

Fair value accounting: Current practice and perspectives for future research

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Abstract

A fundamental issue debated in the accounting literature centres on the appropriate basis for measuring firms' assets and liabilities. During the last several decades, scholars have generated a growing body of important insights about the use of the fair value measurement attribute in financial reports around the globe. In this paper, we provide an overview of the institutional background of fair value accounting and the associated accounting standards that prescribe the use of fair value measurements under International Financial Reporting Standards and Generally Accepted Accounting Principles in the US. We discuss and document the extent to which firms across different industries and accounting regimes recognize and disclose in their financial reports assets and liabilities measured at fair value and we reflect on aspects of the fair value accounting literature. In doing this, we identify several areas in which additional research can further our understanding of fair value measurements and disclosures.

KEYWORDS

Fair value accounting, FASB, IASB

JEL CLASSIFICATION

G21, M40, M41, M48

1 | INTRODUCTION

Over the last several decades, fair value measurement has taken centre stage in international discussions concerning the appropriate basis for measuring (and remeasuring) assets and liabilities. Academics, policymakers, and practitioners alike have sought to attribute both positive and negative capital market outcomes to fair value measurements in corporate financial reports. Interest in this topic intensified because of the recent global financial crisis (e.g., Laux & Leuz, 2009, 2010) and because of increasing reliance on fair value measurements that are inherently subject to bias and measurement error. In this article, we contribute to the ongoing debate about fair value measurements in financial reports by providing an analysis of current practice and by discussing potentially fruitful avenues of inquiry in the context of the extant academic literature related to fair value accounting.

In Section 2, we begin by discussing the historical development of fair value accounting. Notions of fair value accounting in the academic literature can be traced to the discussions of W.A. Paton and A.C. Littleton, among others,

beginning around the 1930s. The concept of an exit value in the context of fair value measurements has been attributed to R.J. Chambers, whose work on this topic began in the 1950s. In Section 2, we also review the current definition of fair value provided by the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB), as well as the associated accounting standards that prescribe the use of fair value measurements. Although a form of fair value accounting – current replacement cost – was initially introduced by both boards to deal with the hyperinflationary environments of the 1970s, global accounting standards did not require or permit fair value measurements until the issuance of the accounting rules for financial instruments, and this remains the area in which fair value measurements have been most extensively required in practice. As we discuss in Section 2, fair value-related disclosure requirements emerged before US and international accounting standards required assets and liabilities to be recognized at fair value in the financial statements.

To gain a deeper appreciation for the prevalence of fair value measurements in practice, in Section 3 we discuss and document the extent to which firms across different industries and accounting regimes report assets and liabilities measured at fair value in their financial statements. We also use a sample of US depository institutions to demonstrate the properties of fair value-related disclosures. It is critical to understand this information when making research design choices and interpreting research findings.

After delineating the institutional landscape of fair value accounting around the globe, in Section 4 we review research related to fair value measurements and disclosures in terms of their valuation and risk relevance. Our goal is not to highlight every paper that has investigated various aspects of fair value-related information in financial reports. Instead, we aim to identify important aspects of the fair value measurement ‘black box’ about which additional research can generate novel insights. We provide concluding remarks in Section 5.

2 | INSTITUTIONAL BACKGROUND

2.1 | Evolution of fair value accounting

One of the central functions of accounting is to record a firm’s transactions using an appropriate measurement basis. Although historical cost accounting was the dominant measurement basis for much of the 20th century, there has been an ongoing debate about the appropriate measurement basis to use in financial reporting since the very early days of the accounting profession, and this debate continues today among academics, practitioners, standards setters and policymakers.¹ The fundamental issue is whether an alternative measurement basis, such as fair value, should be used instead of historical cost.

Discussions about the concept of value in the debates about measurement did not delve deeply into how value might be defined other than as a market-based concept. For example, what is the value of a share of corporate stock that is actively traded in a deep and liquid market? Should the value be the bid price, the ask price, a quoted price during the trading day (e.g., the high or low price)? Accounting measurements typically assume one of three measurement perspectives – that is, entry price, exit price, or value in use.² An entry price is the price an investor would pay to purchase an asset or would receive to assume a liability. An exit price is the price an investor would receive for the sale of an asset or would pay to transfer a liability. In essence, the bid and ask prices for a share of stock are equivalent to the entry and exit prices, respectively. As the term suggests, value in use is the value placed on an asset currently in use by a firm and is defined by the FASB as ‘[t]he amount determined by discounting the future cash flows (including the ultimate

¹Several scholars have discussed in relatively recent studies the historical origins and development of the various measurement bases used or considered for financial reporting in both the US and internationally. We refer readers to Georgiou and Jack (2011); Hodder, Hopkins, and Schipper (2014); Markarian (2014); Zeff (1999) and Zeff (2007a).

²The International Valuation Standards (IVS) identify numerous bases of value (IVSC 2017, Section 104), including market value, investment value and liquidation value. The standards describe the bases of value as the ‘fundamental premises on which the reported values will be based’ (IVSC 2017, Section 104, paragraph 10.1). The basis of value may dictate ‘the methods, inputs and assumptions’ used to determine the amount (IVSC 2017, Section 104, paragraph 10.1).

proceeds of disposal) expected to be derived from the use of an asset at an appropriate rate that allows for the risk of the activities concerned' (FASB Codification Glossary). In particular, the determination of value in use is based on how a firm intends to use an asset.³

In addition to the initial measurement of a transaction, accounting guidance also considers whether the reported value of a transaction should be updated at each balance sheet date; that is, an accounting system must consider both the initial measurement and the remeasurement of a transaction. Although there is and has been significant discussion about how to initially measure a transaction in the financial statements (e.g., should loans for a bank be measured at fair value at initial measurement?), the notion of remeasurement drives much of the heated debate around fair value measurement. For example, should loans on a bank's balance sheet be maintained at fair value at successive balance sheet dates? If so, how should changes in fair value be reported? For instance, Hodder, Hopkins, and Schipper (2014) discuss how a related but distinct issue concerning the remeasurement of assets and liabilities is determining where to recognize changes in the carrying values of assets and liabilities.⁴ Conceptually, there are three choices – record the change in fair value as a component of net income, as a component of comprehensive income, or directly in equity. When changes in fair value are recorded in net income, the volatility of net income may increase. Many argue that the potential increase in volatility induced by fair value accounting is beyond the control of management; thus, including these changes in net income could present an inaccurate picture of a firm's performance.

Hyperinflationary environments pose issues for accounting systems where significant numbers of transactions are measured (and remeasured) at something other than a current price. For example, assume an accounting system records inventory costs and sales at invoice price without any consideration of inflation for a given quantity of output. Nominal sales will increase at the same rate as inflation, while actual taxable profits and after-tax accounting profits will increase at a rate exceeding the actual rate of inflation because inventory costs are recorded at an earlier and lower price that does not reflect their replacement cost. High inflation after the breakup of the Bretton Woods system and after the OPEC oil embargo led to the introduction of some form of current cost accounting (CCA) in a number of countries, including the US, the UK and Australia.⁵ Of course, the idea of CCA was not new to the accounting profession.⁶ Edwards and Bell (1961), Solomons (1966) and Baxter (1975), among others, argued that a form of CCA provides useful information for evaluating performance, while the notion of 'deprival value' that served as the basis for the development of CCA can be traced back at least as far as Bonbright (1937). As academics debated measurement, regulators and standard setters also grappled with the appropriate measurement basis to use for reporting accounting transactions. Historically, accounting across most jurisdictions has relied on historical cost accounting, an entry price measurement system with remeasurement encompassing depreciation, amortization and impairment charges.⁷

³Although value in use is less frequently debated, Baxter (1971) discusses reasons why the change in value and depreciation charge should be distinguished within an accounting system, including when there is an unpredicted value loss and in certain budgetary discussions. A value change is calculated by 'comparing the present values of all perpetuities for all the future payments' (Baxter, 1971, p. 162).

⁴Although we discuss this issue to some extent in Section 4.2.3, we do not consider this issue to be unique to fair value measurements, thus it is generally beyond the scope of our discussion. Hodder et al. (2014), for instance, observe that: '... measuring assets and liabilities at fair value at balance sheet dates does not require changes in value to be reported in net income, and the debate about which items are appropriately included in net income is equally applicable to certain items not measured at fair value, for example, the effects of error corrections and accounting method changes. Finally, the changes in assets and liabilities required to be included in other comprehensive income (ASC 220-10-45-10A), and therefore displayed outside of net income, include both the effects of fair value remeasurements and the effects of calculated items, such as prior service costs or credits. There is, so far, no conceptual basis for including fair value changes along with these calculated changes in other comprehensive income. Therefore, we view the debate over the display of changes in fair values of assets and liabilities as, in fact and substance, a debate over how to define conceptually a component of comprehensive income to be labeled "net income" (or, in IFRS, "profit").'

⁵Annual inflation peaked at 24% in the UK during 1975. Annual inflation climbed over 15% in Australia in 1974, and inflation in the US approached 13.5% in 1980. High or hyperinflationary periods are not limited to this period; for example, Argentina's annual inflation rate hit 50.7% in February 2019.

⁶Whether current price can be estimated simply by adjusting historical cost numbers using an inflation index or not has stirred important debate. The predominant contribution to this debate was that of Chambers (1966), who advocated for an accounting system that would value assets at the price for which they could be sold at each balance sheet date (i.e., an exit value perspective).

⁷In the US, the Securities and Exchange Commission (SEC), from its founding in 1934 until 1972, maintained a strong opposition to upward revaluations or general price-level restatements of fixed assets. This policy position can be attributed to Robert Healy, one of the founding SEC commissioners. Prior to his SEC appointment, he was chief counsel to the Federal Trade Commission, overseeing its investigations into market manipulations, including accounting manipulations, by public utility companies during the 1920s (Zeff, 2007b).

At first, accounting standards setters considered the impact of high inflation on financial statement amounts but subsequently focused more broadly on factors impacting the relevance of reported financial information. In the UK, for example, the Statement of Standard Accounting Practice (SSAP) 16, which was issued in 1980, employed a 'value to business' model, where current cost was defined as the lower of the replacement cost and the recoverable amount. The recoverable amount was the higher of the present value of the asset and its net realizable value (IASB, 1980). In the US, the Statement of Financial Accounting Standards (SFAS) No. 33, *Financial Reporting and Changing Prices*, which was issued in 1979, required supplementary disclosures on the effect of general inflation and income from continuing operations on a current cost basis. For current cost income, expenses were required to be measured at current cost or lower recoverable amount (FASB, 1979).

Both SSAP 16 and SFAS 33 were suspended after inflation declined, and while historical cost accounting resumed as the primary measurement basis for financial reporting, there were some exceptions. In the UK, for example, companies were permitted to disclose the fair value of real estate if the book value of these assets was very different from the current value (Lin & Peasnell, 2000). There was also the option to recognize the fair value of real estate assets in the financial statements if this would better represent the true and fair view, with revaluation increments recognized in equity reserve. Asset revaluation was also permitted in many other countries around the globe (see, e.g., Barlev, Fried, Haddad, & Livnat, 2007; Yoo, Choi, & Pae, 2018). Market values have also been used to modify historical cost accounting in some circumstances, for example, in the valuation of inventories at the lower of cost or market value.

