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Fair Value Measurement in Financial Reporting

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Abstract

This monograph provides a historically informed discussion of conceptual and procedural issues related to the use of the fair value measurement attribute in financial reporting. Our goal is to provide a structure, based on the conceptual frameworks of the Financial Accounting Standards Board and International Accounting Standards Board, for researchers' evaluations of empirical research studies that investigate the informational properties of all measurement bases, including fair values. We begin by defining, addressing misconceptions about, and providing a brief history of the fair value measurement attribute. We next discuss decision usefulness of fair value and other measurement bases, and describe and evaluate examples of empirical research that documents the decision usefulness of recognized and disclosed fair value information, focusing on predictive ability, value relevance, and risk relevance. We also discuss the role of verifiability in the context of relevant and faithfully represented accounting information; describe three untested, verifiability-related maintained assumptions that arise in discussions of fair-value-measurement research; and discuss research designs for investigating questions related to accounting measurement verifiability. Finally, we discuss claims that use of the fair value measurement attribute causes procyclical behavior among financial institutions and that accounting standards have become increasingly fair-value-oriented during the last two decades.

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Introduction

The purpose of this monograph is to discuss practical and conceptual issues related to fair value measurement in financial reporting and to evaluate certain research design aspects of empirical research that investigates the information properties of fair value measurement, both in an absolute sense and in comparison to other measurement bases. Although our primary focus is on fair value measurement, we believe that our evaluation of existing research and suggestions for future research are germane to researchers interested in examining the information properties of any accounting measurement basis. With regard to our discussions of research, we do not aim to review the extensive body of fair-value-measurement-related research that empirically tests the decision-usefulness of fair value measurements. For that coverage, we refer readers to reviews by Barth et al. [2001], Landsman [2007], and Ryan [2011, specifically, Section 4.4]. Our discussions of individual research studies are intended to illustrate key points about the types of research questions that can and cannot be addressed with specific research designs, and not to provide an overview of research on fair value measurements.

Fair value measurement has been a controversial topic in the United States (U.S.) and elsewhere for more than a century. Advances in finance and accounting research, and much discussion, have not reconciled the conflicting perspectives of supporters and critics of using fair value measurement in financial statements. Indeed, after more than twenty years of research documenting the decision usefulness of disclosures about the fair values of financial instruments, standard setters are contemplating abolishing these disclosures for private companies. The 2008 financial crisis increased public scrutiny and brought accounting measurement to the forefront of policy debate, including debate characterized by polarizing rhetoric. Our intention with this monograph is to focus the discussion on the design and execution of rigorous, inferentially valid empirical research that can inform this debate.

We also present a historical overview of the use of fair value measurement based on the writings of prominent nineteenth and twentieth century accounting scholars. Here too, our aim is to dispel certain misunderstandings about the use of fair value measurement in the financial statements, and describe attributes of high quality research that investigates fair-value-measurement-related issues.

Except in the historical overview, we structure our discussion around the conceptual frameworks developed by the Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB). In particular, we analyze fair value measurements in the context of the qualitative characteristics of useful information (e.g., relevance, reliability, representational faithfulness) defined in (the now-superseded) Statement of Financial Accounting Concepts No. 2 (SFAC 2), *Qualitative Characteristics of Accounting Information* [FASB, 1980] and Chapter 3 of SFAC 8, *Qualitative Characteristics of Useful Financial Information* [FASB, 2010].[1] We also use

[1]In 2010, the FASB issued SFAC 8, which superseded SFAC 1, *Objectives of Financial Reporting by Business Enterprises* [FASB, 1978], and SFAC 2. Among numerous other changes, SFAC 8 replaced the SFAC 2 qualitative characteristic, "reliability," with the qualitative characteristic, "representational faithfulness." While it is no longer part of the conceptual framework, we discuss the notion of reliability because much of the empirical research described in this monograph includes pre-2010 sample periods and references to the conceptual framework.

the description of measurement attributes in SFAC 5, *Recognition and Measurement in Financial Statements of Business Enterprises* [FASB, 1984a].[2] We believe that structuring the discussion in this way has two advantages. First, the structure helps to link research, and our discussion of research, to the practical task of setting accounting standards guided by the conceptual framework. Second, it makes salient some of the difficulties encountered in the design and interpretation of research related to fair value measurement. For example, Sections 3 and 4 illustrate how the concepts of relevance and verifiability are empirically and conceptually intertwined and difficult to analyze individually, even with well-structured tests.

This rest of this monograph is organized as follows. In Section 2, we describe the fair value measurement attribute as it is defined in FASB Accounting Standards Codification (ASC) Topic 820, and distinguish it from "fair value accounting," an ambiguous, indeterminate phrase that appears to mean different things to different accounting researchers. We also provide evidence contrary to the view that financial reporting has increasingly adopted a "balance sheet approach" during the last three decades, including some implications of that view. We then compare fair value to other measurement attributes for the purpose of differentiating them. As we note, multiple measurement attributes may coincidentally have the same value at inception, and different patterns of change in subsequent periods. We next discuss potential decision criteria for choosing among alternative measurement bases in financial reporting, and close the section with a description of the development of the fair value measurement attribute during the twentieth century in the U.S.

[2]The objectives of financial reporting and the qualitative characteristics represent converged portions of the FASB's and IASB's conceptual frameworks. Specifically, Chapters 1 and 3 of SFAC 8 [FASB, 2010] are included in the 2010 update of the IASB's conceptual framework. The measurement attributes included in SFAC 5 [FASB, 1984a] are mostly converged with the measurement attributes included in paragraphs 4.54–4.56 of the IASB's conceptual framework. One exception is that "current market value" is included in SFAC 5, but is not in the IASB conceptual framework. In Subsection 2.3 of this monograph, we discuss the five measurement attributes included in SFAC 5. Interestingly, fair value is not included among the measurement attributes described in the FASB or IASB conceptual frameworks.

In Section 3, we discuss concepts related to the decision usefulness of financial statement elements measured using the fair value attribute. We begin with examples illustrating the decision-useful information conveyed by fair value measures, and the deficiencies in current U.S. generally accepted accounting principles (GAAP) for investment securities and loans. We then describe empirical research that documents the decision usefulness of recognized and disclosed fair value information, focusing on predictive ability, value relevance and risk relevance. We end by describing two practical issues that arise with the use of disclosed (as opposed to recognized) fair value measurements in research assessing the decision usefulness of fair values.

In Section 4, we analyze the enhancing qualitative characteristic verifiability in the context of accounting measurement. We focus on verifiability because some prior research and commentaries claim that fair value is a particularly "unverifiable" measurement attribute. We argue that these analyses do not operationalize verifiability in a manner that is consistent with the conceptual framework, because these studies suggest, or assume, that verifiability is a determinative attribute of accounting measurement, independent of the measurement's relevance or representational faithfulness. Because the conceptual framework is clear that accounting measurement must first maximize the joint qualities of relevance and faithful representation, a high level of verifiability of a measure cannot compensate for that measure's lack of relevance or lack of faithful representation.

We next discuss three verifiability-related maintained assumptions: (1) that historical-cost-based accounting information is inherently more verifiable than fair-value-based accounting information, (2) that differential value relevance of fair value measurements is caused by differential measurement verifiability, and (3) that, compared to fair-value-based financial information, historical-cost-based financial information is inherently superior for contracting and stewardship purposes. We suggest that these assumptions represent testable hypotheses and that failure to validate these assumptions limits inferences in many studies. We end Section 4 with a discussion of research designs for investigation of measurement-reliability issues. In evaluating research designs, we emphasize the importance of a

thorough understanding of the relevant accounting standards and concepts as a basis for developing predictions about relevance, representational faithfulness, and verifiability, and for distinguishing the effect of information about firms' holdings of assets and liabilities from the effect of non-accounting-based economic characteristics, and changes in characteristics, of those holdings.

In Section 5, we discuss the relation between fair value measurement and macroeconomic effects. Because fair value measurement was asserted to contribute to systemic risk in the liquidity and credit crisis that began in 2007–2008, we focus on this aspect of the macro-economy. However, we believe that much of this discussion is applicable to other economic attributes that might be linked to fair value measurements, for example, information asymmetry. The notion that fair value measurement increases systemic risk is relatively new and is mainly the product of analytical models that use stylized settings and restrictive assumptions, combined with anecdotes included in accounting research papers and commentaries.

With regard to empirical evidence on this issue, and despite some commentators' belief that accounting measurement, specifically measuring certain financial assets at fair value, contributed to the 2008 economic crisis, to date no published empirical research documents a clear causal relation between the fair value measurement attribute and systemic risk. Instead, research suggests that holdings of certain financial instruments, business models, and regulatory practices have a first-order effect on systemic risk. Accounting may have second-order effects, but research suggests that these primarily are the result of delayed loss recognition on financial assets measured at amortized cost subject to impairment and gains trading involving assets measured at amortized cost, for purposes of income recognition. Finally, we address the claim that accounting standards have resulted in financial statements becoming significantly more fair-value-oriented during the twenty years subsequent to issuance of *Statement of Financial Accounting Standards No. 107* (SFAS 107), "Disclosures about Fair Value of Financial Instruments" (FASB, 1991, codified in FASB ASC Topic 825).

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The Evolving Concept of Fair Value as a Measurement Attribute in Financial Reporting and its Application

This section introduces the concept "fair value measurement" as that term is now used in both U.S. GAAP and International Financial Reporting Standards (IFRS) (Subsection 2.1) and discusses the confusion that can result from conflating the idea of measuring financial statement elements at fair value with the idea of "fair value accounting" (Subsection 2.2). Subsection 2.3 discusses other measurement attributes that may result in the same amount as a fair value measurement, particularly at inception, and compares fair value measurement with value-in-use measurement. Subsection 2.4 describes criteria that might be applied to determine whether fair value should be required or permitted for specific financial statement items. Subsection 2.5 describes certain aspects of the (mostly twentieth-century, mostly U.S.) evolution of fair value as a financial reporting measurement attribute.

2.1 Fair value as a measurement attribute in U.S. GAAP and IFRS

The definition of "fair value" that is to be applied to most recognized and disclosed information that is measured using the fair value

measurement attribute and the framework for fair value measurement in U.S. GAAP are codified in FASB Accounting Standards Codification Topic 820 (ASC 820). The ASC Glossary defines fair value 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."[1] Beginning January 1, 2013, U.S. and international guidance for fair value measurement is mostly converged.[2] Because the remaining differences between U.S. GAAP and IFRS are not significant, our discussion will focus on U.S. GAAP, with the understanding that most of the points made would apply to IFRS as well.[3]

ASC 820 defines fair value using an "exit price" perspective instead of other plausible perspectives, such as entry price or current replacement cost. ASC 820-10-30 acknowledges the potential difference between assumed exit price and entry price. For example, ASC 810-10-55-46 through -49 describes a case in which two counterparties to a transaction have access to different markets that might have different exit prices (e.g., a retail market versus a dealer market). ASC 820-10-30-6 indicates that the difference between assumed exit prices and entry prices could result in recognition of gains or losses at initial recognition of an asset or liability.

[1]Fair value is conceptually distinct from the notion of market value that continues to be included in certain accounting standards. It is not clear if, or when, standard setters will modify existing guidance to eliminate the notion of market value as a measurement. For example, guidance for inventory accounting in ASC 330 retains the term "market value" in the assessment of lower of cost or market, while the FASB amended the accounting for loans held for sale in ASC 948 so that the measurement objective switched from lower of cost or market to lower of cost or fair value.

[2]The standards that converged U.S. GAAP with international standards pertaining to fair value measurement are ASU 2011-04 (in U.S. GAAP), effective for interim and annual periods beginning after December 15, 2011, with early adoption prohibited and IFRS 13, *Fair Value Measurement,* effective for annual periods beginning on or after January 1, 2013, with early adoption permitted.

[3]Examples of remaining differences include the following: (1) U.S. GAAP allows for recognition of gains and losses upon inception of a financial instrument regardless of the level of input used to determine the fair value amount, while IFRS 13 prohibits any such recognition for financial instruments categorized as Level 3; (2) IFRS 13 requires disclosure of quantitative sensitivity analysis for assets and liabilities categorized as Level 3, while ASC 820 requires qualitative disclosure of these sensitivities.

Differences in the structures of markets for financial and nonfinancial assets and liabilities can lead to differences in exit prices for these items. For nonfinancial assets, ASC 820-10-35-10A through 10D requires fair value measurement to assume the "highest and best use" of the asset "that is physically possible, legally permissible, and financially feasible." The highest and best use is from the perspective of market participants, regardless of how the reporting entity uses (or intends to use) the nonfinancial asset. In contrast, financial assets are valued from the perspective of a measurement-date exit price that takes into account the market and counterparty risks inherent in the financial asset, or groups of financial assets, depending on the market structure. ASC 820-10-35-9A defines the fair value of liabilities to be the price at which the liability would be transferred to a market participant on the measurement date and ASC 820-10-35-54H explicitly rejects measuring liabilities at the amount the obligation is expected to be settled with the counterparty or otherwise extinguished.

ASC 820 prescribes a hierarchical order of inputs to be used in arriving at fair value measurements, according the highest priority to unadjusted quoted market prices in active markets for identical assets and liabilities (Level 1 inputs), the second highest priority to adjusted quoted market prices for similar assets and liabilities (Level 2 inputs) and lowest priority to unobservable inputs (Level 3 inputs; the term "unobservable" refers to inputs that are not observable from sources external to the reporting entity). This priority requires the use of quoted prices in active markets for identical assets and liabilities if they exist. In the absence of Level 1 inputs, entities use Level 2 inputs, for example, quoted prices in active markets for similar not identical assets or liabilities, or in non-active markets,[4] or observable inputs other than quoted prices, or inputs that are not directly observable but are corroborated by observable market data. Level 3 inputs are used only if

[4]A recurring issue in Level 2 fair value measurements is the adjustment to an observed price in a market that is becoming, or has become, disorderly. This issue is discussed in FASB Staff Position No. FAS 157-4, April 2009, *Determining Fair Value When the Volume and Level of Activity for the Asset and Liability have Significantly Decreased and Identifying Transactions that are Not Orderly.*

Level 1 and Level 2 inputs are not available. ASC 820 does not prescribe valuation methods, beyond stating (in ASC 820-10-05-1C) that "[w]hen a price for an identical asset or liability is not observable, a reporting entity measures fair value using another valuation technique that maximizes the use of relevant observable inputs and minimizes the use of unobservable inputs."

