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Literature Review on the Effect of Implementation of IFRS 13 Fair Value Measurement

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Purpose of this Paper

1. This paper presents an overview of the academic fair value literature relevant to the Post-Implementation Review—*IFRS 13 Fair Value Measurement*. The objective of this paper is to:
 - (a) provide a review of the relevant academic studies that assist in answering the questions in the International Accounting Standards Board's (IASB) Request for Information¹ (RFI), in particular questions 2, 4, 5, 6 and 7 (ie fair value measurement disclosures, application of highest and best use for non-financial assets, applying judgments required for fair value measurements, effects and convergence); and
 - (b) ask if the IASB has any questions about the academic literature presented in this paper.

Structure of the Paper

2. The paper contains the following sections:
 - (a) background to the literature review;
 - (b) fair value measurement under US GAAP;
 - (c) fair value measurement disclosure under IFRS 13;
 - (d) relevance of fair value information under IFRS 13;

¹ The RFI can be accessed at: <http://www.ifrs.org/-/media/project/pir-ifrs-13/published-documents/request-for-information-pir-ifrs-13.pdf>

- (e) evidence about auditing fair value;
- (f) fair value for non-financial assets; and
- (g) conclusion.

Background to the Literature Review

3. The RFI identifies the following areas that emerged during phase 1 of the PIR:
 - (a) disclosures about fair value measurements;
 - (b) prioritising Level 1 inputs or the unit of account;
 - (c) application of the concept of the highest and best use when measuring the fair value of non-financial assets;
 - (d) application of judgment in specific areas; and
 - (e) the need for further guidance, such as education material, on measuring the fair value of biological assets and unquoted equity instruments.
4. The literature search revealed that academic studies are mainly focused on topics (a) and (d), and to a smaller extent on topics (c) and (e). Therefore, the academic studies are relevant to parts of Questions 2, 4, 5, and 6. Table 3 in Appendix 2 provides a mapping of the paragraphs from this paper into the Questions of the PIR. The questions are as follows:

Question 2—Fair value measurement disclosures

- (a) How useful do you find the information provided about Level 3 fair value measurements? Please comment on what specific information is useful, and why.
- (b) In your experience of Level 3 fair value measurements:
 - (i) How do aggregation and generic disclosure affect the usefulness of the resulting information? Please provide examples to illustrate your response.

- (ii) Are you aware of any other factors (either within or outside IFRS requirements) affecting the usefulness of the information? Please provide examples to illustrate your response.
- (iii) Do you have suggestions on how to prevent such factors from reducing the usefulness of the information provided?
- (c) Which Level 3 fair value measurement disclosures are the most costly to prepare? Please explain.
- (d) Is there information about fair value measurements that you think would be useful and that IFRS 13 does not require entities to disclose? If yes, please explain what that information is and why you think it would be useful. Please provide any examples of disclosure of such information.

Question 4—Application of the concept of highest and best use for non-financial assets

Please share your experience to help us assess:

- (a) Whether the assessment of an asset's highest and best use is challenging, and why. Please provide examples to illustrate your response.
- (b) Whether the current uses of many assets are different from their highest and best use, and in which specific circumstances the two uses vary.
- (c) Whether, when applying highest and best use to a group of assets and using the residual valuation method, the resulting measurement of individual assets in the group may be counter-intuitive. If so, please explain how this happens, and in which circumstances.
- (d) Whether there is diversity in practice relating to the application of the concept of highest and best use, and when and why this arises.

Question 5—Applying judgments required for fair value measurements

Please share your experience to help us assess the challenges in applying judgments when measuring fair value:

- (a) Is it challenging to assess whether a market for an asset or a liability is active? Why, or why not?
- (b) Is it challenging to assess whether an input is unobservable and significant to the entire measurement? Why, or why not?

Question 6A—Education on measuring biological assets at fair value

Please describe your experience of measuring the fair value of biological assets:

- (a) Are any aspects of the measuring challenging? Why, or why not? Please provide examples to illustrate your response.
- (b) What, if any, additional help would be useful in applying IFRS 13? In which areas?

Question 6B—Education on measuring unquoted equity instruments at fair value
Please describe your experience of measuring the fair value of unquoted equity instruments:

- (a) In 2012, the IFRS Foundation Education Initiative published *Unquoted equity instruments within the scope of IFRS 9 Financial Instruments*. Have you used this education material? If so, how did this material help you to measure the fair value of unquoted equity instruments?
- (b) Do you have questions not covered in *Unquoted equity instruments within the scope of IFRS 9 Financial Instruments*? Do you think that additional help would be useful in applying the requirements? Why, or why not? Please provide examples to illustrate your response.

Question 7—Effects and convergence

- (a) Please share your experience of the overall effect of IFRS 13:
 - (i) What effect did IFRS 13 have on users' ability to assess future cash flows? If you are a user of financial statements, please provide us with examples of how you use information provided by entities about their fair value measurements and any adjustments you make to the measurements.
 - (ii) What effect did IFRS 13 have on comparability of fair value measurements between different reporting periods for an individual entity and between different entities for the same reporting period?
 - (iii) What effect did IFRS 13 have on compliance costs; specifically, has the application of any area of IFRS 13 caused considerable costs to stakeholders and why?
 - (b) Please comment on how you are affected by the fact that the requirements for fair value measurement in IFRS 13 are converged with US GAAP; and please comment on how important it is to maintain that convergence.
5. Most terms used in this paper, and in academic research in general, carry a meaning that is consistent with the Conceptual Framework. However, in some instances, expressions used in the Conceptual Framework have a different meaning in academic studies. Such relevant terms (relevance, reliability, value relevance, information content, usefulness, and conditional conservatism) are defined in Appendix 1. Key acronyms are defined as they appear in text.

6. Academic research that examines the implementation of accounting standards generally takes three to five years to materialize. This delay is due to the nature and availability of empirical accounting research that relies on real-life data. For example, company data on a standard implemented starting with 2013 is only available half-way through 2014 (ie when the 2013 financial statements are published). Balance sheet and income statement data that is captured in commercial databases is then relatively easy to obtain, but any additional manual collection of data (eg fair value measurement disclosures) requires a significant amount of time and coordination with research-funding agencies. Research designs that require additional years of data (ie to capture the steady state of accounting standard application) further delay the research process. The length of the publication process is another explanation for this delay.
7. Some of the studies reviewed here examine specific countries while others take an international approach by examining companies from several countries. We caution that the interpretation of their results should be made with consideration for differences in culture as well as regulation implementation and enforcement, and that comparing their findings cannot be done in a straightforward manner.
8. Another important caveat is that results of academic studies reflect choices that the authors made (ie sample time period, type of economic entities included in the sample, computation of the variables of interest, statistical model). Differences along these dimensions often impede the comparisons between studies and the aggregation of empirical results into overall effects for generalization purposes. Particularly regarding the sample time period, some of the studies presented in this paper straddle the period of the financial crisis.

9. A small set of accounting studies examine the financial liabilities accounted for at Fair Value (FV)² and how changes in own credit risk are reflected in earnings. These studies generally find that deteriorations (improvements) of own credit risk resulting in a FV gain (loss) are confusing and misinterpreted even by sophisticated users. Since the IASB updated IFRS 9 in 2014 to require FV gains and losses resulting from changes in own credit risk be recognized in other comprehensive income, rather than profit or loss, and since this change will go in effect starting with 2018, there is no new research evidence on this topic. Therefore, this paper does not summarize the research studies that particularly examine own credit risk.³
10. The purpose of this paper is to identify and analyse the relevant academic work on the implementation of IFRS 13 *Fair Value Measurement*. From that perspective, we adopt a broad and comprehensive view to select the studies for review, not restricting to particular methodologies and approaches. However, the final sample of studies reviewed does reflect choices as to the appropriateness, relevance, and rigour of empirical tests. Most of the studies included are published, but some recent unpublished manuscripts are also included to overcome the limitation caused by data availability and the time elapsed between submission to an academic journal and publication (ie on average 2 to 4 years).
11. In order to identify the set of relevant studies for review, we conduct several large searches on *Google Scholar*, *ProQuest*, *ScienceDirect*, and *EBSCO Business Complete*. The

² Consistent with Fair Value being represented by the acronym (FV), Fair Value Measurement is represented by FVM and Fair Value Accounting by FVA.

³ Some of the studies that examine users' perception of gains or losses due to changes in own credit risk are Gaynor, McDaniel, and Yohn (2011) and Lachmann, Stefani, and Wöhrmann (2015). Dong, Doukakis, and Ryan (2016) examine banks' use of discretion in assessing own credit risk for the purpose of smoothing earnings during and since the financial crisis (ie sample period is 2008–2013). Bischof, Daske, and Sextroh (2014) find that, for a sample of 49 banks from 30 countries over the period 2008–2010, most of the conference call questions and references in financial analyst reports pertain to FV reclassifications and FV changes of liabilities resulting from banks' own credit risk. They further find that most analysts exclude banks' own credit risk effects from reported earnings.

keywords used were “IFRS 13” in combination with “fair value measurement”, “fair value”, “fair value disclosure”, “valuation techniques”, “unit of account”, “biological assets”, “highest and best use”, “unquoted equity”, “private equity”.⁴ Unpublished studies were obtained from the *Social Science Research Network (SSRN)*, the most popular repository for unpublished manuscripts and working papers for accounting researchers. The same keywords were used to search for manuscripts made public by their authors in the last two years (ie August 2015 to September 2017). All the literature searches were done in the second half of July and first half of September 2017. We also include a few studies that are not public but were made available to us privately. We drop search results that were professional publications, commentaries or editorials, that use a case study or analytical (ie mathematical models which generally contain assumptions that do not reflect real-world situations), studies with low quality execution of empirical tests or with research findings not relevant to the PIR objectives. Appendix 2 provides further details on the studies reviewed.

12. Two relatively recent literature reviews provide a summary and overview of the US-based evidence on FV. The monograph by Hodder, Hopkins, and Schipper (2014) provides an exhaustive discussion of the evolution of FV and FV as a measurement base built around a theoretical framework consistent with the Conceptual Framework of the FASB and IASB. For example, the monograph covers in detail aspects related to relevance, reliability, decision usefulness, and verifiability of FV estimates. The review by Marra (2016) covers some recent papers and is built around for-and-against arguments on FVM, with a

⁴ Since countries such as Hong Kong and Australia change the abbreviation of the IFRS standards when adopting them into national regulations, we also conducted searches using “HKFRS 13” and “AASB 13” instead of “IFRS 13”.

particular focus on management discretion and information content of FVM. Since both these literature reviews already cover studies based on US evidence, this paper focuses mostly on international-based evidence, after discussing the context and findings of recent US-based studies.

13. The implementation of SFAS 157 (later reclassified as ASC Topic 820) in the US provides a useful background to the PIR of IFRS 13, albeit with two important caveats.