The US savings and loan crisis in the late 1980s (as well as the Japanese banking crisis in the 1990s) highlighted the limitations of historical cost accounting for financial instruments. Because many US banks used short-term deposits to fund long-term fixed-rate mortgage loans, they were exposed to interest rate risk arising from duration mismatch. Under US generally accepted accounting principles (GAAP) at the time, both loans and deposits were accounted for at amortized historical cost with no disclosure of fair value information based on exit prices. Growth in interest rates meant that cash flows received on the assets were not able to cover what was needed to satisfy the liabilities. However, this exposure to the yield curve was not reflected in a timely manner in financial statements, and many banks had to file for bankruptcy before the market received warning signals. The accounting was argued to have obscured the negative impact of the growth in interest rates during the late 1980s and early 1990s on US banks' financial performance, allowing troubled institutions to go undetected (Linsmeier, 2011). The Japanese banking industry in the 1990s is another example in which the failure to recognize losses in a timely manner in banks' financial statements contributed to a severe financial crisis. More challenges regarding the use of historical cost accounting for financial instruments arose with advances in financial engineering, particularly in the context of derivatives. Derivatives are instruments that are highly levered, and their value can change very quickly. For example, a forward contract has no value at inception and, therefore, will not be recorded in financial statements prepared under historical cost accounting. Nevertheless, a forward contract can very quickly become an asset or a liability of a firm.⁸

Despite the limitations of historical cost accounting, some possible limitations of fair value accounting were exposed during the 2007–2009 global financial crisis. As discussed in Laux and Leuz (2009, 2010), among others, fair value accounting was blamed by some for contributing to and potentially amplifying the severity of the financial crisis. The pressure on policymakers and accounting standards setters was so great during the financial crisis that the FASB and the IASB responded by relaxing fair value accounting requirements (see, e.g., Bowen & Khan, 2014; Cheng, 2012). Although many have made evidence-based arguments that fair value accounting was simply a convenient scapegoat to blame for exacerbating the financial crisis (e.g., Badertscher, Burks, & Easton, 2012; Cantrell & Yust, 2019), this episode nevertheless demonstrates how political pressures can shape the extent to which fair value measurements are used in financial reporting.

⁸Barings Bank, one of the oldest merchant banks in Britain, which was founded in 1762, collapsed in 1995 after an employee fraudulently traded futures contracts. These positions would not have been recorded in Barings' financial statements before the loss of £827 million (twice the bank's available trading capital) was recognized.

2.2 | Fair value accounting standards of the FASB and IASB

The FASB's Statement of Financial Accounting Concepts No. 5, *Recognition and Measurement in Financial Statements of Business Enterprises* (FASB, 1984), describes the measurement attributes that can be applied to the measurement of assets and liabilities. The measurement attributes are historical cost (historical proceeds), current (or replacement) cost, current market value, net realizable (settlement) value, and present (or discounted) value of future cash flows (FASB, 1984, para 67). The IASB's 2010 Conceptual Framework for Financial Reporting included these same measurement bases, with the exception of current market value (IASB, 2010). Fair value was not explicitly included as a measurement attribute in either the FASB's or the IASB's conceptual frameworks; however, current cost and current market value can approximate fair value at and following initial recognition. In addition, the IASB's revised 2018 conceptual framework describes two categories of measurement bases, historical cost and current value. Current value includes fair value, value in use (or fulfilment value), and current cost (IASB, 2018). Although the conceptual frameworks of the FASB and IASB describe the measurement bases that can be applied to recognized assets and liabilities, the standards, which we discuss next, permit or require the use of fair value measurements.

The first standard issued by the FASB that required fair value-related information was SFAS 107, *Disclosures about Fair Value of Financial Instruments* (FASB, 1991). The standard requires disclosure of fair values for financial instruments, whether assets or liabilities, for which it is practicable to estimate fair value. Firms are also required to disclose the methods and significant assumptions used in estimating fair values. SFAS 115, *Accounting for Certain Investments in Debt and Equity Securities* (FASB, 1993), requires marketable securities to be measured at fair value. Trading securities are reported at fair value with unrealized gains and losses included in earnings, while available-for-sale securities are reported at fair value with unrealized gains and losses excluded from earnings but reported in other comprehensive income.⁹ SFAS 119 requires firms to disclose information about the fair value of derivatives to enhance transparency about a firm's risk exposure (FASB, 1994). The recognition of derivative fair values is required by SFAS 133, *Accounting for Derivative Instruments and Hedging Activities* (FASB, 1998). The standard also provides the basic rules for hedge accounting treatment that determines the accounting for changes in the fair value of these instruments. Recognizing the need to provide a more coherent fair value measurement framework to ensure the consistent application of fair value accounting standards, to improve associated disclosures, and to emphasize the responsibility of management in the fair value measurement process, the FASB issued SFAS 157, *Fair Value Measurement* (FASB, 2006). SFAS 159 subsequently introduced the fair value option for financial assets and liabilities to reduce the volatility arising from the mixed attribute model, thus simplifying the use of hedge accounting (FASB, 2007). The fair value option stirred important debate, as it allows some financial instruments to be measured differently by different firms.

While there are some differences in the issuance and adoption dates of the standards, fair value accounting under International Financial Reporting Standards (IFRS) has generally developed in lockstep with US GAAP. The predecessor of the IASB, the International Accounting Standards Committee, issued IAS 32, *Financial Instruments: Presentation* (IASB, 2003b) and IAS 39, *Financial Instruments: Recognition and Measurement* (IASB, 2003c), which were adopted by the IASB. IAS 32 is predominantly a disclosure standard, similar to the FASB's SFAS 107 and 119. The IASB replaced the disclosure provisions of IAS 32 with IFRS 7, *Financial Instruments: Disclosures* in 2005 (IASB, 2005). IFRS 7 requires firms to disclose information related to recognized financial instruments, including the fair value, details of the valuation process, the significance of these instruments to a firm, and the risks arising from them. IAS 39 provides the requirements for the recognition and measurement of particular financial instruments and introduces the option to designate eligible financial assets and liabilities at fair value. IAS 39 has been amended a number of times, and its classification and measurement provisions were replaced by IFRS 9, *Financial Instruments* (IASB, 2014). Following the introduction of IFRS 2, *Accounting for Share-based Payments* (IASB, 2004c), firms that follow IFRS are required

⁹Although still applicable to investments in debt securities, the FASB's ASU 2016-01 removed the need to classify investments in equity securities as either trading or available for sale. Instead, all investments in equity securities with readily determinable fair values are now measured at fair value, with changes in fair value (i.e., unrealized gains and losses) recorded in earnings.

to recognize share-based payments at fair value, similar to the FASB's SFAS 123 (FASB, 1995). Consistent with the FASB's fair value measurement standard (SFAS, 157), the IASB issued IFRS 13, *Fair Value Measurement* (IASB, 2011).

The above standards are generally specific to financial instruments and therefore have a relatively small impact on industries that make little use of such instruments. However, fair value is also used as a measurement basis for some classes of non-financial assets. For instance, the property industry is required to apply the provisions of IAS 40, *Investment Property* (IASB, 2003d). The standard allows firms to choose between a fair value model and a cost model for their investment property. The chosen model should be used for all investment properties, with some restrictive exceptions. Even if a firm adopts the cost model, it is required to disclose the fair value of investment property in the notes of the annual report. IAS 16, *Property, Plant and Equipment* (IASB, 2003a), allows firms to choose between a cost model and a revaluation model for the measurement of property, plant, and equipment (PPE).¹⁰ Under the revaluation model, revaluations are required on an ongoing basis. The revalued amount of an asset is defined as its fair value at the date of revaluation less subsequent depreciation charges and impairment losses. Under US GAAP, PPE is measured at historical cost in accordance with Accounting Standards Codification (ASC) Topic 360, *Property, Plant, and Equipment*.

Biological assets is another class of non-financial assets for which fair value measurements are applicable under IFRS. IAS 41, *Agriculture* (IASB, 2000), requires biological assets (living plants and animals), with the exception of bearer plants, to be measured at fair value less estimated cost to sell. Firms are required to recognize changes in the fair value of biological assets over the reporting period, and changes are reported directly in income. If the fair value cannot be reliably determined, then historical cost can be used.

Fair value is also the required measurement basis in a business combination for all separately identifiable assets and liabilities under both IFRS 3, *Business Combinations* (IASB, 2008), and ASC 805, *Business Combinations*. Furthermore, goodwill impairments are based on a notion of implied fair value, and inventory valuations are typically reported at the lower of cost or market value. As can be seen from the preceding discussion, fair value measurement requirements appear throughout the accounting guidance and impact a variety of transactions and industries.

Although fair value accounting results in the remeasurement of asset carrying values under both US GAAP and IFRS, there are some differences between US GAAP and IFRS with respect to how impairment losses are estimated. IAS 36R, *Impairment of Assets* (IASB, 2004a), requires that assets are not carried at a higher value than their recoverable amount. IAS 36R defines the recoverable amount of an asset as the higher of fair value less cost to sell and value in use. Therefore, under IFRS, impairment loss is measured as the difference between the carrying amount and the recoverable amount. Under US GAAP (ASC 360, *Property, Plant and Equipment*), impairment losses are measured as the amount by which the carrying amount of an asset exceeds its fair value. Here, the definition of fair value focuses on the price a firm will receive if it sells an asset (an exit price); subtraction of the transaction cost is not allowed. Finally, IAS 38, *Intangible Assets* (IASB, 2004b), permits revaluation (based on fair value) of intangible assets other than goodwill. However, because the use of revaluation requires the existence of an active market for specific intangible assets, the use of the revaluation model is likely to be rare. The FASB does not permit firms to revalue intangible assets (ASC 350, *Intangibles – Goodwill and Other*).

2.3 | Current definition of fair value and fair value measurement hierarchy

Given the pervasive reliance on the fair value measurement attribute in both the FASB's and the IASB's standards, it is perhaps surprising that 'fair value' was not defined by the boards until the late 2000s. The FASB and the IASB define fair value in ASC 820, *Fair Value Measurements and Disclosures*, and in IFRS 13, *Fair Value Measurement* (IASB, 2011), respectively.¹¹ Fair value is defined as '[t]he 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' (ASC 820-10-20; IFRS 13, para 8). Thus, it is defined by both standards setters as an exit price in a hypothetical transaction in an active market.

¹⁰IAS 16 was initially issued by the International Accounting Standards Committee and was then reissued by the IASB in 2003.

¹¹ASC 820 was formerly SFAS 157, *Fair Value Measurements* (FASB, 2006).

The application of the fair value measurement attribute hinges on two critical factors: an orderly transaction and market participants. As discussed in Section 2.1, during the global financial crisis of 2007–2009, what constituted an orderly transaction drew considerable attention. Ultimately, the FASB clarified that the market conditions during the crisis may not have been sufficient to facilitate an orderly transaction between market participants. In particular, an orderly transaction is not a forced transaction but a transaction that ‘assumes exposure to the market for a period before the measurement date to allow for marketing activities that are usual and customary for transactions involving such assets and liabilities’ (ASC 820-10-20). The second critical aspect of the fair value definition is the need for market participants. The definition requires market participants to be independent; that is, fair value is based on the information of an independent buyer or seller.

As the definition allows for hypothetical transactions, a fair value measurement can be estimated, and the estimate is not required to be from a recent transaction in an active market. The exchange price from a hypothetical transaction can be estimated from a model or determined by adjusting a price from a comparable asset. When firms use models to estimate fair values, the assumptions (or inputs) embedded in the model-based estimates may not be observable, which potentially impacts the reliability of fair value measurements. Therefore, firms are required to provide disclosures that report fair value amounts according to the three levels of the fair value measurement hierarchy. Level 1 prices are sourced from active markets and are considered the most reliable measures. Level 2 prices are based on quoted market prices for similar assets or liabilities and observable inputs other than quoted prices, for example, interest rates and yield curves. Level 3 estimates are based on unobservable firm-supplied inputs for an asset or liability and should be used only when Level 1- and Level 2-based estimates are not available.

