	69.3
FVL3	849	2.043	0.000	0.000	463.105	23.489	0.000	0.004	28.4
NFVL	849	168.076	31.404	0.001	2914.288	358.380	2.132	147.999	100.0

The table displays the descriptive statistics for each variable in the regression. All variables (except OC and IO) are scaled by the number of outstanding shares.

Table 4 presents the correlations among the variables. All variables have a positive association with the dependent variable, share price. Further, Friday and Emenoye (2012) suggest that a pair-wise correlation above 0.9 may indicate severe collinearity which might influence the reliability of the coefficients. None of the independent variables correlate to such a high degree. Also, the authors state that a VIF (variance inflation factor) above 10 signals the presence of multicollinearity, which thus reduces the quality of the regression model. When performing a VIF test (untabulated) for our main variables none is above 10, thus indicating that there is no presence of multicollinearity in our model.

Table 4 Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)
Share Price (1)	1					
nFVA1 (2)	0.4013	1				
nFVA2 (3)	0.2072	-0.2004	1			
nFVA3 (4)	0.3016	0.1191	0.1067	1		
nNFVA (5)	0.4354	-0.2525	-0.1855	-0.1375	1	
EPS (6)	0.7929	0.2279	0.2904	0.1230	0.5415	1

The table shows the correlation between the variables used in the regression model. All variables are significant at a 0.05 level.

4. RESULTS AND DISCUSSION

4.1 Value relevance

The results of the regression of equation (1) are presented in Table 5. As can be seen, all fair value levels in the hierarchy are value relevant, regardless of level since there is a statistical significance for all the fair value measurements in the model, which supports our first hypothesis¹⁰. The coefficients indicate that there is a positive association between the net fair value assets at each level and the corresponding market value of equity. For instance, the coefficient of 0.635 for nFVA1 indicates that an increase by one Euro in net fair value assets of level 1 would increase the share price by 0.635 Euro. The differences between the coefficients imply that nFVA1, nFVA2 and nFVA3 are priced differently by investors in mutual order. However, by looking at table 6, we can see that the only statistically significant difference between the variables is the difference between nFVA1 and nFVA2 respectively nFVA1 and nFVA3. Between level 2 and 3 no difference can be demonstrated, which suggests that investors distinguish mark-to-market assets from mark-to-model assets. As such, we cannot with adequate certainty accept our second hypothesis. Nevertheless, according to the Wald test, we find no evidence for that the degree of observable input has a significant effect on the value relevance for level 2 respectively level 3 net assets.

¹⁰ Song et al. (2010), Goh et al. (2015), Siekkinen (2016) and Siekkinen (2017) all use a model where assets and liabilities are separated. When using this model, multicollinearity is present. However, when comparing the results of the model with net assets and the model with separated assets and liabilities, the results of net fair value assets and fair value assets are similar. That is, the magnitudes of the coefficients are somewhat lower for the net assets model, but the order of the coefficients, as well as the significance, remain the same.

Table 5 Estimations of equation (1)

Dependent Variable = Share Price				
Independent Variables	Coeff.	Robust Std. Err.	t -stat	p-value
nFVA1	0.635	0.165	3.85	0.000***
nFVA2	0.508	0.192	2.65	0.009***
nFVA3	0.497	0.194	2.56	0.011**
nNFVA	0.512	0.194	2.64	0.009***
EPS	1.011	0.337	3.00	0.003***
Intercept	- 0.149	4.103	0.04	0.971
n	849			
R-sq	0.3511			

** , *** Statistical significance at the, 0.05 and 0.01 levels

The table shows the results of the main regression model. The model is estimated with fixed-effects at firm level¹¹. Share price is the dependent variable and nFVA1, nFVA2, nFVA3 are the net assets of the respective fair value levels 1, 2 and 3. nNFVA is net assets not measured at fair value.