(a) Prior to SFAS 157, users of financial statements only knew the extent to which fair value accounting (FVA) was used as a measurement basis for assets and liabilities, but not the measurement model, ie market prices, market inputs or mark-to-model. The enactment of SFAS 157 led to the revelation of the measurement model used for all assets and liabilities reported at fair value (FV), otherwise known as the FV hierarchy (Levels 1, 2 and 3), with total estimated values and their composition being reported for each level. In contrast, IFRS 13 did not lead to such revelation: the FV hierarchy was already prescribed and its disclosure required by IFRS 7.⁵

(b) By the time IFRS 13 was implemented, SFAS 157 had been in force for several years. Hence, many of the implementation challenges embedded in IFRS 13 had already been dealt with by SFAS 157 adopters and their auditors, thus providing IFRS 13 adopters with useful information to smooth the way for implementation.

14. Therefore, while useful, the SFAS 157 implementation experience needs to be viewed with caution for the purpose of IFRS 13 PIR. Accordingly, the next section presents the

⁵ For instance, the Royal Bank of Canada (Canada's largest bank) and HSBC (one of the world's largest banks), both provided hierarchy disclosures prior to the implementation of IFRS 13, with HSBC actually mentioning that it did not expect the adoption of IFRS 13 to lead to significant changes in its financial statements. The FV hierarchy was required by IFRS 7 starting in 2009. The core of hierarchy disclosure requirements contained in IFRS 7 were moved over to IFRS 13 upon its adoption.

evidence that relates to the period surrounding the advent of SFAS 157 separately. Other U.S.-based studies resulting from ASC 820 are reviewed in later sections, alongside IFRS 13 studies, when the findings provide insights into FVM disclosure under conditions of steady state implementation and convergence to IFRS 13.⁶

Fair Value Measurement (FVM) under US GAAP

15. SFAS 157 *Fair Value Measurements* defines FV as “the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date”. SFAS 157 categorizes assets and liabilities that are measured on a FV basis into three levels that are distinct from one another on the basis of the inputs and methodologies used to assess fair value.
16. The implementation of SFAS 157 for fiscal years beginning after 15 November 2007, constituted a major event, especially for firms with sizable assets and liabilities measured at FV, as it allowed users of financial statements to pierce through FV numbers into their underlying measurement methodologies. In fact, most FV estimates for assets and liabilities are not market prices. Looking at the evidence arising from SFAS 157 initial disclosure of hierarchy levels by a sample of Fortune 500 firms, Bhamornsiri, Guinn, and Schroeder (2010) note that the majority (70%) of FV estimates rely on market inputs (Level 2), with market prices (Level 1) representing 23.5% of FV estimates and model-

⁶ The FASB updated ASC 820 in 2011 as a result of the convergence efforts between IFRS and US GAAP. The Accounting Standards Update 2011-04 is available at:

http://fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176158542829&acceptedDisclaimer=true. Both IFRS 13 and ASC 820 require the disclosure of the valuation techniques used to estimate Level 2 and Level 3 FV, and quantitative disclosures regarding the significant unobservable inputs used to estimate Level 3 FV. The standards differ however in the requirements related to the disclosure of FV sensitivity to changes in unobservable inputs. IFRS 13 requires a qualitative analysis of the sensitivity of Level 3 estimates to changes in unobservable inputs, as well as a quantitative analysis of the possible alternate Level 3 estimates, if changes to valuation inputs were to occur. ASC 820 only requires the qualitative analysis (ie description).

based estimates (Level 3), only 6.5% of FV estimates. A similar picture emerges for liabilities, with Level 2 estimates representing 82.7% of liabilities reported at FV.

17. To date, four main issues have attracted attention from academic researchers that examine the US setting:
 - (a) the value relevance of reported numbers for FV levels, including their reliability
 - (b) the information content of such numbers, especially in terms of predictive ability, and
 - (c) the securities and markets underlying FV estimates, and
 - (d) managerial discretion related to FV measurement and disclosure.

Value Relevance: Evidence and Challenges

18. Overall, academic studies concur that assets and liabilities measured at FV are viewed as value relevant by market participants (Magnan, 2009 provides a review of this aspect).
19. With respect to the additional transparency provided by the disclosure of the FV hierarchy (ie measurement methodologies underlying the valuation of different assets and liabilities), Song, Thomas, and Yi (2010) examine a sample of 431 US banks in the first quarters after SFAS 157 adoption and provide evidence that such disclosure is deemed useful. However, they find that investors assign different valuation coefficients depending upon the hierarchy level being used. For instance, stock market investors heavily discount assets measured at Level 3 relative to assets measured at Levels 1 or 2.⁷ The verifiability of Levels 2 and 3 FV assets and liabilities, which rely on managerial assumptions, is an area

⁷ Song, Thomas, and Yi (2010) also find higher value relevance of Level 3 FV assets and liabilities for banks with stronger corporate governance. Six variables make up the overall corporate governance score: proportion of independent board members, proportion of audit committee members with financial expertise, frequency of annual audit committee meetings, percentage of institutional investor ownership, size of audit engagement office, no material weaknesses problem under Sarbanes-Oxley Act 302 or 404.

of concern which undermines their value relevance. In this regard, Kolev (2008) even refers to Level 3 FV assets and liabilities as being “marked-to-myth”. The ability to shift assets between levels, especially from Levels 1 and 2 into the Level 3 category, is also pointed out as potentially undermining the relevance of FVA information (Milbradt, 2012).

20. Focusing on a sample of US banks in 2008–2009, Du, Li, and Xu (2014) examine asset transfers between Levels 1, 2, and 3, and how they affect the value relevance of FV estimates. According to SFAS 157 (and similarly IFRS 13), when markets are inactive and transactions are not orderly, companies should weigh less or not use quoted market prices in estimating FV and use more unobservable inputs. When significant unobservable market inputs are used for FVM, assets and liabilities classes should be transferred from the Level 1 and Level 2 categories into the Level 3 category. Du et al. (2014) document a significant increase in the value relevance of FVM for banks that transfer assets out of the Level 3 category. These results underscore the dynamics of market conditions in affecting FV estimates and value relevance.
21. By contrast, Lawrence, Siriviriyakul, and Sloan (2016) examine a sample of US closed-end investment funds ($n = 3,146$ fund-year observations) with significant proportions of level 3 FV assets in total assets, and note that Level 3 FV are more informative about securities' future cash flows and more predictive of future stock returns than Level 1 and Level 2 FV. Their results suggest that the stock market discounts found by Song et al. (2010) with respect to level 3 FV, which reflect investors' concerns about the reliability of FV estimates, may be unwarranted or excessive and likely due to the choice of entities (ie banks) comprising the sample. Moreover, while investments at FV logically represent most of the stock market value of closed-end investment funds, inferences about the value

relevance of investment securities held by banks is indirect and rely on several statistical and model assumptions which may or may not be valid.

22. Freeman, Wells, and Wyatt (2017) use a sample of US banks from 2008–2014 ($n = 5,672$ firm-quarters) and find that all levels of FV assets are value relevant. Additionally, Level 1 assets are significantly more value-relevant than Level 3 assets and there is no statistical distinction between the value relevance of Level 2 and Level 3 FV assets. Restricting the sample to banks not undertaking asset securitizations shows that all levels have similar value relevance.⁸ For banks engaging in securitizations, however, Level 3 FV assets are not value relevant. After restricting its analysis to the post-financial crisis period (2010–2014, $n = 4,005$ firm-quarters), the study finds that all levels have similar value relevance for banks engaged in securitizations, but that Levels 2 and 3 are not value relevant for banks not engaging into securitizations. These results lead the authors to attribute the differential value relevance to not only measurement uncertainty under the FVM model but also to differential asset types in different levels of FV hierarchy. Moreover, the results indicate that the time period under consideration as well as a bank's underlying business model (securitization or not) impact any conclusion about the relevance of reported FV numbers.

Information Content of FV Hierarchy

23. The information content of FV estimates, especially in terms of predictive ability, is another area of research. Overall, while in itself the disclosure of the hierarchy levels

⁸ Securitizers are defined here as the banks undertaking asset securitization in fiscal quarter t . In the US, asset securitizations are accounted for in accordance with SFAS 140 *Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities* (http://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1218220124871&acceptedDisclaimer=true) which was amended in 2009 by SFAS 166 *Accounting for Transfers of Financial Assets – an amendment of FASB Statement No. 140* (http://fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176156241521&acceptedDisclaimer=true).

allows financial analysts to improve their earnings forecasting accuracy, the information underlying each Level may lead to some confusion and further dispersion among analysts' forecasts. Magnan, Menini, and Parbonetti (2015) ($n = 5,963$ bank-quarter observations over the period 1996–2009) show that the revelation of the hierarchy itself accompanying the enactment of SFAS 157, which allows financial analysts to know which proportion of assets and liabilities is measured at Levels 1, 2 or 3, is useful to analysts and helps them make more accurate earnings forecasts. Moreover, within the hierarchy, a higher proportion of Level 2 valuations leads to more accurate analyst earnings forecasts than Level 1 valuations. Magnan, Menini, and Parbonetti (2015) consider that these findings are consistent with the argument that the subjectivity of Level 2 valuations allows management to provide valuations that incorporate their private information into the estimates (consistent with arguments developed by Barth and Clinch, 1998 and Landsman, 2007). However, Magnan, Menini, and Parbonetti (2015) also find that less reliable information (proportion of securities measured at Level 3) translates into greater dispersion in analyst forecasts.

24. The effect that Magnan, Menini, and Parbonetti (2015) find may be caused by the higher degrees of information asymmetry (ie higher bid-ask spreads and betas) found in Level 3 securities, previously noted by Riedl and Serafeim (2011). Riedl and Serafeim (2011) use a sample of US financial institutions ($n = 952$ firm-quarter observations) over the period Q2 2007–Q2 2008 and find that larger amounts of Level 3 FV assets are related to higher equity betas relative to Level 1 or 2 FV assets.
25. Barron, Chung, and Yong (2016) use a sample of financial and non-financial firms that hold significant amounts of Level 3 FV assets ($n = 3,085$ firm-quarter observations over

the period 2005–2010) and find that SFAS 157 adoption is related to lower analyst earnings forecast errors and lower uncertainty in forecasts. However, the study does not find a statistically significant relation between SFAS 157 adoption and forecast dispersion.

