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# Are Level 3 Fair Values Reflected in Firm Value?

## – Evidence from European Banks –

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**Abstract:** This paper investigates whether, and if so, to what extent, Level 3 fair values disclosed by European banks provide useful information to investors and are reflected in firm value changes. Using a unique sample of 416 hand-collected firm-year observations from European banks reporting under IFRS, in contrast to previous research conducted in the US, we find no overall evidence that changes in Level 3 fair values are associated with changes in firm value. However, the value relevance of Level 3 fair values depends on the category assigned to financial instruments. Level 3 fair values that are held for trading are reflected in firm value. Further analyses suggest that this effect is driven predominantly by banks that operate in market-based economies and hire audit firms with deep industry expertise.

**Keywords:** fair value accounting · valuation · mark-to-model · value relevance · fair value hierarchy

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## I. INTRODUCTION

The usefulness of fair value accounting for financial instruments has often been a controversial topic of discussion in literature, especially since the financial crisis in 2008.<sup>3</sup> Fair value estimates are claimed to be of greater relevance for investors than historical cost based estimates, since price volatility is more accurately reflected and hidden reserves or unrealized losses are more easily identified. However, critics argue that fair value measurement is less reliable as it is susceptible to estimation error, management discretion or even manipulation, all of which can increase information asymmetry. Therefore, investors' perception of the reliability of fair value estimates is likely to depend on the observability of valuation inputs.

The International Accounting Standards Board (IASB) attempted to mitigate these concerns by introducing amendments to IFRS 7,<sup>4</sup> drafted in October 2008 and issued in March 2009, which require enhanced disclosures about fair value measurement. Applicable for annual periods beginning on or after 1 January 2009, fair value estimates are to be classified into a 3-level fair value hierarchy. This prioritizes the valuation inputs used in fair value measurement according to the level of judgment. Fair values are measured at Level 1 when quoted prices in active markets for identical assets or liabilities are available (mark-to-market). They offer superior reliability as no additional valuation assumptions are necessary. Levels 2 and 3, however, include assumptions in valuation, arguably reducing reliability. Level 2 valuation is based on market observables for

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<sup>3</sup> For an overview of the lines of arguments, see Enria et al. (2004), and Laux and Leuz (2009).

<sup>4</sup> IFRS 13 has been effective since January 2013, providing a single IFRS framework for fair value measurement and requiring disclosures about fair value measurements such as the fair value hierarchy. However, our empirical analysis is based on a dataset from 2009 to 2011. For this period the disclosure of fair value levels was mandated by IFRS 7. Thus, we will only refer to IFRS 7 throughout this paper.

similar instruments and applies when markets for identical assets and liabilities are thinly traded (mark-to-model with observable inputs). In the case of a shortage of any observable valuation inputs, the framework provides a third level (mark-to-model with unobservable inputs). In this case, additional internal information and significant assumptions (e.g. concerning the determination of the appropriate discount rate or credit value adjustments) are necessary for estimating fair values. To the extent that investors believe that Level 3 fair values are unreliable because of the many assumptions involved, they may downweight or even ignore them when assessing firm value.

Our analysis focuses on the value relevance of Level 3 fair value estimates under IFRS, taking different degrees of aggregation into account. We focus on the banking sector because it offers the best context in which to evaluate the fair value hierarchy disclosures for several reasons. First, banks naturally hold the largest amount of financial instruments due to their institutional purpose. Second, banks are more likely to recognize a significant amount of their financial assets and liabilities at fair value because they have advanced knowledge of the market and various estimation techniques. Third, due to the diversity of operational transactions, banks are more likely to have different kinds of financial instruments assigned to different financial instrument categories. Finally, the banking sector within the European Union is subject to strict regulation, so we expect fair value disclosures to be complete and detailed.

Using a unique sample of 416 hand-collected firm-year observations from banking firms reporting under IFRS in 23 European countries, we investigate whether, and if so to what extent, Level 3 fair value assets and liabilities disclosed by European banks provide useful information to

investors and are reflected in firm value. Apart from the academic interest, we believe the results are useful for banking firms, bank regulators and standard setters. Specifically, if Level 3 fair value estimates appear not to provide useful information, disclosures should be improved, and not minimized to merely comply with IFRS 7/13 requirements.<sup>5</sup> For example, they could be complemented with additional text-written descriptions and explanations in order to increase the quality of the disclosures.

Our study contributes to prior literature on value relevance of different fair value levels in several ways. First, prior research is based on samples of US banks, for which the disclosure of fair value hierarchy information is mandated by US GAAP (SFAS 157). Kolev (2009), Song et al. (2010), and Goh et al. (2015), provide evidence for Level 3 fair values being value relevant, but to a significantly lesser degree than higher fair value levels. However, it is by no means clear that results from the US can be generalized to other countries. Specifically, differences in value relevance can arise when the judgment of financial statement preparers and users is influenced by their environment. Prior research suggests that the outcome of financial reporting is largely dependent on the regulatory and economic environment as well as on public and legal enforcement mechanisms (e.g. Ball et al., 2000, Leuz et al., 2003, Bischof, 2009, Holthausen, 2009, Morais and Curto, 2009, Fiechter and Novotny-Farkas, 2011, and Barth et al., 2012). Especially for the banking industry, Kanagaretnam et al. (2014) find evidence that the country-level individualism is negatively (positively) associated with the bank's accounting conservatism (risk-taking) and national uncertainty avoidance is positively (negatively) related to accounting

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<sup>5</sup> The common practice of fair value hierarchy disclosure is a presentation of a table with all required numerical information.

conservatism (risk-taking) of a bank. We perform an additional descriptive analysis based on Kangaretnam et al. national culture proxies and find extent differences between them in the US and the average of EU countries, leading to an expectation that banking firms in the US have a lower level of accounting conservatism and a higher risk-taking level than banking firms in the EU.

Second, Skinner (1996) critically hints that several fair values disclosures can limit the ability of market participants to properly process fair value information in their valuation. Fiechter and Novotny-Farkas (2014) investigate extent factors in determining the value relevance of recognized fair values of different fair value categories and find evidence for that objection, specifically, that investors' ability to properly process fair value information depends on the country-specific level of market sophistication and information environment. We provide a holistic evidence for Skinner's objection and apply it to the fair value hierarchy, distinguishing between market-based and bank-based economies, based on their comparative size and activity of the stock market relative to banks (Beck and Levine, 2002, Fiechter and Novotny-Farkas, 2014).

Third, we investigate if the value relevance of Level 3 fair values depends on the category that financial instruments are assigned. IAS 39 regulates recognition and measurement of financial instruments and requires them to be classified into one of the following five categories according to their intended purpose. Whilst *loans & receivables* as well as *held-to-maturity* instruments are to be measured on an amortized cost basis, for derivatives and other *held-for-trading* instruments as well as for *available-for-sale* instruments, fair value measurement is mandatory. In addition, the standard setter allows entities to designate financial instruments to be measured at fair value under certain conditions (*fair value option*). Against this background, prior studies have focused

on the value relevance of different financial instrument categories in total (e.g. Venkatachalam, 1996, Fiechter and Novotny-Farkas, 2011). To the best of our knowledge, our study is the first to investigate value relevance of Level 3 fair value estimates under IFRS, separated by the fair value financial instrument categories.

Finally, we contribute to the fair value disclosures research by analyzing if the relevance of Level 3 disclosures increases with auditor industry expertise. We investigate Level 3 fair values with respect to different financial instrument categories and measure audit quality in terms of auditors' industry expertise (based on market shares). We believe that this proxy is powerful in this context because audit firms specializing in their client's industry can better assess the reasonableness of managers' estimates and are more likely to invest in infrastructures that improve the quality of audits in that industry (Gramling and Stone, 2001).

Figure 1 summarizes expectations and findings of this study.

[Insert Figure 1 here]

Our results suggest that in contrast to changes in fair values measured at Level 1 or 2, changes in Level 3 fair value assets and changes in Level 3 fair value liabilities are not associated with changes in firm value. Also, variations in the net position (surplus of Level 3 assets over Level 3 liabilities) are not reflected in firm value. This suggests that these (aggregated) disclosures do not provide useful information for investors. Our analyses provide evidence that only those Level 3 securities that are *held for trading* purposes are actually significantly correlated with firm value. Since trading instruments are held for short-term purposes only, investors may assess their valuation

technique as less susceptible to estimation errors (e.g. due to more precise forecasts of short-term cash flows) and tend to rely more on managers' estimates. This effect is driven predominantly by banks that are audited by the industry expert auditor. Moreover, our results suggest that quality audits mitigate information risk concerns that investors attribute to Level 3 fair values, measured optionally at fair value, which are thus subject to increased management discretion. Finally, Level 3 held for trading instruments are significantly less value relevant in bank-based economies. This is in line with the argument that the investors' ability to process fair value information is likely to depend on institutional features.

This paper is organized as follows: Section II comprises a literature review from which the hypotheses to be tested are derived. In section III the sample selection is described, summary statistics are presented and the regression results are discussed. The last section concludes.

## **II. PRIOR LITERATURE AND DEVELOPMENT OF HYPOTHESES**

### **Background**

In order to meet the needs of financial statement users, IFRS is built on several guiding principles (IASB 2010, paragraph QC4). In particular, accounting information is intended to be understandable, comparable, faithfully represented (reliable) and capable of making a difference to investor decision-making (relevant). According to Barth (2000), one approach to verify the fulfillment of relevance and reliability empirically, is to conduct value relevance studies that investigate the association between accounting information and share price.<sup>6</sup>

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<sup>6</sup> For limitations of value relevance studies, see Lo and Lys (2000), and Holthausen and Watts (2001).



Prior research (Petroni and Wahlen, 1995, and Khurana and Kim, 2003) suggests that value relevance of fair values also depends on the liquidity of financial instruments. If an active market is available, fair values are closely related to market prices and thus provide reliable information. If, by contrast, financial instruments are thinly traded, the estimation of their fair values may be subject to errors and managerial opportunism. Consequently, investors are more likely to perceive fair values of illiquid financial instruments as less reliable.

In September 2006, the Financial Accounting Standards Board (FASB) issued SFAS 157, which mandates extended disclosures about the measurement of fair values. The International Accounting Standards Board followed by publishing amendments to IFRS 7, effective as of January 2009, which require similar additional disclosures, i.e. the fair value hierarchy. These regulations allow researchers to directly investigate the connection between value relevance of financial instrument fair values and observability of measurement inputs. Whilst there are several studies on the value relevance of fair value hierarchy disclosures for US GAAP, evidence for firms reporting under IFRS is scarce.

Based on a sample of banking firms reporting under US GAAP in 2008, Song et al. (2010) examine the value relevance of fair value measures for each of the three fair value hierarchy levels. They find that value relevance of Level 1 and Level 2 fair values is greater than the value relevance of Level 3 fair values. Moreover, they provide evidence that strong corporate governance mechanisms increase value relevance. Kolev (2009) documents a significant positive association between share price and fair value measures for all three levels. This indicates that mark-to-model fair value estimates are sufficiently reliable to be reflected in firm value. However, the estimated

coefficients on Levels 2 and 3 are consistently lower than those on Level 1. Goh et al. (2015) extend both studies and examine how investors price fair value estimates when market conditions change. They also find that investors price both mark-to-model and mark-to-market fair value assets positively, with the pricing being less for mark-to-model assets than for mark-to-market assets. While Song et al. (2010) and Kolev (2009) use similar samples of banking companies reporting under US GAAP in 2008 and come to the conclusion that investors price reported Level 3 fair values significantly below those reported at Level 1, with a relative discount ranging from 20-30%, Goh et al. (2015) comprise years 2008 – 2011 for the US sample and find a relative discount of 21% and 12% in the years 2008 and 2011, respectively. Laux and Leuz (2010) respond to the fair value hierarchy studies taking into consideration that there are several explanations for their findings regarding the coefficient of Level 3 assets. The authors cannot distinguish between the upward bias in banks' valuation of Level 3 fair values, larger information asymmetry for Level 3 fair values and investor expectations about fire sales. In addition, they argue that the results reflect unobserved differences in bank strategies or business models that influence banks' allocations to the fair value levels.