Table 6 Estimations from the Wald test

	Difference	F-stat	p-value
nFVA1–nFVA2	0.127	7.95	0.005***
nFVA1–nFVA3	0.138	4.27	0.039**
nFVA2–nFVA3	0.011	0.05	0.831
nFVA1–nNFVA	0.123	4.63	0.033**
nFVA2–nNFVA	0.004	0.02	0.893
nFVA3–nNFVA	0.015	0.11	0.743

** , *** Statistical significance at the 0.05 and 0.01 levels

The table shows the difference between the coefficients for all three of the fair value levels compared to each other, as well as the difference between the fair value levels and book values not measured at fair value.

¹¹ Prior studies have not considered Year fixed effects (e.g. Song et al. (2010), Goh et al. (2015) and Siekkinen (2017)). Nevertheless, we included Year fixed effects to see if our results would change. The results differ only marginally from the original model, and we thus follow previous research and only include Firm-level fixed effects. This is consistent for all regressions in in the study.

Our interpretation of the results estimated from equation (1) is that investors have different perceptions depending on the degree of uncertainty related to the provided information. When this information is provided, but it is not clear to outsiders of the firm how the information has been developed, investors arguably seem to be more averse to price the balance sheet items in the market value. This is strengthened by the reasoning of So and Smith (2009) that fair value measurements can be unreliable when there are no active markets to base the valuation on. Thus, since level 1 fair values are based on information available to every market participant, investors arguably seem to trust this information more. However, when the input in the estimations of the fair values becomes more subjective and firm-specific, the information risk seems to increase. As such, the relevance that is proposed to be provided by including fair values in the balance sheet seems, to a degree, be offset by a decrease in reliability. Level 2 fair values allows for management to use their discretion which opens up for opportunistic behavior and manipulation, as well as errors regarding the preparation of the financial position and performance of the firm. This trade-off appears to affect level 3 fair values even more. However, allowing for some subjectivity and managerial discretion (as well as for level 2 estimates) seems to provide investors with useful information.

Our results, indicating a decreasing value relevance when moving down the hierarchy, are in line with previous studies (e.g. Kolev, 2008; Song et al., 2010) where all find significant differences between level 1 and level 3. More interesting, Goh et al. (2015) find a significant difference also between level 2 and level 3, indicating that the degree of observable input makes investors pricing these levels differently. The reason for why we only are able to distinguish mark-to-market and mark-to-model assets may be due to the constellation of our sample. Siekkinen (2016) finds that institutional protection has an effect on investors' pricing of fair values. As such, since our sample consists of a mix of different countries and thus several different institutional protection environments, this could potentially explain parts of the results, considering that the study of Goh et al., (2015) in this context deal with a more homogenous group of firms. Furthermore, by looking at table 5 we can see that nNFVA are valued higher than both level 2 and 3 assets, but markedly below level 1 assets. This condition is supported by the reasoning by So and Smith (2009) who argue that fair value measurements provide investors with more relevant information than cost-based measures. However, based on the empirics in this study, this prerequisite can only be said to prevail for level 1 net assets when all the input is directly observable from an active market.

4.2 The effect of increased disclosures

Table 7 shows the results for the difference in value relevance for the different levels of net fair value assets for the post-IFRS 13 period compared to the pre-IFRS 13 period. The variable IFRS13 is a dummy variable coded with a value of 1 if the observations belong to the years 2013 and 2014. The variables nFVA1xIFRS13, nFVA2xIFRS13 and nFVA3xIFRS13 display the interaction between the dummy variable IFRS13 and the nFVA at respective level. As can be seen, nFVA1xIFRS13 and nFVA2xIFRS13 are statistically significant, with positive coefficients. This indicates that after the introduction of IFRS 13, the value relevance for nFVA1 and nFVA2 has increased. However, this condition does not prevail for nFVA3. Since the coefficient for this variable is not statistically significant, we find no indication that there is a difference pre- and post-IFRS 13. Thus, we find no support for our third hypothesis that increased disclosures in form of IFRS 13 has increased the value relevance for level 3 net assets.