26. There is also some evidence on the relation between the FV hierarchy disclosure and aspects related to credit markets. Magnan, Wang, and Shi (2016) focus only on financial institutions ($n = 567$ firm-year observations) over the period 2007–2014 and find that higher use of Level 2 and 3 FVM is associated with higher cost of debt. Ayres (2016) uses a larger sample of both financial and non-financial firms ($n = 8,432$ firm-years) over the same period and finds that higher amounts of Level 3 FV assets are negatively related to a firm's credit rating.
27. For a sample of closed-end funds ($n = 576$) and using only one year of data (ie 2010), Cullinan and Zheng (2014) find that Level 3 FV assets exacerbate the closed-end fund discounts and premiums. Similarly, Huang, Dao, and Fornaro (2016) use a sample of financial institutions ($n = 814$ firm-year observations) over the two-year period of the financial crisis (2008–2009) and find that a higher amount of Level 3 FV is associated with higher cost of capital, while Level 1 and 2 FV is associated with lower cost of capital.
28. Chung, Goh, Ng, and Yong (2017) provide further light on this issue by observing that some firms voluntarily make disclosures about the controls and processes in place to ensure the reliability of FV estimates. They show that firms with more opaque estimates are more likely to provide such voluntary disclosures (ie discussion of the external and independent pricing of FV estimates and proper classification according to the FV hierarchy), which are associated with higher market pricing and lower information risk for Level 3 estimates ($n = 2,265$ firm-year observations over the period 2007–2011). Thus, this

study shows that by providing disclosure that sheds additional light onto the measurement process underlying FV estimates, a firm's management can attenuate investors' apprehensions and the uncertainty surrounding FVM.⁹

29. For a sample of US companies over the period 2011–2014 ($n = 6,232$ firm-years), Hoitash, Hoitash, and Yezegel (2017) find that accounting reporting complexity discourages financial analysts from covering a firm. Specifically, the complex areas are fair values, derivatives and pensions. Using XBRL data, the authors are able to measure the analysts' experience of covering firms with these complex accounts. They further find that analyst's earnings forecasts accuracy increases with an analyst's account-specific expertise. Interestingly, general or industry-specific expertise does not subsume analysts' account-specific expertise. Overall, this study suggests that understanding complex accounts requires specialization and that this type of specialization plays an important role in mitigating the adverse effects of financial reporting complexity.

Attributes of Investment Securities and Markets

30. Prior research examining the securities' FV estimates finds that the type of investment seems to affect the reliability of the estimates. Less liquid securities show lower levels of reliability and tend to have more FV estimation errors than actively traded securities (Barth, Beaver, and Landsman, 2001). While financial firms in general hold both liquid and illiquid assets, there is seldom a full presentation of the portfolio components within

⁹ Badia, Duro, Penalva, and Ryan (2017) offer a complementary perspective to the results in Chung, Goh, Ng, and Yong (2017). They show that firms holding higher proportions of financial instruments measured at Level 2 and 3 FV report more conditionally conservative comprehensive income attributable to FVM, consistent with firms trying to mitigate investors' discounting of FVM. We present this study in the sub-section on managerial discretion in FVM below.

the notes to the financial statements. Therefore, FV levels may be acting as a proxy for other characteristics of these investments such as their degree of liquidity.

31. Lev and Zhou (2009) provide evidence that is consistent with levels reflecting liquidity risk. They find that abnormal returns exhibited by US firms in reaction to 44 key events following the demise of Lehman Brothers in the Fall of 2008 appear conditioned by the liquidity implications of such events. Negative—liquidity shrinking—events engender the most adverse reaction for Level 3 (highest risk) items, followed by Levels 2 and 1 (often no reaction at all). In other words, a firm's abnormal stock return is conditioned by its relative proportion of Levels 3, 2 and 1 assets, with firms holding more Level 3 items suffering a greater loss. In contrast, positive—liquidity expanding (eg TARP program)—events lead to the most positive returns for Level 3, followed by the other two levels.
32. SFAS 157 divides FV estimates into categories that differentiate between observable and unobservable inputs, with the idea that valuations become less reliable as valuation inputs become less transparent. However, in an illiquid market, valuation inputs that are taken from the market are lower than they should be (ie due to market illiquidity), thus jeopardizing the credibility of level 1 and level 2 valuations (Ryan, 2008). Power (2010) claims that in this case, the valuation methodologies used for level 3 become the “engines of markets themselves”, with the ability to value instruments that cannot be sold on the market.
33. Altamuro and Zhang (2013) ($n = 978$ bank-quarters over the period 2008–2011) find results that back this up, showing that for occasionally-traded assets, during a time frame characterized by uncertainty, level 3 FV include management information and better reflect cash flows than level 2 valuations do. Using a larger sample of banks ($n = 6,893$ bank-

quarters) over the same time period, Goh, Li, Ng, & Ow Yong (2015) find that while Level 3 FV assets are typically priced lower than Level 1 or 2, this difference reduces over time after the financial crisis. This suggests that uncertain market conditions contribute to investors' discounting Level 3 FV.

34. Finally, Fortin, Hammami, and Magnan (2017) note that closed-end funds' market valuations ($n = 1,538$ fund-half year observations over the period 2009–2011) are influenced by the specific types of investments held within each FV level (eg equities in Level 2 impact market valuation differently than corporate bonds in Level 2). They also note that investors' ranking of FV levels, in terms of preference, varies with different investment types within each level, and this rank of preference is reflected in market valuations. For instance, the study finds that for safer investments, investors do not differentiate between the three FV levels in terms of assigning a value. However, for riskier assets, such as equities, Level 1 is the most favourable, followed by Level 2 and then by Level 3, with a similar ranking arising in terms of assigned values.
35. Overall, the evidence reported in this section indicates that the information regarding FV assets is assessed differently by investors depending upon the nature of the underlying investments and surrounding market conditions.

Managerial Discretion in Fair Value Measurement

36. The studies presented in this section examine to what extent the numbers reported for Levels 1, 2 and 3 in financial statements are subject to managerial discretion, with its potential implications on the quality of financial reporting. Such discretion may reflect either manager's reporting biases with an intent to deceive or, alternatively, with the

intention to provide more conservative reporting. The findings provide insights as to how the disclosure of the FV hierarchy allows external financial statement users to ascertain the extent of managerial discretion in the measurement of the Levels. Moreover, the evidence these studies provide suggests that the exercise of such managerial discretion has an effect on the quality of financial reporting and on its decision usefulness.

37. Badia, Duro, Penalva, and Ryan (2017) find that high Level 2 and 3 estimates are related to higher conservatism in accounting numbers. Their argument is that since securities measured on the basis of Levels 2 and 3 are not traded in liquid markets, they are more prone to manipulations and management may exercise discretion over these measurements, and therefore investors discount them. Badia et al. (2017) further argue that firms may mitigate this problem by reporting FVM in a more conditionally conservative manner which increases the perceived reliability of these measures. Covering the period 2007–2014 ($n = 27,904$ firm-year observations), the study finds no asymmetric timeliness for Level 1 FVM, denoting unbiased values. There is a positive relation between Levels 2 and 3 FVM and conditional conservatism, denoting firms' predisposition to exercise discretion and record lower-level FV measurements.¹⁰ Results are more pronounced for firms with higher non-transient institutional ownership¹¹, with higher audit quality¹², and in firms that do not narrowly meet or beat earnings thresholds.¹³

¹⁰ The empirical model relies on the popular Basu (1997) approach which regresses earnings on stock returns and allows separate slope coefficients for positive returns (good news) and negative returns (bad news).

¹¹ Non-transient institutional investors are the institutional investors that do not have short investment horizons. The term was coined by Bushee and Noe (2000) and details about the measurement procedure are available on Brian Bushee's website <http://acct.wharton.upenn.edu/faculty/bushee/IIClass.html>.

¹² In this study, a firm is coded as having high audit quality if its auditor is one of the Big 4 firms and the auditor's tenure is above sample median. More generally in accounting research, audit quality is gauged based on whether the firm's auditor is a Big 4 firm.

¹³ Accounting research generally regards meeting or beating analyst earnings forecasts on a systematic basis as a proxy for net earnings manipulation. The assumption is that this phenomenon should be random under a condition of no manipulation.

38. Hsu and Lin (2016) find that Level 3 FVM are related to a greater likelihood to meet or beat earnings forecasts made by financial analysts. The paper only focuses on Level 3 assets which the authors view as more prone to manipulations, ie managers have more flexibility in such measurements and therefore the expectation is for a positive relation between the disclosed amount of Level 3 FVM and the odds of recognizing unrealized gains to meet or beat analyst forecast target. The sample covers the period 2007–2013 (n = 41,690 firm-quarter observations, of which 537 report all three levels of FV). The results show that firms with a larger proportion of Level 3 FVM are more likely to manipulate these measurements in order to meet or beat earnings targets. For Level 1 and 2 FV, this relation is not present, which denotes that more transparent inputs deter manipulation. However, the study reports that these results hold only for firms with weak corporate governance as managers have incentives to manipulate the measurement of Level 3 FV estimates.¹⁴
39. Similarly, Lin, Lin, Fornaro, and Huang (2017) use accounting restatements as a proxy for financial reporting quality. The authors argue that Level 3 FV assets may contain significant measurement errors and may induce managerial manipulation. Hence, they predict a positive association between accounting restatements and Level 3 FV, and this association should be stronger when compared to Levels 1 and 2. The sample covers the period 2008–2010 (n = 10,104 firm-year observations). Results show that there is a higher probability of a restatement in the two consecutive years following the disclosure of Level 3 FVM. This probability of a restatement for Level 3 FV is significantly higher when

¹⁴ In this study, corporate governance is measured with reference to the following: proportion of independent board members, proportion of audit committee members with financial expertise, percentage of shares held by institutional investors, size of audit engagement office, material control weaknesses reported under the Sarbanes-Oxley Act 404. The firms with an overall corporate governance score below sample median are deemed as having weak corporate governance.

compared to Levels 1 and 2 FV assets. The study reports that these findings are driven both by estimation errors and intentional managerial manipulations. Overall, the findings are consistent with the idea that use of less reliable FV impairs financial reporting quality.

40. Tama-Sweet and Zhang (2015) find that for a sample of US financial firms ($n = 1,282$ bank-quarter observations over the period 2008–2009 compared to $n = 1,481$ bank-quarter observations in 2012–2013), net assets measured at Level 1, 2, and 3 FV are all value relevant. However, assets measured at Level 3 for firms with strong corporate governance (as rated by Institutional Shareholders Services) exhibit lower value-relevance than for firms with weak corporate governance.¹⁵ This suggests that the differential value relevance across FV levels cannot solely be attributed to managerial discretion.
41. Different from the studies presented above, Alford, Luchtenberg, and Reddic (2016) focus on a “real” consequence of fair value disclosure, ie portfolio balancing behaviour. Focusing on the Property and Casualty Insurance industry, the study investigates whether increased disclosure requirements about FV (ie Statement of Statutory Accounting Principle (SSAP) No. 100 – *Fair Value Measurements*) influence the relationship between operating and investing income and portfolio rebalancing.¹⁶ The data is collected from the National Association of Insurance Commissioners annual statement database and covers the period 1996–2013 (ie SSAP No 100 is implemented starting with 2010). This study finds that the likelihood of rebalancing towards taxable securities is not influenced

¹⁵ In this study, the corporate governance score relies on four aspects of standard corporate governance mechanisms: board structure, executive compensation, shareholder rights, and audit and risk oversight.