Several studies focus particularly on Level 3 measures and identify factors that may influence their relevance and reliability. Using an experimental design, Clor-Proell et al. (2014) examine whether their credibility depends on salience in financial statement information. They find that participants weight measurement differences more heavily if fair value information is presented as more salient. Valencia (2011) investigates whether bank managers use discretion opportunistically when estimating end of period fair values for Level 3 instruments and/or classify

instruments as Level 3 instead of Levels 1 or 2. He finds that managers are influenced by earnings targets when setting Level 3 valuations. However, he does not find any evidence to suggest that managers use Level 3 valuations to help them meet capital adequacy targets. So he concludes that managerial discretion with respect to Level 3 instruments is dependent on the incentive context. Thus, not only unwanted noise but also intentional management errors may influence Level 3 estimates. In sum, prior research suggests that less verifiable fair value estimations as well as managerial discretion may negatively affect their relevance.

### **Development of Hypotheses**

Whilst the fair value relevance of fair value measures for each of the three fair value hierarchy levels has already been investigated and confirmed for US banking firms (Kolev, 2009, Song et al., 2010, and Goh et al., 2015), European banks reporting under IFRS have so far received little attention. This is surprising considering that cultural and country-specific differences in regulatory environment as well as in public and legal enforcement mechanisms have an impact on financial reporting outcome (e.g., Ball et al., 2000, Leuz et al., 2003, Bischof, 2009, Holthausen, 2009, Morais and Curto, 2009, Fiechter and Novotny-Farkas, 2011, and Barth et al., 2012) and may influence the value relevance of the fair value hierarchy.

Kanagaretnam et al. (2014) analyze prior research on cultural differences and document that the cultural aspect affects society's behavior and values. Specifically, analyzing the national cultural variables individualism and uncertainty (developed in Hofstede, 2001), Kanagaretnam et al. document that individualism is negatively (positively) related to accounting conservatism (risk-taking), and uncertainty avoidance is positively (negatively) related to conservatism (risk-taking)

in the banking industry. Calculating individualism and uncertainty avoidance for our sample countries (EU) and comparing to the US, we find that individualism is 53% higher in the US than the EU country average. At the same time, EU countries on average display 35% higher uncertainty avoidance compared to the US. Translating these findings to our current context we expect banking firms in the US to have a lower level of accounting conservatism and a higher risk-taking level than banking firms in the EU. Moreover, we identify that the US has a 32% higher degree of enforcement power than the average of EU countries, what is in line with Leuz (2010), demonstrating that the highest level of enforcement is attributed to the US. Additionally, there is a difference in the legal origin, whereby common law is attributed to the US and only the UK and Ireland in the EU. Thus, institutional differences between the US and Europe may affect the generalizability of prior US findings.<sup>7</sup> Therefore, in line with prior research on the value relevance of fair value hierarchy for the US setting, we formulate our first hypothesis for our EU setting as follows:

*H1: The value relevance of Level 3 fair values is lower than higher levels of measurement.*

Another issue we address is based on the fact that prior research demonstrates great variation in relevance of fair value estimates across different categories of financial instruments, notwithstanding their measurement level. Barth (1994) finds fair value estimates for investment securities to be value relevant, which is also supported by Barth et al. (1996), Eccher et al. (1996), and Nelson (1996). None of these studies finds evidence for incremental explanatory power of fair value of deposits. However, their results differ with respect to other financial instruments.

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<sup>7</sup> We will investigate institutional differences within our European sample more detailedly in H3.

While Barth et al. (1996) also find that fair value estimates of loans and long-term debt provide information incremental to measurement at historical costs, Nelson (1996) does not support this finding and Eccher et al. (1996) only support this in limited scenarios. This is in line with Khurana and Kim (2003), who find a significant difference in informativeness of fair value measures and historical costs only for available for sale investment securities, but not for other financial instruments such as loans or deposits. Results are also mixed with respect to derivatives. Wang et al. (2005) find incremental information content of derivatives' fair value disclosures. In contrast, Ahmed et al. (2006) find that derivatives' fair value has a significant influence on the market value only if fair value is not applied solely for the disclosure of the derivatives, but is recognized in the balance sheet.

As far as IFRS are concerned, IAS 39 distinguishes between five different measurement categories, of which only the categories *held-for-trading* (HfT),<sup>8</sup> *fair value option* (FVO) and *available-for-sale* (AfS) are measured at fair value. In an experimental setting, Bischof and Ebert (2014) provide evidence that the category under which a financial instrument is presented under IAS 39 influences the risk perception of individual investors. In particular, they find that a financial product labeled as FVO is perceived as signaling a greater risk compared to an identical investment presented e.g. under the category AfS. HfT was viewed as being the least risky, however, perceived risk increased when the HfT instruments were described as derivatives.<sup>9</sup> Fiechter and Novotny-Farkas (2011) examine the value relevance of optional versus mandatory

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<sup>8</sup> Note that derivatives are generally classified as HfT except for derivatives that are financial guarantees, contracts or effective hedging instruments and are thus reported separately.

<sup>9</sup> In order to avoid the product-specific bias in risk judgment we analyze the value relevance of all derivatives (held for trading and for hedging purposes) together.

fair value measurement but do not distinguish between the three fair value levels. They find that the market valuation of held for trading assets and liabilities of financially distressed banks is significantly higher than the market valuation of financial assets and liabilities that are optionally measured at fair value.

In line with the above mentioned results, we expect (non-derivative) HfT instruments measured at Level 3 to have higher value relevance compared to other Level 3 subcategories. Since trading instruments are intended to be realized in the short term, they are less exposed to duration risk. Thus investors may assess their valuation technique as being less susceptible to estimation error, e.g. due to more precise forecasts of short-term cash flows. Also, counterfactual reasoning theory predicts that investors are likely to assign a higher value relevance to items that are to be sold soon (Koonce et al., 2011). Another reason why HfT securities in particular (across all levels) are expected to be reflected in firm value is due to the fact that, prior to IFRS adaption, this category also existed under almost every local GAAP and was measured at market value. Thus, investors are familiar with the interpretation of HfT securities fair values. For all other Level 3 fair values (including HfT derivatives), we expect lower value relevance for the following reasons. First, the relatively complex accounting rules for derivatives, for AfS and for FVO may limit investors' ability to properly process and interpret fair value information (Skinner, 1996). Second, in contrast to HfT, classification as FVO lacks information about management intent on how value will be realized from such financial instruments. This can lead to uncertainty, which affects value relevance. Finally, a lower value relevance of FVO is in line with the argument that investors are more concerned about management discretion when financial instruments are optionally

designated at fair value (Fiechter and Novotny-Farkas, 2011)). This results in the following hypothesis:

*H2: The value relevance of Level 3 HfT instruments is higher in comparison to the other financial instrument categories measured at Level 3 (FVO, derivatives, AfS).*

Not only do we address the internal banking factors that may influence value relevance, but we also consider a bank's environment. To address investors' information assessment, we focus on institutional differences within the EU and investigate their influence on the value relevance of Level 3 fair values. In order to do so, we cluster countries in market-based and bank-based economies (Ali and Hwang, 2000, Beck and Levine, 2002, and Fiechter and Novotny-Farkas, 2014). This dichotomous classification is based on the relative size and activity of banks relative to the stock market. The US is usually described as a market-based economy for which value relevance is likely to be higher (Ali and Hwang, 2000, Barth et al., 2002). In general, lower value relevance in bank-based economies is proposed by Fiechter and Novotny-Farkas (2014), who find that FVO is less value-relevant in bank-based economies whereas HfT instruments are value-relevant regardless of the institutional environment. Consistent with this argumentation and prior findings, we formulate our next hypothesis as follows:

*H3: The value relevance of Level 3 fair values is lower for bank-based economies compared to market-based economies.*

In addition to the ability to process information, information risk is another important aspect when considering investors' information assessment. Prior literature suggests that opportunistic

behavior of bank managers regarding the estimation of fair values can be reduced by high-quality monitoring (Dietrich et al., 2000, Muller and Riedl, 2002). Therefore, we expect more expertized auditors to mitigate investors' concerns about information risk, which is most inherent in Level 3 assets and liabilities. Given that nearly all of the European banks in our dataset are audited by a Big 4 firm, our study does not rely on the distinction between Big 4 and non-Big 4 auditors as a proxy for auditor quality. Instead, we identify country-specific industry expert auditors who have the highest industry market share following Gramling and Stone (2001). They suggest that audit quality increases with the auditor's industry expertise because audit firms that specialize in their client's industry can better assess the reasonableness of managers' estimates and are more likely to invest in infrastructures that improve the quality of audits in that industry. With respect to the fair value hierarchy, we also investigate the question as to whether the auditor effect on value relevance of Level 3 assets and liabilities varies with the category of financial instruments. The last hypothesis to be tested is thus formulated as follows:

*H4: The value relevance of Level 3 fair values is higher for banks that are audited by the country's industry expert auditor than by a non-expert.*

### **III. EMPIRICAL ANALYSIS**

#### **Sample Selection**

The sample consists of listed banks in the European Union (EU) member states that prepare their accounts according to IFRS. The endorsement process for the adaption of IFRS in the EU ensures that these standards have the same binding character and effective date for all European banks,



increasing comparability of their IFRS financial statements. We initially identify the relevant firms from Bankscope (Bureau van Dijk). However, we obtain firm characteristics from Datastream. Next, we include additional firms from Datastream if they meet the required criteria (public listing, EU member state, IFRS-user, banking industry).<sup>10</sup> We remove observations that do not have price data available on Datastream. Since we manually collect disclosures about the fair value hierarchy from consolidated annual reports, we also require firms to make the annual reports publicly available and to provide the corresponding information as mandated by IFRS 7.<sup>11</sup>

For all banks, the fair value hierarchy is presented in a standardized table format with the corresponding rows for financial instrument categories and their breakdown to the individual product categories and corresponding columns for each level (see, e.g., Ernst & Young, 2009, Appendix 2).<sup>12</sup> Except for most of the Italian and a few French banks, the annual reports are in English. The Italian and French banks still use the English term 'Fair Value', so we find the appropriate chapter in the notes and translate the terms of different financial instrument categories in order to allocate the disclosures correctly.

Our procedure results in a final sample consisting of 420 firm-year observations. The descriptive statistics and regression analysis in the level specifications are based on this sample size. The

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<sup>10</sup> See Figure 4 for an overview of states included in this study. Out of 28 current EU member states, we include 23 countries. For Estonia, Latvia, Malta and Slovakia we have no observations. No Estonian bank firms were identified by Bankscope, while for 15 banks from Latvia, Malta and Slovakia neither market capitalization nor price data were available. Moreover, we do not include Croatia as it was not an EU member state during our investigation period 2009-2011.

<sup>11</sup> We visited each of the 183 banking firm's homepages and downloaded the recent versions of the annual reports for the years 2009, 2010 and 2011, if available. For 150 individual banks we could download or see an online version of the annual report from at least one of the sample years.