Table 7 Estimations of equation (2)

Dependent variable = Share price				
Independent variables	Coeff.	Robust Std. Err.	t-stat	p-value
nFVA1	0.232	0.122	1.91	0.058*
nFVA2	0.216	0.139	1.55	0.122
nFVA3	0.210	0.200	1.04	0.300
nNFVA	0.164	0.147	1.12	0.265
IFRS13	0.954	0.389	2.45	0.015**
nFVA1xIFRS13	0.144	0.021	6.77	0.000***
nFVA2xIFRS13	0.110	0.023	4.84	0.000***
nFVA3xIFRS13	0.020	0.127	0.16	0.874
nNFVAxIFRS13	0.112	0.019	6.01	0.000***
EPS	0.598	0.238	2.51	0.013**
Intercept	7.448	3.023	2.46	0.015**
n	849			
R-sq	0.6196			

*, **, *** Statistical significance at the 0.10, 0.05 and 0.01 levels

The table shows the regression results when introducing the dummy variable IFRS13, which takes a value of 1 if the observations are related to the post-IFRS 13 period 2013-2014. The model is estimated with fixed-effects at firm level. The interaction variables nFVA1xIFRS13, nFVA2xIFRS13, nFVA3xIFRS13 and nNFVAxIFRS13 show the results of the value relevance of fair value assets post-IFRS 13 compared to pre-IFRS 13.

Siekkinen (2017) finds no evidence that the introduction of IFRS 13 increased the overall value relevance of fair values. However, his results indicate that the differences between the fair value asset coefficients were no longer statistically significant, thus concluding that the introduction of the standard has been successful since it makes the distinction between the levels more vague. When estimating equation (2), our results cannot support the notion that the value relevance of level 3 net fair values increased with the introduction. One reason for this may be that the announcement of IFRS 13 was made already in March 2011, i.e. two years before the mandatory adoption of the standard. During the data collection, it became apparent that many firms started to provide disclosures regarding level 3 calculations in advance, which could be considered a sign of early adoption of the increased requirements in the new standard.

4.3 Ownership and its effect on value relevance

4.3.1 Ownership concentration

Table 8 shows the estimations of equation (3) for different levels of ownership concentration and whether there is an effect on the value relevance of level 3 net fair value assets. The results indicate that the degree of ownership concentration is negatively associated with the value relevance of level 3 net fair values and thus provide support for hypothesis 4. When ownership is completely dispersed (when no owner owns more than 5% of the shares) there is a positive effect on the value relevance. Further, the variable $nFVA3xOC$ (1-25%) shows a lower coefficient, but still positive, than when ownership is completely dispersed. Also, when including banks with ownership concentration up to 50% as well as 75% we lose the statistical significance. However, when increasing the level of ownership concentration to 90%, the results indicate that the value relevance is negatively associated with the value relevance of level 3 net fair value assets, though this relationship is only significant at a 10 percent level. Thus, when comparing banks with a high degree of ownership concentration with banks with more dispersion, our results indicate a negative association. That is, when fewer owners hold large proportions of the outstanding shares, the capital market seems to price the accounting information lower.

Table 8 Estimations of equation (3) - Ownership concentration

Dependent variable = Share price						
Independent variables	Observations	Coeff.	Robust	t-stat	p-value	R-sq
			Std. Err.			
nFVA3xOC (0%)	152	0.422	0.167	2.53	0.012**	0.3451
nFVA3xOC (1-25%)	193	0.162	0.059	2.74	0.007***	0.3017
nFVA3xOC (1-50%)	374	0.125	0.153	0.82	0.414	0.2894
nFVA3xOC (1-75%)	580	0.212	0.219	0.97	0.334	0.3278
nFVA3xOC (1-90%)	632	- 0.313	0.187	- 1.68	0.095*	0.3498
n	808					

*, **, *** Statistical significance at the 0.10, 0.05 and 0.01 levels

The table displays a summary of the results from five different regression models where different degrees of ownership concentration (%) are interacted with level 3 net assets. The models are estimated with fixed-effects at firm level. The number of observations increases by each level, as the intervals become wider.