¹⁶ SSAP represent the set of accounting standards prescribed to the property and casualty insurers by US state regulators. In the US, property and casualty insurance is regulated at the state level. SSAP 100 adopted, with modifications, the US GAAP pronouncements related to FV measurement and disclosure (ie SFAS 157 and subsequent amendments). According to the National Association of Insurance Commissioners, “the key modification for statutory accounting with the adoption of GAAP fair value guidance is the rejection of the consideration of non-performance risk in determining the fair value measurement for liabilities” (www.naic.org/documents/committees_e_app_sapwg_exposures_13_06.docx).

unconditionally by the amount of Levels 1, 2, or 3 FV assets. However, insurers with a public stock ownership structure avoid following portfolio rebalancing theory when both operating and investment losses occur and they report Level 3 FV information. These findings suggest that managers of property and casualty insurers assess FV information differently when it comes to their operating and investment losses. Although these results are highly specific to the property and casualty insurance industry, they provide evidence that FVM disclosures may have “real” impact on managers’ behaviour, as reflected in firms’ investment decisions.

42. Similarly, from the point of view of investment managers, Curtis and Raney (2017) examine the speed to which Business Development Companies (BDCs) update the FV of their investments.¹⁷ Their sample comprises mostly BDCs with investments in middle market privately-held companies that must be classified as Level 3 FV. During the period 2009–2014, they find that the longer the FV of an asset is kept flat (ie not updated), the larger the absolute change when the asset is finally updated. Additionally, managers are more likely to delay updating FV estimates when updating implies a decrease in the estimate. In other words, there is a slower incorporation of negative information into reported Level 3 FV. After a decrease in FV estimates, managers take longer to revise the FV of the asset. These results cannot be explained by lack of information about the investments. In a sample where they match investments held by at least two BDCs ($n = 593$), Curtis and Raney (2017) find 32% of cases where one BDC does not update the FV of a particular investment in a specific firm whereas the matched BDC does update (21%

¹⁷ BDC are publicly-traded entities with portfolios of investments (debt and equity) in privately-held companies.

of matched sample) or where the firms update FV estimates in opposite directions (11% of matched sample).

43. Iselin and Nicoletti (2017) examine whether managers of publicly-traded banks change the composition and classification of their investment portfolios after the adoption of SFAS 157. The sample covers the period 2006–2009 ($n = 6,363$ bank-quarter observations). Relative to a control sample of private banks, public banks altered their investment portfolios in a manner that reduced the percentage of holdings in assets measured using Level 3 inputs for which measurement disclosures are required.¹⁸
44. Overall, the evidence shown in this section can be summarized as follows. First, managers use their discretion in the application of FVM. Second, managerial discretion can be used either to compensate for the perceived lack of reliability for Level 2 and 3 assets by providing more conservative estimates or, alternatively, to manipulate reported results to achieve particular goals. Thirdly, in a regulated setting such as property and casualty insurance, discretion in FVM can have real behavioural effects by leading managers to avoid rebalancing their portfolios as it would affect operating and investment incomes.

Summary – Fair value measurement under US GAAP

45. Overall, US-based evidence with respect to FVM under SFAS 157 (ASC Topic 820) indicates that disclosure of such information is deemed useful by market participants (ie investors and financial analysts). However, it also appears that, depending upon their incentives and underlying motivation, managers can take advantage of FVM to either deceive market participants or to convey private information to the market about the value

¹⁸ The study provides carefully-designed falsification tests that enhance the authors' confidence that their main results do not simply capture the effect of the financial crisis.

of underlying securities. In addition, the meaning of estimates across the three FV levels is not always straightforward as it depends on the type of assets or liabilities in each level, which then defines the characteristics of the valuation inputs (eg obtained from illiquid markets), and on managerial incentives.

Fair Value Measurement Disclosure under IFRS 13

46. This section reviews studies that focus on the disclosure aspects of FVM under IFRS 13, organized by main theme as:

- (a) changes in FVM disclosure,
- (b) capital markets effects of FVM disclosure,
- (c) impact on individuals (experimental evidence).

Changes in Fair Value Disclosure upon IFRS 13 Implementation

47. A few studies examine the amount of disclosure upon IFRS 13 implementation in the context of real estate firms in the European Union (Busso, 2014; Feldmann, 2017; Sundgren, Maki, & Somoza-lopez, 2016). These papers find an increase in the level of disclosure related to FV after IFRS 13 implementation compared to disclosure prepared under IAS 40. These papers, however, examine the time period immediately after IFRS 13 implementation (2013–2014). Since disclosure is subject to a learning curve effect and since it takes time for enforcement agencies to exert their influence, these results should be interpreted in relation to more up-to-date reports from practitioners, auditors, and regulators.

48. Busso (2014) examines the first year of IFRS 13 implementation and includes listed real estate firms from Italy, Germany and France. Nine (16%) of the 58 firms included in the sample that report under IFRS 13 for the year 2013 do not disclose the fair value hierarchy. All companies describe the valuation techniques used for Level 2 or Level 3 fair value. Of the 47 firms that use the Level 3 category, 43 (91%) disclose that they use an average of many inputs or many inputs differentiated per category of investment property to estimate Level 3 valuations, and 33 (70%) provide quantitative information about sensitivity analyses when fair value measurement is categorized within Level 3.
49. Similarly, Sundgren, Maki, and Somoza-lopez (2016) and Feldmann (2017) find that after IFRS 13 implementation (2013–2014), real estate firms in the EU provide significantly more items as disclosure for Level 3 FVM compared to the period prior to IFRS 13 implementation. These two studies use disclosure indices to assess the quality and quantity of disclosure. Specifically, Sundgren, Maki, and Somoza-lopez (2016) use a sample of real estate firms from 11 European Union countries reporting under IFRS 13 ($n = 85$ firm-years). **Of these, 46 (54%) provide more disclosure under IFRS 13 than under IAS 40.** The authors use a disclosure index that captures the key assumptions applied in discounted cash flow calculations and the sensitivity of fair value estimates to changes in unobservable input variables (eg discount rate used in present value calculations of fair values of investment properties; expected vacancy rate; expected revenues and operating costs included in the present value calculations; quantitative analysis of how sensitive fair values are to changes in assumptions). Feldman (2017) finds that real estate firms in France, the Netherlands, Finland and Belgium provide higher quality FVM disclosures than firms in

Luxembourg, Greece, and Sweden. Feldman (2017) also notes a small decrease in disclosure quality in 2014 compared to 2013.

50. Overall, based upon the above evidence, it appears that the advent of IFRS 13 had a marginal impact on the quality and quantity of FVM disclosure provided by EU real estate firms. Many firms do not appear to modify their disclosure practices post-IFRS 13. Moreover, the revelation of the magnitude of Level 3 estimates, without sufficient additional information about their derivation, has the potential to undermine confidence in financial reporting. Finally, the quality and quantity of FVM disclosure is dependent upon a firm's institutional environment (laws, regulations, enforcement).

Capital Market Effects of Level 3 Fair Value Measurement Disclosure

51. Due to restrictions imposed by data availability, only a few studies so far investigate how capital markets and capital market participants react to Level 3 FVM disclosure under IFRS 13 or the converged ASC 820. In the context of European real estate firms over the period 2013–2014, Feldman (2017) does not find a significant relation between how real estate firms disclose FVM after IFRS 13 adoption and their market capitalization.
52. In the context of US closed-end investment funds¹⁹ with Level 3 FV assets over the period 2010–2014 before and after the convergence between ASC 820 and IFRS 13 (n = 1,615), Hammami and Moldovan (2017) find that the stock market decreases its discounting of closed-end funds' market values when funds disclose the significant unobservable inputs and the valuation techniques used to estimate Level 3 FV.²⁰ This result is noted after

¹⁹ We present this study here since the type of disclosure examined is directly relevant to the Level 3 FVM disclosure of unobservable inputs and valuation techniques under IFRS 13.

²⁰ The closed-end fund discount is computed as the proportion of market value per share to net asset value per share (ie fair value of net assets). If the proportion is lower than 1, the fund shares are selling at a discount; if the

disclosure of unobservable inputs and valuation techniques used to estimate Level 3 FV became mandatory in 2012 (through the ASC 820 update). In additional tests, the study finds that the effect comes mainly from funds that disclose Level 3 inputs in a table format.²¹

53. Hammami and Moldovan (2017) also find that stock market liquidity decreases in 2012–2014 compared to 2010–2011 for funds with Level 3 disclosures. Lower stock liquidity indicates disagreements between capital market participants. This result suggests that the Level 3 disclosures may in fact increase information asymmetries between investors.
54. To summarize, the advent of IFRS 13 disclosures does not appear to have modified European real estate firms' stock market valuation. In the US, additional disclosures about Level 3 FV estimates is related to a stock market valuation closer to fundamentals (ie a lower discount), but the additional disclosure is also related to reduced stock liquidity for funds with extensive Level 3 holdings, suggesting increased disagreement among market participants. This result is consistent with prior findings in Magnan, Menini, and Parbonetti (2015) that, after SFAS 157 implementation, disclosure of Level 3 in the FV hierarchy translates into greater dispersion in analysts' earnings forecasts for US banks.

Individual Reactions to Fair Value Disclosure: Experimental Evidence

55. The studies reviewed in this section rely on an experimental methodology (ie they draw inferences from individual participants' actions and reactions to a simulated task or

proportion is higher than 1, the fund shares are selling at a premium (ie above net asset value). The fact that most closed-end funds sell at a discount constitutes a long-standing puzzle in the finance and accounting literatures.

²¹ Prior research shows that presenting information in a visually-friendly form (ie graphs and tables) allows investors to understand and incorporate the information in their decision-making faster (Muiño & Trombetta, 2009).

stimulus). Hence, experimental evidence is not based on real world phenomena but on highly simplified settings in terms of, for example, the number of decision alternatives, participants' incentives etc. Therefore, inferences to actual business world phenomena are tentative at best.

56. Cannon (2015) compares the efficiency of FV sensitivity disclosures at conveying the risk attached to Level 3 FVM. The results of an experiment with 69 MBA students that have an average of 3 years of work experience show a decrease in investors' perceptions of risk in FV estimates when the quantitative sensitivity disclosures required by IFRS 13 are present. This is also true when companies' management is considered to be aggressive, thereby showcasing an increase in investor confidence due to detailed qualitative and quantitative sensitivity disclosures as required in IFRS 13.²²
57. In an experiment with business school undergraduate students ($n = 96$), Majors (2016) investigates how managerial reporting and investor behaviour are influenced by range disclosures for uncertain estimates. The results show that when range disclosures are required, managers are less aggressive in their reporting due to the expectation that range disclosures will allow financial statement users to uncover aggressiveness.²³ Majors (2016) also notes that if managerial aggressive behaviour is lacking, investors no longer need to take actions against managers to offset aggressive reporting.
58. Lachmann and Herrmann (2017) investigate why some disclosures of FV estimates are not incorporated into nonprofessional investors' investment decisions. Participants are 137 career starters attending a Big 4 accounting firm's training session in Germany. The study

²² Cannon (2015) infers management aggressiveness from management choosing input values more aggressive than the disclosed industry average.