<sup>12</sup> The example can be downloaded from [http://www.ey.com/Publication/vwLUAssets/Fair-Value-Hierarchy-2009-EN/\\$FILE/Fair-Value-Hierarchy-2009-EN.pdf](http://www.ey.com/Publication/vwLUAssets/Fair-Value-Hierarchy-2009-EN/$FILE/Fair-Value-Hierarchy-2009-EN.pdf)

sample size is reduced by four in the regression analyses in the first differences specification due to additional data requirements. Specifically, we exclude firms with only a single observation in 2009, 2010 or 2011, which yields 416 firm-year and 270 firm-change observations. Furthermore, additional analyses are based on the fair value hierarchy disaggregated by category of financial instruments. In total, 362 annual reports contained information on the allocation of fair value levels to these categories (*held-for-trading securities, derivatives, fair value option, and available-for-sale*),<sup>13</sup> which results in 231 firm-change observations. Table 1 provides the numbers for each sample selection step.

[Insert Table 1 here]

## **Descriptive Statistics**

Table 2 provides information on Level 1 assets, Level 2 assets, Level 3 assets as well as each level's liabilities – their size per share (in euros) and size relative to total assets (Panel A) and by category (Panel B) in order to show differences in the disclosure of financial instrument categories.

[Insert Table 2 here]

On average, fair value assets (FVA) amount to 23.44% of total assets, with Level 1 (FVA1) having the largest share. Concerning fair value liabilities (FVL), the corresponding percentage only amounts to 5.97%, which is mainly driven by Level 2 fair values. On average, the net position (assets-liabilities) of financial instruments measured at fair value is positive. Note that most of the

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<sup>13</sup> In many cases this allocation was incomplete. We excluded cases in which less than 90 % of the aggregated fair values were not reported by category.

financial instruments are measured at Level 1 or Level 2. The ratio of Level 3 fair values to total assets amounts to only 2.68% for FVA and 0.26% for FVL. Nevertheless, 354 (151) out of 420 firm-year observations report Level 3 FVA (FVL) as indicated by the reporting frequency.<sup>14</sup>

Out of 420 firm-year observations, 362 annual reports also provide information about the allocation of fair value levels across the financial instrument categories *held-for-trading securities* (HfT), *derivatives* (D), *fair value option* (FVO) and *available-for-sale* (AfS). This corresponds to the classification proposed by IAS 39, except for the fact that we split trading derivatives from other trading instruments because they may be perceived differently by investors (e.g. Bischof and Ebert, 2014) and add them to the hedging derivatives in a separate product group ‘derivatives’ (D) due to their instrument-specific characteristics.<sup>15</sup> Also, this makes our results more readily comparable to prior studies that focus solely on derivatives. Panel B informs about the reporting frequencies of levels by categories. For example, out of 362 firm-year observations, 266 report *held-for-trading* assets measured at Level 1.

Laux and Leuz (2010) argue that differences in the levels’ value relevance also stem from different strategies or business models that are correlated with banks’ fair value allocation across levels. Figure 2 reveals that fair value measures vary strongly across the business models *commercial bank*, *real estate bank*, *consumer bank* and *interbank services*.<sup>16</sup> For banks focusing on interbank services, for example, 38.03% of total assets are measured at fair value, whilst this percentage

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<sup>14</sup> As our focus is on Level 3 fair values we separately analyze the 354 observations that have non-zero Level 3 fair values in a robustness test.

<sup>15</sup> Hedging is a risk management strategy that does not affect the inherent characteristics of a derivative instrument.

<sup>16</sup> The business model classification is based on the allocation of banks’ loans. The definition of these business models is provided in Table A1 in the appendix.

does not exceed 20% for other business models. In turn, they have the lowest ratio of fair value liabilities to total assets amounting to only 3.52%, whilst e.g. real estate banks report an average ratio of 9.53% again illustrating the heterogeneity across business models. In our main tests these systematic differences are accounted for by including business model fixed effects in the regression equations, as described in section “Research design”.

[Insert Figure 2 here]

Figure 3 shows distribution of fair value levels by year. We do so in order to identify time series trends in the allocation of the levels that may be due to the post-crisis period. We do not, however, detect a tendency of improved market liquidity over time; in fact, Level 1 fair values for both assets and liabilities decrease somewhat in 2011 and Level 3 fair value assets increase slightly over the sample period.

[Insert Figure 3 here]

Figure 4 shows marked differences in fair values relative to total assets between European countries. Whilst for example in Finland, 71.97% of banks’ total assets consist of fair value assets, fair value accounting is less important in Lithuania with an average share of fair value assets in total assets amounting to only 3.39%. Regarding fair value liabilities, Germany discloses the highest percentage (16.93%), which mainly consists of Level 2 measurements. In order to prevent our regression results from being driven by country differences, country fixed effects are also included in our regression equations.

[Insert Figure 4 here]

We further divide our sample into bank-based and market-based economies in order to investigate institutional differences across European banks. In doing so, we adopt a measure introduced by Beck and Levine (2002), that captures the comparative importance of the capital market relative to banks. We first collect country-specific data on market capitalization, total value of traded stocks and claims of banking sector on private sector from the World Bank. Mean values as share of gross domestic product (GDP), averaged over 1995-2011 are reported in Panel A of Table 3. Based on these numbers, we construct one variable for comparative activity (log ratio of value of stocks traded to claims of banking sector on private sector) and one for comparative size (log ratio of market capitalization to claims of banking sector on private sector) of capital markets relative to banks. We then perform a principal component analysis in order to condense both variables to one underlying factor. The resulting first principal component *Structure Aggregate* is also reported in Panel A and shows, for example, that in Finland and Sweden the relative importance of capital markets is high whereas it is rather low in Austria or Bulgaria. Finally, if *Structure Aggregate* takes values below (above) the median, a country is classified as bank-based (market-based).

[Insert Table 3 here]

Panel B of Table 3 informs about the distribution of net fair values (FVA minus FVL) relative to total assets, as well as the per share value, in bank-based and market-based economies, respectively. Net fair values as share of total assets are on average significantly lower for bank-based economies than for market-based economies. With respect to net fair values as share of total assets measured at Level 3 we find only weakly significant differences in mean values

between the two economy types. This indicates that the use of Level 3 fair values does not strongly depend on institutional features. However, we will test whether or not they are assessed differently by investors in bank-based and market-based countries.

## Research Design

To test our hypotheses we apply the residual income valuation model. In order to separate the influence of fair values, book value of equity is split into net fair value measures (FVA minus FVL) and non-fair value measures (NETBE), i.e. book value of equity less FVA plus FVL.  $INC_{it}$  is net income available for common shares.

$$P_{it} = \beta_0 + \beta_1 netFVA1_{it} + \beta_2 netFVA2_{it} + \beta_3 netFVA3_{it} + \beta_4 NETBE_{it} + \beta_5 INC_{it} + \epsilon_{it} \quad (1)$$

We next transform the price specification (1) to a change specification by estimating it in annual first differences  $\Delta$  (current year minus previous year):<sup>17</sup>

$$\Delta P_{it} = \beta_0 + \beta_1 \Delta netFVA1_{it} + \beta_2 \Delta netFVA2_{it} + \beta_3 \Delta netFVA3_{it} + \beta_4 \Delta NETBE_{it} + \beta_5 \Delta INC_{it} + \epsilon_{it}. \quad (2)$$

We apply the latter specification for three reasons. First, we believe that investors do not assess the absolute level value of financial instruments, but rather the change in the level value of financial instruments, arising from a specific management action. Second, the change

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<sup>17</sup> We also estimate the price specification directly in a robustness test as reported in Table 7.

specifications have the advantage of mitigating omitted correlated variable bias. Third, in our dataset price specifications suffer from non-trivial collinearity problems among the explanatory variables.<sup>18</sup> Table A2 in the appendix shows that both pairwise Pearson correlation coefficients as well as variance inflation factors exceed tolerable values when the underlying research design is specified in absolute values (Panels A and B) rather than in value changes (Panels C and D). This is particularly true for Level 3 fair values disaggregated by category. However, no such problem arises when changes in fair value measures are considered.

All variables are deflated by the number of outstanding common shares.<sup>19,20</sup> The dependent variable is the change in share price  $P$  three months after the fiscal year-end, i.e. price from 3 months after the fiscal year-end minus the same value one year earlier. This time lag is used to ensure that annual reports are already published and that all price-relevant information is reflected in firm value.<sup>21</sup>

Residuals in the regression model may be correlated across time and firms, causing OLS standard errors to be biased. Since our data spans three years (2009, 2010 and 2011 in level specification) and two changes in time (2009/2010 and 2010/2011 in change specification), we parametrically absorb the time effect by including a year dummy variable, which also captures the potential post-

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<sup>18</sup> Prior research (e.g. Song et al., 2010, Goh et al., 2015) experience similar collinearity problems.

<sup>19</sup> Table A1 in the appendix contains a definition of all variables.

<sup>20</sup> In line with prior research we use common shares outstanding as a scaling factor in our study. In order to analyze whether deflation by shares causes a scaling bias, we rerun the main regression (H1) unscaled and scaled by the lagged price (price at the end of the fiscal year). We have chosen not to present the result tables here due to significant collinearity problems experienced in both cases. The regressions showed a very high mean VIF: Unscaled specification had a VIF of 8.28 and the lagged price specification even a higher VIF of 9.40. Disaggregation of fair values in separate categories displayed an inherent higher collinearity and hence an increase in VIF.

<sup>21</sup> In further robustness checks we reran our regressions with a four month time lag.

crisis effect. According to the Hausman test there is no need to perform a fixed effects regression ( $p=0.469$ ). Instead, we run a pooled regression with robust standard errors that are clustered by firms only following Petersen (2009).<sup>22</sup> As mentioned earlier, we also add country fixed effects as well as business model fixed effects to the regression model to account for regional disparities and differences between banks' business strategies.

## Regression Results

Our first hypothesis suggests that fair values measured at Level 3 are less relevant than Level 1 or Level 2 fair values.

[Insert Table 4 here]

Model (1) of Table 4 reveals that changes in Level 1 and Level 2 net fair values are indeed significantly associated with changes in share price (t-statistics are 3.583 and 3.515 respectively). In contrast, changes in net fair value assets measured at Level 3 cannot explain variation in share price ( $t=-0.203$ ), indicating that investors do not view them as relevant enough to be reflected in firm value.

IFRS 7.26 only allows entities to offset fair value assets and fair value liabilities to the extent that their carrying amounts are offset in the statement of financial position. Investors may therefore only attribute value relevance to Level 3 fair values when disaggregated into fair value assets and

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<sup>22</sup> According to Petersen (2009) clustering in both dimensions, firm and year, produces unbiased standard errors only if the number of clusters is sufficiently large. However, this is not the case for number of years in our data.



fair value liabilities. Therefore, we perform additional regressions without netting  $\Delta FVA3$  and  $\Delta FVL3$ , using the following regression equation:

$$\begin{aligned} \Delta P_{it} = & \beta_0 + \beta_1 \Delta netFVA1_{it} + \beta_2 \Delta netFVA2_{it} + \beta_3 \Delta FVA3_{it} + \beta_4 \Delta FVL3_{it} \\ & + \beta_5 \Delta NETBE_{it} + \beta_6 \Delta INC_{it} + \epsilon_{it} \end{aligned} \quad (3)$$

The results are shown in model (2) of Table 4. Neither changes in Level 3 fair value assets nor liabilities have coefficients significantly different from zero, which is consistent with our prediction. The lack of value relevance of Level 3 fair values is contrary to results from prior US studies that focus on the corresponding fair value hierarchy as mandated by SFAS 157 (Kolev, 2009, Song et al., 2010, and Goh et al., 2015). Given that the extent to which managers use discretion in Level 3 measurement as well as the extent to which investors are able to properly process fair value information depend on the firm's legal, economic and regulatory environment, we cannot rule out that the different findings stem from the different geographical settings (US versus Europe). In particular, the US is attributed with the highest level of enforcement (Leuz, 2010) and with a market-oriented financial system for which value relevance is likely to be higher (Ali and Hwang, 2000, Barth et al., 2012). Another explanation for different results may be of a methodological nature: Whilst the results of the US studies are mainly derived from a price specification of the residual income model and measure the value relevance of absolute values of level disclosures, we apply a change specification in order to capture investors' reaction in changes in firm value to the changes in fair value level disclosures.