While the complexity of determining fair value and the information asymmetry between preparers and users of financial reports is relatively low for Level 1 fair values, it is not always the case with Level 2- and Level 3-based fair values. The use of discretion and the complexity of financial models generally increase from Level 1 to Level 2 and from Level 2 to Level 3 of the fair value measurement hierarchy. Discretion can lead auditors to increase their efforts to verify fair value estimates, and the complexity of valuation methods may increase auditors’ reliance on external specialists to clarify the measurement process. Reporting complexity is also likely to increase information processing costs for external stakeholders. As a result, accounting standards require the provision of fair value-related disclosures that enable financial statement users to better assess the reliability of reported fair value amounts. For Level 2 and Level 3 fair values, firms are required to describe the valuation technique and the inputs used in their fair value measurements. Firms are also required to provide quantitative information about significant unobservable inputs used for assets or liabilities categorized within Level 3 of the fair value measurement hierarchy.

3 | ANALYSIS OF THE EXTENT OF FAIR VALUE USE IN PRACTICE

The use of fair value measurements varies between industries and across countries. Because financial institutions are generally the primary users of financial instruments, we expect they will recognize a greater proportion of their assets and liabilities at fair value. However, fair value measurements can also substantially impact the financial statements of firms in other industries. For example, firms in the energy industry use derivatives extensively for commodity price hedging. Researchers should consider the extent to which assets and liabilities are measured at fair value and differences across global markets and industries in their research design choices when examining the effects of fair value. To inform some of these research design choices, in this section we investigate fair value data availability, present descriptive statistics on fair value measurements across financial and non-financial firms reporting under US GAAP and IFRS, and provide basic descriptive statistics of the textual properties of associated disclosures for a sample of banks.

3.1 | Data availability

The Appendix summarizes the availability of fair value-related data provided by major commercial databases, particularly SNL Financial (‘SNL’), S&P Compustat Bank (‘Compustat’), and Bank Regulatory. As can be seen from the Appendix,

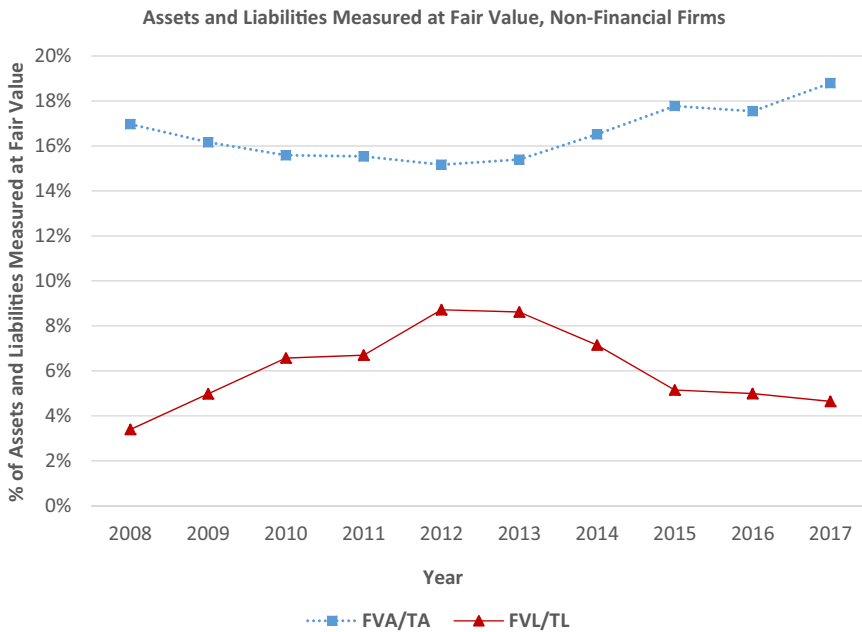


FIGURE 1 Fair value measurement of assets and liabilities, non-financial firms [Colour figure can be viewed at wileyonlinelibrary.com]

Notes: This figure presents trends in the percent of non-financial firms' assets and liabilities measured at fair value. *FVA/TA* (*FVL/TL*) is the ratio of assets (liabilities) measured at fair value to total assets (liabilities).

a constraint for studies investigating the implications of fair value accounting in non-financial firms is that detailed information on the use of fair value measurements for different classes of assets and liabilities needs to be hand-collected. As a result, many studies focus on financial firms. In our discussion of prior studies, we mention if authors hand-collected fair value-related information that was not provided by commercial databases.

3.2 | Descriptive statistics of fair value measurements in financial reports

In Figures 1 and 2 and Table 1, we present data on the extent of fair value measurements for financial and non-financial firms. We limit our sample to US firms, as fair value measurement information is readily available in Compustat.¹² The database provides information on total assets (liabilities) measured at fair value (Compustat items TFVA and TFVL), in addition to information about assets (liabilities) measured at Levels 1, 2 and 3 (Compustat items AQPL1, AOL2, AUL3, LQPL1, LOL2 and LUL3).

Figures 1 and 2 illustrate the evolution of fair value measurements for financial and non-financial firms from 2008–2017. For non-financial (financial) firms, the average percent of assets measured at fair value (*FVA/TA*) is 17% (23%) in 2008. For non-financial firms, this ratio decreases to 15% in the period 2012–2013 and then increases to 19% in 2017. For financial firms, this ratio steadily increases to 30% in 2014 before dropping to 27–28% after 2014. The average percent of liabilities measured at fair value (*FVL/TL*) for non-financial (financial) firms increases from 3% (3%) in 2008 to 9% (7–8%) in 2012–2013 and then decreases to 5% (3%) in 2017. These patterns can be driven by the quantity of assets and liabilities measured at fair value or changes in market prices.

Table 1 provides more detailed information about the extent of fair value measurements and fair values by level in 2017. Panel A (Panel B) provides information for non-financial (financial) firms, while Panel C provides mean values by

¹²Data for firms outside the US are only available if they have been cross-listed on a US stock exchange.

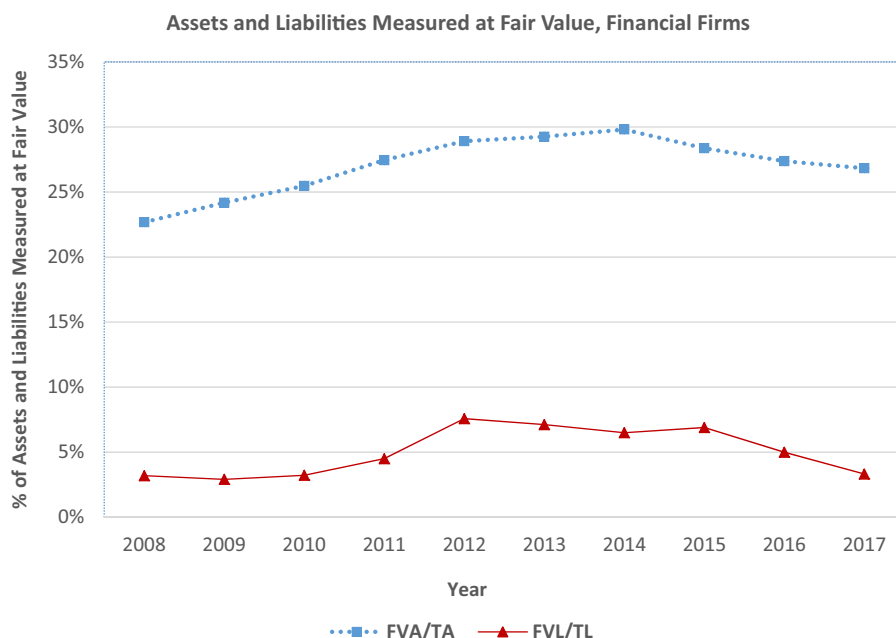


FIGURE 2 Fair Value Measurement of Assets and Liabilities, Financial Firms [Colour figure can be viewed at wileyonlinelibrary.com]

Notes: This figure presents trends in the percent of financial firms' assets and liabilities measured at fair value. FVA/TA (FVL/TL) is the ratio of assets (liabilities) measured at fair value to total assets (liabilities).

industry. From Panel A we can see that the mean FVA/TA is 19%, while the median value is 3%, highlighting the skewed underlying distribution. The mean value of FVL/TL is only 5%, indicating that, on average, fair value measurements are used more for assets. $AssetsL1/FVA$ ($AssetsL2/FVA$) is the ratio of assets measured at fair value Level 1 (Level 2) to the sum of assets measured at fair value Levels 1, 2 and 3. The number of observations decreases to 1,974 because some firms have zero total assets measured at fair value. On average, 51% (44%) of assets reported at fair value are measured using Level 1 (Level 2) inputs, while only 4% are measured using Level 3 inputs (i.e., $AssetsL3/FVA$). This suggests that reliability issues associated with Level 3 estimates are not likely to be economically meaningful for non-financial firms. Of the 1,436 firms that report liabilities at fair value, we can see that 49% of liabilities are measured at fair value Level 2, while 43% are measured at fair value Level 3. It is not surprising that the percentage of liabilities measured at Level 1 is quite low (8%), as not many firms have their liabilities traded in active markets. From Panel B, we can see that, on average, financial firms measure 27% of their assets at fair value, with most of these assets measured at fair value Level 2. Surprisingly, financial firms measure a smaller percentage of their liabilities at fair value (3%) compared to non-financial firms (5%); 66% of financial firms' liabilities are measured at fair value Level 2, while 25% are measured at Level 3.

In Panel C, we provide the mean values of the variables reported in Panels A and B by industry using the Fama-French 12-industry classification. The mean value of FVA/TA is highest in the healthcare, finance, and business equipment industries, with mean values of FVA/TA exceeding 20% in all three industries. In the healthcare and business equipment industries, most of the assets are reported at fair value Level 1, while in finance, only 15% of the assets are reported at fair value Level 1. Healthcare is also the industry with the highest proportion of liabilities reported at fair value (9%), with most of these liabilities reported at fair value Level 3 (83%). The energy industry has the second-highest percentage of liabilities reported at fair value (5%), with most reported at fair value Level 2. The chemicals and utilities industries have the highest percentage of liabilities reported at Level 1.