²³ Majors (2016) computes reporting aggressiveness as the value the manager reports less the lower bound of the reasonable range, divided by the width of the reasonable range of the uncertain estimate.

finds that, on average, FV estimates are perceived as reliable, and that reliability is positively correlated with the perception of decision usefulness. The study then finds that information acquisition does not vary with the presentation format for FV estimates (ie point, range value, change value, qualitative information) when FV gains occur. However, when FV losses occur, FV estimates disclosed as range or qualitative information are correlated with a higher level of information acquisition, and decreased perceived reliability and decision usefulness. Disclosure of FV estimates as points does not have the same effect. These results indicate that non-professional investors become aware of the uncertainty in FV estimates only when the disclosure format indicates the presence of uncertainty and the development of the FV assets is negative (ie FV loss).

59. However, Du, McEnroe, and Stevens (2014) argue that due to the subjectivity and uncertainty in FV estimates, less precise FV estimates may not necessarily be viewed as less reliable. Their experiments show that participants ($n = 114$ MBA students) perceive a point FV estimate with a specified confidence level to be more reliable than a precise point estimate. Their results suggest that investors need not necessarily find FV estimates unreliable.
60. Jana and Schmidt (2017) asked 202 Master students enrolled in financial and managerial accounting courses and 20 auditors (average audit experience of 7.5 years and 5.8 years of experience with FV) to rank for decision usefulness five different techniques to calculate the risk premium for a corporate bond when determining a model-based FV. The five techniques exhibit different combinations of relevance and reliability in such a way that an increase in one characteristic is related to a decrease in the other characteristic. Overall results show that both master student participants and professional accountants prefer

relevance over reliability. Further tests find that the individual's uncertainty avoidance preference or their familiarity with FV does not impact the preference of relevance over reliability.

61. Lim, Ng, Pan, and Yong (2017) conduct a survey of accounting professionals in 2016. Survey respondents are members of the Institute of Singapore Chartered Accountants (ISCA) and the Institute of Valuers and Appraisers of Singapore (IVAS). A total of 704 accounting professionals responded, most of them with a work experience of over 5 years. While the respondents indicate a high level of confidence in financial statements, "they believe fair value accounting has the potential to decrease their trust in financial reporting." Specifically, respondents express "a high level of distrust about Level 3 fair value estimates." Some of the additional results indicate that "more discussion of the derivation of fair value estimates" enhance the credibility of fair value accounting with accounting professionals.
62. The studies reviewed in this section test managerial and investor behaviour and reactions to representations of FV disclosures required by IFRS 13. In general, experimental findings show that the Level 3 FVM disclosures are beneficial as they restrain managers' propensity to engage in aggressive reporting, provide investors with added assurance that reduces their perception of risk in FV estimates and increases investors' confidence as they are better able to judge and process managerial estimates. However, some studies also find that non-professional investors' reliance on FV estimate disclosures is inconsistent (ie depends on the gain or loss associated with the FV assets). The studies report that there are benefits from requiring range disclosures for uncertain FV estimates as well as quantitative and qualitative sensitivity disclosures for Level 3 FV.

Relevance of Fair Value Information under IFRS

63. Value relevance is a key area of academic research in accounting as it reveals if financial reporting captures information or economic phenomena that are relevant to stock market investors. These studies generally document that Level 1 and Level 2 assets are value relevant whereas the value relevance of Level 3 seems contextual. However, the studies differ in terms of the root cause for differential value relevance findings, a major difference being the sample firms' institutional environment (ie laws and regulations, enforcement) and governance.
64. Siekkinen (2016) investigates the value relevance of FV estimates from financial firms based in 34 countries over the period 2012–2014 ($n = 985$ firm-year observations corresponding to 355 unique financial firms). The study shows that, irrespective of the level, FV assets and FV liabilities are value relevant. Level 1 FV assets are more relevant than Level 2 or Level 3 FV assets. Level 1 and 2 FV liabilities (ie together) are more value-relevant than Level 3 FV liabilities. Irrespective of level, FV assets and liabilities are value relevant in countries with a strong or medium investor protection environment.²⁴ However, for firms in countries with a weak investor protection environment, only assets measured and reported at market prices (level 1) are value relevant to investors. The study attributes the differential value relevance to investors distrusting FV estimates for Levels 2 and 3 made by managers in weak investor protection environments. The argument is that

²⁴ Investor protection is measured by reference to the following aspects: board independence, enforcement of securities laws, protection of minority shareholders' interest, enforcement of accounting and auditing standards, independence of the justice system, freedom of press (Houqe, van Zijl, Dunstan, and Karim, 2012). Australia, Belgium, Canada, Germany, UK are examples of countries with strong investor protection environment. Bahrain, Brazil, France, Jordan are examples of countries with medium investor protection environment. Ghana, Greece, Hungary, Slovakia, South Korea, Turkey are examples of countries with weak investor protection environment, as defined in Siekkinen (2016).

investors assume that managers take advantage of their discretion in arriving at FV estimates as the level of regulatory monitoring and enforcement is low. Interestingly, Level 2 FV estimates are more value relevant within a strong investor protection environment than either Level 1 or Level 3, a finding that is consistent with prior observations that managers can use their discretion to convey useful information to market participants (Landsman, 2007; Magnan et al., 2015).

65. In a similar vein, Siekkinen (2017) shows for a sample of financial firms from 29 European Economic Area countries that in the first year of IFRS 13 adoption ($n = 293$ financial institutions) all levels of FV assets and liabilities are value relevant, and there is no distinction between the value relevance of the levels. In the prior year, however, ($n = 288$ financial institutions), Level 3 FV assets are less value relevant than Level 1 or 2 FV assets. After IFRS 13 adoption, Level 3 assets of firms with strong corporate governance exhibit higher value-relevance than for firms with weak corporate governance.²⁵ To the extent that strong corporate governance provides a better and more efficient monitoring of managers and limits managerial opportunism, Siekkinen's (2017) findings also underscore managerial discretion as a root cause for the relatively low value relevance of Level 3 FV.
66. Relying on an international sample of banks that use IFRS, Fiechter and Novotny-Farkas (2017) find that, while FVA information is value relevant, its stock market pricing properties differ across firm-specific and institutional factors. The study compares the value-relevance of different types of financial assets measured at FV, Fair Value Option (FVO), Held for Trading (HFT) and Available for Sale (AFS), and financial liabilities (FVO and HFT) across 46 countries during the period 2006–2009 ($n = 907$ bank-years).

²⁵ Strong corporate governance is defined in terms of a more independent, more diversified, and larger board of directors.

All three types of fair value assets (FVO, HFT, AFS) are value-relevant, of which HFT have the highest value-relevance. Both types of fair value liabilities (FVO, HFT) are value-relevant. They find that (1) FVO assets are generally less value relevant than HFT and AFS assets, and (2) this differential value relevance is particularly pronounced in bank-based economies.²⁶ They attribute the finding to institutional frictions that investors' use of and experience with FV assuming that investors' ability and comfort in using FV information are lower in bank-based economies. In addition, during the financial crisis, assets measured at FV exhibit a substantial discount. Thus, they conclude that the general reliability of FV is still an open question.

67. One concern is that although FVM under IFRS 13 can produce more value-relevant numbers, investors may perceive these numbers to be unreliable; this concern is paramount in jurisdictions where financial markets are less developed to support Levels 1 and 2. Wang, Song, and Zhang (2017) examine market reactions to the announcement of CAS 39, an IFRS 13-converged standard in China. They find that, overall, the market has significantly positive reactions to the draft version exposure (on 17 May 2012), official announcement (26 January 2014), and enforcement of CAS 39 (1 July 2014). However, for financial institutions, market reactions on these dates are significantly negative ($n =$ between 2101 and 2267, depending on the date for non-financial industries and between 41 and 45 for firms in the financial industry). They conclude that the results reflect investors' concerns about the precision of FVM in the less-developed Chinese financial markets.
68. Overall, the studies reviewed suggest that the value relevance of FV estimates is conditioned not only by the uncertainty embedded in FVM, but also by market conditions,

²⁶ Countries are classified into bank-based economies (eg China) and market-based economies (eg the UK) based on the development of their stock market.

managerial intent with respect to underlying assets, managerial discretions and the institutional environment. Hence, while the FV hierarchy explicitly assumes an ordering of FV items in terms of potential relevance and faithful representation, empirical evidence suggests that such ordering is not necessarily generalizable to all institutional contexts and markets. These studies also indicate that market participants' sophistication and ability to discern information underneath FV estimates play a role in their value relevance.

Other Aspects Addressing Post-Implementation Review Questions

Fair Value Measurement for Non-financial Assets: Highest-and-best Use and Market Participants

69. There is only scant research on the application of the concept of highest-and-best use. Feldmann (2017) surveys 93 managers of European real estate companies and finds that there is a wide range of weight placed on this concept when estimating FV. Based on a content analysis of annual and interim reports of 64 real estate firms, Feldmann (2017) also finds that only about 50% of firms comment on the role highest-and-best use played in estimating FV.
70. Barker and Schulte (2017) examine FVM of non-financial assets through a field case study relying on interviews with managers in eleven large European firms. They report that companies rely solely on Level 3 estimations for non-financial assets due to the lack of active markets and comparable non-financial assets. Interviewees reveal that Level 3 estimates include the preparers' own perspective, which is inconsistent with the IFRS 13 goal of delivering valuations that represent market participants' perspectives. Interviewees also point out that firms implement IFRS 13 by choosing to use one or more of the

following techniques: (1) finding a suitable result by strategically adapting IFRS 13 requirements; (2) narrowing the problem to make it manageable, which some firms achieved by supplying auditors with limited information in order to reduce any disagreements on this topic; (3) outsourcing the problem by relying on external valuations.

Fair Value Measurement of Private Equity

71. Palea and Maino (2013) raise a number of issues with the application of IFRS 13 valuation techniques to measure the FV of private equity. They argue that the FV definition of an exit price does not suit private entities, which are usually held with a strategic intent, with no expectation of capital gains. Market-based FVM fails to consider the financial instrument liquidity and investors' horizons which are critical to private equity valuation. Using a field test, the authors point out that estimation errors related to valuation techniques bear significant economic consequences.²⁷ Their field test replicates the best practices followed by practitioners in private equity valuation on a portfolio of European non-financial listed companies ($n = 20$ firms) that operate in investment-intensive or cyclical industries (ie chemicals, energy, aerospace and defence, technology, automobiles, telecom, healthcare and natural resources). Assuming these companies are private, the authors evaluate them according to IFRS 13 over the period 2006–2010. Using Level 2 FV, the study finds that market multiples are more than double actual market capitalization and that market multiples and transaction values are, on average, more than four times the book value.