ASC 820 also requires quarterly disclosures for "classes" of assets and liabilities recognized at fair value on a recurring basis in the statement of financial position. These disclosures are not required for (1) unrecognized fair value measures that are disclosed in the notes to the financial statements or (2) net assets in the statement of financial position that are initially recognized at fair value, but are not remeasured at fair value at future financial statement dates (e.g., intangible assets recognized pursuant to business combinations). The fair-value-related disclosures are organized according to the fair value input hierarchy, with the most extensive disclosures required for Level 3 items.[5] Although ASC 820 provides latitude in the level of aggregation represented in each asset and liability "class" for which fair value information is disclosed, ASC 820-10-50-2B indicates that the disclosed classes of assets and liabilities should reflect greater disaggregation than the line items reported in the statement of financial position and that Level 3 assets and liabilities should reflect a greater number of classes because those measurements have greater uncertainty and subjectivity. Regardless of the number of disclosed classes of assets and liabilities, the disaggregated fair values disclosed in the notes should reconcile to the fair values of reported assets and liabilities in the statement of financial position.

ASC 820 requires disclosure of valuation techniques and inputs used to measure classes of asset and liabilities categorized as Level 2 and Level 3 of the fair value hierarchy. For each class of Level 3 assets and liabilities, entities must disclose the significant unobservable

[5]For disclosure purposes, the level of the lowest significant input into the fair value measurement determines the overall level of the fair value measure (e.g., if a recognized financial statement element is measured at fair value using significant Level 2 inputs and significant Level 3 inputs, then the element is considered to be Level 3).

inputs used in determining the fair value measurements, the sensitivity of fair value measurements to changes in significant unobservable inputs, the performance statement location of realized and unrealized gains and losses, and a "roll-forward" reconciliation (i.e., for each class provide separate disclosed line items for beginning balance, realized gains (losses), unrealized gains (losses), purchases, sales, issuances, settlements, transfers in, transfers out and ending balance). In addition, transfers between Level 1 and Level 2 must be disclosed.[6]

Financial statement users, including accounting researchers, should be aware of three limitations of the applicability of ASC 820 that arise because ASC 820 does not prescribe when fair value measurements may or must be used; rather, ASC 820 provides guidance for measuring fair values when other guidance permits or requires fair value measurement. The first limitation arises because some standards continue to permit or require measurements that are similar to fair value, for example, "market value" in the context of inventory valuation (ASC 330). The second limitation arises because some standards provide for fair-value-measurement "practicability" exemptions that override the application of the fair value guidance in ASC 820. For example, and as discussed in more detail in Section 3, the fair value disclosures for financial instruments required by ASC 825 (pre-codification SFAS 107, *Disclosures about Fair Value of Financial Instruments*) are *not* necessarily measured using the fair value guidance in ASC 820. Because ASC 825-10-50-16 through -19 includes a practicability exemption for disclosure of fair values for entire classes of financial instruments, these disclosures sometimes include non-fair-value measurements. This is often the case for the ASC 825 disclosure of the fair values of loans held by small-to-medium-sized banks.

The third limitation arises because U.S. GAAP also requires or permits non-fair-value measurements for certain recognized or disclosed items that some financial statement users may perceive to be recognized on a fair value basis. For example, ASC 460-10-30-2 requires that

[6]Nonpublic entities are exempt from the requirement to disclose transfers between Level 1 and Level 2, the description of the sensitivity of fair value measures to changes in unobservable inputs and information about unrecognized disclosure-only fair value measurements.

the liability for a written guarantee be initially recorded at fair value, but ASC 460-10-35 does not specify subsequent measurement at fair value; ASC 410-20-25-4 allows an exemption to fair value measurement of asset retirement obligations at initial recognition if fair value is not readily determinable; ASC 805 requires certain exceptions to fair value measurement of assets and liabilities obtained in a business combination (e.g., indemnification assets); and ASC 958 allows not-for-profit entities fair value measurement exemptions if fair value cannot be measured with sufficient precision. We discuss certain research design implications of exceptions to fair value measurement in Sections 3 and 4.

2.2 Distinguishing fair value measurement from fair value accounting

The application of the fair value measurement attribute in financial reporting is sometimes conflated with other accounting issues. In this subsection, we consider two such issues, both of which sometimes appear in discussions of "fair value accounting," a term which implies that fair value measurements are viewed as akin to a system of accounting, or an approach to accounting. The first issue is how to display changes in fair values of assets and liabilities, specifically, whether such changes should or should not be included in net income. The second issue is whether the FASB's conceptual framework contains or implies a "balance sheet" approach that implicitly or explicitly favors fair value measurements.

How to display changes in fair values of assets and liabilities. Some oppose fair value (re)measurements of assets and liabilities at successive balance sheet dates based on the argument that fair value changes should not be included in net income. However, 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"). Because this debate lies outside the scope of our discussion, and proceeds whether financial statement items are or are not measured at fair value, we do not consider it further.

We also do not consider the display-related argument that requiring or permitting fair value measurement of assets and liabilities would result in a loss of information about acquisition costs. Our reasoning is that questions exist about descriptive labeling, appropriate levels of disaggregation, and comprehensible display independent of measurement basis. As is evident from existing guidance, alternative measurement bases and allocation amounts can be required to be disclosed.

Whether the FASB's conceptual framework embodies a "balance sheet" approach that implicitly or explicitly favors fair value measurements. We approach this issue indirectly, by first stating the argument that proper income measurement should be based on specified classification and cost allocation practices that would often preclude fair value measurements, and that balance sheet amounts are the result of these practices. For example, Dichev [2007, p. 4] states: "[t]he goal of accounting is to record accruals, which properly record the timing of economic achievements (revenue) and the alignment of associated expenses (matching). Balance sheet accounts and amounts are mostly the residual of this process, and assets and liabilities are in essence the cumulative effect of periodic accruals." Continuing, Dichev (p. 21) explains that "[o]perating assets are not really independent assets but essentially just a listing of unexpired costs. One can rightly view them as a listing of shorter and longer-term operating bets or as commitments on streams of future operating costs. Most of these costs will be realized internally, and there is little reason to pursue fair value accounting for them. In other words, the value of these assets is value-in-use and

there is no sense to use fair value or some other benchmark of outside utility to value them."

We believe this argument can be broken into three components. The first component, discussed next, is that the function of accounting is the determination of net income by a process of matching costs to revenues, meaning that items on the statement of financial position need not meet the definitions of assets and liabilities.[7] The second component is that fair value measurement has potential relevance only for assets intended to be exchanged; we address this argument in Subsection 3.1. The third component raises the question as to whether only one basis of measurement can (or should) be used in the financial reports; we discuss criteria to be used in selecting measurement bases in Subsection 2.4.

Taking the first component of the argument as given, we note that one can accept the premise that the primary function of accounting is the determination of net income by a process of matching costs to revenues and still advocate the use of something akin to fair value measurement in certain circumstances. For example, inventories qualify as an asset and also as an "unexpired cost," and are required to be measured at the lower of acquisition cost and adjusted selling price, so as to provide a better measure of current earnings. Moreover, the measurement basis applied to an asset for balance sheet recognition could be fair value, while the measurement basis used to depreciate the asset could be acquisition cost, as illustrated by the IFRS accounting for certain real property in International Accounting Standard (IAS) 16, *Property, Plant and Equipment* (revised 2003). Similarly, as of 2014, both U.S. GAAP and IFRS accounting requirements for AFS (available-for-sale) securities specify fair value as the measurement basis on the balance sheet and amortized cost on the income statement.

[7]This component of the argument is consistent with the asset and liability definitions included in the Accounting Principles Board's (APB's) Statement No. 4, *Basic Concepts and Accounting Principles Underlying Financial Statements of Business Enterprises*, [1970a, par. 132], which states that assets and liabilities "include certain deferred charges that are not resources" and liabilities "include certain deferred credits that are not obligations." However, as indicated in note 43, APB Statement 4 does not use the term "matching" because it is subject to "a variety of meanings."

We now turn to a more fundamental issue that we believe confuses debate about the merits of fair value measurement compared to other alternatives and has the potential to cloud interpretation of academic studies. That issue arises from the view that fair value accounting is somehow associated inextricably with, or even synonymous with, a "balance sheet approach" that grants primacy to asset and liability recognition over revenue and expense recognition, and for which the ideal measure of the fair value of an entity's net assets would equal the market value of the entity's equity, making the income statement redundant [for example, Dichev, 2007, Nissim and Penman, 2008].

The debate about the conceptual primacy of assets and liabilities over revenue and expenses arose when the FASB undertook the task of developing precise and workable definitions of financial statement elements for the conceptual framework.[8] Finding it impossible to define revenues and expenses without referring to assets, resources, or benefits, the writers of the conceptual framework accorded *definitional* primacy to assets; that is, the writers of the conceptual framework defined assets first; then defined liabilities in terms of assets; then defined revenues and expenses in terms of assets and liabilities. As noted by Gellein [1992, p. 198]:

> Every conceptual structure builds on a concept that has primacy. That is simply another way of saying some element must be given meaning before meaning can be attached to others. I contend that assets have that primacy. I have not been able to define income without using a term like asset, resources, source of benefits, and so on. In short, meaning can be given to assets without first defining income, but the reverse is not true. That is what I mean by conceptual primacy of assets. No one has been successful in giving meaning to income without first giving meaning to assets.[9]

[8] Storey and Storey [1998], especially pages 47–66, explain why the FASB determined that it needed workable and precise definitions of assets and liabilities.

[9] Providing rental property as an example, Dichev [2007, p. 15] argues that the FASB's definition of assets as future economic benefits is circular because future benefits equate to future net rental income which is capitalized to obtain present

The conceptual framework is also explicit that items that do not meet the definitions of financial statement elements are to be excluded from the primary financial statements (FASB SFAC 6, *Elements of Financial Statements* [FASB, 1985], par. 166). However, the definitions of these financial statement elements are silent as to how the elements should be *measured*.

The links among the conceptual framework's focus on the definitions of assets and liabilities, the use of those definitions to define revenues and expenses, and the idea that according definitional primacy to assets implies fair value measurement, seems to us to derive from conflating the idea that assets are "stores of value" [Dichev, 2007] with the idea that a "store of value" should logically be measured at its fair value. The result of this blend of reasoning is a portrayal of "fair value accounting" as a system of accounting in which the quest to recognize financial statement elements meeting the definition of assets and liabilities at fair value effectively undermines the relevance and importance of the income statement. For example, Dichev (p. 6) writes, "(t)he FASB has been increasingly adopting more pure and extreme forms of the balance sheet approach, particularly with the recent broad initiative for moving to 'fair value' accounting." In analyzing the income statement and the balance sheet in this context, Dichev (p. 12) concludes: "The balance sheet model takes asset values as given, as stores of value, which are divorced from what the firm is doing, and diverts attention from operations, which are the key to firm success and value. . . "

We are unable to discern any diversion of attention away from the income statement in favor of the balance sheet in the conceptual framework; however, our view is that even if such a diversion existed, fair

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value. We disagree with the interpretation that future economic benefits are equivalent to future earnings because assets also embody probable future economic benefits if they can be exchanged or consumed. The ability of the asset to generate gross or net income in the future is not a necessary condition for the asset to have value. A rental property can have expectations of negative future net income and still have present value. We also disagree with Dichev's interpretation because he omits the component of the asset definition that specifies the entity must control the future benefit (meaning that if there is a benefit the entity will receive it). The control component would preclude, for example, current period recognition of next period's revenues even if the amount is highly predictable.

value measurement would play an inconsequential role. The definitional primacy of assets in the conceptual framework simply means that the definition of one financial statement element (for example, revenue) derives from a previously-defined element (assets). Definitional primacy does not imply priority in the sense that the one financial statement (the balance sheet) is more important than another (the income statement); the conceptual framework does not prioritize any basic financial statement above any other.

We also conclude that tensions between the "balance sheet view" and the "income statement view" primarily relate to *recognition* (i.e., specifying the individual items that should be recorded on the balance sheet), rather than *measurement*, (i.e., the amounts at which recognized balance sheet items are measured). Our conclusion is derived from assertions associated with the opposing perspective that balance sheet amounts are more properly defined as the "residuals" that result from the matching of costs and revenues than as probable future economic benefits. Under this perspective, the deferral of certain costs to achieve matching may result in recognition of amounts on the balance sheet that do not meet the conceptual framework definition of assets even when those costs (expenditures) reflect sunk costs. While it may be self-evident that entities typically make expenditures in anticipation of earning future revenues, incurred costs are not equivalent either to revenues or to probable future benefits. The pertinent question in the case of expenditures is whether the entity, through its actions, has obtained an asset, meaning that, as a result of the expenditure, it has control over a probable future economic benefit. Thus, the conceptual objection to *recognizing* costs as assets is unrelated to *measurement*. The appropriate measurement basis is a logically subsequent issue that arises only after the item has met the definition of an asset.