With respect to our second hypothesis, we split net fair values into the categories *held-for-trading* (HfT), *derivatives* (D), *fair value option* (FVO) and *available-for-sale* (AfS) in order to assess

whether investors' reliance on fair values measured at Level 3 depends on the category to which they are assigned. We hypothesize that Level 3 fair values of the category HfT are more relevant than those of other categories. To the best of our knowledge, the only prior attempt to investigate value relevance of fair value levels according to type of financial instrument is Song et al. (2010). They conclude that level information combined with type information has greater explanatory power for firm value than type information alone. However, they do not interpret coefficients due to limitations in their dataset, such as a large number of zero observations and high collinearity. In contrast, we do not have many low reporting frequencies (see Table 2, Panel B) and the variance inflation factors in Table A2, Panel D show that no serious collinearity problems exist. Consequently, we can test H2 based on the following regression equations for Level 3 net fair value assets disaggregated by category:

$$\begin{aligned} \Delta P_{it} = & \beta_0 + \beta_1 \Delta netFVA1_{it} + \beta_2 \Delta netFVA2_{it} + \beta_3 \Delta netFVA3_{HfT_{it}} + \beta_4 \Delta netFVA3_{D_{it}} \\ & + \beta_5 \Delta netFVA3_{FVO3_{it}} + \beta_6 \Delta FVA3_{Afs_{it}} + \beta_7 \Delta NETBE_{it} + \beta_8 \Delta INC_{it} + \epsilon_{it} \end{aligned} \quad (4)$$

Model (3) of Table 4 shows the regression results. Changes in *derivatives*, *fair value option* and *available-for-sale* fair values measured at Level 3 do not have statistically significant coefficients. This suggests that investors do not perceive fair value changes in these instruments to be relevant enough to be reflected in firm value changes. However, we find some evidence (t-stat 1.911) for trading securities being value relevant as changes in HfT net assets correlate with changes in market value. Since trading securities are held for short-term purposes only, investors can view their valuation technique as being less susceptible to estimation errors and they then tend to rely more on managers' estimates, even when measurement takes place at Level 3. Also, investors

may be more familiar with the interpretation of this category as HfT securities have traditionally been measured at market value. The coefficient, however, deviates from its theoretically expected value of 1, which is consistent with the argument that investors discount Level 3 fair values due to their inherent information risk. With respect to our hypothesis, we can state that value relevance of Level 3 fair values does indeed vary across categories with HfT being the only category with attributed value relevance.

Next, we test whether institutional differences within Europe influence value relevance of Level 3 fair values. Due to limited processing abilities of investors in bank-based economies we expect value relevance of Level 3 fair values to be lower than in market-based economies. In order to test this prediction we include interaction terms between the variable *bank-based* and Level 3 fair values to our regression model.

$$\begin{aligned}\Delta P_{it} = & \beta_0 + \beta_1 \Delta netFVA1_{it} + \beta_2 \Delta netFVA2_{it} \\ & + \beta_3 \Delta netFVA3_{it} + \beta_4 \Delta netFVA3_{it} * Bank-based_i \\ & + \beta_5 Bank-based_i + \beta_6 \Delta NETBE_{it} + \beta_7 \Delta INC_{it} + \epsilon_{it}\end{aligned}\quad (5)$$

Moreover, we again disaggregate  $\Delta netFVA3$  into the categories *held-for-trading* securities (HfT), *derivatives* (D), *fair value option* (FVO) and *available-for-sale* (AfS) and add the corresponding interaction terms to the regression equation.

$$\begin{aligned}\Delta P_{it} = & \beta_0 + \beta_1 \Delta netFVA1_{it} + \beta_2 \Delta netFVA2_{it} \\ & + \beta_3 \Delta netFVA3\_HfT_{it} + \beta_4 \Delta netFVA3\_HfT_{it} * Bank-based_{it} \\ & + \beta_5 \Delta netFVA3\_D_{it} + \beta_6 \Delta netFVA3\_D_{it} * Bank-based_{it} \\ & + \beta_7 \Delta netFVA3\_FVO_{it} + \beta_8 \Delta netFVA3\_FVO_{it} * Bank-based_{it} \\ & + \beta_9 \Delta FVA3\_AfS_{it} + \beta_{10} \Delta FVA3\_AfS_{it} * Bank-based_{it}\end{aligned}\quad (6)$$

$$+\beta_{11} \text{Bank-based}_{it} + \beta_{12} \Delta \text{NETBE}_{it} + \beta_{13} \Delta \text{INC}_{it} + \epsilon_{it}$$

Note that we do not include country fixed effects in these regressions because the variable *bank-based* is a mere linear combination of country dummies. Results are presented in Table 5 and provide evidence that net fair value assets measured at Level 3 are not reflected in firm value, in neither bank- nor market-based economies (model 4). However, with respect to Level 3's subcategories we do find differences between the two economy types that correspond with the direction of our hypothesis (model 5). Specifically, in market-based countries changes in HfT and D instruments measured at Level 3 are significantly positively (coefficients 1.051 and 0.954 respectively) associated with changes in share price. The coefficients are even close to their theoretical value of 1. However, there is no significant difference in coefficients between market-based and bank-based economies for derivatives. On the contrary, for *held-for-trading* securities, we additionally observe a significant interaction term (-1.662), indicating that changes in Level 3 HfT are negatively related to changes in share prices in bank-based economies (1.051-1.662=-0.611) whereas they are positively related in market-based economies (1.051). A significant Wald test result ( $p < 0.001$ ) verifies that the higher magnitude of market-based coefficient indicates a significantly higher value relevance in these economies. The sign of the coefficients is in line with the argument of the investors' insufficient ability to evaluate information in bank-based economies. With respect to Level 3 fair values optionally designated at fair value, we do not find a significant association with firm value, in any type of financial structure. With respect to the category AfS, we find a significant negative interaction. The difference in the coefficients for

market-based economies (-0.044) and for bank-based economies (-0.044-1.333=-1.377) is statistically significant (Wald test,  $p < 0.001$ ).<sup>23</sup>

[Insert Table 5 here]

Finally, we investigate whether Level 3 fair values are more relevant when banks are audited by the auditor with the greatest industry expertise in each country. Following the market share approach we measure industry expertise by the share in total audit fees paid by all companies in the same segment (Gramling and Stone, 2001).<sup>24</sup> In our analyses the relevant segment comprises all listed banks reporting under IFRS in one country. Out of 420 reports from which we manually collected information on the fair value hierarchy, 151 were audited by the country-specific audit expert. The regression equations on which tests of H4 are based are formulated as follows (see equations (7) and (8)). Firstly, we regress price changes on changes in net fair value assets ( $\Delta netFVA$ ) measured at Level 1, 2 and 3, on the dummy variable *Auditor Expert* as well as on the interaction between the auditor variable and  $\Delta netFVA3_{it}$ .

$$\begin{aligned} \Delta P_{it} = & \beta_0 + \beta_1 \Delta netFVA1_{it} + \beta_2 \Delta netFVA2_{it} \\ & + \beta_3 \Delta netFVA3_{it} + \beta_4 \Delta netFVA3_{it} * AuditorExpert_i \\ & + \beta_5 AuditorExpert_i + \beta_6 \Delta NETBE_{it} + \beta_7 \Delta INC_{it} + \epsilon_{it} \end{aligned} \quad (7)$$

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<sup>23</sup> Results (unreported) remain qualitatively unchanged when performing subsample analyses for market-based and bank-based economies, respectively, instead of including interaction terms in the full sample.

<sup>24</sup> Because information on audit fees was not always publicly available, there is a variety of proxies for auditors' market share in literature. These proxies are e.g. based on client firms' size (measured by assets or revenues) or on the number of clients an audit firm has in one industry.

Next, we disaggregate  $\Delta netFVA3$  into the categories *held-for-trading* securities (HfT), *derivatives* (D), *fair value option* (FVO) and *available-for-sale* (AfS). Taking into account each interaction with the auditor variable the regression equation results in

$$\begin{aligned} \Delta P_{it} = & \beta_0 + \beta_1 \Delta netFVA1_{it} + \beta_2 \Delta netFVA2_{it} \\ & + \beta_3 \Delta netFVA3\_HfT_{it} + \beta_4 \Delta netFVA3\_HfT_{it} * AuditorExpert_{it} \\ & + \beta_5 \Delta netFVA3\_D_{it} + \beta_6 \Delta netFVA3\_D_{it} * AuditorExpert_{it} \\ & + \beta_7 \Delta netFVA3\_FVO_{it} + \beta_8 \Delta netFVA3\_FVO_{it} * AuditorExpert_{it} \\ & + \beta_9 \Delta FVA3\_AfS_{it} + \beta_{10} \Delta FVA3\_AfS_{it} * AuditorExpert_{it} \\ & + \beta_{11} AuditorExpert_{it} + \beta_{12} \Delta NETBE_{it} + \beta_{13} \Delta INC_{it} + \epsilon_{it}. \end{aligned} \quad (8)$$

The results are presented in Table 6. Model (6) shows that even in the presence of a quality audit, changes in Level 3 fair values are not relevant enough to be reflected in firm value. Neither main nor interaction effects are significant. However, we again find differences when considering the financial instrument categories separately (model 7). We find no significant relations for any category except for D instruments (albeit at the 10% level) in the absence of the quality audit. However, we do observe a highly positive, statistically significant interaction terms for HfT and FVO instruments (coefficients 1.903 and 3.778 respectively). The corresponding differences in coefficients between quality audits and non-quality audits are significant (Wald tests,  $p < 0.05$ ). This indicates that the value relevance of Level 3 fair values of the category HfT (see Table 5) is driven by those Level 3 HfT fair values that are audited by the industry expert auditor. With respect to Level 3 fair values belonging to the category *fair value option*, our results suggest that the inherent information risk may be decreased if the bank is reviewed by an auditor with a large degree of expertise. Investors' concerns about management discretion, when financial

instruments are optionally designated at fair value, are likely to decrease with higher audit quality.

[Insert Table 6 here]

## **Robustness Checks**

In order to test the robustness of our results we perform several additional analyses.

### *Price specification*

In order to compare our results to prior research, we rerun the main regressions in the price specification.

[Insert Table 7 here]

In model (1) we find all three fair value levels to be statistically significant, which is in line with prior US findings. However, the discount for Level 3 fair value is less (coefficient 0.578) than for Levels 1 and 2 fair values (coefficients 0.135 and 0.092 respectively), suggesting that Level 3 fair values are more value-relevant for investors than other levels. This finding is counterintuitive. Moreover, when disaggregating Level 3 fair value to financial instrument categories both Level 2 and Level 3 fair values become insignificant. We attribute these results to the aforementioned methodological shortcomings, particularly the collinearity problems.