²⁷ This issue is discussed in the US context above. In addition, Palea and Maino (2013) refer to Enria et al. (2004), a European Central Bank White Paper that points out that volatility in financial reporting causes procyclical effects on capital requirements and real economy financing, and through this mechanism affects financial stability.

Biological Assets and Other Non-Financial Assets²⁸

72. Bocart and Hafner (2015) examine the fair valuation of wine by French funds specialized in wine ($n = 12$). The study argues that wine is particular in the sense that it does not fall under IAS 41 since it is a processed product and that the concept of highest and best use or most advantageous market do not really apply (ie there is only one use for wine—consumption—that destroys its value and there is no central or principal market for wine). Nevertheless, all wine investment funds value wine at fair value. However, the study finds that FV estimation for wine does not entirely follow IFRS 13 and the FVM disclosure is often incomplete. We note that the study examines wine funds from a concentrated geographical area (Bordeaux, France) in the first year of IFRS 13 adoption.
73. Goncalves and Lopes (2015) examine the value relevance of biological assets ($n = 389$ firm-year observations corresponding to 132 unique firms) from 27 countries over the period 2011–2013. The study finds that the recognized amounts for biological assets are value-relevant, and even more so when the disclosure levels related to how these amounts were measured is high. The authors find the average score for the disclosure index is slightly higher in 2013, the first year of IFRS 13 implementation, than in the previous two years. The study also reports tests based on a split sample between bearer and consumable biological assets and finds that high disclosure levels are value relevant in the case of bearer, but not for consumable biological assets.²⁹

²⁸ Sellhorn and Stier (2017) review the academic studies examining FVM for non-financial assets and note that since the number of studies on the topic is low and the research settings diverse, these studies do not yet provide a large-enough body of evidence to draw clear conclusions.

²⁹ IAS 41 par. 5 defines bearer plants as living plants that are used in the production or supply of agricultural produce, are expected to bear produce for more than one period, and have a remote likelihood of being sold as agricultural produce, except for incidental scrap sales.

74. Huffman (2016) tests the role that asset use plays for the value-relevance of FVM. The study examines the association between the FV of biological assets and stock market prices, the change in FV and stock returns, and the change in FV of biological assets and future operating cash flows ($n = 115$ firms from 31 countries that adopt IAS 41). Even though the companies do not disclose this directly (since the sample is before 2009), the author codes the biological assets as Level 1, 2 or 3 based on the FV hierarchy for financial assets and takes into account differences in measurement reliability between Level 2 and Level 3 FV. In a sample of companies that adopted IAS 41, the study finds that the FV of biological assets and the associated unrealized gains and losses are more decision-useful when the assets derive value in-exchange (held for sale) compared to the assets that derive value in-use (bearer).
75. Daly and Skaife (2016) examine the effect of IAS 41 on firms' cost of debt. Their sample period covers 2001–2013 and contains 648 firm-year observations (127 unique firms) from 26 countries around the world. The study partitions the sample into bearer and non-bearer biological assets and tests whether the choice between cost and FV model is associated with the firm's cost of debt. Results show that greater use of FV in financial statements raises a firm's cost of debt, particularly for firms with bearer plants. For firms with non-bearer biological assets, FV combined with auditor attested IFRS financial statements is related to lower cost of debt.
76. Overall, the evidence suggests that FVM can be problematic in terms of decision usefulness in the case of firms with bearer plant assets. However, it is possible for a firm to compensate this problem by providing additional disclosure.

Audit Research on Fair Value Measurement

Experimental Evidence

77. This section presents studies that examine the auditors' judgment related to FVM. Most of the studies included here use experiments as research methods and may have a US or international focus. Auditors assess the reliability of their clients' FVM, and if needed, require their clients to adjust FV before recognition. FVM carries uncertainty under two dimensions: the subjectivity of inputs used to compute estimates, and the imprecision of possible outcomes. Considering the findings discussed in previous sections about the managerial discretion in FVM, the auditor's judgement regarding complex estimates reported in financial statements is important.
78. Griffin (2014) is the first to provide empirical evidence about how auditors make decisions related to FVM in the context of SFAS 157 application ($n = 106$ auditors with an average of 8.9 years of experience). The study investigates how two types of uncertainty (ie subjectivity and imprecision), and supplemental footnote disclosure influence auditors' FV adjustment decisions. The findings show that subjectivity (level 3) and imprecision (ie wide range for the estimate versus a point value) interact to increase the likelihood that auditors will require their clients to adjust recognized FV estimates. Additional findings suggest that auditors view disclosures as lessening their responsibility for the possible misstatement of recognized amounts, and that they are less likely to require adjustment when preparers supplement recognized FV with footnote disclosure.
79. Relying on a sample of US senior auditors ($n = 92$, with an average of 2.34 years of public accounting experience and an average of 40 hours spent on FVM judgments in the prior year), Joe, Vandervelde, and Wu (2017) examine two factors that can influence auditors'

testing of management discretion in FVMs—the degree of quantification (ie amount of numerical detail) in the client specialist’s report and the level of the client’s control environment risk (a significant component of client risk). They investigate whether and how auditors’ planned substantive testing of a complex FVM is influenced by the joint effects of the degree of quantification in audit evidence and the client’s control environment risk. Their findings document that auditors are most influenced by the degree of quantification in client-provided evidence when client control risk is high. But alerting auditors to regulators’ preference does not mitigate auditors’ tendency to be influenced by quantification – the trade-off in audit effort between subjective versus objective substantive procedures remained unchanged following the practice alert. These findings suggest that auditors are aware that they suffer from a “complexity competence gap” and rely on in-house specialists to complete more subjective procedures.

80. In another experiment with senior Big 4 auditors from the US ($n = 104$), Joe, Wu, and Zimmerman (2017) investigate whether communication complexity makes it harder for auditors to critically evaluate and interpret technical information when auditing complex estimates. The findings support the idea that a specialist’s highly complex report will impair auditors’ ability to critically evaluate and integrate the specialist’s evidence. The auditors who spend some time in advance thinking through the FV estimation (ie putting themselves in the place of the specialist) tend to exhibit higher critical evaluation and integration of the evidence in a complex specialist report.
81. Brink, Tang, and Yang (2016) conduct an experiment with junior Chinese auditors ($n = 95$) to investigate how the provenance of the FV estimate influences auditor’s judgment about the FVM. The study finds that auditors perceive FV estimates provided by external

consultants as less risky compared to the situation when the client company management provides the FV estimate.

82. Glover, Taylor, and Wu (2017) complement the prior experimental evidence with a survey of audit partners with FVM expertise in the US market. They find that the gap between auditor performance and regulators' expectations rests mainly on auditors' inability to gather verifiable and corroborative evidence as well as on their reliance on valuation experts. Such reliance results from auditors' limited knowledge and expertise regarding complex valuation inputs, analyses, and models. Auditors are likely to test management's assumptions and underlying data when auditing typical or lower-risk estimates. However, as audit risk and complexity increase, auditors are more likely to rely on management estimations or on third-party valuations. The study also finds that auditors are more likely to use a third-party valuation specialist or pricing service for financial FVM than for nonfinancial FVM. A majority of respondents believe that audit challenges are different for financial versus nonfinancial FVM because of the lack of observable market information for nonfinancial FVM. Auditors also report problems due to management's lack of valuation process knowledge.

Empirical archival evidence

83. In an empirical archival study, Alexeyeva and Mejia-Likosova (2016) examine the relation between FVM and audit fees in the banking sector. The sample covers 24 European countries over the period 2008–2013 (n = 177 unique banks, 814 firm-year observations). The study finds that the total proportion of FV assets does not affect audit fees. However, the results show a positive relation between high uncertainty FV assets (ie Level 3) and

audit fees.³⁰ This is consistent with more complex estimates requiring greater audit effort. These results mirror findings from the US banking industry over the period 2008–2011 in Ettredge, Xu, and Yi (2014) ($n = 1,022$ bank-year observations) who find (a) a positive relation between the proportion of assets measured at FV and audit fees and (b) a higher association between Level 3 inputs and audit fees compared to Level 1 or Level 2. Alexeyeva and Mejia-Likosova (2016) further show that the strength of a country's institutional setting is positively related to the effort spent on evaluating high-uncertainty FV inputs.³¹

84. In the real estate industry, Goncharov, Riedl, and Sellhorn (2014) find that reporting at FV compared to depreciated cost, is related to lower audit fees. The relation is driven in part by impairment tests necessary under depreciated cost. The study further documents that audit fees decrease in firms' exposure to FV and increase in the complexity of the FV estimation (sample period is 2005–2008, $n = 159$ firm-year observations corresponding to 59 unique firms).

Summary – Audit Research on Fair Value Measurement

85. To sum up, experimental studies show that auditors themselves face several challenges when assessing FV estimates, mostly as a result of the complexity of the underlying models, inputs and assumptions. Auditors' judgements on FVM are also influenced by the

³⁰ This implies that the lack of influence of total FV assets on audit fees could be attributed to Level 1 FV dominating the total proportion of FV assets.

³¹ The study uses four variables to measure the strength of the institutional setting developed in Kaufmann, Kraay, and Mastruzzi (2011) or Brown, Preiato, and Tarca (2014): code versus common law, rule of law index (measures the overall authority of law taking into account the quality of contract enforcement, property rights, the police, and the courts), regulation quality (government's ability to promote private sector development), audit and accounting enforcement (proxy constructed to capture enforcement in relation to accounting standards, takes into account the quality of auditors' working environment as well as the strength of accounting enforcement).

level and type (ie quantification versus qualification) of management's FVM disclosures and by the use of external or internal valuation experts. Potential outcomes of such complexity are auditors' increasing reliance on specialists to resolve measurement issues and a propensity to lead clients to provide additional disclosure.

Conclusion

86. This paper provides a review of the academic literature that examines the implementation of IFRS 13. The review covers 55 studies (of which 36 published in academic journals and 19 unpublished) that address some of the questions raised in the IASB's RFI. Three key takeaways arise from the review of prior research. First, the disclosure of the FV hierarchy underlying FV estimates (vs. a situation of no disclosure) is beneficial to capital markets' participants such as investors and financial analysts. It allows them to be more precise in their valuation of a firm and in the forecasting of its future earnings. Second, regarding specific FV levels, the ranking which is explicit in the hierarchy (ie Level 1 > Level 2 > Level 3 in terms of relevance or faithful representativeness) does not appear to be stable. Some studies provide evidence that is consistent with value relevance, informativeness and reliability being higher for Level 1 (Level 2) vs. Levels 2 and 3 (Level 3). However, such evidence is conditional upon the liquidity/riskiness of assets being measured, their complexity, and uncertainty surrounding the measurement process and market conditions. Hence, greater details in disclosure may actually lead to some confusion in the market. Third, depending upon their incentives, including the governance to which they are subject, managers will take advantage of their measurement discretion to either inform financial

statements users (and thus increase the quality of reporting) or to deceive them (eg to achieve some earnings targets).