TABLE 1 Fair value measurements by US firms

Panel A: Non-financial								
	N	Mean	Median	S.D.	P1	P99		
<i>FVA/TA</i>	2,360	0.19	0.03	0.29	0.00	1.00		
<i>FVL/TL</i>	2,360	0.05	0.00	0.13	0.00	0.71		
<i>AssetsL1/FVA</i>	1,974	0.51	0.55	0.42	0.00	1.00		
<i>AssetsL2/FVA</i>	1,974	0.44	0.36	0.42	0.00	1.00		
<i>AssetsL3/FVA</i>	1,974	0.04	0.00	0.18	0.00	1.00		
<i>LiabL1/FVL</i>	1,436	0.08	0.00	0.23	0.00	1.00		
<i>LiabL2/FVL</i>	1,436	0.49	0.44	0.47	0.00	1.00		
<i>LiabL3/FVL</i>	1,436	0.43	0.04	0.47	0.00	1.00		
Panel B: Financial								
	N	Mean	Median	S.D.	P1	P99		
<i>FVA/TA</i>	1,053	0.27	0.15	0.30	0.00	0.98		
<i>FVL/TL</i>	1,053	0.03	0.00	0.13	0.00	0.82		
<i>AssetsL1/FVA</i>	1,028	0.15	0.00	0.29	0.00	1.00		
<i>AssetsL2/FVA</i>	1,028	0.74	0.96	0.37	0.00	1.00		
<i>AssetsL3/FVA</i>	1,028	0.11	0.00	0.28	0.00	1.00		
<i>LiabL1/FVL</i>	515	0.08	0.00	0.24	0.00	1.00		
<i>LiabL2/FVL</i>	515	0.66	0.99	0.43	0.00	1.00		
<i>LiabL3/FVL</i>	515	0.25	0.00	0.41	0.00	1.00		
Panel C: Averages by industry								
	<i>FVA/TA</i>	<i>FVL/TL</i>	<i>AssetsL1</i> / <i>FVA</i>	<i>AssetsL2</i> / <i>FVA</i>	<i>AssetsL3</i> / <i>FVA</i>	<i>LiabL1</i> / <i>FVL</i>	<i>LiabL2</i> / <i>FVL</i>	<i>LiabL3</i> / <i>FVL</i>
Consumer NonDurables	0.06	0.03	0.43	0.52	0.05	0.11	0.66	0.22
Consumer Durables	0.05	0.04	0.51	0.48	0.01	0.07	0.63	0.31
Manufacturing	0.05	0.02	0.45	0.53	0.02	0.06	0.73	0.21
Energy	0.04	0.05	0.37	0.58	0.05	0.08	0.68	0.23
Chemicals	0.05	0.04	0.49	0.48	0.04	0.17	0.60	0.23
Business Equipment	0.20	0.03	0.53	0.44	0.03	0.05	0.47	0.48
Telecommunications	0.08	0.05	0.42	0.46	0.13	0.11	0.53	0.36
Utilities	0.03	0.01	0.53	0.34	0.13	0.16	0.57	0.27
Shops	0.06	0.05	0.51	0.43	0.06	0.10	0.60	0.30
Healthcare	0.44	0.09	0.55	0.44	0.01	0.02	0.16	0.83
Finance	0.27	0.03	0.15	0.74	0.11	0.08	0.66	0.25
Other	0.15	0.03	0.57	0.38	0.05	0.07	0.47	0.46

Notes: This table provides descriptive statistics on fair value measurements of assets and liabilities by US firms in 2017. *FVA/TA* (*FVL/TL*) is the ratio of assets (liabilities) measured at fair value to total assets (liabilities). *AssetsL1/FVA* (*AssetsL2/FVA*) [*AssetsL3/FVA*] is the ratio of assets measured at fair value Level 1 (Level 2) [Level 3] to total assets measured at fair value. *LiabL1/FVL* (*LiabL2/FVL*) [*LiabL3/FVL*] is the ratio of liabilities measured at fair value Level 1 (Level 2) [Level 3] to total liabilities measured at fair value. Panel A (Panel B) provides information for non-financial (financial) firms, while Panel C provides mean values by industry.

Table 1 provides interesting insights into the use of fair value measurements across industries in the US. Typically, prior research has examined financial firms because the incidence of fair value measurements is high, but the business equipment and healthcare industries appear to make extensive use of fair value measurements for assets. To further investigate the high percentage of *FVA/TA* in the healthcare industry, we look at the revenues of the firms. Untabulated findings indicate that firms in the industry that are in the top quartile of *FVA/TA* have average revenues of US\$ 16.31 million. The average revenue of healthcare firms not in the top quartile of *FVA/TA* is much higher, at US\$ 1,526.31 million, indicating that healthcare firms in the top quartile of *FVA/TA* are primarily investing in clinical trials or are organized as shell companies. Furthermore, 41% of healthcare firms in the top quartile of *FVA/TA* have no revenues, compared to only 17% for the remaining healthcare firms in our sample. For example, Madrigal Pharmaceuticals Inc., a firm with a very high *FVA/TA*, has no revenues and very few assets, and nearly all of their assets are invested in available-for-sale debt securities (presumably to maintain and grow available capital for investing in research and development). Madrigal Pharmaceuticals is a clinical-stage biopharmaceutical firm, with most of its expenses stemming from research and development activities.¹³

Due to data limitations, it is challenging to examine the use of fair value across industries for non-US firms. However, studies using hand-collected data provide insights into non-financial firms' fair value measurements outside of the US. Gebhardt (2012) presents evidence regarding fair value measurements for a sample of non-financial European firms included in the STOXX Europe 600 Index, which tracks small, medium, and large capitalization firms from 17 European countries. The study shows that, on average, firms measure 24% (6%) of their financial assets (liabilities) at fair value and that financial assets (liabilities) measured at fair value account for less than 6% (3%) of total assets (liabilities). This is lower than the mean *FVA/TA* and *FVL/TL* we report in Table 1. Further, the study reports that European non-financial firms measure 57% of their financial instruments at Level 2, while only 35% are measured at Level 1. Note, however, that the study considers only financial instruments measured at fair value. Because firms following IFRS can measure some classes of non-financial instruments at fair value (e.g., PPE, investment property, intangibles, and biological assets), *FVA/TA* may be higher.

International data are available for financial firms, which enables us to compare across countries. Table 2 provides mean values for certain assets (liabilities) weighted by total assets (liabilities) for banks reporting under US GAAP and IFRS in 2017. The table also reports information on fair value levels for assets and liabilities measured at fair value. We obtain data from the SNL database. After we delete observations with missing values, we have 480 banks that report under US GAAP and 362 banks that report under IFRS. We classify banks into large and small banks using the US\$ 50 billion size threshold for stress tests in 2017. While the percent of total financial assets and liabilities is similar between banks reporting under US GAAP and IFRS, the breakdown across assets (liabilities) is different. US banks have higher amounts of loans and deposits compared to their international counterparts. Depending on the research question, these business model differences might be necessary to consider.

Cash and cash equivalents include cash and funds due from banks, as well as federal funds sold and securities purchased under agreements to resell. Although those positions are mainly recorded at historical cost, they have values very close to fair value because they are typically short term. The next category, trading assets, includes securities held primarily with the intention of selling them in the near term. Under both US GAAP and IFRS, trading assets are measured at fair value, with changes in fair value recognized directly in the income. Trading assets are more significant for large banks (6% for IFRS banks and 3% for US banks) than for small banks (2% for IFRS banks and 0% for US banks).

Other securities, which include available-for-sale and held-to-maturity securities, are a substantial part of total assets (18% for US banks and 12% for IFRS banks). Available-for-sale securities are measured at fair value, with

¹³Madrigal Pharmaceuticals is among the top 10 healthcare firms in terms of *FVA/TA*. When we examine the other nine, we find they are similar to Madrigal Pharmaceuticals. The other nine firms are AnaptysBio Inc., Arqule Inc., Catalyst Pharmaceuticals Inc., Dermira Inc., Fennec Pharmaceuticals Inc., G1 Therapeutics Inc., Geron Corp., Sage Therapeutics Inc., and Stemline Therapeutics Inc. They follow a similar pattern to Madrigal Pharmaceuticals in that they have little to no revenues, most of their non-cash assets are in short- and long-term investments, and their research and development expenditures typically far exceed the little to no reported revenues.

TABLE 2 Fair value measurements by US and IFRS banks

	All banks			Large banks			Smaller banks		
	US GAAP	IFRS	Diff	US GAAP	IFRS	Diff	US GAAP	IFRS	Diff
	n = 480	n = 362		n = 25	n = 129		n = 455	n = 233	
Assets									
Cash and Cash Eq.	0.06	0.10	-0.04***	0.11	0.08	0.03	0.05	0.11	-0.06***
Trading Assets	0.00	0.04	-0.03***	0.03	0.06	-0.03**	0.00	0.02	-0.02***
Other Securities	0.18	0.12	0.06***	0.21	0.11	0.10***	0.17	0.12	0.05***
Available for Sale	0.15	0.09	0.06***	0.15	0.08	0.06***	0.15	0.09	0.05***
Held to maturity	0.03	0.03	0.00	0.07	0.03	0.04***	0.03	0.02	0.00
Total Net Loans	0.70	0.59	0.11***	0.53	0.57	-0.04	0.71	0.60	0.11***
Financial Assets	0.94	0.94	0.00	0.91	0.94	-0.03***	0.94	0.95	0.00
Total Assets	1.00	1.00		1.00	1.00		1.00	1.00	
AssetsL1/FVA	0.05	0.50	-0.45***	0.13	0.47	-0.34***	0.04	0.51	-0.47***
AssetsL2/FVA	0.90	0.42	0.48***	0.82	0.48	0.35***	0.90	0.38	0.52***
AssetsL3/FVA	0.06	0.09	-0.03***	0.04	0.06	-0.01	0.06	0.10	-0.05***
Liabilities									
Trading Liabilities	0.00	0.02	-0.02***	0.02	0.05	-0.03***	0.00	0.01	-0.01***
Deposits	0.89	0.68	0.22***	0.79	0.61	0.18***	0.90	0.71	0.18***
Total Debt	0.09	0.14	-0.05***	0.16	0.16	0.00	0.09	0.13	-0.04***
Financial Liabilities	0.99	0.96	0.03***	0.95	0.94	0.01	0.99	0.96	0.02***
Total Liabilities	1.00	1.00		1.00	1.00		1.00	1.00	
LiabL1/FVL	0.04	0.08	-0.04***	0.11	0.10	0.01	0.03	0.06	-0.03*
LiabL2/FVL	0.84	0.88	-0.04	0.86	0.86	0.00	0.84	0.89	-0.05*
LiabL3/FVL	0.12	0.05	0.07***	0.03	0.04	-0.01	0.13	0.05	0.08***

Notes: This table provides mean values of the ratio of different types of bank assets (liabilities) to total assets (liabilities) for banks reporting under US GAAP and IFRS in 2017. The table also provides information on fair value Levels. *AssetsL1/FVA* (*AssetsL2/FVA*) [*AssetsL3/FVA*] is the ratio of assets measured at fair value Level 1 (Level 2) [Level 3] to total assets measured at fair value. *LiabL1/FVL* (*LiabL2/FVL*) [*LiabL3/FVL*] is the ratio of liabilities measured at fair value Level 1 (Level 2) [Level 3] to total liabilities measured at fair value. The financial assets (liabilities) category includes all financial assets (liabilities) recognized on the balance sheet, irrespective of the measurement method. Large banks include banks with total assets of more than US\$ 50 billion. *, ** and *** indicate statistical significance in the differences at 10%, 5% and 1% levels (two-tailed t-test), respectively.

unrealized gains and losses recognized in other comprehensive income. Securities a bank intends to hold until maturity are classified as held-to-maturity and are measured at amortized cost.

The most critical assets for banks are loans. For many banks, the origination of loans and the related fees are the principal sources of income. Loans account for more than half of the total assets. Smaller banks in the US have the highest loan-to-total-assets ratio (71%), while large and smaller IFRS banks have very similar ratios. Under US GAAP, the loans are classified as either 'held for sale' or 'held for investment'. 'Held for investment' loans are measured at amortized cost subject to impairment testing, while 'held for sale' are measured at the lower of cost or fair value. Under IFRS, loans are measured at amortized cost subject to impairment testing. Under both IFRS and US GAAP, banks can adopt the fair value option for specific loans or other financial instruments. This option allows a firm to reduce accounting mismatches and the related volatility in earnings that arises from the measurement of other instruments at fair value. Although the SNL database does not provide for all banks in our sample data on loans or other financial assets measured at fair value under the fair value option, the fraction of loans in this category is typically not substantial.