In contrast to the view that restricting balance sheet recognition to items meeting the conceptual framework definitions of assets and liabilities is fundamentally at odds with meaningful income determination, Gellein [1992, p. 198] proposes that asset and liability definitions are necessary to legitimize measurement of periodic income that

is determined by matching expired costs to earned revenues. Moreover, Gellein makes clear that tension between the FASB's definitions of assets and liabilities and arguments supporting sunk cost deferral to facilitate matching exists within the confines of historical cost measurement:

> I contend further that by giving primacy to the meaning of assets, historical cost can be improved. My article in the June 1987 issue of Accounting Horizons addressed that issue. I believe that since income cannot be made to have conceptual primacy, there is nothing inherent in matching that enables one to distinguish between appropriate accounting and inappropriate accounting. There is no built-in test identifying the bounds of matching, except the notion of the primacy of assets. If the matching results in balance sheet items that are not assets or liabilities, that matching is out of bounds. The idea of asset primacy will serve to strengthen accrual accounting and to add credence to the results of matching.

More recently, the view that fair value measurement is either identical to, or inextricably linked with, what some have called the balance sheet approach has led some to conclude that the objective of fair value measurement is to produce a statement of financial position in which the fair value of net assets equals the market value of equity and the income statement conveys no information [for example, Penman, 2007]. The idea is stated succinctly by Nissim and Penman [2008, p. 13]:

> Fair value accounting ideally satisfies the shareholder reporting objective by accounting for assets and liabilities in the balance sheet at fair value. The income statement then reports changes in fair value calculated in the balance sheet, and no separate income concept drives the income statement . . . . This lack of information in the income statement is of no concern, however, because the balance sheet gives a complete accounting for value.

Although standard setters have stated that fair value is the most relevant measurement basis for certain assets and liabilities, there are many reasons why, even if fair value measurement is applied to all recognized assets and liabilities, the fair value of net assets will never equal the market value of equity, nor would it be expected to do so. This idea is more fully developed in the next subsection, which discusses several measurement attributes that sometimes result in the same amount as a fair value measurement.

Our aim in this subsection is to address issues that, in our view, frequently confound discussions about measurement. These include issues of recognition and display that must be addressed irrespective of measurement. Moreover, because the issue of fair value measurement has been blended with other, unrelated accounting issues that sometimes are grouped under the heading "fair value accounting," we prefer to avoid the use of that term altogether. We take the view that fair value is a measurement basis that is used, to some extent, within some system of accounting, and is not itself a system of accounting.[10] Because our concern lies with fair value as a measurement basis, we address only tangentially, if at all, the following issues: where, on a statement of comprehensive income, fair value changes might be displayed; cost allocation procedures; accounting classification; the appropriate level of disaggregation. In later sections, we discuss examples of accounting research whose inferences we believe are clouded by confounding other attributes of the accounting system with our topic of interest: fair value measurement.

[10]Some definitions of "fair value accounting" do not conflate display with measurement and do not confuse the definitions of assets and liabilities with the measurement bases for those items. For example, Ryan [2009, p. 215] defines fair value accounting as "a financial reporting approach in which firms are required or permitted to measure and report on an ongoing basis certain assets and liabilities (generally financial instruments) at estimates of the prices they would receive if they were to sell the assets or would pay if they were to be relieved of the liabilities. Under this approach, firms report unrealized losses when the fair values of their assets decrease or liabilities increase, thereby reducing their owners' equity and (in most cases) net income. Firms report unrealized gains when the fair values of their assets increase or liabilities decrease, thereby increasing their owners' equity and (in most cases) net income."

2.3 Fair value measurement compared to other measurement bases

In this subsection, we first discuss the measurement attributes listed in the FASB's Conceptual Framework, specifically, FASB SFAC 5, *Recognition and Measurement in Financial Statements of Business Enterprises* [FASB, 1984a]. The second portion of this subsection considers value-in-use measurement, in particular, the similarities and differences between this measurement attribute and fair value, and why, even if fair value measurement is applied to all recognized assets and liabilities, the fair value of net assets will never equal the market value of equity, nor would it be expected to do so.

Measurement attributes listed in SFAC 5. SFAC 5 (par. 67) lists the following five asset and liability measurement attributes observed in practice, some of which may approximate fair value, along with their definitions, but does not describe fair value measurement *per se.*[11]

a. *Historical cost (historical proceeds)*: The amount of cash, or its equivalent, paid to acquire an asset, commonly adjusted after acquisition for amortization or other allocations. For liabilities, the historical-proceeds basis is the amount of cash, or its equivalent, received when an obligation was incurred and may be adjusted after acquisition for amortization or other allocations.

b. *Current cost or replacement cost*: The amount of cash, or its equivalent, that would have to be paid if the same or an equivalent asset were acquired currently.

[11]SFAC 5 does not list "value in use" as a measurement attribute. We discuss this measurement attribute later in this section both because it has appeared, implicitly or explicitly, in academic discussions of measurement and also because it is a measurement attribute in IFRS. For example, IAS 36, *Impairment of Assets* (revised 2004, 2006) defines value in use as "the present value of the future cash flows expected to be generated from an asset or a cash-generating unit" and clarifies (par. 30) that the inputs to the present value calculation are to be based on the how the entity expects to use the asset.

c. *Current market value*: The amount of cash, or its equivalent, that could be obtained by selling an asset in orderly liquidation.

d. *Net realizable (settlement) value*: The undiscounted amount of cash, or its equivalent, into which an asset is expected to be converted in due course of business, less direct costs, if any, necessary to make that conversion. Liabilities that involve known or estimated amounts of money payable at unknown future dates generally are reported at their net settlement value, which is the undiscounted amount of cash, or its equivalent, expected to be paid to liquidate an obligation in the due course of business, including direct costs, if any, necessary to make that payment.

e. *Present (or discounted) value of future cash flows*: The present value (discounted at the implicit or historical rate) of future cash inflows into which an asset is expected to be converted in due course of business less present values of cash outflows necessary to obtain those inflows. Long-term payables are similarly reported at the present value (discounted at the implicit or historical rate) of future cash outflows expected to be required to satisfy the liability in due course of business.

At initial recognition of assets and liabilities, the first three listed attributes, historical cost, current cost and current market value, will often result in the same recognized amounts that can also approximate fair value. This equivalence occurs because historical cost is usually based on observed transaction prices at initial recognition and exchange transactions are generally presumed to occur at current market prices that are often the same as current costs. As noted in SFAC 5, the equivalence of initially recognized amounts under these three alternative measurement attributes might result simultaneously in agreement on the recognized amount and disagreement about the attribute used to arrive at that amount.

After initial recognition, historical cost amounts will usually diverge from current cost and current market value amounts because recognized historical cost amounts usually depend on previously recognized amounts, possibly adjusted for depreciation and amortization.

We characterize the historical cost measurement basis as "path dependent" because subsequently recognized balance-sheet amounts are typically a function of previously recognized amounts. Because the amounts recognized in financial statements for depreciation/amortization are not economically determined, and because recorded monetary units are not adjusted for changes in purchasing power, strictly historical-cost-basis asset and liability balances and changes in those balances do not usually reflect information about economic conditions, and changes in those conditions, at successive balance sheet dates. In comparison, for a given recognized net asset item, current cost and current market value provide "fresh start" measurements on each reporting date, after initial recognition.[12] Thus, current cost and current market value are not path dependent with respect to the amounts recognized subsequent to initial recognition, and each measurement basis results in an amount that can approximate fair value.

Neither net realizable value nor present value of future cash flows, as defined in SFAC 5, is consistent with the notion of fair value. Net realizable value is based on *undiscounted* expected future cash flows, net of expected entity-specific direct costs of converting the asset to cash or for settling the liability. The absence of discounting and the inclusion of expected entity-specific cash flows cause net realizable value to yield measurements that do not approximate fair value.

Although the SFAC 5 description of present value involves discounting, it specifies use of the "implicit or historical rate" instead of the current market rate. As a result, the SFAC 5 definition of present value yields a measurement that supports historical-rate effective-interest amortization during periods after balance sheet items are initially recognized using historical cost, current cost or current market value. The

[12]The term "fresh start" measurement is introduced in SFAC 7, *Using Cash Flow Information and Present Value in Accounting Measurements.* In SFAC 7's Glossary of Terms, fresh start is defined as "[m]easurements in periods following initial recognition that establish a new carrying amount unrelated to previous amounts and accounting conventions." In other words, fresh start measurements are not path dependent because the recognized amounts are not dependent on previously recognized measurements for given net assets. This notion is conceptually distinct from fresh start accounting described in FASB Accounting Standards Codification ASC Topic 852: *Reorganizations.*

path dependency of the SFAC 5 definition of present value makes it consistent with historical cost measurement after initial recognition, and does not produce subsequent measurements consistent with current cost or current market value. In addition, the SFAC 5 notion of present value is inconsistent with a fair value measurement objective because it ignores current market interest rates.

SFAC 7 contrasted with SFAC 5. In 2000, the FASB issued SFAC 7, *Using Cash Flow Information and Present Value in Accounting Measurements*, to provide guidance on the use of expected cash flows and present value techniques in accounting measurement. SFAC 7 (par. 25) states that fair value estimation is the only objective of present value techniques when they are used in accounting measurements (i.e., at both initial recognition and subsequent fresh-start measurements).

By rejecting SFAC 5's use of historical or implicit rates in accounting measurement, and shifting the focus of present value techniques to take account of economic conditions at the measurement date, SFAC 7 improves the comparability of balance sheet elements measured using present value procedures. Observed market prices implicitly achieve the same comparability outcome in that they aggregate market participants' assessments of the current worth of a set of future cash flows, the uncertainties surrounding those cash flows, and the expected return required by market participants to bear those uncertainties. SFAC 7 includes the following example to illustrate the information and assumptions market participants would consider when differentiating among five assets, each of which has cash flows equal to $10,000:

a. An asset with a fixed contractual cash flow of $10,000 due in 1 day. The cash flow is certain of receipt.

b. An asset with a fixed contractual cash flow of $10,000 due in 10 years. The cash flow is certain of receipt.

c. An asset with a fixed contractual cash flow of $10,000 due in 1 day. The amount that ultimately will be received may be less than $10,000 but will not be more.

d. An asset with a fixed contractual cash flow of $10,000 due in 10 years. The amount that ultimately will be received may be less than $10,000 but will not be more.

e. An asset with an expected cash flow of $10,000 due in 10 years. The amount that ultimately will be received may be as high as $12,000, as low as $8,000, or some other amount within that range.

While an accounting measurement based on undiscounted cash flows would record each of these assets at $10,000, a rational market participant would pay a different amount for each asset, so each asset has a different fair value. The differences in fair value among these assets arise because market participants will fully incorporate *all* of the following five pieces of information to estimate the asset's value:

1. An estimate of the future cash flow, or the series of future cash flows at different times

2. Expectations about possible variations in the amount or timing of those cash flows

3. The time value of money, represented by the risk-free rate of interest

4. The price for bearing the uncertainty inherent in the asset or liability

5. Other, sometimes unidentifiable, factors including illiquidity and market imperfections

Non-fair-value measures incorporate these elements to varying degrees. Generally, alternatives to fair value will (a) add factors that are not contemplated in the price of a market transaction for a given asset or liability, (b) replace market participant assumptions with assumptions made by the entity's management, and/or (c) exclude factors that would be contemplated in the price of a market transaction. Stated differently, each alternative to fair value either adds characteristics to the asset or liability for which marketplace participants will not pay

or excludes characteristics for which marketplace participants demand and receive payment. We illustrate these effects by discussing a sixth measurement attribute, *value-in-use*, an entity-specific measurement that excludes certain market-based inputs and measures the item's value conditional on the way the item is used in the entity's business.

Value in use compared to fair value. Value-in-use can be applied to capture all five elements of a fair value measurement, but the specific inputs incorporated into the estimate will typically not reflect the full range of assumptions made by market participants, because the objective of a value-in-use measurement is to capture the item's value in the use intended by management.[13] Applied to an asset, the concept is that the value of the asset is firm-specific and is measured as the amount of value the entity can generate from using or holding the asset, or alternatively, the amount of value foregone by the entity if the entity no longer controlled the asset. The value-in-use measurement basis is silent as to the discount rate to be used in measuring the asset. In contrast, fair value represents the value of the asset based on assumptions made by market participants, not by management. A key feature of value-in-use, for a given item, that makes value-in-use not consistent with fair value measurement is that the value-in-use measurement will reflect management's intended use of the item, given the specifics of the entity's business model, including firm-specific advantages and disadvantages relative to other entities.[14]

A historical transaction price, or acquisition cost, of an asset could represent value-in-use if the buyer pays a premium over fair value

[13]An alternative term is "deprival value" [Byatt, 1986]. The concept of value-in-use is described in detail by Gadd [1989]; we trace the idea as well to the report of the U.K.'s Sandilands Committee [1974, Chapter 12]. MacNeal [1939, pp. 100–102] distinguishes between a measurement of an asset that is equivalent to value-in-use (without using that term) and a measurement that is determined by "external factors of supply and demand," a notion that is similar to fair value.

[14]Examples of entity-specific advantages might include special regulatory preferences, barriers to entry, controlled trade secrets, efficiencies derived from proprietary production processes, or a management team with superior skill and foresight. Similarly, disadvantages might include excess regulatory burdens, inefficient managers or production processes, and a planned use for the entity's assets that differs from market participants' perceived best use of those assets. We refer to these entity-specific factors as comparative advantages and comparative disadvantages.

to acquire the asset in anticipation of realizing future above-market returns.[15] The premium over fair value represents entity-specific value. If an asset that is purchased for fair value is remeasured using value-in-use with the effect of remeasurement included in income, the anticipated advantages from the entity's use of the asset will be included in income at the remeasurement date. In both cases, the anticipated comparative advantage or disadvantage that derives from the entity's use of that asset will be included in the values of the entity's assets and equity at the measurement or remeasurement date. In contrast to a fair-value-based impairment model that would require loss recognition when the carrying value of an asset exceeds its fair value, an impairment model based on value-in-use would require loss recognition when the carrying value exceeds the value of firm-specific profits expected to be realized in the future. Thus, the value of capitalized, contingent, firm-specific anticipated revenue is implicitly included in the value of recognized assets when recognition is based on value-in-use.