### *Winsorizing*

We deal with potential statistical outliers by winsorizing data used in our main regressions to the 1st and 99th percentile. We obtain similar results (and, therefore, refrain from presenting them

here), namely that changes in overall Level 3 fair values are not associated with changes in stock price (t-stat 0.71), except for *held-for-trading* securities that are reflected in the firm value (coefficient 0.856, t-stat 1.76). Level 2 fair values are still significantly associated with changes in stock price (t-stat 3.11), while the association for Level 1 fair values is much weaker here (t-stat 1.83).

#### *Non-zero fair values at level 3*

Moreover, we performed a subsample analysis solely based on those firm-change observations with non-zero fair values measured at Level 3 (not presented here). All main results remain qualitatively unchanged. In particular, changes in overall Level 3 fair values are not associated with changes in stock price. This holds true independently from the auditor type and from the institutional setting. With respect to Level 3's subcategories we find evidence that changes in *HfT* are reflected in changes in the firm value. The differences between banks that hire audit firms with deep industry expertise vs. non-industry expertise or that operate in market-based vs. bank-based economies remain in the same direction and magnitude as the main results.

#### *4-month time lag*

Value relevance may be affected by the capability and promptness of capital markets incorporating accounting information into prices. To ensure that annual reports are prepared, published and priced by investors, value relevance studies usually base their dependent variable on share prices three months after the fiscal year-end. We account for the possibility that accounting information is reflected in stock prices at some later points in time by performing



additional robustness tests with an alternative time lag. In particular, we use annual changes in share prices four months after the fiscal year-end as a dependent variable even though the results may also be driven by the first quarterly reports if they are publicly available by then. The corresponding results are presented in Table 8.

[Insert Table 8 here]

None of the model specifications in Panel A show significant effects for Level 3 net fair values at aggregated level. With respect to the categories that Level 3 fair values are assigned (Panel B), we find a significant positive association of HfT and D instruments with the change in share price in market-based economies and a significantly lower relation of HfT instruments in bank-based economies (Wald test,  $p < 0.001$ ). This is consistent with the results obtained from a three month time lag. However, in contrast to those results, if a longer time lag is considered the results show a positive difference in the coefficients only for HfT instruments measured at Level 3 provided that an audit firm with deep industry expertise is hired (Wald test,  $p = 0.008$ ). We additionally performed all specifications based on a five month time lag (not presented here). The results remain qualitatively unchanged.

#### **IV. CONCLUSION**

IFRS 7 requires enhanced disclosures about fair value measurement and provides guidance on how to measure fair values. In particular, the standard uses a 3-level fair value hierarchy, which prioritizes the inputs used in the valuation technique according to the level of judgment: fair values measured at Level 1 are based on quoted prices in active markets for identical assets or liabilities (mark-to-market). However, if such prices are not available, valuation models are used

to determine fair values (mark-to-model). Whilst Level 2 is based on (directly or indirectly) observable inputs, Level 3 inputs are unobservable and are thus more likely to leave room for considerable management discretion or even manipulation.

Using a sample of 416 firm-year observations from 150 European banks reporting under IFRS, we test whether, and if so, to what extent, Level 3 fair values disclosures provide useful information to investors and are reflected in firm value changes. Our results suggest that investors do not generally rely on Level 3 assets or Level 3 liabilities when assessing firm value. The lack of value relevance can be explained by investors' concerns about the inherent valuation flexibility that managers may use opportunistically. However, we provide evidence that their value relevance depends on the financial instrument category they are assigned: Only those Level 3 fair values that belong to the category of *held-for-trading securities* are reflected in firm value. Since trading securities are a bank's most liquid assets and are held for short-term purposes only, our findings are consistent with the argument that investors view their valuation technique as being less susceptible to estimation errors and tend to rely more on managers' estimates. Moreover, we investigate institutional differences within our European sample and provide evidence that the level of market sophistication and information environment influence the value relevance of Level 3 fair values. Particularly with respect to Level 3 instruments held for trading purposes, we expect and find a significantly positive association in countries with a market-oriented financial structure and a significantly lower association in countries with a bank-oriented financial structure. This finding is in line with the argument that the abilities of market participants to properly process fair value information in bank-based economies are lower. Additional analyses reveal that the

value relevance of held for trading instruments measured at Level 3 is driven predominantly by banks that hire audit firms with deep industry expertise. This finding indicates that more expertized auditors are more likely to mitigate information risk concerns that investors attribute particularly to fair values measured at Level 3.

There are several limitations to this study. First, our dataset only comprises annual reports from three consecutive years; this stems from the fact that the disclosure of the fair value hierarchy only became mandatory after 1 January 2009. This may reduce the power of our tests and requires further research when longer time series are available. Second, our observation years may continue to be affected by the post-crisis period as the usage of higher fair value levels do not show an increasing tendency. Thus, it is unclear if the results persist in the times of stability.

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## APPENDIX

**TABLE A1: Definition of Variables**

Variable	Definition
$(\Delta)P_{it}$	(Change in) closing share price of firm $i$ at home stock exchange (Datastream item P) three months after the fiscal year-end $t$ between two consecutive fiscal years. Thus, the price difference is always based on a twelve-month return window.
$(\Delta)FVA1_{it}$ , $(\Delta)FVA2_{it}$ , $(\Delta)FVA3_{it}$	(Change in) fair value assets measured at Level 1, Level 2, Level 3 of firm $i$ between two consecutive fiscal years $t$ , scaled by the number of common shares outstanding
$(\Delta)FVL1_{it}$ , $(\Delta)FVL2_{it}$ , $(\Delta)FVL3_{it}$	(Change in) fair value liabilities measured at Level 1, Level 2, Level 3 of firm $i$ between two consecutive fiscal years $t$ , scaled by the number of common shares outstanding
$(\Delta)netFVA1_{it}$ , $(\Delta)netFVA2_{it}$ , $(\Delta)netFVA3_{it}$	(Change in) net fair value assets (fair value assets- fair value liabilities) measured at Level 1, Level 2, Level 3 of firm $i$ between two consecutive fiscal years $t$ , scaled by the number of common shares outstanding
$(\Delta)netFVA1\_HfT_{it}$ , $(\Delta)netFVA2\_HfT_{it}$ , $(\Delta)netFVA3\_HfT_{it}$	(Change in) net fair values assets of the category <i>held-for-trading securities</i> measured at Level 1, Level 2, Level 3 of firm $i$ between two consecutive fiscal years $t$ , scaled by the number of common shares outstanding
$(\Delta)netFVA1\_D_{it}$ , $(\Delta)netFVA2\_D_{it}$ , $(\Delta)netFVA3\_D_{it}$	(Change in) net fair value assets of the category <i>derivatives</i> measured at Level 1, Level 2, Level 3 of firm $i$ between two consecutive fiscal years $t$ scaled by the number of common shares outstanding
$(\Delta)netFVA1\_FVO_{it}$ , $(\Delta)netFVA2\_FVO_{it}$ , $(\Delta)netFVA3\_FVO_{it}$	(Change in) net fair value assets of the category <i>fair value option</i> measured at Level 1, Level 2, Level 3 of firm $i$ between two consecutive fiscal years $t$ , scaled by the number of common shares outstanding
$(\Delta)FVA1\_AfS_{it}$ , $(\Delta)FVA2\_AfS_{it}$ , $(\Delta)FVA3\_AfS_{it}$	(Change in) fair values assets of the category <i>available-for-sale</i> measured at Level 1, Level 2, Level 3 of firm $i$ between two consecutive fiscal years $t$ , scaled by the number of common shares outstanding
$(\Delta)NETBE_{it}$	(Change in) shareholder equity – fair value assets + fair value liabilities of firm $i$ between two consecutive fiscal years $t$ , scaled by the number of common shares outstanding
$(\Delta)INC_{it}$	(Change in) net income available for common shares of firm $i$ between two consecutive fiscal years $t$ , scaled by the number of common shares outstanding
Commercial Bank	Dummy variable that equals 1 if the bank's ratio of commercial and industrial loans (Datastream datatype (WC02265)) to total loans (Datastream datatype (WC02271)) is the highest in comparison to the ratios based on other loan types

Real Estate Bank	Dummy variable that equals 1 if the bank's ratio of real estate mortgage loans (Datastream datatype (WC02267)) to total loans (Datastream datatype (WC02271)) is the highest in comparison to the ratios based on other loan types
Consumer Bank	Dummy variable that equals 1 if the bank's ratio of consumer and installment loans (Datastream datatype (WC02266)) to total loans (Datastream datatype (WC02271)) is the highest in comparison to the ratios based on other loan types
Interbank Services	Dummy variable that equals 1 if the bank's ratio of interbank loans (Datastream datatype (WC02055)) to total loans (Datastream datatype (WC02271)) is the highest in comparison to the ratios based on other loan types
Auditor Expert	Dummy variable that equals 1 if a company is audited by the industry expert auditor. Industry expertise is measured by the total audit fees (Datastream datatype (WC01801)) an audit firms earns in the segment of all listed banks reporting under IFRS in relation to the sum of all audit fees in that segment per country.
Bank-based	Dummy variable that equals 1 for bank-based economies, and 0 for market-based economies. The classification is based on the variable <i>Structure Aggregate</i> which is the first principal component of the variables measuring comparative activity (LN(value of stocks traded/domestic credit to private sector by banks)) and comparative size (LN(market capitalization/domestic credit to private sector by banks)) of the capital market relative to banks. A country is classified as either bank-based or market-based when <i>Structure Aggregate</i> takes values below or above its median respectively.

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**TABLE A2: Correlations**

This table presents pairwise Pearson correlation coefficients and variance inflation factors of the explanatory variables. Whilst numbers in Panel A and B are based on a price specification, Panel C and D show correlation statistics for variables specified in first differences (change specification).

**Panel A: Pearson Correlation between Variables in Price Specification**

Variable	netFVA1	netFVA2	netFVA3	NETBE	INC
netFVA1	1				
netFVA2	-0.100	1			
netFVA3	0.459	-0.435	1		
NETBE	-0.784	-0.465	-0.206	1	
INC	-0.416	-0.308	0.103	0.579	1
VIF	11.998	6.943	2.166	16.589	1.930

**Panel B: Pearson Correlation between Variables by Category in Price Specification**

Variables	netFVA1	netFVA2	netFVA3_ HfT	netFVA3_ D	netFVA3_ FVO	FVA3_ AfS	NETBE	INC
netFVA1	1							
netFVA2	-0.103	1						
netFVA3_HfT	0.297	-0.198	1					
netFVA3_D	0.052	0.218	0.460	1				
netFVA3_FVO	0.489	-0.675	0.593	0.269	1			
FVA3_AfS	0.368	-0.399	0.351	0.141	0.568	1		
NETBE	-0.786	-0.459	-0.194	-0.202	-0.085	-0.149	1	
INC	-0.419	-0.317	0.082	0.017	0.107	0.086	0.589	1
VIF	13.097	10.626	2.430	2.333	7.510	2.114	17.169	1.965

**Panel C: Pearson Correlation between Variables in Change Specification**

Variable	$\Delta$ netFVA1	$\Delta$ netFVA2	$\Delta$ netFVA3	$\Delta$ NETBE	$\Delta$ INC
$\Delta$ netFVA1	1				
$\Delta$ netFVA2	-0.078	1			
$\Delta$ netFVA3	0.128	0.429	1		
$\Delta$ NETBE	-0.462	-0.287	-0.318	1	
$\Delta$ INC	0.403	0.004	0.030	0.156	1
VIF	2.234	1.616	1.490	2.170	1.630

**Panel D: Pearson Correlation between Variables by Category in Change Specification**

Variables	$\Delta\text{netFVA1}$	$\Delta\text{netFVA2}$	$\Delta\text{netFVA3}_{\text{HfT}}$	$\Delta\text{netFVA3}_{\text{D}}$	$\Delta\text{netFVA3}_{\text{FVO}}$	$\Delta\text{FVA3}_{\text{AfS}}$	$\Delta\text{NETBE}$	$\Delta\text{INC}$
$\Delta\text{netFVA1}$	1							
$\Delta\text{netFVA2}$	-0.077	1						
$\Delta\text{netFVA3}_{\text{HfT}}$	-0.068	0.504	1					
$\Delta\text{netFVA3}_{\text{D}}$	0.070	0.196	-0.105	1				
$\Delta\text{netFVA3}_{\text{FVO}}$	-0.160	0.142	-0.306	0.210	1			
$\Delta\text{FVA3}_{\text{AfS}}$	0.209	-0.212	-0.446	0.083	0.125	1		
$\Delta\text{NETBE}$	-0.341	-0.331	-0.179	-0.228	0.141	-0.094	1	
$\Delta\text{INC}$	0.460	0.002	0.052	-0.043	-0.032	-0.003	0.155	1
VIF	2.054	2.264	2.067	1.413	1.772	1.486	2.100	1.676

### FIGURE 1: Summary of Predictions and Findings

netFVA3 are the net fair value assets measured at Level 3. netFVA3\_HfT are the net fair value assets held for trading purposes measured at Level 3. All variables are described in Table A1 in the appendix.