Our interpretation of the results is that the value relevance of level 3 net assets is negatively associated with the degree of ownership concentration. The results are supported by those of Fan and Wong (2002) who find that an increased ownership concentration has a negative effect on accounting quality. The results can be explained by the arguments of Connelly et al. (2010) who claim that blockholders have the ability to worsen firms' corporate governance due to affecting managers to act in accordance with the blockholders' own incentives. As such, other investors than the blockholders may find the discretionary accounting information less reliable, which in turn would decrease the overall value relevance of the level 3 measurement. Furthermore, our results can be strengthened by the findings of Zhong et al. (2007) which indicate that outside blockholders are not effective monitors of managerial discretion. Also, Harris et al. (1994) claim that blockholders usually receive a substantial amount of information directly from management. As a result, information asymmetry between blockholders and minority owners may increase. Thus, when a more subjective measurement (like level 3) is used, the information provided to the capital markets is less comprehensive than the information reaching the blockholders. Consequently, due to less verifiability and the risk that blockholders act in their own interest, potential investors have a reason to trust the information provided in the financial statements less, resulting in a discount of the fair value assets measured at level 3 and a reduction in value relevance. Previous studies within the value relevance field (e.g. Song et al., 2010; Siekkinen, 2017) have documented a positive association

between a stronger corporate governance and the value relevance on mainly level 3 assets. With these empirics in mind, this reversed relationship between weaker corporate governance and a decreasing value relevance seems logical.

4.3.2 Institutional ownership

Table 9 displays the results when estimating equation (4). The coefficient of the interaction variable nFVA3xIO (0%) shows that when institutional owners are not present at all, the effect on investors' pricing of nFVA3 is remarkably negative. We find no statistical relationship when including banks with institutional ownership to 25% respectively 50%. However, when including banks with a level of institutional ownership up to 75%, we find a positive relation with investors' pricing of level 3 net fair value assets. When further including firms with a degree of institutional ownership up to 90% the value relevance of nFVA3 increases even more. As such, we find a positive association between the pricing of level 3 net fair value assets and the level of institutional ownership, which is in line with our fifth hypothesis.

Table 9 Estimations of equation (4) - Institutional ownership

Dependent variable = Share price						
Independent variables	Observations	Coeff.	Robust	t-stat	p-value	R-sq
			Std. Err.			
nFVA3xIO (0%)	33	-0.952	0.223	-4.26	0.000***	0.3708
nFVA3xIO (1-25%)	398	0.053	0.108	0.49	0.625	0.3478
nFVA3xIO (1-50%)	611	0.281	0.231	1.22	0.226	0.3518
nFVA3xIO (1-75%)	693	0.728	0.201	3.62	0.000***	0.3651
nFVA3xIO (1-90%)	742	0.840	0.196	4.29	0.000***	0.3682
n	815					

*** Statistical significance at the 0.01 level

The table displays a summary of the results from five different regression models where different degrees of institutional ownership (%) are interacted with level 3 net assets. The models are estimated with fixed-effects at firm level. The number of observations increases by each level, as the intervals become wider.

As is evident from the results, the presence of institutional owners seems to play an important role to ensure investors that the accounting information provided is of high quality. Dai (2007) states that this group of owners often have an active role in firms and use their strong influence in order to mitigate managerial discretion. They are considered as having great knowledge as

well as resources to accomplish this (Velury & Jenkins, 2006). Zhong et al. (2017) investigate the relationship between institutional ownership and earnings quality and find a positive relation indicating that the monitoring role by institutional investors positively impacts the strength of corporate governance. Having this in mind, our results can be explained by the fact that investors perceive the presence of institutional owners as value creating since they arguably have the potential to perform successful monitoring and thus mitigate managerial opportunism. This is supported by the view of Penman (2007) who argues that a key aspect of successful monitoring is competence. These empirics are also in line with previous research, where Song et al. (2010) and Siekkinen (2017) both find positive associations between stronger corporate governance and an increased value relevance on especially level 3 assets. Additionally, another intriguing aspect of our results is the fact that the negative impact of not having any presence of institutional owners seems to be stronger than the positive impact of having a high proportion of institutional owners. This is in accordance with the argument of Habib and Azim (2008) who claim that the disadvantage of weak corporate governance exceeds the potential benefit of having a strong corporate governance.