The distinction between value-in-use and fair value can also apply to non-financial liabilities (performance obligations, such as warranty obligations and asset retirement obligations). Both U.S. GAAP and IFRS define the fair value of a liability as the amount an entity would pay to transfer a liability in an orderly transaction between market participants. That amount would be based on market participants' assumptions about the costs to settle the performance obligation, not the entity's specific costs, which could be greater (a comparative disadvantage) or smaller (a comparative advantage). A reporting entity with a comparative (cost) advantage in performing the obligation would realize a benefit from using its own internal resources. Measuring the obligation at fair value would result in the entity's recognizing a gain (loss) when it settles the obligation if the entity has a comparative advantage (disadvantage).

For example, an entity with a comparative advantage in performing warranty services that measures its warranty obligations at fair

[15] In this situation, cost, or transaction price, does not equal fair value at inception. For example, a firm may self-construct an asset, or the firm may be the high bidder in a sealed bid auction with few bidders. In each case, the exit price may be less than the cost or transaction price.

value would recognize a gain when it settles the obligation at a cost that is lower than the cost that would be incurred by a market participant without that comparative advantage. The amount of the gain captures the amount of the entity's comparative (cost) advantage, and would be recognized in the period when the entity performs the obligation. If the entity records the obligation at its estimated cost (the amount it expects to pay to settle the obligation, analogous to value-in-use) its gain from its cost-based comparative advantage appears in income when the obligation is recorded, not when it is settled. Recognizing an obligation at an amount reflecting anticipated, but unrealized, firm-specific comparative advantages may understate liabilities if future comparative advantages are speculative.

In contrast to the outcome of measuring items at value-in-use, measuring assets and liabilities at fair value with changes in fair value included in income causes income to include comparative advantages and disadvantages as they occur, rather than in anticipation of their occurrence. Put another way, one difference between fair value and value-in-use is that when fair value is used to recognize assets or liabilities, recognition of profits or losses arising from entity-specific comparative advantages or disadvantages will be deferred until the entity realizes assets or settles obligations for amounts different from fair value.[16]

This difference between fair value and value-in-use illustrates two points. First, value-in-use measurement is based on management intentions (plans) for a given item, that is, on the entity's business model, so application of that measurement *anticipates* the outcomes of those intentions and does not recognize the effects of management's implementation of the entity's business model as those effects occur. In contrast, fair value measurement captures outcomes of operating the business model, not plans and intentions. We believe that this distinction clarifies why fair value measurement captures an entity's business model better than alternative plausible measurement attributes.

Second, the difference between fair value and value-in-use explains why even a pure fair-value measurement regime applied to all of an

[16]This argument appears in SFAC 7, par. 33 and in SFAS 157, *Fair Value Measurement* [FASB, 2006], par. C40–C41.

entity's recognized assets and liabilities would typically not result in a net asset amount that equals the entity's market value of equity. If value-in-use were used comprehensively as a measurement basis for initial and subsequent recognition with all remeasurement effects included in income, the difference between value-in-use and fair value at any point in time would reflect the present value of firm-specific abnormal profits or losses expected to be realized in the future (where "abnormal" refers to effects of the entity's comparative advantages and comparative disadvantages). If all assets were recognized at value-in-use, there would be no expected periodic abnormal profit recognized in income because realization of abnormal profits would be accompanied by a decline in the carrying value of assets whose recognized values impound the expected abnormal profits. In contrast, income recognized in a fair value measurement regime would reflect the portion of abnormal profits or losses realized in that period and would therefore reveal the income effects of firm-specific advantages and disadvantages as those comparative advantages and disadvantages occur.

One impediment to value-in-use as a measurement basis is that the present value of expected firm-specific profits or losses arising from management's intended use of an asset often cannot be meaningfully attributed to an individual item. If, for example, a specialized asset must be used in conjunction with a proprietary business process to achieve abnormal profits, sometimes referred to as "synergy," prospective purchasers cannot generate those rents without possessing both the asset and the proprietary process.[17] Thus, allocating joint "value in use" to any individual asset would be misleading. In the limit, one would expect the benefits of firm-specific advantages and disadvantages to be obtainable only by purchasing the firm itself.

The existence of entity-specific value arising from that entity's use of an asset has two implications. First, as long as the unit of account for purposes of recognition and measurement is some subset of net assets, the fair value of net assets of an entity will not equal the entity's market

[17]The notion of synergies among recognized and unrecognized assets is consistent with the economic view of efficiency rents expressed by Demsetz [1973, p. 2] as follows: "In this case the return to superior performance is in the nature of a gain that is completely captured by the owner of the firm, and not by its inputs."

value of equity, because that market value will reflect the efficiency (or inefficiency) in the *entity-specific* uses of net assets. In contrast, the fair value of an entity's net assets reflects the marginal efficiency with which *market participants* would deploy those items. That is, the market value of equity is not additively separable into the fair values of its components because the fair values of individual assets do not reflect the value increment or decrement that arises from using the specified assets in a particular way together with other (possibly unrecognized) assets and liabilities.

The second implication is that as long as the fair value of net assets diverges from the market value of equity, the income statement will reflect (1) realizations of the entity's comparative advantages and comparative disadvantages that are not, by definition, reflected in fair values, (2) resolution of uncertainty about fair value estimates, and (3) outcomes that are not recognized until they meet criteria provided by accounting standards for recognition, for example, expected gain or loss amounts that were not probable prior to realization.

We next consider the possibility that, although the value-in-use component of an entity's equity market value cannot be meaningfully allocated to any single asset or liability, that component might embody a separately identifiable asset or liability that if recognized at fair value would account for the difference between the fair value of net assets and the market value of equity.[18] If recognized, this separately identifiable asset or liability would, if measured as the difference between the fair value of recognized net assets and the market value of equity, cause the fair value of net assets to equal the market value of net assets.

Under this approach, the first issue is whether the value-in-use component of net asset value would meet the definition of asset or liability. For example, a firm saddled with comparative disadvantages would be

[18]This is not a new issue in financial reporting. For example, MacNeal [1939, pp. 272–273] discusses that the "value of a business as a whole [can be] far less than the combined values of its possessions, [sic] often it is far more" and notes that in order to create a balance sheet that shows the value of the business as whole, the accountant would have to introduce goodwill or "badwill."

expected to have a lower market value of equity than an otherwise similar firm without those disadvantages. However, under the current conceptual framework, the discount reflected in the market value of equity relative to the fair value of net assets would not meet the definition of a liability because there exists no present obligation to continue to operate at a comparative disadvantage. In contrast, for a firm that enjoys the benefits of comparative advantages, the value-in-use component of net asset value is similar to internally generated goodwill, not currently recognized as an asset.[19] While this value-in-use component of net asset value seems to meet the "probable future economic benefit" characteristic of an asset, it does not appear to meet the characteristic that specifies the future economic benefit is "obtained or controlled . . . as a result of a past transactions or events." This characteristic allows for a distinction between certain items currently recognized as assets (e.g., purchased goodwill) and other probable-future-benefit items not currently recognized as assets (e.g., expected future sales).

The fact that a probable-future-benefit item can be measured or calculated does not make that item an asset, under the current definition. As previously discussed, internally developed goodwill can be calculated as the difference between the market value of equity and the fair value of net identifiable assets, and future sales can be often be estimated with reasonable precision. In the case of internally developed goodwill, recognition is precluded based on the argument that there is no evidence of a past exchange or transaction (e.g., paragraph B30 of pre-codification SFAS 142); in the case of future sales, exchanges between the entity and its customers have not yet occurred.[20] Thus, recognizing the value-in-use component of net asset value would require significant changes in the definitions of assets and liabilities.

[19] Whether even *purchased* goodwill meets the definition of an asset is contentious [Johnson and Petrone, 1998]. For example, applying Schuetze's [1993] criterion that exchangeability is an essential characteristic of an asset, neither purchased goodwill nor the value-in-use component of net asset value would qualify as an asset, because its realization requires disposal of the entire collection of assets and liabilities, often the firm as a whole.

[20] Applying the exchange requirement to purchased goodwill might preclude recognition of any component of purchased goodwill that is expected to be realized through *future* exchanges with customers.

As previously discussed, the issue of which measurement basis to apply is distinct from the issue of which items qualify for recognition as assets and liabilities. We believe that some arguments supporting the use of "value-in-use" or "historical cost" as measurement bases confuse these two issues. The fact that an item can be measured (e.g., anticipated future sales, the difference between the fair value of assets and the market value of equity, or the amount of an expenditure) does not mean the item meets the definition of a financial statement element.[21]

We also believe fair value measurement supports a clear separation of recognition from measurement because fair value focuses on quantifying observable benefits rather estimating unobservable firm-specific benefits or recording observable incurred costs that may or may not qualify as recognizable assets. That said, "unit of account" issues confound fair value measurement to the extent that "highest and best use" for purposes of fair value measurement depends on aggregation or pooling of assets and liabilities.[22] When aggregation reflects the assumptions of market participants for individual assets, the confound is likely to be small. However, if values for individual assets materially depend on the inclusion of other assets or liabilities with which they may be sold, aggregation-dependent valuation converges to value-in-use.

2.4 Criteria that might be applied to require or permit fair value measurement

In this subsection, we consider four criteria that might be applied to require or permit (or, possibly, to prohibit) fair value measurement:

[21] Chambers [1966, p. 104] similarly distinguishes between an asset ("Assets are objects, or titles to objects or rights") and the measurement of an asset. With regard to the latter, he argues for "current cash equivalents . . . as these are established in current markets."

[22] For example, in amending SFAS 65, *Accounting for Certain Mortgage Banking Activities* [FASB, 1982], SFAS 157 par. E10 describes situations where loan fair values may be obtained based on the assumption that the loans will be pooled or securitized. To the extent the value of pooled loans deviates from the value of unpooled loans, an element of value-in-use will be captured by the valuation of loan pools.

relevance, as described in Chapter 3 of FASB SFAC 8, *Conceptual Framework for Financial Reporting* [FASB, 2010]; reliability, as described in FASB SFAC 2, *Qualitative Characteristics of Accounting Information* [FASB, 1980] and FASB SFAC 5, *Recognition and Measurement in Financial Statements of Business Enterprises* [FASB, 1984a]; comparability, as described in Chapter 3 of FASB SFAC 8, *Conceptual Framework for Financial Reporting* [FASB, 2010]; and whether fair value has practical uses.

Relevance. Chapter 3 of SFAC 8 describes relevance of financial reporting information in terms of the capability to affect financial statement users' decisions, presumably resource allocation decisions. The component concepts of relevance are predictive value, confirmatory value (providing feedback that confirms or changes previous evaluations), and materiality. In this discussion, we focus mostly on predictive value, based on Chapter 1 of SFAC 8, which points to assessments of the prospects for future net cash inflows to an entity as a key input to decisions about resource allocations.

This focus raises the following question: given that management's plans (intentions) for realizing value (often, cash) from assets and for settling or transferring liabilities provide information about the cash inflows and outflows associated with those items, does the application of the relevance criterion indicate that the measurement of an item should be based on management intent for that item? This question is not hypothetical; IFRS 9, and ASC 320 specify that identical debt instruments with only contractual cash flows can be accounted for differently depending on management's intent.[23] In addition, a June 2009 IASB staff paper, *Measurement in Financial Reporting,* proposed that "value realization method," meaning the way the future inflows of an asset or outflows of a liability will arise, should be a factor in selecting a measurement attribute, and linked value realization method explicitly with relevance. Finally, the IASB's Discussion Paper, *A Review of the*

[23]In ASC 320-10-25-1, the differences are based on whether management has the intent to sell the security within hours or days, even if it does not do so (trading securities), versus hold the security to maturity (held-to-maturity securities). A third category, available-for-sale, does not embody explicit management intent.

Conceptual Framework for Financial Reporting (2013, par. 6.17, 6.73-6.109) does not use the term "value realization method" but retains its import by proposing that the measurement attribute for an asset would depend on how it contributes to future cash flows and the measurement attribute for a liability would depend on how the entity will settle or fulfill the obligation.

Taking this reasoning as given suggests that basing measurement on management's intent for realizing value from a given financial statement item would increase relevance, defined as predictive ability of financial information for the entity's future net cash flows. We believe this possibility raises two empirical questions. The first is straightforward: does a measurement basis that is explicitly linked to management intent increase the predictability of future cash flows, as compared to other plausible measurement bases? In analyzing this question, it is important to keep in mind that application of the value realization criterion does not, in and of itself, point to any specific measurement basis for a given item — the measurement attribute would be expected to vary across otherwise similar items within an entity as well as across entities depending on management's intent.

A second empirical question pertains to the verifiability of management intent, which is a state of mind, largely unobservable and reasonably subject to change as economic conditions change. Is it reasonable to proxy for management's intent by observing management's *actions* with regard to an item? While actions are verifiable *ex post,* those actions may or may not reflect the original intent with regard to realizing value from the item.