For banks that report under US GAAP (IFRS), more than 20% (22%) of assets are reported at or close to fair value. This percentage is higher for large US banks than for smaller US banks, whereas large and smaller IFRS banks are very similar. The SNL database also provides information on the amount of assets and liabilities reported using Level 1, Level 2 and Level 3 inputs. There are clear differences between US GAAP and IFRS banks with respect to their use of Level 1, Level 2 and Level 3 inputs. Of the total assets measured at fair value, 5% are reported at fair value Level 1 by US banks. In contrast, IFRS banks use Level 1 inputs for nearly half of their assets measured at fair value. It is not clear *ex ante* why IFRS banks would have a significantly larger proportion of assets in actively traded markets compared to US banks, given that the US would be expected to have the most active and liquid markets. The percentage of assets measured at Level 1 is higher for large US banks than for smaller US banks. This is not the case with IFRS banks; smaller IFRS banks use Level 1 inputs for 51% of their assets that are measured at fair value, while large IFRS banks use Level 1 inputs for 47% of their assets that are measured at fair value. The percentage of Level 3 fair value assets is quite small for both US GAAP and IFRS banks. The proportion of assets in different levels of the fair value measurement hierarchy, as well as differences between US and IFRS banks, should be considered in studies investigating the informativeness, and value and risk relevance of fair value information.

The proportion of trading liabilities to total liabilities is small in our sample, ranging from 5% for large IFRS banks to less than 1% for smaller US banks. Trading liabilities are measured at fair value, with resulting changes recognized in the income. Deposits are the most important liability class for banks. Smaller banks have a higher proportion of deposits to total liabilities than large banks. Deposits are measured at amortized cost, except for those cases for which the fair value option is elected. This is also the case for debt. Again, we do not have information for all banks in our sample regarding the proportion of deposits and debt for which the fair value option is elected; however, the proportion is typically small. Most liabilities measured at fair value are based on Level 2 inputs, and the differences between IFRS and US banks are not substantial. Large US and IFRS banks have more liabilities measured at fair value Level 1, while smaller US banks measure, on average, 13% of their fair valued liabilities using Level 3 inputs. The percentage of Level 3 liabilities is lower for large US and all IFRS banks. Finally, financial instruments account for more than 90% of banks' assets and liabilities. Because firms need to disclose aggregate fair values for financial instruments in the notes to the financial statements, investors have fair value information for a very high proportion of assets and liabilities for both US and IFRS banks.

The most comprehensive data on assets and liabilities held at fair value are for US bank holding companies (BHCs) that file FR Y-9C. For these banks, we obtain detailed information from the SNL database on assets and liabilities measured at fair value by level in the fair value measurement hierarchy. We include all BHCs in 2017. After we delete observations with missing data, the sample includes 322 BHCs. As reported in Table 3, almost 5% of the assets of BHCs is held in cash and cash equivalents. This includes 0.35% in federal funds sold and securities purchased under agreements to resell. Of these, a small percentage is measured at fair value. However, even for those assets recorded at historical cost, reported values are generally very close to fair value because, as we discussed above, they are typically short term.

Trading assets account for less than 1% of BHCs' total assets. 77% of trading assets are measured at fair value Level 2, while only 6% are measured at Level 3. Other securities, which consist of held-to-maturity and available-for-sale securities, account for 18% of BHCs' total assets. Of these other securities, 3% are invested in held-to-maturity securities and, therefore, are measured at historical cost. Available-for-sale assets are predominately measured at fair value Level 2 (92%).

Loans and leases, which account for 70% of BHCs' total assets, are a critical asset category for BHCs. 69% of the loans and leases are classified as held-for-investment. Most of these held-for-investment loans are measured at historical cost, with BHCs adopting the fair value option for a very small percentage. The loans reported at fair value are commonly measured using Level 3 inputs. Less than 1% of loans and leases consists of loans held-for-sale, and approximately half of these are measured at fair value. Other assets at fair value includes assets that are not in the other categories and that are measured at fair value. On average, 16% of BHCs' total assets are measured at fair value, with

TABLE 3 Fair value measurements by US bank holding companies

Assets		Liabilities	
1. Cash and Cash Equivalents	4.94%	1. Deposits	88.93%
1.1 Other Cash and Cash Equivalents	4.59%	1.1 Deposits_HC	88.66%
1.2 Federal Funds and Repos	0.35%	1.2 Deposits_FV	0.28%
1.2.1 Federal Funds and Repos_HC	0.31%	Level 1	0.00%
1.2.2 Federal Funds and Repos_FV	0.04%	Level 2	94.44%
Level 1	0.00%	Level 3	5.56%
Level 2	100.00%	2. Federal Funds and Repos	1.74%
Level 3	0.00%	2.1 Federal Funds and Repos_HC	1.73%
2. Trading Assets	0.28%	2.2 Federal Funds and Repos_FV	0.02%
Level 1	17.09%	Level 1	16.67%
Level 2	76.64%	Level 2	83.21%
Level 3	6.27%	Level 3	0.13%
3. Other Securities	18.29%	3. Trading Liabilities	0.13%
3.1 Held to Maturity	3.14%	Level 1	3.50%
3.2 Available for Sale	15.15%	Level 2	90.78%
Level 1	7.14%	Level 3	5.71%
Level 2	92.14%	4. Total Debt	9.65%
Level 3	0.72%	4.1 Debt_HC	9.58%
4. Loans and Leases	70.25%	4.1 Debt_FV	0.07%
4.1 Held for Investment	69.46%	Level 1	0.00%
4.1.1 Held for Investment_HC	69.13%	Level 2	67.82%
4.1.1 Held for Investment_FV	0.33%	Level 3	32.18%
Level 1	4.35%	5. Other Liabilities at Fair Value	0.05%
Level 2	25.70%	Level 1	8.43%
Level 3	69.95%	Level 2	77.41%
4.2 Held for Sale	0.79%	Level 3	14.16%
4.2.1 Held for Sale	0.39%	Total Liabilities at Fair Value	0.53%
4.2.2 Held for Sale_FV	0.40%	Level 1	6.08%
Level 1	1.02%	Level 2	80.06%
Level 2	87.62%	Level 3	13.85%
Level 3	11.36%	Financial Liabilities	98.58%
5. Other Assets at Fair Value	0.17%	Total Liabilities	100.00%
Level 1	6.08%		
Level 2	55.49%		
Level 3	38.43%		
Total Assets at Fair Value	16.37%		
Level 1	6.86%		
Level 2	91.06%		
Level 3	2.09%		
Financial Assets	93.47%		
Total Assets	100.00%		

Notes: This table provides mean values of the ratio of different types of bank assets (liabilities) to total assets (liabilities) for US bank holding companies in 2017. The sample includes 322 bank holding companies. The table also provides information on the percentage of each fair valued item measured at Level 1, Level 2 and Level 3. This percentage is based only on the bank holding companies that have fair valued assets/liabilities in the specific category. The financial assets (liabilities) category includes all financial assets (liabilities) recognized on the balance sheet, irrespective of the measurement method.

91% measured using Level 2 inputs. Financial assets, for which fair values are disclosed in the notes, account for 93% of BHCs' total assets.

Fair value measurements are used much less on the liability side for BHCs. From Table 3, we can see that less than 1% of the liabilities are measured at fair value, with 80% of these reported at fair value Level 2. Most of the liabilities measured at fair value come from deposits for which a bank adopts the fair value option, with 94% of these deposits measured using Level 2 inputs. Trading liabilities comprise only 0.13% of BHCs' liabilities, while some BHCs adopt the fair value option for a portion of their debt. As financial liabilities account for more than 98% of BHCs' total liabilities, their fair value is disclosed in the notes of the financial statements.

Given the differences between the US and IFRS banks reported in Table 2, it is not clear if the breakdowns reported by the US BHCs would be similar for IFRS banks. Unfortunately, we are unable to obtain comparable data for these banks beyond the data captured in SNL. Researchers interested in understanding or controlling for the differences between US and IFRS bank holding business models should carefully consider what is underlying the differences we report.

While the reported data highlight the importance of fair value measurements for financial instruments, they provide no insights into the use of fair value measurement for other classes of assets. As we discuss in Section 2.2, firms are required under IFRS to measure some biological assets at fair value; however, they have a choice between fair value and historical cost accounting for investment property, PPE, and intangibles. Studies rely on hand-collected samples to provide evidence regarding the use of fair value measurements for non-financial assets.

Using a sample of 228 large listed firms in the UK and Australia around the adoption of IFRS, Cairns, Massoudi, Taplin, and Tarca (2011) find that only two UK firms report biological assets, and both use fair value measurement under IFRS. In Australia, of the seven firms holding biological assets in the post-IFRS period, six use the fair value measurement basis under IFRS, while one uses the cost model. For a sample of 183 IFRS users with biological assets that comprise more than 5% of their total assets, Huffman (2018) finds that most of the firms measure in-exchange biological assets at fair value upon IAS 41 adoption, whereas, more than 40% of the firms continue to measure in-use biological assets at historical cost. The study finds that earnings information is more relevant when firms measure in-exchange biological assets at fair value, while this is not the case when firms measure in-use biological assets at fair value.

Using a sample of over 1,500 UK and German firms, Christensen and Nikolaev (2013) find that fair value measurements for PPE are used sparingly, while none of the firms measure intangibles at fair value. This is not surprising given that for the revaluation of intangibles (based on fair value), IFRS requires the existence of an active market, which is rare. The study also finds that firms are equally likely to use historical cost and fair value measurements for investment property. In line with these results, Nobes and Stadler (2013) examine 514 IFRS firms across 12 countries and find that fair value measurements are used mainly for investment property, rather than PPE. Müller, Riedl, and Sellhorn (2015) find that the majority of the real estate firms in their sample of 245 IFRS adopters located in the European Economic Area recognize investment property at fair value and that equity prices were more strongly associated with recognized investment property fair values than disclosed fair value amounts. Similarly, Israeli (2015) finds that investment property is reported at fair value in more than 60% of the firm-years in a sample that includes IFRS adopters from France, Germany, Italy and Spain.

3.3 | Fair value disclosures

Reported fair value amounts are ultimately presented in financial statements as point estimates, but like many financial statement numbers the true value of an asset or liability measured at fair value lies somewhere within a band of possibilities. Disclosures can help financial statement users better ascertain the extent to which fair values were measured with a high or low degree of certainty. In particular, the decision usefulness of fair value information is often conditional on financial statement users' understanding of the information they are provided through relevant financial disclosures (Gaynor, McDaniel, & Yohn, 2011).

Consistent with a firm's information environment playing a central role in determining the decision usefulness of fair value information to capital market participants, academic research considers the effect of fair value-related disclosures on the usefulness of fair value estimates. Chung, Goh, Ng, and Yong (2017a) examine a sample of 681 US financial firms and find that voluntary fair value-related disclosures are associated with higher market pricing and lower information risk for Level 3 fair value estimates, while Clor-Proell, Proell, and Warfield (2014) find in an experimental setting that making fair value changes more salient in the income statement allows users to better incorporate disclosed fair value-related information in their judgements. However, Griffin's (2014) findings in an experimental setting suggest that auditors are less likely to require adjustments to Level 3 fair value estimates when supplemental footnote disclosures are provided by a firm, suggesting that supplemental disclosures may have unintended consequences related to the auditing of fair values recognized in the financial statements.

Firms are required to make extensive disclosures about the fair value measurements recognized in their financial statements. The nature of the disclosure depends on whether the fair value measurement is recognized or disclosed in the financial statements. Further, the disclosures for items recognized at fair value differ depending on whether the items are recurring or non-recurring measurements. Firms are required to disclose the period-end amounts of items measured at fair value, the level in the fair value measurement hierarchy to which measurements belong, a description of the valuation technique used, and significant details about Level 3 fair values, including a roll-forward of the balances and an analysis of the sensitivity of the measurement. The disclosures for many firms can be several pages long. One question that future research could address is whether and which fair value-related information is useful to investors and whether fair value-related disclosures could be improved.