4.4 Robustness check

Siekkinen (2017) claims that it is possible that the choice of price may have an effect on the results. Since our main sample contains share prices approximately 30 days after the filing date of the financial statements, our results may alter if another price had been chosen as the dependent variable. We therefore follow the method of Siekkinen (2017) and test whether our results would be different if we would have used the share price 60 respectively 90 days after the filing dates. The results for equation (1) where the dependent variable is the share price 60 days after the filing dates (untabulated) are similar to the results in the original regression. The relative order of the coefficients for the different levels of nFVA remains the same, but the values of the coefficients increase slightly. Furthermore, when testing the difference between these coefficients, the results are the same as in the original regression, that is, we observe a statistically significant difference between nFVA1 and nFVA2 as well as between nFVA1 and nFVA3. In addition, the difference between nFVA2 and nFVA3 is not statistically significant with a p-value above 0.05.

We also test the model with a share price 90 days after the filing date as the dependent variable. Overall, the results stay the same, with slight differences from the original regression. The variable nFVA1 remains as the variable with the highest coefficient, but the order between

nFVA2 and nFVA3 changes. However, the value of the coefficients still vary but only marginally. The coefficients of nFVA1, nFVA2, nFVA3 and nNFVA increase slightly in comparison to the original model, but are still significant at the five percent level. Furthermore, the difference between the coefficients of nFVA1 and nFVA3 loses its significance at the five percent level since the p-value increases to 0.0547. The relationship between nFVA1 and nFVA2 as well as nFVA1 and nNFVA remains the same as in the original model with p-values below 0.05.

Siekkinen (2016) finds that the institutional protection environment has an effect on the value relevance of fair values estimates. Since our sample consists of 30 different countries, and thus several different institutional environments, we want to consider potential differences across these countries. Brown, Preiato and Tarca (2014) create an index based on financial reporting enforcement for 51 countries for the years 2002, 2005 and 2008. The enforcement score is a scale up to 24, where the maximum score for countries in our sample is 22, and the minimum is 6 (based on the 2008 scores). We use the scores for the countries in our sample and create a dummy-variable taking the value of 1 if the score is above the median in our sample, and 0 if it is below. The median and mean score is 19 and 17.14 respectively, meanwhile the total number of observations drops to 786¹². The results show no significance for level 1 and 2 net fair values, while we find a coefficient of 0.91 with significance at the 10 percent level for level 3. Consequently, when applying the measure created by Brown et al. (2014), the estimations indicate that our main results might be affected by institutional environments in the form of financial reporting enforcement.

Since our sample consists of European banks, including both banks based in EU countries as well as non-EU countries, all sample firms are not mandatory adopters of IFRS. Horton, Serafeim and Serafeim (2013) argue that the accounting quality between mandatory and voluntary adopters of IFRS might differ. As such, we want to control for whether these different groups of firms might have an impact on our overall results. When considering only EU-based banks, the results (untabulated) are very similar to the ones previously presented. Thus, our results do not seem to be influenced by the fact that some firms in the sample may be voluntary adopters of IFRS.

¹² Malta, Luxembourg, Bulgaria, Lithuania, Cyprus, Liechtenstein and Slovakia are not included by Brown et al. (2014). As a consequence, firms based in these countries are excluded due to the lack of data which leads to a total loss of 63 observations.

Further, Song et al. (2010) argue that certain bank characteristics, such as size, may have an effect on the results. As such, we test whether there is a difference when introducing the logarithmic value of total assets as a control variable. Our results presented in Table 10 indicate that when this control variable is included in the regression model, the coefficients of the fair value levels differ only marginally. However, the coefficients for nFVA2 and nNFVA are no longer statistically significant at the one percent level. When further testing the differences between the coefficients with a Wald test, the results remain the same as in the original model. As such, firm size seems to only have minor effects on the estimations from equation (1) and does not drive our results. When testing whether size has an impact on the value relevance when considering the ownership aspects, our results remain unchanged.