Reliability. SFAC 5 provides criteria for recognizing items in the financial statements, including sufficiently reliable measurability, "a relevant attribute that can be quantified . . . with sufficient reliability" (par. 65) but does not explain how to apply this criterion to select a measurement attribute for a given recognized item.[24] The reliability

[24]SFAC 5 includes two competing notions of reliability: one synonymous with representational faithfulness and one synonymous with measurement precision. For example, par. 75 states that reliable information is "sufficiently faithful in its representation of the underlying resource, obligation, or effect of events and sufficiently free of error and bias to be useful to investors, creditors, and others in making decisions." In contrast, par. 76 notes that "[i]nformation about some items that meet

concept as originally described by the FASB in (the now-superseded) SFAC 2 rests on combined representational faithfulness, verifiability and neutrality (FASB, 1980, par. 58–110).[25] Representational faithfulness is the correspondence between the accounting and the phenomenon, that is, the economic conditions or events, that the accounting purports to represent. Verifiability has been defined as consensus in measurement, or reproducibility, in the sense that measurements or estimates may be "substantially duplicated by independent measurers" [APB 1970a, par. 90].[26] Neutrality means that neither accounting standards nor the information that results from the application of those standards should be biased toward achieving a predetermined result. Neutrality in financial reporting would not skew or tilt or alter the information produced for the purpose of influencing behavior in a particular pre-specified direction.

Some contend that observable transaction prices are preferable to fair value estimates because they are more verifiable [e.g. Watts, 2003a,b, Ramanna, 2008, Ramanna and Watts, 2012]. There are at least three difficulties with this contention. First, the contention implies that verifiability is a sufficient basis or criterion for evaluating the appropriateness of a measurement attribute. Second, advocating historical cost as a measurement basis because it is more verifiable than fair value

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a definition may never become sufficiently reliable at a justifiable cost to recognize the item. For other items, those uncertainties are reduced as time passes, and reliability is increased as additional information becomes available." The discussions in SFAC 2 and Chapter 3 of SFAC 8 suggest that representational faithfulness is the more appropriate characterization.

[25]The qualitative characteristic "reliability" as described in SFAC 2 has been superseded by the qualitative characteristic "representational faithfulness" in Chapter 3 of SFAC 8. Verifiability is not a component of representational faithfulness in SFAC 8, but is rather an "enhancing characteristic." We discuss verifiability because that characteristic has been used in accounting research to evaluate fair value measures.

[26]Verifiability, viewed in isolation, does not systematically favor or disfavor fair value measurement. Certain fair values may be observable and thus verifiable. Nor does application of the verifiability criterion systematically favor or disfavor the "revenue and expense" view. For example, revenue-and-expense-based accounting would require the use of unverifiable cost-flow assumptions to achieve a matching of costs with revenues and the resulting residual amounts reported on balance sheets would be similarly unverifiable.

implies that the use of historical costs results in financial statements that are materially less subjective than those prepared using fair value measurements. The third difficulty is that the extent of verifiability of fair values and historical cost measures is an assertion — there is little empirical evidence that fair values inherently are less verifiable than historical transaction prices. We address this issue in subsequent sections.

The idea that verifiability is a sufficient criterion for assessing the merits of alternative measurement bases fails to take into account the other components of decision-usefulness which include relevance and representational faithfulness. As noted in SFAC 5, verifiability is of little or no value if the measurement being verified is not adequately informative about the underlying resource or obligation subject to measurement. At the extreme, assets could be recorded an amount that reflects their weight.[27] Although this number may be highly verifiable, it tells us little about the value of those assets. Similarly, past transaction amounts may tell us little about either the value or existence of particular assets at a particular measurement date.

Although not a sufficient criterion, verifiability is a desirable qualitative characteristic of accounting information. Those who argue that historical cost should be preferred because it is more verifiable, even when fair values would be more decision-relevant, imply that historical cost-based financial statements are sufficiently less subjective to compensate for loss of decision-relevant information that may be provided by fair value. We believe that this characterization is both potentially misleading and empirically unsubstantiated. The use of perfectly verifiable measures does not eliminate the substantial subjectivity inherent in financial reporting. Recognizing economic transactions and events requires material, subjective judgments, independent of measurement basis, and judgments are inherently difficult to verify.

For example, although a cash receipt is typically highly verifiable, representationally faithful and neutral accounting requires determining

[27] Although adding items measured by weight to items measured at currency equivalents violates the presumption of a common numeraire, so does the accepted practice of adding historical nominal amounts to present values and future nominal amounts.

whether the cash receipt should be accounted for as an increase to revenue, liabilities, or equity, or a decrease to assets.[28] Recognizing the receipt as revenue is a matter of judgment. Similarly, a cash expenditure may be a verifiable fact, but representationally faithful and neutral accounting requires determining whether the disbursement should be accounted for as an increase to assets, decrease to liabilities or equity, or increase to expense. Historical transaction prices may be verifiable; however, the "appropriate" amount of those incurred costs to allocate to income in the form of depreciation or amortization is not. All of these determinations require the application of informed professional judgment to implement accounting guidance, even within the confines of historical cost measurement.

Because the application of accounting principles requires judgment, the use of any particular measurement basis cannot remove from the financial statements the effects of subjective management judgment. We maintain that the procedures necessary to provide assurance over fair value estimates are equally applicable to other critical accounting judgments associated with the use of historical cost measurement. That is, those wishing to verify the reasonableness of the financial statements taken as a whole must evaluate the reasonableness of the models, processes, and assumptions used to arrive at financial statement numbers, as well as the inputs to those models and processes. Moreover, we are aware of no research that documents that financial statements incorporating fair-value-based measurements are, taken as a whole, more subjective than those incorporating historical cost based measures.

This lack of evidence as to the relative subjectivity of financial statements that include more or fewer items measured at fair value versus historical costs is related to the third difficulty, namely, that if verification means the ability to independently corroborate or confirm, there is no reason to conclude *ex ante* that fair values are inherently less verifiable than historical costs. Specifically, an observable fair value measurement is as verifiable as an observable historical transaction

[28] A discussion of the judgment required to determine the proper accounting for a cash receipt or a cash expenditure also appears in Hatfield [1927, pp. 60–61 and pp. 66–67].

amount. Both require comparing the reported amount to an independent source document. For the historical transaction price, this may be an invoice. For the fair value, the source document may be a list of prices published in an independent newspaper. Similarly, there are cases where both fair value and historical transaction prices are more difficult to verify. In the case of fair value, verification may require review of a valuation model and the inputs to that model. In the case of historical transaction price, verification may require review of accumulated and allocated costs.

To summarize, the pre-2010 qualitative characteristic "reliability" requires that the financial reporting be not only verifiable, but also representationally faithful and neutral, and this requirement implies that (1) all three factors must be considered together and (2) no one factor should be determinative. In selecting a measurement attribute, pre-2010 standard setters (i.e., before issuance of SFAC 8) would choose fair value if that measurement provided the best combination of relevance, verifiability, representational faithfulness and neutrality, even if fair value is not the most highly verifiable measurement. After the issuance of SFAC 8 in 2010, standard setters would choose fair value if that measurement provided the best combination of relevance and representational faithfulness.

Comparability. Chapter 3 of SFAC 8 describes comparability as an enhancing characteristic that would increase the usefulness of relevant and representationally faithful financial reporting information. Comparability, unlike relevance or reliability, does not pertain to a single item but rather to two or more items; comparability of information about two or more items allows users of that information to "identify and understand similarities in, and differences among, items" (SFAC 8, par. QC21). SFAC 8, par. QC25 notes that "permitting alternative accounting methods for the same economic phenomenon diminishes comparability." Absent a determination that management's intent with regard to an asset or liability affects the economic characteristics of that item, allowing different measurement bases for identical items would impair comparability. The loss of comparability arises from different measurement bases, not from whether fair value is or is not used as a measurement attribute.

In a discussion of the link between intent-based accounting and measurement bases, Leisenring et al. [2012] posit that current exit value, that is, fair value, applied to financial assets, yields a measurement that is both relevant and invariant to management intent, therefore comparable. Their reasoning is that the fair value of a financial asset is the amount foregone from holding the asset or the amount that could be received from selling the asset, under current conditions, and, in the case of financial assets specifically, there are few impediments, and high incentives, to change the method of value realization when economic conditions change. These authors suggest that management intent can determine classification and display, but should not determine measurement, in the case of financial assets.

Practical uses. Setting aside for the moment any conceptual considerations, we now consider whether fair value measurements have practical uses. Two related and distinct arguments are that remeasurement of assets and liabilities at every balance sheet date reduces managerial slack by revealing reserves that would remain hidden with the use of amortized cost accounting (Kohler, 1952) and that ignoring increases in asset values ("asset undervaluation") establishes a "secret reserve" that has the potential to mislead investors (Hatfield, 1927, p. 80-81). Although he is frequently characterized as an advocate of strict historical-cost asset measurement, in the context of management decision making, Paton [1918] argued that "[i]t is not the cost of the [asset] which is significant to the manager interested in a wise utilization of available resources. It is rather the *cost of replacement* which must form the basis of his reckoning" [emphasis in original]. We consider these arguments and related ones in the next subsection, where we describe certain aspects of the historical development of fair value measurements.

The fact that fair values are used internally to manage operations suggests their practical value to entity insiders, which would buttress the case for reporting amounts at fair value to help outsiders evaluate management's stewardship of the entity's resources. Managers and governing boards of entities would be expected to use fair value estimates as inputs into decisions to dispose of assets, operating segments or subsidiaries and as inputs into decisions about whether to undertake a

business combination or joint venture. Focusing specifically on financial services entities, Tschirhart et al. [2007] document that a majority of banks surveyed use fair value in the management of their loan portfolios. Such uses include:

- *Credit risk management.* Fair value is useful in structuring credit hedges and as an early warning signal for credit deterioration that allows the bank to hedge or limit further deterioration.

- *Interest rate risk management.* Fair values assist in identifying the impact of various market factors, including changes in interest rates and credit spreads on the bank's financial position and future net interest income.

- *Loan pricing and origination decisions.* Banks use fair values as a guide for pricing new loans. Fair value estimates based on recent market data represent the market's perception of risk which can be contrasted with the bank's own view.

- *Decisions to hold or sell loans.* Fair value estimates are used as inputs to the decision to hold or sell loans.

- *Transfer pricing.* For example, a shortfall resulting from "relationship lending" may be charged to the division responsible for generating ancillary customer revenue.

We acknowledge that the practical uses of fair value measurements for internal management and governance purposes are likely to depend on the entity's business model (for example, financial services firms hold many financial assets that would be efficiently managed on a fair value basis) and its strategy (for example, an entity may or may not engage in business combinations and asset disposals). That said, we note that certain fair value measures must be sufficiently reliable to serve as inputs to corporate decisions, else they would not be brought to bear on those decisions.

2.5 Evolution of fair value measurement in financial reporting

This subsection outlines some features of the development of fair value as a measurement attribute during the twentieth century in the U.S. We do not aim to provide a comprehensive description or analysis, but rather to illustrate certain features of the historical debate about the appropriateness of fair value measurement and other measurement attributes that share the characteristic of impounding information about economic conditions as at the balance sheet date, as opposed to the date when the item entered the balance sheet.

Historically-oriented discussions of how fair value measurement for financial reporting developed appear in, for example, Barlev and Haddad [2003], Georgiou and Jack [2011], and Richard [2004, with a focus on French and German accounting between the seventeenth century and 1914]. Zeff's [2007] description of the history of the SEC's long-standing prohibition on the use of fair-value-like measurements in registrants' financial reports also helps shed light on certain contemporary criticisms of fair value measurement.[29] We do not repeat these ideas, but rather present five inferences that are based on our analysis of authoritative guidance, historical accounts, and accounting theory. We conclude this subsection by examining the evolution of several ideas pertaining to how fair value is measured.

Inference #1. Pertaining to practical uses other than external financial reporting and internal management of the entity (discussed in Subsection 2.4), fair-value-like measures were used in rate-setting for certain regulated entities in the U.S. around the beginning of the twentieth century. The discussions of rate-setting use the term "fair value," but not in the way that term is currently defined in U.S. GAAP and IFRS. For example, in 169 U.S. 466, the Circuit Court for the District of Nebraska ruled that rate-setting for the Union Pacific Railway must be based on the fair value of the railroad's property. The notion

[29] Zeff [1999, p. 90] also refers to the American Accounting Association's 1936 "Tentative Statement of Accounting Principles Affecting Corporate Reports" as both "a paean to historical cost accounting" and authoritative guidance to support the SEC's prohibition of fair-value-like asset measurements.

of fair value used in this decision appears to be based on something like replacement cost of the railroad's property, except for its financial instruments, where the measure is given as "market value." As another example, 189 U.S. 439 is a 1903 California water rate case that required rates to be based on the "value" of the water utility's property, again, seeming to refer to something like replacement cost.[30] These examples illustrate three points:

(1) economic decisions, specifically, rate-setting, were based in part on a measurement that reflects current economic conditions, not conditions that existed at the time items entered the regulated entity's balance sheet, in the early twentieth century in the U.S.;

(2) the use of "fair value" to refer to *both* current entry values and current exit values, with the latter reserved for financial assets;

(3) the apparent conclusion that fair value estimates are sufficiently relevant to the decision at hand, and sufficiently reliable, to serve as inputs to the rate-setters' decisions about prices that certain regulated entities could charge their customers.

Another practical use of fair-value-like remeasurements during the first half of the twentieth century was in quasi-reorganizations, a variant of fresh-start accounting in which balance sheet values are restated to current values. As described in the AIA's 1950 discussion of "Departures from the cost basis," the new balance sheet values should be "those which willing buyers and willing sellers would recognize as proper when actual transactions take place in comparable circumstances." This definition, which refers to a hypothetical arms' length transaction amount, indicates a measurement basis similar to fair value as that term is currently defined in U.S. GAAP and IFRS.[31]

[30] In a discussion of what is meant by, for example, the Interstate Commerce Commission in using the term "fair value," Paton [1918, pp. 46–47] describes a measurement that appears to be similar but not identical to replacement cost.

[31] This type of fresh-start accounting could occur in a pooling-of-interest, in a material ownership change "if the costs on the books . . . are clearly not indicative of the fair value of the property," and in other circumstances as well.