To provide a high-level overview of these disclosures, we have collected from SEC 10-K filings the fair value measurement footnotes for all depository institutions (SIC code 60) in the US for the period 2010–2018. Our final sample contains 2,141 firm-year observations. We include some basic descriptive statistics of the textual properties of the disclosures in Panel A of Table 4. We use variables as defined in Loughran and McDonald (2016) and Bodnaruk, Loughran, and McDonald (2015). We observe a substantial degree of variation with respect to each dimension of the disclosures analyzed. For example, the mean (median) observation in our sample discloses 220 (183) numbers; however, the first percentile firm discloses 26 numbers, while the 99th percentile firm discloses 920 numbers.

To better understand the variation in disclosures across firms, we begin by partitioning firms into large and small depository institutions.¹⁴ Once again, we use US\$ 50 billion in assets to partition the sample. The two sub-samples differ along nearly every dimension; the only variables not significantly different at their means are *Negative* and *Avg_syllables_per_word*. Small banks' fair value-related disclosures are less *Positive* than large banks' disclosures; however, small banks' disclosures exhibit greater *Uncertainty*. Interestingly, the increased *Uncertainty* does not result in a larger proportion of *Litigious* words. Large banks' disclosures are significantly larger across every dimension we capture; for example, *Alphabetic* is 44% larger for large banks than for small banks (17,086 versus 9,637), and *Numbers* is 45% larger for large banks than for small banks (315 versus 172).

We next examine how fair value-related disclosures compare to other disclosures. To do so, we collect loan-related note disclosures from our sample of depository institutions' SEC 10-K filings. We picked the loan-related notes as loans are typically the largest asset class for a bank and they are typically maintained at amortized historical cost even though the underlying assets are financial instruments. Panel B provides basic descriptive statistics of the textual properties of these loan-related disclosures. Similar to our analysis of the fair value-related disclosures, the loan-related disclosures exhibit significant differences across all the dimensions measured between large and small banks. Interestingly, the small banks' loan disclosures are more *Positive* and *Negative* than large banks' loan disclosures. In Panel C, we

¹⁴The footnote data that we used in this paper are available for download at the following link: <https://doi.org/10.17635/lancaster/researchdata/323>. The paper only uses footnote data for depository institutions to allow for a comparison of fair value- and loan-related note disclosures. However, fair value data are available for all financial institutions. Instructions on using the data are available at the link.

TABLE 4 Analysis of the textual properties of the fair value-related footnotes

	Panel A: Fair value-related footnotes									
	All depository institutions (n = 2,141)					Large > US\$ 50 billion Assets (n = 722)		Small < US\$50 billion Assets (n = 1,419)		
	Mean	Median	S.D.	P1	P99	Mean	S.D.	Mean	S.D.	Diff
Positive	0.31	0.28	0.20	0.00	1.02	0.35	0.21	0.29	0.20	0.06***
Negative	1.22	1.22	0.55	0.00	2.66	1.24	0.49	1.21	0.58	0.04
Uncertainty	1.46	1.46	0.42	0.31	2.57	1.42	0.41	1.48	0.43	-0.06**
Litigious	0.24	0.18	0.23	0.00	1.14	0.37	0.28	0.17	0.16	0.20***
Modal_weak	0.26	0.25	0.15	0.00	0.69	0.24	0.15	0.28	0.15	-0.04***
Modal_moderate	0.37	0.36	0.18	0.00	0.87	0.34	0.16	0.39	0.19	-0.05***
Modal_strong	0.12	0.09	0.12	0.00	0.51	0.10	0.09	0.13	0.14	-0.02***
Constraining	1.08	1.07	0.47	0.00	2.25	0.91	0.37	1.17	0.49	-0.27***
Alphabetic	12,149	10,874	8,127	1,438	46,615	17,086	11,025	9,637	4,375	7,449***
Digits	854	709	665	128	3,716	1,278	939	639	284	639***
Numbers	220	183	185	26	920	315	274	172	82	143***
Avg_syllables_per_word	1.93	1.93	0.08	1.80	2.05	1.93	0.05	1.93	0.09	0.00
Avg_word_length	5.68	5.69	0.17	5.37	5.99	5.69	0.14	5.68	0.18	0.02*

(Continues)

TABLE 4 (Continued)

	Panel B: Loan-related footnotes										
	All depository institutions (n = 2,342)					Large > \$50 billion Assets (n = 815)			Small < \$50 billion Assets (n = 1,527)		
	Mean	Median	S.D.	P1	P99	Mean	S.D.	Mean	S.D.	Diff	
Positive	0.31	0.27	0.27	0.00	1.19	0.27	0.21	0.33	0.29	-0.06***	
Negative	4.15	4.21	1.75	0.32	9.31	3.84	1.77	4.32	1.71	-0.48***	
Uncertainty	1.18	1.18	0.69	0.00	2.81	1.07	0.66	1.24	0.69	-0.17***	
Litigious	0.30	0.27	0.29	0.00	1.19	0.32	0.26	0.29	0.30	0.03*	
Modal_weak	0.25	0.21	0.24	0.00	1.00	0.21	0.20	0.28	0.25	-0.06***	
Modal_moderate	0.29	0.27	0.24	0.00	1.09	0.27	0.22	0.30	0.26	-0.02*	
Modal_strong	0.11	0.09	0.12	0.00	0.48	0.09	0.10	0.13	0.12	-0.03***	
Constraining	1.40	1.27	0.90	0.00	5.32	1.34	0.79	1.43	0.95	-0.10*	
Alphabetic	12,413	11,621	8,059	389	33,871	13,437	9,143	11,867	7,360	1,570***	
Digits	2,400	2,274	1,542	124	7,369	2,879	1,904	2,144	1,234	735***	
Numbers	567	548	347	27	1,717	608	406	545	308	64***	
Avg_syllables_per_word	1.91	1.91	0.09	1.72	2.19	1.90	0.07	1.92	0.10	-0.03***	
Avg_word_length	5.75	5.72	0.23	5.27	6.49	5.72	0.19	5.77	0.25	-0.06***	

(Continues)

TABLE 4 (Continued)

	Fair value footnotes (n = 2,141)		Loan footnotes (n = 2,342)		Diff
	Mean	S.D.	Mean	S.D.	
	Positive	0.31	0.20	0.31	
Negative	1.22	0.55	4.15	1.75	-2.93***
Uncertainty	1.46	0.42	1.18	0.69	0.28***
Litigious	0.24	0.23	0.30	0.29	-0.06***
Modal_weak	0.26	0.15	0.25	0.24	0.01
Modal_moderate	0.37	0.18	0.29	0.24	0.08***
Modal_strong	0.12	0.12	0.11	0.12	0.00
Constraining	1.08	0.47	1.40	0.90	-0.32***
Alphabetic	12,149	8,127	12,413	8,059	-264
Digits	854	665	2,400	1,542	-1,546***
Numbers	220	185	567	347	-347***
Avg_syllables_per_word	1.93	0.08	1.91	0.09	0.01***
Avg_word_length	5.68	0.17	5.75	0.23	-0.07***

Notes: This table provides descriptive statistics on the textual properties of footnote disclosures from the 10-K reports of firms in two-digit SIC code 60. All variables are as defined in Loughran and McDonald (2016) and Bodnaruk et al. (2015). Panel A provides information on fair value-related footnotes, while Panel B provides information on loan-related footnotes. Panel C provides a comparison of fair value- and loan-related footnotes. Large banks include banks with total assets of more than US\$ 50 billion. *, **, and *** indicate statistically significant differences in means at 10%, 5% and 1% levels (two-tailed t-test), respectively.

compare the mean values of our variables for fair value- and loan-related disclosures. Some variables are insignificantly different across the two samples, specifically *Positive*, *Modal_Weak*, *Modal_Strong* and *Alphabetic*. There are some potentially interesting differences between the two note disclosures. Fair value disclosures are significantly less *Negative*, *Litigious* and *Constraining* and have significantly more *Uncertainty*. While one might expect to see fewer negative words in the fair value measurement notes, it is not clear why the disclosure would have fewer litigious words but more uncertain words. Panel C only provides high-level descriptive evidence using pre-existing dictionaries. It would be interesting to dig deeper into the notes to understand if the differences are driven by the measurement basis used in the two notes.

It could be interesting to examine some of the textual properties of these disclosures in relation to the issues raised earlier. For example, large banks have more Level 3 assets and liabilities, which automatically triggers increased disclosure requirements. However, large banks have less *Uncertainty* in their disclosures. Why would numbers that are generally considered less reliable result in less *Uncertainty* in the textual properties of the disclosures? In addition, it is important to determine whether these disclosures provide incremental information to financial statements users and to determine the characteristics that make fair value disclosures more or less useful.

4 | USEFULNESS OF FAIR VALUE MEASUREMENTS

In this section, we discuss the current state of accounting research aimed at documenting the decision usefulness of both recognized and disclosed fair value information. Our goal is not to discuss every paper written on the topic of fair value measurement. Rather, we aim to offer insights into areas of the literature for which our understanding of fair value measurements remains limited; thus, future research can generate important insights. In Sections 4.1 and 4.2 below, we focus on the value relevance and risk relevance of assets and liabilities measured at fair value.

To provide context to our discussion, it is useful to consider a simplified framework of the fair value measurement process, as outlined in Figure 3. After identifying items that need to be measured (or remeasured) at fair value, firms must determine the availability of valuation inputs (i.e., Level 1, 2 or 3) and the corresponding valuation approach (e.g., a market-based approach using quoted prices for identical or similar assets or an income-based approach using a discounted cash flow analysis). This step in the process, which is influenced by firms' fair value measurement capabilities, auditor capabilities, managerial incentives and discretion, and other institutional and market factors, largely remains a 'black box' to researchers despite its importance to the production of useful fair value estimates. Researchers typically observe the next step in the process in which fair value amounts are displayed in financial reports. Finally, market participants use fair value measurements and disclosures in their decision processes. Although this final step has been studied quite a bit, our understanding of how fair value amounts are used by capital market participants remains limited.

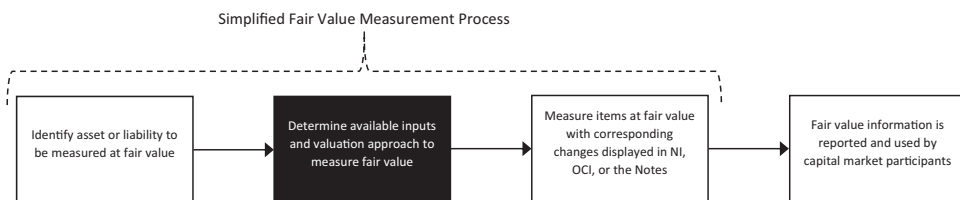


FIGURE 3 This figure provides a high-level framework that reflects the major steps in the fair value measurement process

4.1 | Valuation of fair value measurements

In tests of the value relevance of fair value information, researchers commonly examine statistical associations in regressions of fair value measurements on equity prices.¹⁵ Under relatively strong assumptions, the regression coefficients corresponding to the fair values of assets and liabilities are expected to be 1 and -1, respectively. However, empirical research generally finds that investors often price fair value estimates at a discount. In particular, the association between fair value measurements and equity prices is attenuated in the context of unverifiable fair value estimates that are sensitive to managerial discretion over valuation inputs, measurement error, or both. The main issues we explore in the following discussion are the valuation differences between assets and liabilities measured at fair value and the characteristics and decision usefulness of fair value measurements within different levels of the fair value measurement hierarchy.