Table 10 Estimation of equation (1) - Controlling for size

Dependent variable = Share price				
Independent variables	Coeff.	Robust Std. Err.	t-stat	p-value
nFVA1	0.634	0.179	3.53	0.001***
nFVA2	0.509	0.205	2.48	0.014**
nFVA3	0.496	0.204	2.43	0.016**
nNFVA	0.511	0.204	2.50	0.013**
EPS	1.014	0.351	2.89	0.004**
lnTA	0.056	0.899	0.06	0.951
Intercept	- 0.329	3.293	- 0.10	0.920
n	849			
R-sq	0.3510			

** , *** Statistical significance at the 0.05 and 0.01 levels

The table provides results when controlling for size. The model is estimated with fixed-effects at firm level. The control variable lnTA is the logarithmic value of total assets, while the rest of the variables are the same as in the initial model.

As a final robustness check, we test whether our results change when controlling for profitable banks. As for Siekkinen (2017), our results show a higher coefficient for EPS than for the respective book values of equity. As a result, we mimic his study and test whether the results provided by our model is the same for banks making a profit as well as a loss. We are doing this by coding a dummy variable (ProfitableEPS) that takes the value of 1 if EPS is larger or

equal to 0, and 0 if EPS is negative. We then interact this variable with each of the nFVA and nNFVA variables. Table 11 indicates that only nFVA3xProfitableEPS is somewhat statistically significant with a p-value of 0.053 and a coefficient of -0.146. This indicates that compared to loss-making firms, the value relevance for nFVA3 is lower for profit-making firms. These results are in line with the ones of Siekkinen (2017), which suggest that book values of equity are more value relevant for banks with negative results, and earnings are more value relevant for investors when banks are making positive results.

Table 11 Estimations of profitable firms

Dependent variable = Share price				
Independent variables	Coeff.	Robust Std. Err.	t-stat	p-value
nFVA1	0.667	0.164	4.07	0.000***
nFVA2	0.556	0.170	3.27	0.001***
nFVA3	0.538	0.193	2.79	0.006**
nNFVA	0.490	0.183	2.68	0.008**
ProfitableEPS	- 1.322	0.579	- 2.28	0.023**
nFVA1xProfitableEPS	- 0.004	0.080	- 0.05	0.958
nFVA2xProfitableEPS	- 0.034	0.096	- 0.36	0.722
nFVA3xProfitableEPS	- 0.146	0.075	- 1.95	0.053*
nNFVAxProfitableEPS	0.048	0.105	0.45	0.650
EPS	1.204	0.402	3.00	0.003**
Intercept	0.304	4.158	0.07	0.942
n	849			
R-sq	0.3767			

*, **, *** Statistical significance at the 0.10, 0.05 and 0.01 levels

The table provides results when comparing whether profitability has an impact on the estimations. The model is estimated with fixed-effects at firm level. ProfitableEPS is a dummy variable taking a value of 1 if EPS is positive, and 0 if EPS is negative. The variables nFVA1xProfitableEPS, nFVA2xProfitableEPS, nFVA3xProfitableEPS and nNFVAxProfitableEPS are interaction variables showing the difference between profit-making firms compared to loss-making firms.

5. CONCLUSION

We investigate whether the fair value measurement provides investors with relevant and reliable information, and how this is affected by the ownership structure in form of ownership concentration and the presence of institutional owners. By using a sample of 223 European banks, distributed across 30 countries, our results indicate that balance sheet items measured at fair value can be found to be incorporated into market prices. Thus, investors perceive this kind of information as relevant and reliable enough to use as a base for investments. However, the value relevance differs between assets classified in different levels in the fair value hierarchy. We find that mark-to-market (level 1) net assets generally yield a higher value relevance than mark-to-model (level 2 and 3) net assets. Furthermore, our results show that these perceptions of fair values are affected by the ownership structure. A presence of institutional owners seems to increase the value relevance of level 3 net fair value assets, while the concentration of ownership tends to decrease the value relevance. Regarding the effect of regulators on the quality of fair value information, we find an indication that the overall value relevance, in form of level 1 and 2, increased after the introduction of IFRS 13. On the other hand, we do not find support that the increased disclosures stemming from the introduction of IFRS 13 resulted in a higher value relevance of fair values measured at level 3.