Influential Factors on Value Relevance		Prediction	Findings
Internal perspective / Usage of financial instruments	netFVA3	+	0
	netFVA3_HfT	+	+
External perspective/ Environment	Bank-based economy	-	-
	Auditor Expertise	+	+

**TABLE 1: Sample Selection**

The sample consists of listed companies that prepare their accounts according to IFRS, are member states of the European Union and operate in the banking industry. The relevant firms were identified from Bankscope and supplemented by additional firms from Datastream. We excluded firms where matching of both databases failed and observations that did not have price data available on Datastream, went bankrupt before our period of investigation as well as observations without annual reports available online. This procedure yields 150 banks and 420 firm-year observations. Regressions with change specification are based on 416 firm-year and accordingly 270 firm-change observations. 362 annual reports provided additional information about fair value levels disaggregated by category, resulting in 231 firm-change observations.

Sample selection step	Remaining # of firms	# of firm-year observations				# of firm-change observations		
		2009	2010	2011	Total	Δ2010	Δ2011	Total
All listed, EU institutions on Bankscope that report according to IFRS	210							
Less: not matchable to Datastream	186							
Plus: additional listed EU banks on Datastream that report according to IFRS	197							
Less: no price data on Datastream	190							
Less: non-traded firms	183							
Less: no annual report available	150	139	146	135	420			
Thereof: with allocation of fair values to categories	134	121	126	115	362			
Less: single observation (no change)	146	137	146	133	416	137	133	270
Thereof: with allocation of fair values to categories	125	119	126	113	358	119	112	231

**TABLE 2: Descriptive Statistics**

This table is based on 150 banks and 420 firm-year observations and provides summary statistics for the relative size of fair value measures and values per share, which are used in the regressions (Panel A). Panel B informs about the level classification depending on the financial instrument category and is based on 362 firm-year observations only, since some firms did not (fully) report this allocation. Figure 2 shows level disclosures per business model, Figure 3 per year and Figure 4 per country. Price is the share price three months after the fiscal year-end. FVA and FVL are the fair value assets and fair value liabilities. The numbers 1, 2 and 3 indicate the fair values' measurement Level 1, 2 or 3. NETBE is the book value of equity less net fair value assets. INC is the net income available to common shares. TA stands for total assets. All share deflated numbers are reported in euros. Freq stands for the frequency of non-zero reported numbers.

**Panel A: Relative Size**

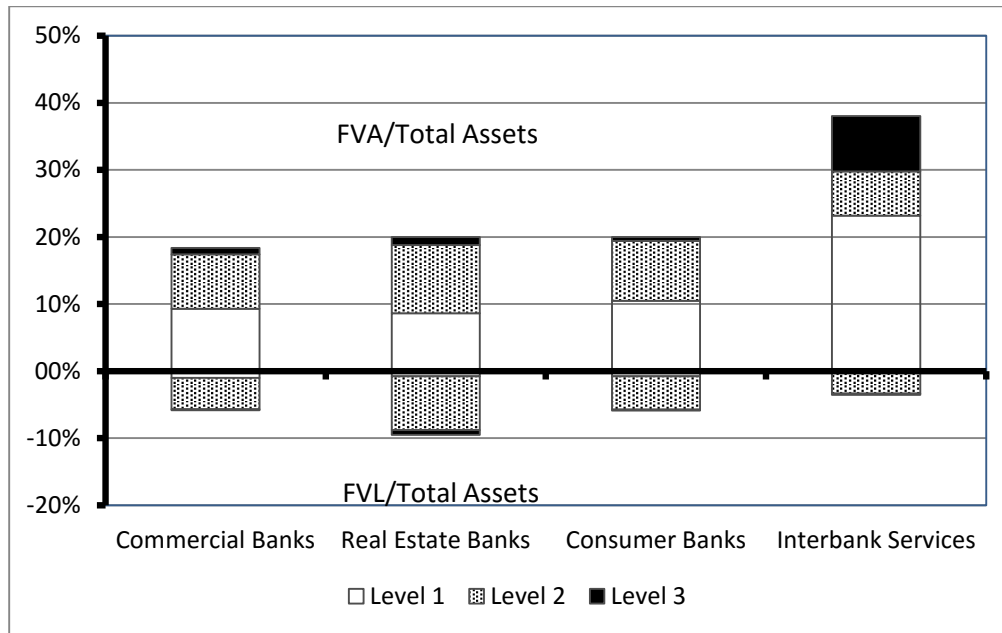
Variable	N	Mean	Std.dev.	P25	p50	P75	Freq
FVA1/TA	420	12.55%	16.73%	3.15%	8.15%	14.50%	402/420
FVA2/TA	420	8.22%	11.85%	0.71%	4.05%	10.40%	373/420
FVA3/TA	420	2.68%	10.20%	0.03%	0.26%	1.07%	354/420
FVA/TA	420	23.44%	22.67%	7.77%	16.68%	28.97%	417/420
FVL1/TA	420	0.79%	2.16%	0.00%	0.00%	0.51%	201/420
FVL2/TA	420	4.92%	8.57%	0.06%	1.14%	5.32%	343/420
FVL3/TA	420	0.26%	1.50%	0.00%	0.00%	0.03%	151/420
FVL/TA	420	5.97%	9.88%	0.13%	1.41%	6.74%	355/420
FVA1/shares	420	41.577	127.461	0.823	6.584	20.674	402/420
FVA2/shares	420	46.160	166.579	0.193	2.693	17.557	373/420
FVA3/shares	420	2.943	10.706	0.007	0.231	1.151	354/420
FVA/shares	420	90.680	268.858	2.314	11.374	55.629	417/420
FVL1/shares	420	3.285	12.845	0.000	0.000	0.538	201/420
FVL2/shares	420	38.723	154.424	0.013	0.798	8.952	343/420
FVL3/shares	420	0.908	4.345	0.000	0.000	0.025	151/420
FVL/shares	420	42.917	167.283	0.029	0.954	10.663	355/420
Price	420	14.308	24.684	1.849	4.860	15.596	420/420
NETBE/shares	420	-24.670	94.577	-14.007	-1.341	1.429	420/420
INC/shares	420	-0.838	17.666	0.015	0.320	1.034	420/420

**Panel B: Fair Value Assets and Liabilities by Category**

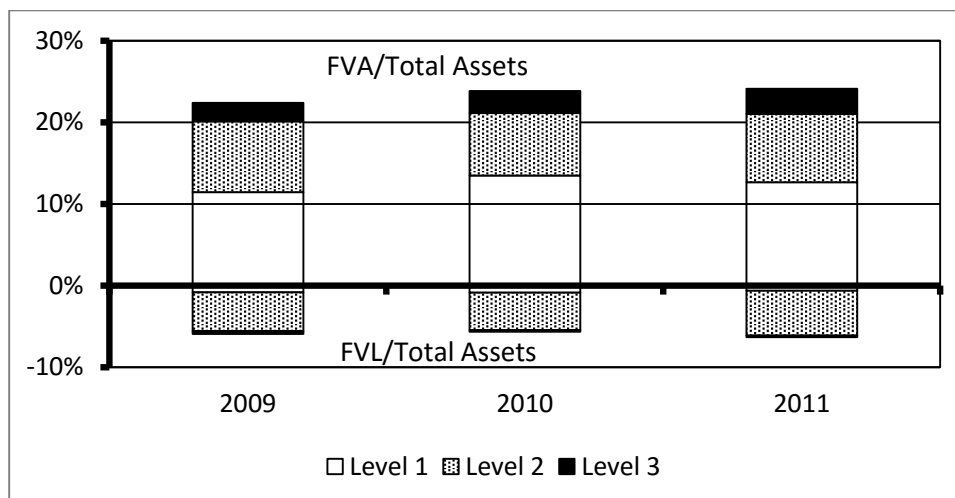
Variable	FV Category 1 <i>Held for Trading Securities</i>			FV Category 2 <i>Derivatives</i>			FV Category 3 <i>Fair Value Option</i>			FV Category 4 <i>Available for Sale</i>		
	Freq	Mean	Std.dev.	Freq	Mean	Std.dev.	Freq	Mean	Std.dev.	Freq	Mean	Std.dev.
FVA1/TA	266/362	2.01%	4.22%	117/362	0.09%	0.72%	160/362	1.55%	7.27%	320/362	6.72%	8.66%
FVA2/TA	209/362	1.65%	5.04%	271/362	2.74%	6.30%	149/362	1.20%	4.88%	274/362	2.37%	3.71%
FVA3/TA	143/362	0.20%	0.87%	108/362	0.13%	0.79%	114/362	0.90%	6.85%	271/362	1.45%	7.78%
FVA/TA	282/362	3.86%	7.46%	279/362	2.99%	6.62%	196/362	3.65%	13.78%	336/362	10.51%	12.35%
FVL1/TA	124/362	0.25%	0.72%	109/362	0.07%	0.28%	63/362	0.49%	2.13%	-	-	-
FVL2/TA	126/362	1.10%	3.57%	281/362	2.83%	6.24%	110/362	1.41%	3.40%	-	-	-
FVL3/TA	60/362	0.11%	0.92%	108/362	0.12%	0.92%	48/362	0.06%	0.37%	-	-	-
FVL/TA	168/362	1.47%	4.05%	288/362	3.02%	6.55%	129/362	1.79%	4.06%	-	-	-