4.1.1 | Assets versus liabilities measured at fair value

Although the value relevance of assets measured at fair value has been well studied in the literature, considerably less is known about the value relevance of liabilities measured at fair value. One reason for the scarcity of research examining the value relevance of liabilities measured at fair value is that relatively few firms measure liabilities at fair value (see, e.g., Song, Thomas, and Yi (2010) and Section 3.2 and Tables 1–3 in this paper). In theory and absent any informational or measurement frictions, assets and liabilities measured at fair value should be treated similarly by investors. A US\$ 1 increase in the fair value of a firm's assets (liabilities) should correspond to a US\$ 1 increase (decrease) in the market value of the firm's equity. Existing studies, however, indicate that investors' perceptions and beliefs about the relevance and reliability of fair value estimates may be impacted by whether an instrument measured at fair value is an asset or a liability.

For instance, Koonce, Nelson, and Shakespeare (2011) conduct experiments to assess whether investors consider fair value measurements to be less relevant for financial liabilities than for financial assets, even after holding constant the underlying economics of the financial instrument. The authors find evidence in support of the notion that investors do, in fact, consider fair value information to be more useful for assets than for liabilities. However, their results suggest that investors find fair value measurements for liabilities to be more useful for liabilities that are expected to be settled over short durations than for liabilities that are held to maturity. These results are consistent with arguments made by Lipe (2002) against the use of fair value measurement for liabilities. In contrast to the above results, Chung et al. (2017b) and Cedergren, Chen, and Chen (2019) find some evidence in support of measuring liabilities at fair value by demonstrating that changes in the value of US financial firms' liabilities measured at fair value are generally value relevant to investors. Regardless, neither of these studies considers whether and how investors or analysts view assets measured at fair value differently than liabilities measured at fair value.

Future research can help by developing a better understanding of why investors may view fair value measurements for liabilities as relatively less decision-useful than asset fair values and whether investors' perceptions of fair value measurements for liabilities influence firms' adoption of the fair value option for liabilities. In addition, academics can advance both the scholarly literature and current practice by evaluating financial reporting and disclosure alternatives that may facilitate the use of fair value information by investors (as in, for example, Gaynor et al., 2011). Although these are challenging issues to address, particularly given that the use of fair value accounting for liabilities remains limited, we believe that investigating them may yield valuable insights.

4.1.2 | The characteristics and decision usefulness of fair value measurements

In this subsection, we review the process for determining the fair value of an asset or liability, as prescribed by the fair value measurement hierarchy established in IFRS 13 and ASC 820. In this context, we discuss research that explores

¹⁵For insightful discussions of value relevance studies, we refer readers to Barth, Beaver, and Landsman (2001), Hodder et al. (2014), Holthausen and Watts (2001) and Landsman (2007).

the value relevance of fair value estimates derived from inputs corresponding to different levels in the fair value measurement hierarchy.

As discussed in Section 2.3, the fair value measurement hierarchies of the FASB and the IASB require that firms measure assets and liabilities at fair value using a hierarchy of inputs. Level 1 (Level 2) fair value measurements are derived from observable valuation inputs based on quoted prices of identical (similar) assets and liabilities. In contrast, Level 3 fair value estimates are based on unobservable valuation model assumptions that are relatively more prone to managerial discretion and estimation error. Firms use the highest level in the hierarchy based on available information; for example, a firm should use Level 1 inputs if such inputs are available.

Song et al. (2010) provide early evidence regarding the relevance of fair value estimates under SFAS 157 using a sample of US banks' 2008 quarterly financial reports (see also Kolev, 2019). They find that the value relevance of Level 1 and Level 2 fair value estimates is greater than the value relevance of Level 3 fair value estimates. They also find that the value relevance of Level 1 and Level 2 fair values is not statistically different.¹⁶ Similarly, Goh, Li, Ng, and Yong (2015) find that Level 3 fair value measurements are priced at a deeper discount than Level 2 fair value estimates, which are both priced at a discount compared to Level 1 fair value estimates. Level 1 fair value estimates for assets are priced at their theoretical value of 1, while Level 1 fair value estimates for liabilities are priced at a slight discount to -1. The findings of Goh et al. (2015), however, suggest that the pricing discounts begin to diminish following the 2007–2009 global financial crisis.

In contrast to the preceding discussion, Lawrence, Siriviriyakul, and Sloan (2016) suggest that there are only small differences in value relevance across the fair value measurement hierarchy. The authors attribute their conflicting evidence to problems with the research designs used in earlier studies, as conclusions are drawn from samples where only a small proportion of assets are measured at fair value. If the value of assets measured at fair value is correlated with changes in the value of assets recognized at amortized cost or are recorded off-balance sheet, this causes a correlated omitted variables problem (Ahmed & Takeda, 1995; Carroll, Linsmeier, & Petroni, 2003). For example, in the Song et al. (2010) sample, on-balance sheet assets measured at fair value are, on average, approximately 15% of total assets, with most of these assets measured using Level 2 inputs (13.31% of total assets). Lawrence et al. (2016) argue that the proportion of Level 3 assets was likely higher in banks focusing on the origination and sale of non-agency loans. It is therefore unclear whether the results of Song et al. (2010) are driven by reliability issues associated with Level 3 estimates or by the decline in value of the underlying lending businesses during the 2008 sample period. This example highlights the importance of identifying a setting that is reasonably free of correlated omitted variables when evaluating the decision usefulness of fair value measurements that are based on valuation inputs associated with the different levels of the fair value measurement hierarchy.

Currently, there is much discussion in the literature about the value relevance of Level 3 fair values with respect to pricing discounts relative to theoretical values and to Level 1 estimates. Although the evidence is mixed – for instance, some studies report that assets measured at fair value using Level 3 inputs are traded at a discount due to measurement concerns, while other studies indicate that no such discount exists and that Level 3 fair values are useful in providing investors with information – the consensus is that Level 1 and Level 2 fair values are considered more relevant and reliable than Level 3 fair values. Level 2 fair value estimates, however, are sometimes treated as equivalent to Level 1 fair values, especially when researchers consider the value relevance of liabilities measured at fair value. A notable exception is Altamuro and Zhang (2013), who use a sample of 82 BHCs to study the value relevance of Level 2 and Level 3 fair value measurements, particularly in the context of mortgage servicing rights. They find that Level 3 fair value measurements are more value relevant than Level 2 estimates. The evidence presented by Altamuro and Zhang (2013), which was critiqued in a discussion by Hendricks and Shakespeare (2013), suggests that managerial discretion over valuation model inputs can generate fair value measurements that are more informative than fair values based on Level 2 inputs.

¹⁶To assess the value relevance of liabilities measured at fair value, the authors combine Level 1 and Level 2 fair value estimates into a single category.

The accounting rules classify fair value measurements into three classifications that are perceived to be distinct; in reality, these classifications exist on a continuum. We currently know little about how firms exercise discretion when measuring assets and liabilities at fair value using Level 2 inputs. For example, how do firms select an asset or a liability that is *similar* to the asset or liability being measured at fair value? At what point do managers switch from using a Level 1 input to using a Level 2 input or from using a Level 2 input to using Level 3 inputs? What role do managerial incentives play in these decisions? And does the fair value measurement process impact managers' investment decisions? Furthermore, do investors perceive Level 1 and Level 2 fair value measurements differently in terms of information content and measurement reliability? If so, when are these differences the largest or smallest? What can firms and their auditors do to improve the decision usefulness of a firm's fair value measurements, regardless of the source of valuation input? These questions are particularly germane to the fair value literature when considering the differences in the composition (in terms of the extent to which Levels 1, 2 and 3 are used) of assets and liabilities measured at fair value across industries and accounting regimes, as highlighted in Tables 1 and 2.

4.2 | Fair value measurements and risk

In this section, we present the findings of key studies exploring the risk relevance of fair values. We focus on the relationship between historical cost and fair value and the effect of firms' risk management and fair value measurement capabilities.

At the heart of the American Bankers Association (ABA)'s comments on fair value is the idea that fair values do not represent a bank's business model accurately (ABA, 2009). The ABA argues that non-traded financial instruments should not be maintained at fair value if a bank intends to hold the instrument until collection/payment because fair values are transitory and, therefore, will reverse before the instrument is fully collected at maturity. Measuring these instruments at fair value may lead investors to believe that the financial instruments may be settled at prevailing market values, thus overstating their assessment of the riskiness of a bank's business model. Given these concerns, an important question concerns the relationship between fair value and risk.

Hodder, Hopkins, and Wahlen (2006) use a sample of US commercial banks to investigate how the volatilities of various income measures compare and how the volatilities of these measures are associated with market-based risk measures. They use three measures of bank performance in their tests – net income, comprehensive income that includes some unrealized fair value gains and losses, and a full-fair-value income measure. Full-fair-value income is constructed using fair value changes of all financial instruments disclosed in the notes of banks' annual reports. It is not clear a priori whether full-fair-value income will be more volatile, as banks often have some natural hedge between the asset and liability sides of their balance sheet. The study finds that full-fair-value income volatility is significantly greater than net-income volatility for 90% of the sample banks and significantly greater than comprehensive-income volatility for 77% of the sample banks. For the majority of banks, the fair value adjustments recognized in comprehensive income do not covary significantly negatively with the fair value adjustments that would have been recognized in full-fair-value income, thus providing no evidence of a hedge.

The volatilities of all three income measures exhibit varying degrees of a positive correlation with market-based and disclosed risk measures. Net-income volatility exhibits the most consistent and robust correlations across the risk factors, while the volatility of full-fair-value income correlates positively with the standard deviation in stock returns and banks' exposure to derivatives. The incremental volatility in full-fair-value income (beyond volatility in net income and comprehensive income) is positively associated with market-based risk measures. The study also finds that the incremental volatility in full-fair-value income negatively moderates the capitalization of abnormal earnings in bank share prices and that the expected returns on bank equity are increasing in the incremental volatility in full-fair-value income. This is in line with the volatility of incremental full-fair-value income capturing elements of bank risk that the capital markets price.

Blankespoor, Linsmeier, Petroni, and Shakespeare (2013) assess the extent to which leverage ratios, including financial instruments based on fair value, US GAAP measurement, and Tier 1 regulatory capital values, are associated with

credit risk, captured by bond yield spreads and future bank failure. The authors find that leverage ratios based on fair values explain more variation in credit risk than the other leverage ratios. The results of the study hold for both complex banks and banks with more traditional books of business, primarily loans and deposits, and within both the expansionary and recessionary phases in the test period. Interestingly, the study shows that the leverage ratio based on Tier 1 regulatory capital values is generally least descriptive of credit risk and, in some instances, even has a negative relationship with credit risk and that the ability of the Tier 1 ratio to reflect credit risk improves if loans and deposits are included at fair value.

4.2.1 | Historical cost versus fair value

The empirical evidence shows that fair values correlate more with various measures of risk and that fair value numbers are value relevant to investors. However, analysts commonly ask for amortized cost numbers; for example, analysts looked for more detail on historical cost numbers than fair value information during the recent deliberations around the accounting for loan losses. During the recent credit losses project undertaken by the FASB, one model proposed was to fair value the loans at each reporting period, with changes going through the income statement. Not surprisingly, the preparer community was opposed to this model. However, the user community also asked to retain much of the current information presented under an amortized cost model. There are a couple of plausible explanations for this. First, users may not want to diminish any information advantage they perceive themselves to have. Second, amortized historical cost numbers and fair values may provide complementary information.