Finally, when checking the results for robustness, we find indications for that our results generally seem to hold. The choice of share price has a minor effect on the equations, with marginal effects when testing the model with prices quoted 90 days after filing date. Nevertheless, we find a difference when distinguishing profitable firms from loss-making firms, indicating that our overall results might be affected by the firms' financial performance.

Our contribution is twofold. First, we document a relationship between fair value measurements and how that is affected by corporate governance, in this case ownership structures. By doing this we find support for the conclusions drawn by Song et al. (2010) and Siekkinen (2017). Second, our results can be interpreted by financial accounting regulators as factors affecting the primary purpose of financial accounting.

Our study suffers from a few limitations. Due to multicollinearity problems the same model which has been extensively used in prior research (i.e. Song et al., 2010; Goh et al., 2015; Siekkinen, 2016, 2017) was inadequate.

As a solution, we applied the model used by Kolev (2008) who uses the net of assets and liabilities. This is a shortcoming in our study since our results cannot be directly compared with those of most earlier research within the field. However, as a robustness test we compare the results of both models and find that the results of net assets are similar to the results of fair value assets. Further, our sample only consists of financial firms, and as for Siekkinen (2017) the implication of this is that the results may be hard to generalize to other industries. Also, our sample consists of many different countries that may be differentiated by different institutional factors. The sample is rather skewed towards the UK which may affect our results. Our robustness test based on a financial reporting enforcement score created by Brown et al. (2014) shows that such institutional factors may influence our results. Thus, in order to exclude potential individual country institutional effects, future studies may find interesting results by investigating specific countries, or groups of countries with similar institutional environments. Also, when considering the robustness tests, it could be beneficial to select a more homogeneous sample consisting of firms with similar characteristics, such as financial performance.

Finally, another limitation of our study is that our ownership data does not allow us to distinguish different types of owners, and their respective investment style. For example, whether an owner has an investment style that is strategic and long-term may affect the abilities of this owner to be an efficient monitor of the firm. As such, our results can only give an indication of the general implication of ownership structure on investors' valuation of fair values provided in the financial statements. Future research could find it beneficial to use data where different owners are classified in accordance with their investment style. This would potentially give intriguing results and a more comprehensive view on how ownership structure affect investors' valuation of balance sheet items.

APPENDIX

Variable	Definition
<i>Dependent variable</i>	
Share price	The price of firm i 's stock 30 days after filing date
<i>Independent variables</i>	
FVA1	Fair value assets measured at level 1
FVA2	Fair value assets measured at level 2
FVA3	Fair value assets measured at level 3
NFVA	Non-Fair value assets
FVL1	Fair value liabilities measured at level 1
FVL2	Fair value liabilities measured at level 2
FVL3	Fair value liabilities measured at level 3
NFVL	Non-Fair value liabilities
nFVA1	Net Fair value assets measured at level 1 Calculated as the difference between FVA1 and FVL1
nFVA2	Net Fair value assets measured at level 2 Calculated as the difference between FVA2 and FVL2
nFVA3	Net Fair value assets measured at level 3 Calculated as the difference between FVA3 and FVL3
nNFVA	Net Non-Fair value assets (liabilities) Calculated as the difference between NFVA and NFVL
EPS	Earnings per share
OC	Ownership concentration (0-100%). Owners holding > 5% are classified as blockholders
IO	Institutional ownership (0-100%)
<i>Dummy variables</i>	
IFRS13	Observations from time period 2013-2014 take a value of 1
ProfitableEPS	Observations when $EPS \geq 0$ take a value of 1

The table provides a description of all variables used in the study. All independent variables (except EPS, OC and IO) are scaled by number of outstanding shares.

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