Inference #2. As has been discussed by numerous commentators [e.g., Zeff, 2007], certain U.S. listed firms, especially public utility holding companies, remeasured both financial and nonfinancial assets to amounts greater than, and less than, acquisition cost during the 1920s. The extent of asset write-ups is documented by Fabricant [1936], who reports 70, 7, and 43 write-ups of tangible assets, intangible assets, and financial assets, respectively, among 208 listed firms during 1925–1934 and Dillon [1979], who reports that approximately 25% of 110 sample firms reported upward asset revaluations during the same time period. Dillon also reports that downward revaluations were more common than upward revaluations, and often of larger amounts.

These asset remeasurements and other accounting practices were subsequently judged to be dubious accounting at best and in some cases fraudulent.[32] Some SEC commissioners and some at the Federal Trade Commission even argued that financial difficulties during the 1930s could be traced to the 1920s practice of writing up assets [e.g., Holthausen and Watts, 2001, Dillon, 1979]. As Zeff [2007] explains, Robert Healy, an exceptionally long-serving SEC Commissioner (1934–1946), was outraged by 1920s accounting practices that included remeasuring assets upward; Healy's views on the absolute necessity of prohibiting upward-remeasurement departures from historical cost measurement of assets greatly affected the SEC's behavior through 1972.[33]

During this period, private-sector considerations of financial accounting guidance were mostly carried out under the auspices of the

[32]For example, Chatfield [1974, p. 132] notes: "The belief that loose accounting practices had contributed to the 1929 market crash and the depression led to the first effective agitation for compulsory audit requirements." Edwards and Bell [1961, p. 185] write of "... the era between 1918 and 1934, when corporations frequently wrote up or wrote down the value of fixed assets by some arbitrary amount and altered depreciation charges accordingly. Often the revaluation made then seemed to have more to do with influencing the value of the company's securities on the stock exchange or with controlling dividend payments than with effort to take account of changing prices in order to obtain a meaningful statement of profit."

[33]Zeff [2007] reports that all the Chief Accountants of the SEC up to 1972 had joined the SEC staff during the 1930s, and were thus imbued with Healy's obdurate aversion to upward asset remeasurements. Holthausen and Watts [2001] report that the SEC used the registration process to eliminate asset write-ups.

accounting profession, starting with the American Institute of Accountants (AIA), the predecessor of the AICPA. Based on AIA and AICPA published guidance, upward asset remeasurements seem to have been viewed by nearly all of the U.S. accounting profession as undesirable; for example, Paton and Littleton's [1940] influential monograph provided "an elegant explication and rationalization of the historical cost accounting model that was already widely accepted in the U.S." [Zeff, 1999, p. 91].[34] Similarly, Accounting Research Bulletin No. 9 (ARB 9), *Report of the Committee on Terminology*, [Committee on Accounting Procedure (CAP), 1940] states that "accounting is predominantly based upon cost [so] the proper uses of the word 'value' in accounting are largely restricted to the statement of items at cost or at modifications of cost," such as lower-of-cost-or-market for inventories and depreciated cost for fixed assets.

In terms of reflecting the general view among accounting practitioners during the 1960s, we turn to the research program of the APB, the successor to the AICPA's Committee on Accounting Procedure and the predecessor to the FASB. The APB commissioned a number of research projects, of which Accounting Research Study No. 3 (ARS 3), *A Tentative Set of Broad Accounting Principles for Business Enterprises*, [APB, 1962], is particularly well known for two reasons. First, ARS 3 argued for measuring tangible assets at replacement cost and for

[34]Although Paton and Littleton [1940] is regarded by some as sufficient justification to ban fair value measurements from the financial statements, Paton [1980] himself implies that Paton and Littleton [1940] is widely misunderstood and misrepresented. Specifically, Paton [1980, p. 630] notes that "'Cost' has significance, of course, only as it provides acceptable evidence of *market value* at date of acquisition in commonplace purchase transactions. *Value* is the substantive fact, not *cost* as such" [emphasis in original]. In describing the appropriate computation of a company's "earning rate," Paton [1980, p. 630] notes that "It is not sufficient to determine the amount of net income (defined either before or after interest and related charges) per period. The question remains: What is the relation of the net figure to the value of the resources employed in producing it? And the value in this case should be the approximate current worth of such resources." Paton [1980, p. 630] closes his commentary by stating: "Perhaps the main reason I am writing this statement is to make my personal stand clear. I have always been a *value* man. This is partly the result, no doubt, of my training in neo-classical economics, and several years of teaching in that area before wandering into accounting" [emphasis in original].

using discounted values for financial items.[35] Second, ARS 3 attracted eight published and mostly critical commentaries from its own advisory committee and was itself repudiated by its sponsor, the APB, as being too radical a departure from current practice. It is of course unclear what would have been the view of the recommendations in ARS 3, including upward asset remeasurements, had the accounting practices of the 1920s been seen as less egregious and had the depression of the 1930s been less severe.

Also during the 1960s, accounting theorists were debating the merits of various asset measurement approaches. A committee of the American Accounting Association (AAA) published *A Statement of Basic Accounting Theory* [1966] which advocated the presentation of both historical costs and current costs of assets in adjacent columns. Edwards and Bell [1961] argued for market values or replacement costs as asset measurements, as well as separately displaying the effects of operating profit or loss and the effects of remeasurements (holding gain or loss). Just past the end of the 1960s, Arthur Andersen & Co. published *Objectives of Financial Statements* [1972] that criticized both the application of conservatism and the dominance of historical cost asset measurement; no other large accounting firm issued a similar statement.

Inference #3. Calls for departures from strict historical cost measurement of assets during the twentieth century arose in part because of concerns about how inflation (changes in price levels) affects reported numbers. Advocates of departures, including Paton [1918, 1920] and Dickinson [1913] referred to variants of replacement cost measurement and price-level-adjusted (constant dollar) historical cost measurement as remedies for the defects of historical cost asset measurement in times of inflation, including the post-World War I rise in prices.[36]

[35] At the time, discounting cash flows from receivables was not common in the U.S..

[36] As previously discussed, replacement cost shares with fair value the characteristic of reflecting the specific effects of current economic conditions while constant dollar adjustments reflect only the effects of a specified inflation measure applied to historical costs. We do not regard price-level adjustments to historical cost amounts as constituting a measurement basis. Accounting for price-level changes is discussed in Mattessich [1964, Chapter 5.6] and in Accounting Research Study No. 6 (ARS 6), *Financial Reporting of Price-Level Changes* (APB, 1963).

A related argument was that historical-cost-based depreciation charges were inadequate during inflationary periods, so those charges should be based on revalued asset amounts [e.g., Sweeny, 1936]. The AIA's 1950 discussion of "Departures from the cost basis" refers explicitly to "the decreased value of the dollar" as a reason to adjust historical-cost-based asset measurements.

In a significant and short-lived departure from historical cost accounting, SFAS 33, *Financial Reporting and Changing Prices* [FASB, 1979] required certain large firms to provide unaudited disclosures of both price-level adjusted and current cost financial reporting information. Donald Kirk, chairman of the FASB during the SFAS 33 period, described this standard as a "laboratory" for the measurement component of the FASB's conceptual framework project [Kirk, 1988, p. 16] and concluded that the current cost information was little used, expensive to prepare and quite possibly unreliable. The requirements of SFAS 33 were rescinded in SFAS 82 [FASB, 1984b] and SFAS 89 [FASB, 1986].

Inference #4. Aversion to fair-value-like measurements has evolved to become asymmetric, in that asset write-downs have come to be viewed favorably as compared to asset write-ups, particularly in the case of current assets.[37] Before the asset value declines associated with the depression of the 1930s, Hatfield [1927, pp. 75–77] distinguishes between "circulating" (current) assets and fixed assets with regard to recording declines in value. He notes that "[i]n general it is considered legitimate to continue fixed assets at their cost despite a subsequent decline in value. But in valuing circulating assets regard must be had to current values. . . ," based on the reasoning that current assets are to be converted to cash in the immediate future while changes in fixed asset values "do not affect the value to the going concern."

Similarly, Accounting Research Bulletin No. 29 (ARB 29), *Inventory Pricing* (CAP 1947, Statement 5), clarifies that "a departure from

[37] As many commentators have noted, the asymmetrically favorable view of recognized asset value decreases but not increases is associated with conservatism. Sometimes, as in Paton [1920] the ideas of conservatism and estimation errors are linked. We do not analyze the role of conservatism, beyond noting that its application leads to the use of irregular remeasurements of assets downward to reflect adverse changes in economic conditions.

the cost basis of pricing the inventory is required when the usefulness of the goods is no longer as great as its cost. . . . This is generally accomplished by stating such goods at a lower level commonly designated as 'market'," where lower of cost or market means replacement cost, bounded by measures of net realizable value.[38] Evidencing an evolution of thought to contemplate writing down both fixed and current assets, the AIA's 1950 discussion of "Departures from the cost basis" listed situations in which downward departures from the cost basis would be recognized; in addition to lower-of-cost-or-market for inventory, the situations include costs of capital assets that are no longer recoverable, and both legal reorganizations and quasi-reorganizations.[39]

Inference #5. The use of fair-value-like measures such as "market value" (however measured) and replacement cost has historically been criticized on grounds of both relevance and reliability. With regard to relevance, Paton and Littleton [1940, p. 125] argue against the recognition of unrealized gains and losses, noting that value changes of "unexpired cost factors . . . may never become actual income or loss to the enterprise and hence recognition at the moment of the implied change in values may be downright misleading." Also with regard to relevance, and broadly consistent with the perspective, discussed in Subsection 2.4, that would apply measurement attributes as a function of how management intends to use an item, Hatfield [1927, pp. 74–77] argues that the "proper value of assets is that which they have to the holding concern, and not that which they might have to other persons. . . " seeming to point to a measurement like value-in-use. Similarly, ARB 9 [Committee on Accounting Procedure, 1940] emphasizes the "complete rejection in accounting of the "worth" basis for the statement of assets not intended to be sold within any foreseeable future." With regard to reliability, concerns about the subjective and even conjectural

[38]Interestingly, Paton dissented from the issuance of ARB 29 [Committee on Accounting Procedure, 1947], partly on the grounds of relevance; he objected to "apparent acceptance of the theory that replacement cost is significant to owners and managers when prices are falling but deserves no notice in accounts or statements when prices are advancing."

[39]The 1950 AIA discussion describes a quasi-reorganization as a way to achieve the same accounting outcome as would be achieved by setting up a new corporation to take over the assets of an existing corporation.

nature of fair-value-like measurements in contrast to the objectivity and verifiability of historical cost are discussed in Paton and Littleton [1940], Paton [1920, pp. 10–11], Mattessich [1964, Chapter 5] and AIA's 1949 discussion of "Should estimated current value of inventories be disclosed?"

How has fair value been measured? We first consider the idea that in order to be effective fair value measurement requires the availability of a transaction amount in an active market for an identical item, that is, a Level 1 measurement in ASC 820. This idea seems to derive mostly from concerns about verifiability, under the assumption that fair value measurements, as opposed to fair values obtained from transaction amounts in active markets, are less-than-verifiable and susceptible to special types of bias and estimation error [e.g., Penman, 2007]. Historically, the idea that market value or fair value requires an active market for the item being measured is refuted by the use of fair values in rate-setting and also as a matter of theory by MacNeal [1939, pp. 87–88] who describes an *imputed market price*, "estimated by calculating or imputing what [the item's] market price would be if existing potential buyers and sellers were brought together," to transact at arms' length and emphatically not in a forced sale.

More recently, in creating SFAS 157, *Fair Value Measurements* [FASB, 2006], now ASC 820, the FASB explained that it was responding in part to concerns about the ability to apply fair value measurement, specifically concerns about reliability in the absence of quoted market prices and about verifiability (SFAS 157, par. C3). After extensive analysis and constituent input, the FASB concluded that it could address those concerns by providing both guidance on the definition of fair value and discussion of how to apply that definition in specific contexts. SFAS 157 emphasizes the consistent application of valuation techniques and requires that those techniques must be applied to inputs (assumptions) that market participants would use (par. C57, C63–C70).

ASC 820 (SFAS 157) provides for Level 1 inputs (quoted prices for identical items in active markets), Level 2 inputs (all inputs other than Level 1 inputs that are observable from sources external to the firm), and Level 3 inputs (inputs that are not observable from sources external to the firm, including the reporting entity's own data). The

discipline in application of Level 2 inputs and the verifiability of the resulting measures derives from the requirement that Level 2 inputs and valuation techniques be externally observable, hence verifiable; that is, the measures are verifiable because the ingredients of the measures are verifiable. The discipline in application of Level 3 inputs derives from the requirement that the entity's inputs "should be used as a basis for replicating the actions of market participants in a hypothetical transaction for the asset or liability at the measurement date" (SFAS 157, par. C87). In explaining its reliance on this discipline the FASB noted that disputes as to whether hypothetical constructs such as Level 3 measures can be relevant measures of assets and liabilities pertain more to the appropriateness of fair value as a measurement attribute than to the decision-usefulness of Level 3 fair value measures (SFAS 157, par. C87).

3

Decision Usefulness of Fair Value Measurements: Relevance

In this section and in Section 4 which follows, we discuss the decision usefulness of fair value information and related research. This section focuses on relevance, one of two fundamental qualitative characteristics of useful financial information in SFAC 8, Chapter 3, *Qualitative Characteristics of Useful Financial Information* [1980]. We begin by explaining why fair values are relevant, as that term is used in SFAC 8. We then describe research design issues associated with empirical assessments of relevance, using several examples to illustrate.