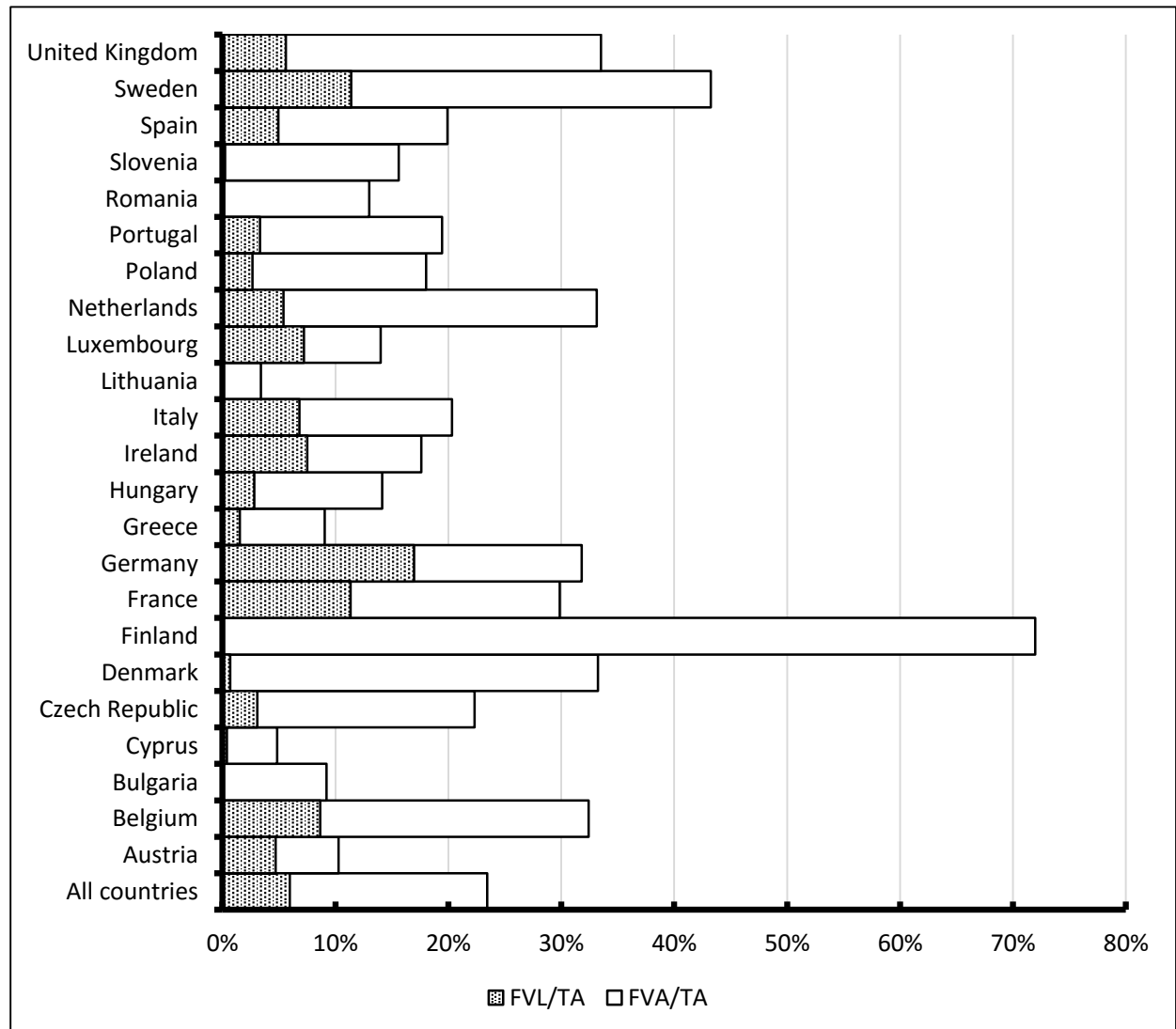
**Figure 2: Fair Values to Total Assets by Business Model**



**Figure 3: Fair Values to Total Assets by Year**



**Figure 4: Fair Value Assets and Liabilities by Country**



**TABLE 3: Institutional Characteristics and Measurement Levels**

Panel A shows institutional characteristics for each of the 23 countries in our sample. N is the number of firm-year observations per country. Market capitalization, value of stocks traded, and domestic credit to private sector by banks are reported as share of gross domestic product (GDP), averaged over 1995-2011. Data source is WorldBank. From this data we construct one variable for comparative activity ( $\ln(\text{value of stocks traded}/\text{domestic credit to private sector by banks})$ ) and one for the comparative size ( $\ln(\text{market capitalization}/\text{domestic credit to private sector by banks})$ ) of the capital market relative to banks. With these two variables we perform a principle component analysis with the first principal component being Structure Aggregate. The dichotomous variable Bank-based equals one if a country's Structure Aggregate does not exceed the median value for Structure Aggregate of all countries (see Beck and Levine (2002), Fiechter and Novotny-Farkas (2014)). Panel B informs about the distribution of Level 1/2/3 net fair values (FVA-FVL) relative to total assets as well as per share by bank-based and market-based countries. Significance in mean values based on a two-tailed Wilcoxon-Mann-Whitney test at the 10%, 5%, and 1% levels are indicated by \*, \*\* and \*\*\*.

**Panel A: Institutional Features**

Country	N	Market capitalization of listed companies (% of GDP)	Value of stocks traded (% of GDP)	Domestic credit to private sector by banks (% of GDP)	Structure Aggregate	Bank-Based
Austria	24	23.63	11.11	108.84	-1.78	1
Belgium	12	63.83	23.44	81.37	0.60	0
Bulgaria	6	12.29	1.96	40.62	-1.76	1
Cyprus	11	44.23	17.53	186.16	-1.70	1
Czech Republic	3	23.77	12.64	47.55	-0.07	1
Denmark	10	58.62	43.60	136.47	-0.17	1
Finland	3	106.53	98.71	69.65	2.45	0
France	20	74.04	65.47	94.81	1.10	0
Germany	32	44.88	53.60	111.51	-0.02	1
Greece	25	52.24	31.48	68.26	0.84	0
Hungary	3	23.36	18.26	44.15	0.27	0
Ireland	6	54.10	25.20	140.46	-0.66	1
Italy	73	37.59	43.00	84.29	0.16	0
Lithuania	6	15.71	1.85	32.86	-1.04	1
Luxembourg	6	164.99	2.03	135.53	-0.54	1
The Netherlands	9	103.91	121.66	154.09	0.98	0
Poland	39	22.15	9.12	32.40	0.39	0
Portugal	9	37.94	24.51	133.70	-1.06	1
Romania	6	10.78	1.45	20.69	-0.80	1
Slovenia	6	19.63	2.65	53.26	-1.47	1
Spain	21	75.55	117.66	134.11	0.80	0
Sweden	13	104.83	107.34	88.21	2.01	0
United Kingdom	77	136.30	137.01	150.95	1.46	0

**Panel B: Fair Value Assets and Liabilities by Bank-based and Market-based Economies**

Variable	Bank-based			Market-Based			Total		
	N	Mean	Std.dev.	N	Mean	Std.dev.	N	Mean	Std.dev.
netFVA1/TA	125	7.59%	9.08%	295	13.52%**	18.97%	420	11.75%	16.86%
netFVA2/TA	125	3.45%	9.48%	295	3.23%	7.05%	420	3.30%	7.84%
netFVA3/TA	125	1.22%	3.93%	295	2.93%*	11.83%	420	2.42%	10.17%
netFVA/TA	125	12.25%	13.15%	295	19.68%**	24.20%	420	17.47%	21.76%
netFVA1/shares	125	65.432	174.156	295	26.792**	88.859	420	38.292	121.775
netFVA2/shares	125	28.980	69.134	295	-1.692	53.796	420	7.436	60.351
netFVA3/shares	125	3.044	8.281	295	1.607	10.045	420	2.035	9.567
netFVA/shares	125	97.456	220.394	295	26.707*	56.453	420	47.763	132.891

**TABLE 4: Regression Results – Level 3 Fair Value**

This table presents the pooled regression results of examining the effect of changes in fair value disclosures on price changes. Standard errors are robust and clustered by firms following Petersen (2009). Significance (two-tailed) at the 10%, 5%, and 1% levels are indicated by \*, \*\* and \*\*\*. The dependent variable is the change in share price three months after the fiscal year-end.  $\Delta FVA$ ,  $\Delta FVL$  and  $\Delta netFVA$  are the changes in fair value assets, fair value liabilities and net fair value assets per share. The numbers 1, 2 and 3 indicate the fair values' measurement Level 1, 2 or 3.  $\Delta NETBE$  is the change in book value of equity per share less net fair value assets per share.  $\Delta INC$  is the change in net income available for common shares. Models (1) and (2) are based on 270 firm-change observations of 146 European banks. Model (3) focuses on changes in Level 3 fair values disaggregated in the categories held-for-trading (HfT), derivatives (D), and fair value option (FVO) and available-for-sale (AfS). This information was available for 231 firm-change observations of 125 European banks.

Independent Variables	(1)			(2)			(3)		
	netFVA3			FVA3 and FVL3			netFVA3 by Category		
	Coeff.	t-Stat		Coeff.	t-Stat		Coeff.	t-Stat	
$\Delta netFVA1$	0.179	3.583	***	0.180	3.584	***	0.194	4.132	***
$\Delta netFVA2$	0.235	3.515	***	0.233	3.227	***	0.152	3.094	***
$\Delta netFVA3$	-0.070	-0.203							
$\Delta FVA3$				-0.123	-0.228				
$\Delta FVL3$				0.306	0.216				
$\Delta netFVA3\_HfT$							0.653	1.911	*
$\Delta netFVA3\_D$							0.492	0.904	
$\Delta netFVA3\_FVO$							-0.267	-0.232	
$\Delta FVA3\_AfS$							-0.399	-1.271	
$\Delta NETBE$	0.093	2.053	**	0.092	2.053	**	0.093	2.072	**
$\Delta INC$	0.056	2.028	**	0.056	2.020	**	0.045	2.053	**
Constant	-2.793	-1.654		-2.804	-1.653		-3.023	-1.622	
<i>Clustered St. Errors</i>	<i>Firm</i>			<i>Firm</i>			<i>Firm</i>		
<i>Country Fixed Effects</i>	YES			YES			YES		
<i>Business Model Fixed Effects</i>	YES			YES			YES		
<i>Year Fixed Effects</i>	YES			YES			YES		
<i>N</i>	270			270			231		
<i>Mean VIF</i>	1.75			1.90			1.76		
<i>Adjusted R<sup>2</sup></i>	0.509			0.507			0.605		

**TABLE 5: Institutional Features and Fair Value Level 3**

This table presents the pooled regression results of examining the effect of institutional features on the value relevance of Level 3 fair values. Standard errors are robust and clustered by firms following Petersen (2009). Significance (two-tailed) at the 10%, 5%, and 1% levels are indicated by \*, \*\* and \*\*\*. The sample includes 270 firm-change observations of 138 European banks for which we obtained information on level disclosures. 231 cases additionally provided sufficient information about the allocation of fair value levels to the categories *held-for-trading* (HfT), *derivatives* (D), *fair value option* (FVO) and *available-for-sale* (AfS). The dependent variable is the change in share price three months after the fiscal year-end.  $\Delta\text{netFVA}$  are the changes in net fair value assets per share. The numbers 1, 2 and 3 indicate the fair values' measurement Level 1, 2 or 3.  $\Delta\text{NETBE}$  is the change in book value of equity per share less net fair value assets per share.  $\Delta\text{INC}$  is the change in net income available for common shares. Bank-based is a dummy-variable that equals 1 (0) if the firms operate in a bank-based (market-based) economy. This classification is based on the activity and size of stock markets in comparison to banks.