Future research could consider if the two measurement systems are substitutes or complements and whether this relationship varies over time and by firm type. In addressing this issue, we need to understand better if there is information in historical cost numbers that is lost if fair values are used. Both measurement systems use different underlying assumptions to determine the numbers recognized in the financial statements. Both measurement systems may vary in the disclosures and the precision of those disclosures. These factors could impact the actual or perceived decision usefulness of the disclosures.

4.2.2 | Risk management and fair value measurement capabilities

Several studies have explored sources of variation in the reliability of fair value measurements. For instance, Bhat and Ryan (2015) use a sample of 238 US BHCs to explore whether risk management technologies affect the relationship between stock returns and unrealized fair value gains and losses on financial instruments. Instead of using the levels of the fair value measurement hierarchy to proxy for fair value measurement reliability, the study uses the location that unrealized gains and losses are displayed in the financial statements as a proxy for reliability. The results suggest that banks' risk management technologies can improve the reliability, and thus the usefulness, of unrealized gains and losses suffering the most from reliability concerns (i.e., unrealized gains and losses on less liquid instruments, which are typically disclosed in the notes rather than recorded in net income or other comprehensive income).

Future research in this area should seek to better understand the fair value estimation process, especially for Level 3 fair value estimates, and to further explore the causes and consequences of variation in the reliability of these estimates. This may include firm-specific factors such as management incentives to bias fair value estimates, a firm's capabilities and technologies related to the estimation of fair values, and other institutional factors. The challenge is to identify settings in which researchers can disentangle the role of these factors and unobservable fair value estimation capabilities in determining the reliability of fair value measurements. For example, in the study by Bhat and Ryan (2015), we cannot rule out the possibility that the increased reliability of fair value measurements is driven by unobservable fair value estimation capabilities that are correlated with the disclosure of risk management technology.

4.2.3 | Fair value for liabilities and own credit risk

The fair value option (FVO) (FASB, 2007; IASB, 2005) enables firms to measure financial liabilities at fair value. If a firm adopts the FVO for liabilities, the component of a change in fair value related to changes in a firm's own credit risk

must be separately recognized and disclosed in the financial statements (i.e., debt valuation adjustments, or DVAs). In particular, a firm reports a gain (loss) when the firm's own credit risk deteriorates (improves). This has been criticized as counterintuitive to the way in which gains and losses are typically viewed – that is, liabilities diminish (increase) as the firm's underlying financial condition deteriorates (improves) – and the results have been argued to be difficult to explain to creditors and investors (e.g., Chasteen & Ransom, 2007; Lipe, 2002; Reilly, 2007).¹⁷ Bischof, Daske, and Sextroh (2014), for instance, find in a sample of IFRS banks from 30 countries that analysts frequently ask management during conference calls about the effects of changes in a banks' own credit risk on the fair value of liabilities. They also find that analysts typically exclude from reported earnings the impact of changes in a bank's own credit risk. The counter-argument has been that recognition of DVAs is consistent with debtholders partially absorbing shocks to firm value. Barth, Hodder, and Stubben (2008) show that the presence of debt attenuates the effect of changes in own credit risk on equity returns, indicating that DVAs should be candidates for inclusion in accounting income if the objective is the faithful representation of a firm's liabilities and economic performance.

Whether the recognition of DVAs makes accounting numbers more informative is an intriguing empirical question. Gaynor et al. (2011) provide experimental evidence suggesting that disclosures about own credit risk changes and DVAs mandated by SFAS 159 are not sufficient to avoid misinterpretations. In particular, the participants in their study (Certified Public Accountants) were unable to associate a gain (loss) arising from changes in the fair value of liabilities with an increase (decrease) in credit risk. Lipe (2002) analyzes the financial statements of a US firm, Boston Chicken, that experienced severe financial distress to show that financial ratios computed using net income adjusted by positive DVAs did not faithfully depict the firm's negative performance.

Using a sample of 117 IFRS banks from 24 European countries, Schneider and Tran (2015) provide evidence that those banks recognizing DVAs exhibit lower bid-ask spreads compared to non-adopters of the FVO for liabilities. In a sample of US financial firms, Chung et al. (2017b) investigate the value relevance of DVAs and find a positive relationship between DVAs and stock returns, while Cedergren et al. (2019) find insignificant results in their sample of 47 US BHCs. However, when Cedergren et al. (2019) consider the amount of unrecognized intangibles assets, they find that DVAs are positively related to equity returns when the level of unrecognized intangibles assets is low. Using a sample of 104 IFRS banks from 23 European countries, Fontes, Panaretou, and Peasnell (2018) find that the fair value measurement of assets is associated with noticeably lower information asymmetry and that this reduction is larger when banks also recognize DVAs. This finding is consistent with DVAs providing investors with important information on how gains and losses are shared between equity holders and debtholders (Merton, 1974).

The above studies assume that changes in the fair value of liabilities are reliably measured. However, this is one of the main practical concerns related to the FVO for liabilities, and this issue has been addressed very little by the current literature. Although the absence of active markets is an obvious problem for non-financial assets, the problem is also significant for financial instruments, especially those with embedded options (Landsman, 2007). Structural models are widely used in practice to value financial liabilities when active markets do not exist. Despite their frequent use, the literature largely suggests that structural models of credit risk do not accurately price corporate debt. Barth, Landsman, and Rendleman (1998) study a sample of 120 non-financial firms in the US and conclude that estimates of bond values from a binomial option-pricing model may be relevant to financial statement users but may lack reliability, especially when market information from other instruments of the same firm is not available to be used as model inputs. More recent studies that use flexible models that allow for coupons, stochastic interest rates, and default before maturity

¹⁷With respect to creditors, academics have debated whether reporting changes in fair value in net income reduces the contractibility of income statement numbers. For instance, Ball, Li, and Shivakumar (2015) argue that when net income is influenced by fair value gains and losses, it is less useful for debt contracting purposes. They also note that while the FVO for liabilities may be value relevant to investors, it reduces the debt contracting value of accounting information 'because debt contracts require repayment of principal and interest, not the debt's fair value'. Accordingly, they find that the frequency and intensity of accounting-based debt covenants declines in a sample of 22 countries adopting IFRS (relative to a sample of 21 non-IFRS countries), and also provide evidence indicating that fair value accounting is likely a primary contributor to the decline in the use of accounting covenants following IFRS adoption. In contrast, Demerjian, Donovan, and Larson (2016) study the impact of the adoption of SFAS 159 and conclude that the use of accounting-based covenants is not impacted by SFAS 159, although covenant definitions are sometimes modified to exclude the effects of fair values adjustments, for instance to exclude the effects of liabilities measured at fair value.

also report poor performance of these models in explaining debt prices (Eom, Helwege, & Huang, 2004; Schaefer & Strebulaev, 2008).

It is important to recognize that empirical studies make assumptions about model inputs. While managers may improve fair value estimates by using more precise information about the characteristics of financial instruments, we need to consider a number of issues. First, if managers try to incorporate all the features of financial instruments, valuation models can become complex and challenging to implement. The average reporting entity may lack the expertise to implement these models. Second, Schaefer and Strebulaev (2008) conclude that the poor performance of structural models is due to their inability to explain the component of value corresponding to non-credit risk. The non-credit risk component is influenced by factors such as market liquidity, and these factors are absent from structural models altogether. Beyond considering issues related to reliability and improving the performance of structural models, future research could consider how to present information related to DVAs to investors and creditors to improve their understanding of what these changes mean, and the extent to which managers may exercise discretion over valuation model inputs.

5 | CONCLUSIONS

Our objective in this paper is to contribute to the discourse on the role of fair value measurement in financial reporting. Rather than argue for one measurement basis over another, we take stock of fair value accounting in current practice and provide context through a discussion of how we got to where we are today. We also offer perspectives on aspects of the fair value measurement 'black box' that we believe warrant further investigation.

To further our understanding of fair value accounting around the globe, it is important that researchers strive to overcome the limitations imposed by a lack of available fair value-related data, particularly outside the US. This is important given that we find, in our high-level analyses, differences in the extent to which firms across industries and accounting regimes (i.e., US GAAP vs. IFRS) incorporate in their financial reports assets and liabilities measured at fair value. For instance, we find that most financial assets that are reported at fair value are measured using Level 1 and Level 2 valuation inputs, suggesting that the potential reliability issues related to Level 3 fair values may not be substantial in economic terms for many firms. For the small percentage of liabilities measured at fair value, the majority of those fair values are based on Level 2 and Level 3 inputs. However, we find variation in the composition of portfolios across industries and around the globe, suggesting that there is important cross-sectional variation in the extent to which firms rely on different levels of valuation inputs. At a minimum, it is important for researchers to consider these differences when making research design choices, but our findings also provide insights into opportunities for further research to enrich our understanding of fair value measurements.

In reviewing research related to the decision usefulness of fair value measurements and fair value-related disclosures in terms of their valuation and risk relevance, we are left with many questions. We currently know little about why investors (and creditors) may view fair value measurements for liabilities as relatively less useful than asset fair values. The literature also does not provide much evidence regarding how firms measure assets and liabilities at fair value using Level 2 inputs, or at what point managers switch from using a Level 1 input to using a Level 2 input or from using a Level 2 input to using Level 3 inputs. In addition, we know little about the role of managements' incentives in the fair value measurement process or about what firms and their auditors can do to improve the decision usefulness of their fair value measurements. We have only just started to penetrate the 'black box' of the fair value measurement process to improve our understanding of the organizational capabilities and technologies that need to be developed and deployed in the fair value estimation process to enhance the quality of fair value measurements and disclosures in financial reports.

Future research can also seek to determine whether historical cost and fair value measurements are substitutes or complements, and whether this relationship varies over time or by firm type. In setting out to address this issue, we

need to understand better if there is information in historical cost numbers that is lost if fair values are used. Finally, accounting research needs to investigate further the role of fair value disclosures in reducing the information processing costs for financial statement users, as well as the potential unintended consequences of these disclosures.

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APPENDIX

Availability of Fair Value Measurements

Types of Data	US GAAP		IFRS	
	Financial Firms	Non-Financial Firms	Financial Firms	Non-Financial Firms
FVA and FVL	SNL, Bank Regulatory, Compustat	Compustat	SNL	Hand-collected
FVA and FVL by Level 1, 2, 3	SNL, Bank Regulatory, Compustat	Compustat	SNL	Hand-collected
Fair values by type of asset or liability (e.g., AFS, HFT, debt at fair value, etc.)	SNL, Bank Regulatory	Hand-collected	SNL (some items, mainly financial instruments)	Hand-collected
Fair value levels by asset or liability type (e.g., AFS Level 1, AFS Level 2, AFS Level 3, etc.)	SNL, Bank Regulatory	Hand-collected	Hand-collected	Hand-collected
Fair value disclosures	Hand-collected	Hand-collected	Hand-collected	Hand-collected

Notes: The table provides information on fair value data availability in the SNL Financial ('SNL'), S&P Compustat Bank ('Compustat'), and Bank Regulatory databases. These are the major commercial databases that make data about fair value measurements available to researchers. In our discussion of the prior literature, we mention if authors hand-collected fair value measurements that were unavailable through commercial databases. In the table, FVA (FVL) refers to total assets (liabilities) measured at fair value, AFS refers to available-for-sale securities, and HFT refers to held-for-trading securities. Levels 1, 2, 3, refer to the levels of the FASB's and the IASB's fair value measurement hierarchies.