3.1 Why fair values and changes in fair values are relevant

As explained in Chapter 1 of SFAC 8, financial statement users need information to help them assess an entity's prospects for future cash flows, where "prospects" refers to the amounts, timing and uncertainty of the cash flows. Fair values and changes in fair values of assets and liabilities are relevant to this assessment because those amounts reflect the present value of expected future cash flows based on assumptions used by market participants. Put another way, changes in fair value should reflect some combination of changes in the amount or timing

of expected future cash flows, changes in the risk associated with the expected future cash flows, changes in the price of risk, changes in real interest rates, and changes in liquidity premiums. How changes in fair value will be realized, or observable in the future, depends on the source of the change in fair value. We will return to this point in our discussion of research relating current period changes in fair value to future financial reporting outcomes, including future income or future cash flows.

We couch our discussion of the relevance of fair value changes in the context of a financial asset, an investment in a fixed income security. The fair value (FV) of the security at any time t is equal to the present value of expected future cash flows (CF):

$$\mathrm{FV}_t = \Sigma \mathrm{E}(\mathrm{CF}_t)/(1 + r_f + r_p)^t$$

Σ indicates the sum over all relevant future periods, E is the expectations operator, r_f is the risk free rate of interest, and r_p is a risk premium equal to $\Sigma\beta_i$ (return/unit β_i) where β_i are measures of compensated risks, and the required return per unit of β_i is the compensation for bearing each unit of risk.[1] The expression for fair value has a numerator (expected cash flows) and a denominator (1 + discount rate). The discount rate, in the case of a fixed income security, would be the interest rate demanded by investors to hold that security.

If the amount exchanged in the transaction to acquire the security is equal to the security's fair value at the date of acquisition, future fair value will differ from the transaction amount because of either or both of the following: (1) *Numerator (cash flow) effect:* change in the amount or timing of expected future cash flows; (2) *Denominator (discount rate) effect:* change in the risk of the expected future cash flows; change in the price per unit of risk; change in the risk-free (market) rate of interest. We first discuss fair value changes due to a denominator effect and then discuss fair value changes due to a numerator effect.

[1]We believe the discussion in this subsection is equally applicable to financial and nonfinancial assets and financial and nonfinancial liabilities. In the interests of simplicity, and to illustrate concepts without complications that are not pertinent to our discussion, we choose a financial asset with contractually specified cash flows.

Table 3.1: Cash flows, reported income, and fair values of five year $1,000, 10% bond issued at par assuming no change in interest rates over the term.

	Year 1	Year 2	Year 3	Year 4	Year 5
Operating cash flows	$ 100	$ 100	$ 100	$ 100	$ 100
Investing cash flows	(1,000)				1,000
Interest income	100	100	100	100	100
Fair value	1,000	1,000	1,000	1,000	1,000
Change in fair value	n/a	n/a	n/a	n/a	n/a

Analysis of fair value changes that arise from changes in discount rates. Although a fair value change caused by a change in expected cash flows would, in principle, be observable in financial reports when realized cash flows deviate from expectations, the other three sources of fair value changes (discount rate effects) will not be apparent in the subsequent financial reports of the reporting entity because these changes in fair value represent the present value of opportunity costs or benefits. To see this, consider a $1,000 five-year bond with a 10% coupon issued at par. Assuming no changes in cash flow expectations or interest rates, realized cash flows, reported income, and fair value at the end of each year are presented in Table 3.1.

Now assume that the interest rate required by investors to hold this asset changes to 12% at the end of year 2, and that the rate increase is solely attributable to an exogenous change in the general level of interest rates. The increase in market interest rates causes the present value of future cash flows to decline by $48.04, representing the present value of the opportunity cost of holding a 10% investment when the rate demanded by market participants is 12% (Table 3.2).

This example illustrates that as long as the interest rate demanded by the market does not affect expected cash flows, changes in fair value will not be correlated with future realized cash flows. Moreover, if future changes in fair value are recognized in income, those changes will be negatively related to the gain or loss associated with the initial exogenous rate shift. Specifically, assuming no further rate changes, the fair

Table 3.2: Cash flows, reported income, and fair values of a five year $1,000, 10% bond issued at par assuming an increase in the interest rate to 12% at the end of year 2.

	Year 1	Year 2	Year 3	Year 4	Year 5
Operating cash flows	$ 100	$ 100	$ 100	$ 100	$ 100
Investing cash flows	(1,000)				1,000
Interest income	100	100	100	100	100
Fair value	1,000	951.96	966.20	982.14	1,000
Change in fair value	n/a	$(48.04)	$ 14.24	$ 15.94	$ 17.86

value decrease of $48.04 in year 2 is followed by predictable fair value increases in years 3, 4, and 5 that sum to $48.04 ($14.24 + $15.94 + $17.86). This apparent reversal of the initial decline in fair value arising from an exogenous change in interest rates leads some to conclude that changes in fair value attributable solely to interest rate shocks should not be relevant to financial statement users (investors) as long as the firm intends to hold the security to maturity.

We disagree with this conclusion, for two reasons. The first relates to differences in horizon between the reporting entity holding the financial asset and its investors. Investors purchasing or selling shares at a given point want information that helps them value the company at the date of trade. The historical cost-based carrying value, the $1,000 face value of the bond in our example, conveys no information about the value of holding the bond to maturity subsequent to the rate change. To argue that unrealized gains and losses due to interest rate changes should be irrelevant to investors because they should be interested only in the amount the bond will be settled for if the company holds it to maturity is similar to arguing that investors in a closed end mutual fund that holds only debt securities to maturity should be willing to pay par value for the fund's investments.[2]

[2]The argument that fair values are relevant to investors does not imply that other information is irrelevant. Clearly, if the entity were to sell appreciated or depreciated securities and realize gains and losses, the amounts realized would be relevant to the

The second reason we believe fair changes are relevant is that unrealized gains and losses attributable to interest rate changes quantify opportunity costs and benefits, information about which is key to making efficient asset allocation decisions. Put another way, an entity holding investments earning 10% will have less cash at maturity than an otherwise similar firm holding investments earning 12%, a 200 bp opportunity loss. Although the difference between a firm earning 10% and one earning 12% on a comparable asset base will eventually appear in the firms' realized income and cash flows, regardless of how fixed-income assets are measured, recognition of fair value changes has the potential to be both more timely and more informative than non-recognition. Fair value changes reflect the present value of the above- or below-market earnings of the investment over the entire horizon during which earnings are expected to accrue. Other things equal, abnormal earnings that persist for longer periods of time will result in larger fair value changes. In contrast, even when investors can identify opportunity cost differences by analyzing realized earnings, they are unlikely to have the information necessary to determine the period over which above- or below-market earnings are likely to persist. In addition, firms' realized rates of return may be affected by confounding factors including growth or contraction of investment that obscure the extent of abnormal return.

Returning to the example, we note that if fair value changes are recognized in income, fair value changes accreted after the interest rate shock will appear persistent. The increase in fair value in year 3 is followed by an increase in year 4 that is 12% larger, and the increase in fair value in year 5 is 12% larger than that in year 4. This pattern emerges because changes in fair value due solely to the passage of time are in fact interest accruals, even though they are recognized as such only when a financial asset is purchased at a premium or discount. Under current accounting rules, the entity will not accrete the $48.04 to interest income, but will instead recognize future fair value "gains." If interest rates do not change, the reported gains will appear persistent because the difference between the yield anticipated at inception and

entity's investors for assessing the entity's liquidity and compliance with contracts, and for making other judgments.

the current market rate will accrete predictably over the remaining holding period.

The fact that certain changes in fair values represent opportunity costs or benefits, together with accounting requirements that classify as fair value gains amounts that reflect economic interest from holding financial assets, have implications for accounting research that aims to relate current period changes in fair value that arise from interest rate changes to future financial reporting outcomes. In the case of fixed income financial assets for which fair value changes are not recognized in income there is likely to be no meaningful positive over-time association, at the entity level, between changes in fair values of those assets and future reported income. Specifically, the correlation of unrealized gains and losses with future interest income at the firm level should be zero because future interest income is computed at the historical rate.

To empirically detect the future opportunity cost or benefit represented by fair value changes, researchers need to correlate fair value changes with abnormal future income. With respect to comprehensive income, unrealized gains/losses resulting from interest rate shocks should be negatively correlated with future comprehensive income, while changes in fair value resulting from the passage of time should be positively related to future comprehensive income. Detecting either effect requires separating changes in fair value due to interest rate shocks from changes in fair value due to the passage of time, and testing their contradictory relations with future accounting outcomes. Because such refinements are beyond the scope of most empirical research designs, we suggest that researchers wishing to test whether changes in fair value are correlated with future interest cash flows should use *cross-sectional* tests, not firm-specific time-series tests. That is, firms with unrealized losses on financial assets should have lower cash flows from interest than otherwise similar firms without unrealized losses.

Analysis of fair value changes that arise from changes in cash flows. Any risky cash flow stream contains an inherent probability distribution over outcomes. In the context of the financial asset described above, some outcomes will involve collecting less than the asset's contractual cash flows, meaning that there is an expected loss associated with the asset. To illustrate, assume a lender originates a 1-year loan with a

principal amount of \$1,000 when the risk-free rate is 5% and the total risk premium (the price of risk) is 1%. Principal and interest are due at maturity. To operationalize counterparty (default) risk, assume there is a 51% chance of collecting 100% of the contractual cash flows, and a 49% chance of collecting 85% of the contractual cash flows.

If the lender wishes to earn a 6% return, the contractual cash flows must exceed 1.06 × the \$1,000 of cash disbursed, because the expected amount of the contractual cash flow of \$1,060 is only \$982.89 [(51% × 100% × \$1,060) + (49% × 85% × \$1,060)]. For the lender to earn a 6% return, the contractual cash flows must be sufficiently large to offset the expected loss that arises from counterparty risk (the possibility the borrower will not pay 100% of the contractual cash flows). In this example, we can compute that the *contractual* cash flows need to equal \$1,144.09 in order for the *expected* cash flows to equal \$1,060. Assume the lender increases the contractual cash flows to \$1,144.09 so there is no loss on origination. Discounting the new expected cash flows by the risk-adjusted interest rate of 6% now yields an expected present value of \$1,000. Even though the market rate of interest is 6%, under current GAAP, interest should be recognized for accounting purposes at a rate of 14.4%. This is the imputed rate of interest on the loan, determined by subtracting 1.0 from the quotient derived from dividing the contractual cash flows of \$1,144.09 by the present expected value of \$1,000.00. The imputed rate of interest of 14.4% exceeds the actual cost of borrowing of 6% because the expected loss due to potential non-collection is imbedded in the imputed interest rate.

This example illustrates four points that are pertinent to the design of empirical accounting research.[3] First, if the contractual cash flows

[3]Because the expected loss due to potential non-payment is offset by the amount by which contractual cash flows exceed expected cash flows, the economic loss is zero. Recognizing as expense the expected loss due to potential non-payment fails to account for the fact that contractual cash flows are greater than expected cash flows at inception. Others have discussed these points. For example, Ryan [2007] notes that absent faulty lending decisions, losses are not incurred at loan inception. Ryan also notes that because the expected loss is accounted for in the contractual rate of interest, bad debt expense would be more properly classified as contra-revenue. We present these concepts here to examine their implications for empirical research design.

are sufficient to compensate the lender for the expected loss associated with potential non-collection, there is no inherent economic loss at the date the loan is originated. However, current accounting rules generally presume a certain inherent level of credit losses at the inception of lending arrangements that must be recognized as loss or expense.[4] Second, consistent with the first point, an economic credit loss occurs subsequent to loan inception only when either the probability of default or the loss, given default, increases beyond the amounts assumed at inception. Because these conditions require the arrival of new information that causes a revision in the expected timing or amounts of future cash flows, designation of any portion of losses that are expected at inception as "incurred" is inherently arbitrary and potentially misleading.

Third, interest revenue, which is based on the imputed or stated rate of interest for accounting purposes, is overstated, because it exceeds the amount expected to be collected when the loan is originated. Returning again to the example, the revenue that exceeds 6% is mischaracterized as well as overstated because the excess does not represent an amount related to the time value of money. Stated alternatively, accruing as revenue amounts not expected to be collected is inconsistent with revenue recognition principles that require revenues must be realizable, and classifying as interest revenues gains and losses associated with the realization of uncertain outcomes is inconsistent with the conceptual definition of interest.

Fourth, and related to point three, relative to expectations, collecting an amount greater than the expected cash flows at inception reflects a gain, and collecting an amount less than the expected cash flows at inception reflects a loss. However, if 100% of the contractual cash flows are collected, the realized gain relative to initial cash flow expectations is classified as revenue. The loss from collecting less than the expected cash flows at inception would be recorded either as a reduction in interest revenue (e.g., when accrued but uncollected revenue is reversed on a problem asset), or as a loan charge-off (e.g., when cash collections

[4]Note that when loans are purchased at fair value, no provision for credit losses is allowed (ASC 310). However, if loans are originated at fair value, a provision for credit losses may be required.

were recognized as interest income in prior periods so that the carrying value is an amount arbitrarily labeled "principal").

These four points are relevant to empirical research attempting to relate changes in fair value caused by changes in expected cash flows to financial statement outcomes. Holding interest rates constant, a loan's fair value will change with the assessed collectability of the contractual cash flows. Although fair values obviously will decline when expected cash flows decline after inception, less obvious is that fair value will increase when expected cash flows increase after inception. That is, when information arrives that full collection of contractual cash flows is certain, the firm must realize an economic gain. Accounting does not recognize the gain because accounting anchors on contractual cash flows rather than expected cash flows at inception. From an empirical standpoint, increases in fair value due to the expectation that the firm will collect more than was expected at inception have no counterpart in the financial statements to which they can be compared.