Independent Variables	(4)			(5)		
	netFVA3			Net FVA3 Categories		
	Coeff.	t-Stat		Coeff.	t-Stat	
$\Delta\text{netFVA1}$	0.188	4.237	***	0.220	6.043	***
$\Delta\text{netFVA2}$	0.244	4.203	***	0.189	3.069	***
$\Delta\text{netFVA3}$	0.559	0.909				
$\Delta\text{netFVA3\_HfT}$				1.051	3.600	***
$\Delta\text{netFVA3\_D}$				0.954	2.368	**
$\Delta\text{netFVA3\_FVO}$				0.591	0.796	
$\Delta\text{FVA\_AfS}$				-0.044	-0.373	
$\Delta\text{netFVA3}$ *Bank-based	-1.106	-1.214				
$\Delta\text{netFVA3\_HfT}$ *Bank-based				-1.662	-3.440	***
$\Delta\text{netFVA3\_D}$ *Bank-based				1.276	0.955	
$\Delta\text{netFVA3\_FVO}$ *Bank-based				-4.183	-1.112	
$\Delta\text{FVA3\_AfS}$ *Bank-based				-1.333	-2.220	**
Bank-based	-2.178	-1.906	*	-1.535	-2.111	**
$\Delta\text{NETBE}$	0.091	2.201	**	0.082	2.366	**
$\Delta\text{INC}$	0.049	2.063	**	0.032	1.757	*
Constant	-0.243	-0.466		0.120	0.226	
<i>Clustered St. Errors</i>		<i>Firm</i>			<i>Firm</i>	
<i>Country Fixed Effects</i>		<i>No</i>			<i>No</i>	
<i>Business Model Fixed Effects</i>		<i>YES</i>			<i>YES</i>	
<i>Year Fixed Effects</i>		<i>YES</i>			<i>YES</i>	
<i>N</i>		<i>270</i>			<i>231</i>	
<i>Mean VIF</i>		<i>1.73</i>			<i>1.95</i>	
<i>Adjusted R<sup>2</sup></i>		<i>0.482</i>			<i>0.629</i>	

**TABLE 6: Auditor Expertise and Fair Value Level 3**

This table presents the pooled regression results of examining the effect of auditor expertise on the value relevance of Level 3 fair values. Standard errors are robust and clustered by firms following Petersen (2009). Significance (two-tailed) at the 10%, 5%, and 1% levels are indicated by \*, \*\* and \*\*\*. The sample includes 253 firm-change observations of 138 European banks for which we obtained information on level disclosures and on the auditor. 214 cases additionally provided sufficient information about the allocation of fair value levels to the categories *held-for-trading* (HfT), *derivatives* (D), *fair value option* (FVO) and *available-for-sale* (AfS). The dependent variable is the change in share price three months after the fiscal year-end.  $\Delta\text{netFVA}$  are the changes in net fair value assets per share. The numbers 1, 2 and 3 indicate the fair values' measurement Level 1, 2 or 3.  $\Delta\text{NETBE}$  is the change in book value of equity per share less net fair value assets per share.  $\Delta\text{INC}$  is the change in net income available for common shares.

Independent Variables	(6)			(7)		
	netFVA3			Net FVA3 Categories		
	Coeff.	t-Stat		Coeff.	t-Stat	
$\Delta\text{netFVA1}$	0.182	3.772	***	0.217	5.867	***
$\Delta\text{netFVA2}$	0.229	3.746	***	0.134	3.056	***
$\Delta\text{netFVA3}$	-0.205	-0.558				
$\Delta\text{netFVA3\_HfT}$				-0.514	-0.830	
$\Delta\text{netFVA3\_D}$				1.557	1.806	*
$\Delta\text{netFVA3\_FVO}$				-2.271	-1.330	
$\Delta\text{FVA\_AfS}$				-0.355	-1.032	
$\Delta\text{netFVA3*Auditor Expert}$	0.788	0.595				
$\Delta\text{netFVA3\_HfT*Auditor Expert}$				1.903	2.995	***
$\Delta\text{netFVA3\_D*Auditor Expert}$				-0.413	-0.446	
$\Delta\text{netFVA3\_FVO*Auditor Expert}$				3.778	2.034	**
$\Delta\text{FVA3\_AfS*Auditor Expert}$				0.285	0.714	
Auditor Expert	-0.562	-0.636		0.067	0.115	
$\Delta\text{NETBE}$	0.093	2.091	**	0.078	2.193	**
$\Delta\text{INC}$	0.053	2.116	**	0.035	2.076	**
Constant	-2.414	-1.395		-2.753	-1.641	
Clustered St. Errors		Firm			Firm	
Country Fixed Effects		YES			YES	
Business Model Fixed Effects		YES			YES	
Year Fixed Effects		YES			YES	
N		253			214	
Mean VIF		2.09			2.85	
Adjusted R <sup>2</sup>		0.516			0.649	

**TABLE 7: Regression Results – Level 3 Fair Value (price specification)**

This table presents the pooled regression results of examining the effect of levels of fair value disclosures on prices. Standard errors are robust and clustered by firms following Petersen (2009). Significance (two-tailed) at the 10%, 5%, and 1% levels are indicated by \*, \*\* and \*\*\*. The dependent variable is the share price three months after the fiscal year-end. FVA, FVL and netFVA are fair value assets, fair value liabilities and net fair value assets per share. The numbers 1, 2 and 3 indicate the fair values' measurement Level 1, 2 or 3. NETBE is the book value of equity per share less net fair value assets per share. INC is the net income available for common shares. The regression is based on 420 firm observations of 150 European banks.

Independent Variables	(1)			(2)			(3)		
	netFVA3			FVA3 and FVL3			netFVA3 by Category		
	Coeff.	t-Stat		Coeff.	t-Stat		Coeff.	t-Stat	
netFVA1	0.135	5.40	***	0.135	5.06	***	0.129	4.92	***
netFVA2	0.092	2.01	**	0.092	2.01	**	0.068	1.54	
netFVA3	0.578	2.86	***						
FVA3				0.579	2.64	***			
FVL3				-0.574	-1.77	*			
netFVA3_HfT							0.573	0.93	
netFVA3_D							0.499	0.27	
netFVA3_FVO							2.225	1.60	
FVA3_AfS							0.169	0.30	
NETBE	0.056	0.83		0.056	0.70		0.037	0.48	
INC	0.535	2.37	**	0.534	2.32	**	0.542	2.35	***
Constant	17.847	3.13		17.844	3.15	***	19.123	2.83	***
<i>Clustered St. Errors</i>		<i>Firm</i>			<i>Firm</i>			<i>Firm</i>	
<i>Country Fixed Effects</i>		<i>YES</i>			<i>YES</i>			<i>YES</i>	
<i>Business Model Fixed Effects</i>		<i>YES</i>			<i>YES</i>			<i>YES</i>	
<i>Year Fixed Effects</i>		<i>YES</i>			<i>YES</i>			<i>YES</i>	
<i>N</i>		<i>420</i>			<i>420</i>			<i>362</i>	
<i>Mean VIF</i>		<i>2.16</i>			<i>2.25</i>			<i>2.2</i>	
<i>Adjusted R<sup>2</sup></i>		<i>0.745</i>			<i>0.745</i>			<i>0.756</i>	



**TABLE 8: Regression Results based on a Four Month Time Lag**

This table presents the pooled regression results of examining the effect of changes in fair value disclosures on price changes with the dependent variable being the change in share price four months after the fiscal year-end. Standard errors are robust and clustered by firms following Petersen (2009). Significance (two-tailed) at the 10%, 5%, and 1% levels are indicated by \*, \*\* and \*\*\*.  $\Delta\text{netFVA}$  are the changes in net fair value assets per share. The numbers 1, 2 and 3 indicate the fair values' measurement Level 1, 2 or 3.  $\Delta\text{NETBE}$  is the change in book value of equity per share less net fair value assets per share.  $\Delta\text{INC}$  is the change in net income available for common shares. Panel A (B) shows results for netFVA3 (disaggregated by the categories *held-for-trading (HfT)*, *derivatives (D)*, *fair value option (FVO)*, *available-for-sale (Afs)*) and the influence of bank-based economies and auditor expertise.

**Panel A**

Independent Variables	(1) net FVA3			(4) Bank-based			(6) Auditor Expertise		
	Coeff.	t-Stat		Coeff.	t-Stat		Coeff.	t-Stat	
$\Delta\text{netFVA1}$	0.134	2.874	***	0.146	3.804	***	0.136	3.028	***
$\Delta\text{netFVA2}$	0.212	3.357	***	0.229	4.507	***	0.208	3.696	***
$\Delta\text{netFVA3}$	-0.243	-0.649		0.694	0.891		-0.424	-1.305	
$\Delta\text{netFVA3} \times \text{Auditor Expert}$							1.165	0.720	
$\Delta\text{netFVA3} \times \text{Bank-based}$				-1.583	-1.552				
Auditor Expert							-0.579	-0.606	
Bank-based				-2.560	-2.261	**			
$\Delta\text{NETBE}$	0.064	1.469		0.063	1.683	*	0.065	1.519	
$\Delta\text{INC}$	0.066	2.427	**	0.057	2.665	***	0.063	2.530	**
Constant	-2.794	-1.600		0.178	0.319		-2.285	-1.260	
<i>Clustered St. Errors</i>		<i>Firm</i>			<i>Firm</i>			<i>Firm</i>	
<i>Country Fixed Effects</i>		YES			No			YES	
<i>Business Model Fixed Effects</i>		YES			YES			YES	
<i>Year Fixed Effects</i>		YES			YES			YES	
<i>N</i>		270			270			253	
<i>Mean VIF</i>		1.75			1.73			1.80	
<i>Adjusted R<sup>2</sup></i>		0.443			0.422			0.451	

**Panel B**

Independent Variables	(3) net FVA3			(5) Bank-based			(7) Auditor Expertise		
	Coeff.	t-Stat		Coeff.	t-Stat		Coeff.	t-Stat	
$\Delta$ netFVA1	0.156	3.807	***	0.183	6.756	***	0.177	5.680	***
$\Delta$ netFVA2	0.123	2.393	**	0.166	2.623	**	0.1	1.999	**
$\Delta$ netFVA3_HfT	0.611	1.367		1.164	3.670	***	-0.661	-0.833	
$\Delta$ netFVA3_D	-0.261	-0.351		0.835	2.152	**	0.779	0.632	
$\Delta$ netFVA3_FVO	-0.981	-0.715		-0.240	-0.286		-1.992	-1.120	
$\Delta$ FVA_AfS	-0.544	-1.562		-0.073	-0.635		-0.511	-1.624	
$\Delta$ netFVA3_HfT *Auditor Expert							2.129	2.670	***
$\Delta$ netFVA3_D *Auditor Expert							0.027	0.022	
$\Delta$ netFVA3_FVO *Auditor Expert							2.583	1.407	
$\Delta$ FVA_AfS *Auditor Expert							0.385	1.044	
$\Delta$ netFVA3_HfT *Bank-based				-2.028	-3.741	***			
$\Delta$ netFVA3_D *Bank-based				0.649	0.491				
$\Delta$ netFVA3_FVO *Bank-based				-3.938	-1.161				
$\Delta$ FVA_AfS *Bank-based				-1.584	-2.005	**			
Auditor Expert							0.25	0.433	
Bank-based				-2.054	-2.566	**			
$\Delta$ NETBE	0.057	1.494		0.050	1.875	*	0.044	1.459	
$\Delta$ INC	0.049	2.790	***	0.035	2.734	***	0.04	2.921	***
Constant	-3.045	-1.640		0.508	0.913		-2.792	-1.600	
Clustered St. Errors		Firm			Firm			Firm	
Country Fixed Effects		YES			No			YES	
Business Model Fixed Effects		YES			YES			YES	
Year Fixed Effects		YES			YES			YES	
N		231			231			214	
Mean VIF		1.76			1.93			2.85	
Adjusted R <sup>2</sup>		0.560			0.589			0.602	