87. In this regard, it is noteworthy to mention that no paper actually discusses and analyses the process by which FV estimates are arrived at. Chung et al. (2017) provide a clue that such process is actually deemed important by market participants, but their insights are limited to what is currently being voluntarily disclosed. Investors may need a better understanding of this process, which will allow them to adjust their reliance on FV estimates.

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Appendix 1: Definitions of Key Academic Terms

Term	Definition in academic research
Relevance	The relation between a firm's underlying current economic constructs and its future net cash flows. ³²
Reliability	The degree to which a piece of accounting information objectively represents an underlying economic construct. ³²
Value relevance	Value relevance typically implies that there is a statistical association between an accounting number included in the financial statements (either on the face of financial statements or in the notes) and a stock market-based measure of value (eg stock price, price-to-book, stock return); hence, such a statistical association depends on both relevance and reliability.
Information content	Implies that financial statement users (investors, analysts and debtholders) take an observable action upon the release of an accounting number.
(Decision) Usefulness	The usefulness of accounting information depends on the degree to which it provides a reliable representation of the relevant economic constructs that determine future cash flows to the firm. ³² This is why many accounting studies that refer to relevance often allude to reliability as well since both reliability and relevance are needed for accounting information to be useful in predicting a firm's future cash flows.
Conditional conservatism	Also referred to as "ex post" or "news dependent" conservatism. The extent of conservatism in accounting measurement depends on the characteristics of the event being measured. Examples would usually have a "lower of cost or net realizable value" feature in accounting such as, for example, inventory and asset impairment. ³³ An alternative definition is that bad economic news is reflected in earnings faster than good news.

³² Maines and Wahlen (2006) provide a discussion.

³³ Gigler, Kanodia, Sapra, and Venugopalan (2009) and Watts (2003) provide discussions.

Appendix 2: Details about the studies presented

Table 1: Distribution of studies by topic and geographical area from which the sample is drawn

Topic	International-based studies	US-based studies
Changes in FVM disclosure due to IFRS 13 or to SFAS 157	3	1
Value-relevance and other capital market consequences	4	18
Other aspects that address questions from the RFI	7	0
Management discretion and individual reactions to FV disclosure	4	10
Auditing	3	5
TOTAL	21	34
<i>Of which, as of the date of the review:</i>		
Published in academic journals	9	27
Not published in academic journals	12	7

Table 2: Mapping of the paragraphs of this paper into the Questions of the RFI

RFI Question	Paragraphs in this paper that address the question
Question 2—Fair value measurement disclosures	Par. 16 Par. 18 to 33 Par. 47 to 68
Question 4—Application of the concept of highest and best use for non-financial assets	Par. 69 to 70
Question 5—Applying judgments required for fair value measurements	Par. 36 to 44
Question 6A—Education on measuring biological assets at fair value	Par. 72 to 76
Question 6B—Education on measuring unquoted equity instruments at fair value	Par. 71
Question 7—Effects and convergence	Par. 29 Par. 83 to 84

Appendix 3: Summary of evidence from research studies

Table 1: Fair Value Measurement Disclosure under IFRS 13

Panel A: Changes in Fair Value Disclosure upon IFRS 13 Implementation

Paper	Country, period	Type of sample constituents, sample size	Findings
Busso (2014)	Italy, Germany, France 2013	Listed real estate firms n = 58	<p>Nine (16%) of the sample firms do not disclose the FV hierarchy.</p> <p>All companies describe the valuation techniques used for Level 2 or 3 FV.</p> <p>91% of the firms that use Level 3, disclose that they use an average of many inputs or many inputs differentiated per category of investment property to estimate Level 3 FV.</p> <p>70% provide quantitative information about sensitivity analyses for Level 3 FVM.</p>
Sundgren, Maki, and Somoza-lopez (2016)	11 countries from the EU 2013–2014	Listed real estate firms n = 85 firm-years	About 54% of the firms provide more disclosure under IFRS 13 than under IAS 40.
Feldmann (2017)	France, Netherlands, Finland, Belgium, Luxembourg, Greece, Sweden; 2013–2014	Listed real estate firms n = 64 firms	Small decrease in disclosure quality in 2014 compared to 2013.

Panel B: Capital Market Effects of Level 3 Fair Value Measurement Disclosure

Paper	Country, period	Type of sample constituents, sample size	Total effect	Conditional effects
Feldmann (2017)	European 2013–2014	Listed real estate firms n = 64	No significant relation between how firms disclose FVM after IFRS 13 adoption and their market capitalization.	
Hammami and Moldovan (2017)	US 2010–2014	Closed-end funds n = 1,615 fund-half year observations	<p>Lower closed-end fund discount when firms disclose the significant unobservable inputs and valuation techniques used to estimate Level 3 FV.</p> <p>Stock liquidity is lower after 2012 for funds with Level 3 disclosures.</p>	The effect is concentrated in the sub-sample of funds that disclose Level 3 inputs in a table format.

Panel C: Individual Reactions to Fair Value Disclosure: Experimental Evidence

Paper	Participants, sample size, country, period	Participants' Perspective:		
		Investors	Managers	Others
Cannon (2015)	US n = 69 MBA students, average of 3.18 years of work experience	Decrease in risk perception of FV estimates when quantitative sensitivity disclosures are present.		
Majors (2016)	US n = 48 business school college students playing the role of managers		Report less aggressively when range disclosures are required.	
Lachmann and Herrmann (2017)	Germany n = 137 junior auditors at Big4 accounting firm, average private investment experience of 5.33 years (non-professional investors)	On average, FV is perceived as reliable. Information acquisition occurs only when FV losses occur and FV estimates are disclosed in range or qualitative disclosure format.		
Du et al. (2014)	US n = 114 MBA students, average of 6.5 years of work experience and 4.5 years of investment experience	Perceived reliability is highest for FV stated as a point estimate with a specified confidence level attached to it.		
Jana and Schmidt (2017)	France n = 202 master students enrolled in accounting courses n = 20 auditors, average audit experience of 7.5 years and 5.8 years of professional experience with FV	Both categories of participants generally favour relevance over reliability. Individual's degree of uncertainty avoidance or familiarity with FV does not impact the preference for relevance over reliability.		
Lim et al. (2017)	Singapore Survey conducted in 2016 n = 704 chartered accountants and appraisers			High level of distrust about Level 3 FV estimates. More disclosure of how FV estimates are derived would enhance credibility.
Wang et al. (2017)	China Date of announcement of CAS 39 (17 May 2012), adoption (26 January 2014), and enforcement (1 July 2014) Non-financial firms n = between 2,101 and 2,267; Financial institutions n = between 41 and 45 depending on the date.	Stock market reacts positively to the three events related to CAS 39, an IFRS 13-converged standard. For non-financial firms, market reactions are significantly positive. For financial institutions, market reactions are significantly negative.		

Panel D: Relevance of Fair Value Information under IFRS

Paper	Country, period	Type of sample constituents, sample size	Total effect	Conditioning factors
Siekkinen (2016)	34 countries 2012–2014	Financial institutions n = 985 firm-year observations (355 unique firms)	All three levels of FV assets and FV liabilities are value relevant. Level 1 FV assets are more value-relevant than level 2 assets or level 3 assets. Level 1 and 2 FV liabilities are more value-relevant than level 3 FV liabilities.	All FV levels are value relevant in countries with a strong or medium investor protection environment. In countries with weak investor protection, only assets measured and reported as Level 1 are value relevant.
Siekkinen (2017)	29 EU and EEA countries 2012–2013	Financial institutions; n = 581 firm-year observations for the period 2012–2013 n = between 150 and 189 firms in the year 2013, depending on the test	All three levels of FV assets and liabilities are value relevant No statistically significant differential value relevance among different levels of FV assets or liabilities. FV assets are statistically more value-relevant than non-fair-value assets. Levels of FV assets in 2013 are value-relevant and there is no distinction between the levels. In 2012, Level 3 was less value-relevant compared to levels 1 or 2.	Higher value-relevance of Level 3 assets for firms with strong compared to weak corporate governance.
Fiechter and Novotny-Farkas (2017)	International 2006–2009	Banks n = 907 bank-years	FVA information is value relevant.	During the financial crisis, FV assets are substantially discounted. FVO assets are generally less value relevant than HFT and AFS assets, and this differential value relevance is larger in bank-based economies.

Panel E: Other Aspects Addressing Post-Implementation Review Questions

Fair Value Measurement for Non-Financial Assets: Highest-and-best Use and Market Participants

Paper	Country, period	Type of sample constituents, sample size	Total effect	Conditional effects
Feldmann (2017)	EU	Survey of n = 93 managers of real estate companies	There is a wide range of weight placed on the concept of highest-and-best use when estimating FV.	
		n = 64 real estate firms	About 50% of the firms disclose the role highest-and-best use played in estimating FV in their annual or interim reports.	
Barker and	EU	Interviews with	Non-financial assets FV are all Level	

Schulte (2017)		managers at 11 large non-financial European firms	3 due to the lack of active markets and comparable non-financial assets. Level 3 FV estimates include the preparers' own perspective. Firms often rely on auditors or external specialists to estimate Level 3 FV.	
<i>Fair Value Measurement of Private Equity</i>				
Palea and Maino (2013)	EU 2006–2010	n = 20 non-financial listed companies	Using Level 2 FV, market multiples are more than double actual market capitalization and that market multiples and transaction values are, on average, more than four times the book value.	
<i>Biological Assets and Other Non-financial Assets</i>				
Bocart and Hafner (2015)	Bordeaux, France 2013	Funds specialized in wine n = 12	All wine investment funds value wine at FV. FV estimation for wine does not entirely follow IFRS 13 and the FVM disclosure is often incomplete.	
Goncalves and Lopes (2015)	27 countries 2011–2013	n = 289 firm-year observations (132 unique firms)	The recognized amounts for biological assets are value-relevant, and even more so when the disclosure levels related to how these amounts were measured is high. In 2013, disclosure level is slightly higher than in the previous two years.	High disclosure levels are value relevant in the case of bearer, but not for non-bearer biological assets.
Huffman (2016)	31 countries First year of IAS 41 adoption	n = 115 firms		The FV of biological assets and the associated unrealized gains and losses are more decision-useful for non-bearer compared to bearer biological assets.
Daly and Skaife (2016)	26 countries 2001–2013	n = 648 firm-years (127 unique firms)	Greater use of FV in financial statements raises a firm's cost of debt.	Higher cost of debt for firms with bearer plants at FV. Lower cost of debt for firms with non-bearer biological assets at FV if combined with audit report under IFRS.

Table 2: Fair Value Measurement (FVM) under US GAAP

Panel A: Value relevance: Evidence and Challenges

Paper	Type of entities, Sample size, time period	Main effect	Conditional effect
Song et al. (2010)	Banks Q1–Q3 2008 N = 1,260 bank-quarter observations (431 unique banks)	For assets measured at FV, all 3 levels are value-relevant. For liabilities, levels 1 and 2 together are not value-relevant, but level 3 FV liabilities are value relevant and perceived as understated by investors (ie negative association to share price is smaller than -1). Level 3 is less value-relevant than Level 1 and 2 FV assets. Same for liabilities.	Level 3 is more value-relevant when banks have strong corporate governance.
Du et al. (2014)	Banks 2008–2009 N = 2,524 bank-quarters, of which 393 bank-quarters with transfers of FV assets and liabilities	Overall, transfers in or out of Level 3 FV are associated with lower value-relevance. Increase in value relevance of FVM for banks that transfer assets out of the Level 3 category.	
Freeman et al. (2017)	Banks 2008–2014 Full sample n = 5,672 firm-quarters; Non-securitizers n = 1,422 firm-quarters; n = 987 bank-quarters in 2010–2014; Securitizers n = 3,018 bank-quarters in 2010–2014	All levels of FV assets are value relevant. Level 1 FV assets are significantly more value-relevant than Level 3 FV assets. There is no significant difference between value relevance of Level 2 and 3 FV assets.	For non-securitizers, Levels 1, 2 and 3 FV assets have similar value relevance. For securitizers, Level 3 FV assets are not value relevant. In the post-financial crisis period, all levels are value-relevant for non-securitizers and not different from each other. In the post-financial crisis period, Level 1 FV assets are value-relevant, but Level 2 and 3 are not value relevant for securitizers.
Lawrence et al. (2016)	Closed-end funds 2008–2013 N = 3,146 fund-year observations (710 unique funds)	Level 3 FV are of similar value-relevance to Level 1 and Level 2 FV assets.	

Panel B: Information content of FV hierarchy in the US context

Paper	Type of entities, Sample size, time period	Stock markets	Financial analysts	Debt markets
Magnan et al. (2015)	Bank holding companies 1996–2009 n = 5,963 bank-quarter observations (309 unique banks)		FVM is associated with higher earnings forecast dispersion. Disclosure of the FV hierarchy positively relates to forecast accuracy, but not for banks with high proportions of assets measured at FV. Level 2 FV is related to more accurate forecasts. Level 3 FV is related to higher forecast dispersion.	
Riedl and Serafeim (2011)	Financial institutions Q2 2007–Q2 2008 n = 952 firm-quarter observations	Higher proportions of FV assets are related to higher leverage-adjusted equity beta. Higher proportions of Level 3 FV are associated with higher equity betas relative to Level 1 and 2 FV. This differential is larger for firms with low-quality information environments.		
Barron et al. (2016)	Financial and non-financial listed firms that hold significant amounts of Level 3 FV assets October 2005–February 2010 n = 3,085 firm-quarter observations		SFAS 157 adoption is associated with reduced uncertainty regarding future earnings and lower forecast errors. No significant association between SFAS 157 adoption and forecast dispersion.	
Magnan et al. (2016)	Financial institutions 2007–2014 n = 567 firm-year observations			Higher use of Level 2 and 3 FVM is associated with higher cost of debt.
Ayres (2016)	Listed firms 2007–2014 n = 8,432 firm-years, of which 1,841 financial industry firm-years			Higher holdings of Level 3 FV assets negatively impact credit ratings.

Cullinan and Zheng (2014)	Closed-end funds 2010 n = 391 funds traded at a discount n = 185 funds traded at a premium	Level 3 FV assets exacerbate the closed-end fund discounts and premiums.		
Huang et al. (2016)	Financial institutions 2008–2009 n = 814 firm-year observations	Level 3 FVM is associated with higher cost of capital. Level 1 and 2 FVM is associated with lower cost of capital.		
Chung et al. (2017)	Banks and insurance companies 2007–2011 n = 2,265 firm-year observations (555 unique banks and 126 unique insurance companies)	Firms with higher amounts of Level 3 FV are more likely to provide voluntary disclosure about the controls and processes involved in FV estimation. Such disclosures are associated with higher market pricing and lower information risk for Level 3 FV estimates.		
Hoitash et al. (2017)	Listed companies 2011–2014 n = 6,232 firm-years and 112,950 firm-year-analyst forecasts		Accounting reporting complexity (FV, derivatives, pensions) discourages financial analysts from covering a firm. Higher analyst expertise with the complex area increases that analyst's earnings forecast accuracy.	

Panel C: Attributes of investment securities and markets

Paper	Type of entities, Sample size, time period	Main effect	Conditional effects
Lev and Zhou (2009)	Stock market reaction to 44 key events after the demise of Lehman Brothers 1 September 2008–31 December 2008 n = 3,139 non-financial firms n = 790 financial firms	Negative—liquidity shrinking—events engender the most adverse reaction for Level 3 (highest risk) items, followed by Levels 2 and 1 (often no reaction at all)	The results are similar for financial and non-financial firms.
Altamuro and Zhang (2013)	Banks holding companies with mortgage servicing assets/liabilities as Level 2 or 3 FV	During times of high uncertainty, for occasionally-traded assets, Level 3 FV better reflect underlying cash flows than level 2	

	2008–2011 n = 978 bank-quarters (82 unique banks)	FV.	
Goh et al. (2015)	Banks 2008–2011 n = 6,893 bank-quarters	Level 3 FV are typically priced lower than Level 1 or 2 FV.	The difference between the pricing of the levels reduces over time after the financial crisis.
Fortin, Hammami, and Magnan (2017)	Closed-end funds 2009–2011 n = 1,538 fund-half year observations	The rank of FV levels in terms of impact on market valuations varies across investment types. For equities the rank is Level 1 > Level 2 > Level 3, while for government bonds the impact is similar across the three levels. Investments within a single FV level do not impact market valuations in the same way.	Auditing FV levels does not improve the market's view of FV, thereby supporting the existence of investment risks and characteristics within FV levels.

Panel D: US-based evidence on managerial discretion in FVM

Paper	Type of entities, Sample size, time period	Main effect	Conditional effects
Badia et al. (2017)	2007–2014 n = 27,904 firm-year observations	Higher conservatism associated with Level 2 and 3 FVM	Results are more pronounced for firms with higher non-transient institutional ownership, with higher audit quality, in firms that do not narrowly meet or beat earnings thresholds.
Hsu and Lin (2016)	2007–2013 n = 41,690 firm-quarter observations	Higher propensity to meet or beat earnings forecasts made by financial analysts associated with Level 3 FV assets. This relation is not present for Level 1 and 2 FV assets.	Results hold only in companies with weak corporate governance.
Lin et al. (2017)	2008–2010 n = 10,104 firm-year observations	Higher probability of restatement after Level 3 FVM is shown in the FV hierarchy	
Tama-Sweet and Zhang (2015)	Banks n = 1,282 bank-quarter observations in 2008–2009 n = 1,481 bank-quarter observations in 2012–2013	All levels of FV net assets are value relevant	Level 3 is less value-relevant in firms with strong corporate governance.
Alford et al. (2016)	PCI industry 1996–2013 n = 6,766 firm-year observations	Adoption of the FVM standard is not generally associated with changes in investment policy.	Reporting Level 3 FV and incurring operating and investment losses becomes a factor in portfolio rebalancing decisions for insurers with a public or stock ownership structure (ie avoid rebalancing).

Curtis and Raney (2017)	Business Development Companies 2009–2014 n = 17,273 firm-quarter-investments n = 593 matched firm-quarter-investments	Managers are more likely to delay updating FV estimates when updating implies a decrease in the estimate. After a decrease in FV estimate, managers take longer to revise the FV of the asset	Conditional on having the same investment, 32% of matched sample are cases where one BDC updates and the pair does not or where they update in different directions.
Iselin and Nicoletti (2017)	Public and private banks 2006–2009 n = 6,363 bank-quarter observations	Public banks altered their investment portfolios in a manner that reduced the percentage of holdings in assets measured using Level 3 FV.	

Table 3: Audit Research on Fair Value Measurement

Panel A: Experimental Evidence

Paper	Country, period	Type of sample constituents, sample size	Audit effort	Use of valuation experts	Other audit-related aspects
Griffin (2014)	US	n = 106 auditors with an average of 8.9 years of experience			<p>More likely to require adjustments for Level 3 FV.</p> <p>More likely to require adjustments when the Level 3 estimates result in a wide range rather than a point value.</p> <p>Less likely to require adjustments for Level 3 FV when firms provide supplementary FV disclosures.</p>
Joe, Vandervelde, and Wu (2017)	US Big 4 audit seniors	n = 92 with average of 2.34 years of public accounting experience and spent on average 40 hrs on FVM judgments in the prior year	Lower to test the subjective inputs to the FV estimate when the client evidence is numerically complex and client risk is high.		
Joe, Wu, and Zimmermann (2017)	US Big 4 audit seniors	n = 104, average of 2.86 years of public accounting experience, and routinely perform FVM audit procedures		Highly complex specialist reports impair auditors' ability to critically evaluate and integrate the specialist's evidence.	
Brink et al. (2016)	China	n = 95 auditors with an average of 2.37 years of auditing experience		FV estimates provided by an external consultant perceived as less risky compared to those provided by the client.	
Glover et al. (2017)	US	Survey of audit partners n = 32, average of 22.3 years of audit experience	Test management's assumptions when dealing with typical/lower-risk estimates.	More likely as audit risk and complexity increase. More likely for financial than for non-financial FVM.	<p>Lack of observable market information for nonfinancial FVM is problematic.</p> <p>Problems due to management's lack of valuation process knowledge.</p>

Panel B: Empirical archival evidence

	Country, period	Type of sample constituents, sample size	Audit fees	Audit effort
Alexeyeva and Mejia-Likosova (2016)	24 European countries 2008–2013	Banks n = 814 bank-year observations corresponding to 177 unique banks	Not related to the total proportion of FV assets. Higher when high uncertainty FV assets (ie Level 3).	Higher effort to evaluate Level 3 FV for firms in countries with strong institutional environment.
Ettredge et al. (2014)	US 2008–2011	Banks n = 1,022 bank-year observations	Positive relation with the proportion of assets measured at FV. Higher association between Level 3 inputs and audit fees compared to Level 1 or Level 2.	
Goncharov et al. (2014)	EU 2005–2008	Real estate firms n = 159 firm-years (59 unique firms)	Lower when reporting at FV compared to depreciated cost. Lower in firms' exposure to FV and higher in the complexity of the FV estimation.	