Conversely, because loan accounting (except for impaired financial assets) essentially assumes full collection of contractual cash flows from inception, accounting losses are defined by the amount by which revisions in expected cash flows deviate from contractual cash flows. This means that loans for which contractual cash flows are not expected to be collected in full are considered impaired and non-performing, even when they are performing exactly as, or better than, expected at inception. Accounting metrics such as non-performing asset ratios and charge-off ratios do not represent economic losses. Economic losses do not occur when a loan's expected cash flows are less than its contractual cash flows. If they did, all other-than-risk-free fixed-income securities would be impaired at inception because risk means that expected cash flows must be less than contractual cash flows.

Because changes in the fair value of a lender's loan portfolio do not map well into financial statement metrics, and because loan balances are aggregated across loans with increased and decreased expectations of future cash collections, those aggregated changes in fair value attributable to changes in cash flow expectations are unlikely to be reliably associated with future charge-offs, future bad debt expense, or

future non-performing loans, particularly over short intervals relative to the loan term. Put another way, a researcher may not detect a posited association between loan portfolio fair value changes and accounting outcomes, but the failure to detect the posited association says almost nothing about the relevance or representational faithfulness of fair values, because of the confounding and obscuring effects of accounting rules governing classification of loan-related items and recognition of net loan revenue.

The points in the preceding paragraphs can be illustrated in the context of the earlier example. Assume that upon arrival of new information, the lender ultimately expects collection of $1,061 in settlement of the $1,144.09 contractual cash flow at maturity. This reflects a $1 fair value gain relative to the expected cash flows of $1,060 at loan inception.[5] However, if the difference between the contractual cash flows of $1,144.09 and the cash collected of $1,061 is provided for as bad debt expense, the lender's financial statements will reflect a realized loss of $83.09 subsequent to the fair value increase. This illustrates a situation in which fair value changes will be negatively associated with future financial statement amounts, even when fair value changes perfectly represent the economic events. Another mismatch between fair value changes and financial statement amounts occurs when fair value declines because of decreased expected cash collections and no charge-off is recognized. This occurs to the extent reduced cash flow expectations are recorded as reductions of interest revenue. In this case, declines in fair value would be associated with lower interest income, but not bad debt expense. These examples show that the association between fair value decreases and future charge-offs and bad debt expense may be confounded by the effects of accounting for interest and gains and losses due to changes in cash flow expectations. Research attempting to associate fair value changes with future realizations of cash flows or income should be designed to take into consideration these (purely) accounting effects.

[5]The choice of $1,061 is arbitrary. Any collected amount greater than the expected cash flows and less than the contractual cash flows will result in a fair value gain.

The next subsection describes research design issues confronting researchers attempting to correlate changes in fair value with future observable outcomes. We label this correlation "predictive ability," a component of relevance.

3.2 Research assessing the predictive ability of fair values

Chapter 3 of SFAC 8 describes relevance of financial reporting information in terms of its ability to affect financial statement users' decisions, presumably resource allocation decisions. The component concepts of relevance are predictive value, the focus of this section; confirmatory value (providing feedback that confirms or changes previous evaluations); and materiality. Empirical analyses of confirmatory value are difficult to execute given the need to measure and control initial information use and subsequent confirmation. The importance of materiality in defining decision-useful information is tautological, and is not typically the subject of empirical financial reporting research.[6]

Although the conceptual framework lists predictability as a component of relevance, some researchers use predictive ability in tests of reliability, or representational faithfulness. The likely reason is that future realizations (outcomes) provide a convenient (or the only possible) benchmark for validation of a previously reported amount. For example, the existence and (estimated) measurement of a recognized liability might be validated by comparing the estimated amount of the liability to its settlement amount, if and when that occurs. However, the settlement amount provides no information as to whether the previous estimated amount was or was not correct, in the sense of appropriately reflecting economic conditions at that previous reporting date. We believe that correlating current period estimates with future outcomes can be justified only when information about economic conditions does not systematically and materially change between the

[6]Materiality has been studied extensively in the context of auditing and auditor judgments. With respect to financial reporting, the FASB notes that "materiality is an entity-specific aspect of relevance based on the nature or magnitude or both of the items to which the information relates in the context of an individual entity's financial report" [FASB, 2010, QC11].

estimation date and the date of the observable outcome. In the remainder of this discussion, we focus on predictive ability as a component of relevance, not a component of reliability.

A second problem with labeling the comparison of an outcome to a prior estimate a test of reliability arises if the test of predictive ability is inherently a joint test of relevance and reliability. To be associated with a future outcome, the current measure must be estimated with sufficient precision, must represent what it purports to represent, and must be sufficiently relevant to the outcome to which it is compared. For example, the existence of an association between a change in fair value of a financial asset with contractual cash flows that will be held to maturity and the realized cash flows from that asset would require three conditions: (1) the fair value estimate is a faithful representation of the present value of the future cash flows; (2) the fair value is sufficiently accurate; (3) the fair value change is relevant to future recognized cash flows. If the change in fair value is due to a change in interest rates, the third condition is not met.[7]

Fair value predictive ability for performance outcomes. Research on whether fair value changes are relevant, in the sense of having predictive ability, requires the specification of a financial reporting outcome that could affect resource allocation decisions. While one plausible candidate outcome might seem to be next period's fair value, we argue that fair values should not be good predictors of themselves because fair value changes are not typically persistent. Rather, we take the view that changes in fair value attributable to discount rate changes should have predictive value because they reflect the present value of opportunity costs and benefits. Opportunity costs/benefits are relevant to investment decisions and taking account of them should improve asset allocation decisions at the firm and investor levels. Empirical accounting research that investigates the relevance of fair value measurement has, we believe, for the most part overlooked the role of fair values in providing information about opportunity costs and benefits. We use

[7]If the asset is sold before maturity, the realized cash flows would reflect the realized gain or loss due to a change in interest rates. Similarly, interest rate changes affect the realized cash flows of an open portfolio of financial assets financed by liabilities.

Evans et al. [2014] to illustrate the design issues involved in analyzing this role.

Evans et al. [2014] propose that fair value measurements of fixed-income financial assets will have predictive value for an entity's *relative* levels of future accounting earnings and cash flows because (1) gains and losses may be realized via future sales and/or settlements and, more importantly, (2) in the absence of sale or settlement, the difference between fair value and amortized cost represents an amount by which the entity's future recognized interest income will be greater or less than market yields on comparable instruments, that is, an opportunity benefit or an opportunity loss. Put another way, Evans et al. propose that (1) fair values of financial assets have predictive ability in the cross section and (2) expectations of future above- or below-market interest income are relevant for valuation and should be reflected in the cross section of current equity prices. Although above- or below-market returns are reflected in future realized accounting earnings, fair value changes are more timely measures of abnormal earnings, and fair values impound market participant beliefs about the persistence of those abnormal earnings. Evans et al. analyze these proposals using 7,794 commercial-bank firm-year observations from 1994–2007. Their design exploits the disaggregated financial data in commercial bank regulatory reports to link individual fair value balance sheet measures of investment securities to the specific corresponding income statement accounts that record future income from those securities. They conduct three sets of analyses; we discuss the research designs of these analyses next.

First, Evans et al. [2014] use a cross-sectional design to analyze the predictive ability of investment securities fair value measurements within-sample (one-year and two-year horizons) and out-of-sample. Results show that fair value holding gains and losses for investment securities have significant, incremental explanatory power for banks' relative interest income and securities-related cash flows (in-sample tests). Their choice of *cross-sectional* tests is based on the reasoning that fair values should be related to *relative* future interest outcomes, because fair values capture expected opportunity costs and benefits of holding financial assets. Thus, for interest-bearing instruments that are not sold, the opportunity costs (benefits) associated with fair value

holding losses (gains) will be realized in future periods as the *relative* amount of interest income that is lower (higher) than that expected by the market.

Second, Evans et al. condition their tests of relative predictive ability of investment securities' fair value holding gains and losses on proxies for measurement error included in prior research on the value relevance of fair values [e.g., Barth, 1994], reasoning that greater measurement error impairs predictive ability. They find that banks holding a higher proportion of U.S. Treasury securities, and banks with more shorter-duration securities, have better predictive ability of fair value holding gains related to future interest income.

Third, Evans et al. investigate whether the relative predictive ability of banks' investment security fair values affects the relation between investment securities' fair values and banks' equity prices, based on the reasoning that fair value measurements that are more highly associated with future performance outcomes should also be more fully reflected in current period equity prices. Their design includes a proxy for prediction error in a value-relevance regression; the proxy moderates the relation between investment securities fair value holding gains and share prices.

Using a sample of 455 bank-firm-years between 1993 and 1995, Park et al. [1999] investigate the intent-based held-to-maturity (HTM) and available-for-sale (AFS) reporting categories for investment securities and find that AFS classification decisions, but not HTM decisions, are associated with future net income. Their research design is based on the idea that managers classify as AFS securities those they intend to sell in the short term, meaning that future income will include realizations of the previously unrealized holding gains and losses. Their design focuses on aggregate net income, not securities-specific income accounts [as do Evans et al., 2014], so the association between unrealized gains and losses and net income or net interest income can be confounded by non-securities-related costs and revenues.

Two of Park et al.'s [1999] design choices are based on the separation of AFS versus HTM securities and the presumption that AFS securities are likely to be sold, resulting in realized gains and losses. Empirically, their design requires both meaningful holdings of HTM

securities and meaningful sales of AFS securities. Evans et al. report that HTM securities declined from 15.0 percent to 1.8 percent of assets between 1994 and 2007. In 2007, the aggregate percentage of AFS (i.e., AFS/(AFS+HTM)) was 96.1 percent, and the median bank classified *all* investment securities as AFS. Despite the increase in AFS securities, sales of these securities do not appear to increase proportionately with the decrease in HTM classification during 1994–2007. Conceptually, as noted by Evans et al. [2014], separating AFS securities from HTM securities, and analyzing realized gains and losses from selling AFS securities, is not necessary or useful, because unrealized gains and losses on investment securities, regardless of their intent-based classification, represent economically meaningful opportunity benefits and opportunity costs that are detectable in cross-sectional tests.

Fair value predictability for future cash flows. Changes in fair value can also reflect changes in expected nominal, rather than relative, cash flows. For example, if expectations of cash flows from financial assets are revised downward, the resulting decline in fair value should be associated with lower future cash collections relative to previously expected cash flows. We are not aware of empirical tests of this prediction, perhaps because substantial downward cash flow predictions are relatively rare, and because financial reports may not provide sufficient detail to compare future cash flow realizations to those expected at inception. Analyzing financial asset impairments to test this prediction would, in addition, require taking into account whether recognized accounting impairments reflect economic losses. For example, impairments measured by discounting the expected cash flows at the contractual rate would not necessarily capture economic losses or be reflected in fair values.

To test the association between positive revisions in cash flow expectations, as captured by fair value increases, and future performance outcomes, researchers have analyzed long-term asset revaluations permitted under IAS 16, *Property, Plant, and Equipment*. For example, Aboody et al. [1999] report that upward revaluations of fixed assets by 1334 UK firms during 1983–1995 are positively related to changes in future adjusted operating income (i.e., income before depreciation, interest, taxes, and gains on assets) across one-, two- and three-year

horizons. Aboody et al. interpret the magnitudes of the coefficients as indicating, on average, that 7%, 5%, and 12% of asset revaluations are realized in incrementally higher income in one-year, two-years, and three-years, respectively, after incremental revaluations are recognized. Aboody et al. also report that current-year upward revaluations of fixed assets are positively associated with future operating cash flows one-year and three-years after incremental revaluations (i.e., revaluations were not significantly related to year-two operating cash flows).

Fair value predictive ability for business failure. Blankespoor et al. [2013] investigate whether banks' leverage ratios computed using proxies for fair value measurements of financial instruments better predict bank failure than leverage computed using current U.S. GAAP or leverage computed using current Tier 1 capital guidelines (i.e., according to Schedule HC-R: *Regulatory Capital* from the Federal Reserve Y9-C report). For 53 bank failures during 1997–2009, Blankespoor et al. find no statistical difference among three leverage ratios — fair-value-based, GAAP-based and Tier-1-based — in predicting bank failure one year prior to the failure. The fair-value-based measure is statistically more likely to predict future bank failure two years and three years prior to failure. Surprisingly, leverage based on Tier 1 capital is negatively related to bank failures three years before failure.

In contrast, Cantrell et al. [2014] provide evidence that banks' reported amortized cost balance sheet information for loans is more useful than loan fair values in predicting failures of publicly traded banks two- and three-years after the banks' accounting data are available. Cantrell et al. analyze failures of 73 banks during 2005–2010, and find that banks are more likely to fail when they have a higher percentage of net loans to total assets, more non-performing loans, higher average amounts of deposits in each branch, and lower net loans (i.e., gross loans adjusted for the loan-loss allowance) scaled by gross loans. This analysis also yields an insignificant coefficient on the total disclosed fair value of loans minus net carrying value of loans divided by gross loans. Cantrell et al. partially replicate Blankespoor et al.'s leverage-related predictive ability tests; they adjust the GAAP-based leverage ratio to include loan fair values to obtain "fair value leverage." As compared to Blankespoor et al.'s fair value leverage ratio, Cantrell

et al. omit fair values for HTM securities, deposits, short-term borrowings, and long-term debt. They conclude that the Tier 1 leverage ratio performs the best at predicting bank failure, with the adjusted fair value leverage ratio statistically unrelated to bank failures.

We believe that research design choices, and the specialized features of bank failures, make it difficult to interpret a null association between leverage adjusted for the fair value of loans and future bank failures. First, the posited association would exist only if leverage adjusted for the fair value of loans, in isolation, is an economically important determinant of bank failure. Second, the fair values of other financial instruments may reflect a correlated omitted variable, suggesting that results of Cantrell et al. might be reconciled to results of Blankespoor et al. by making the empirical specifications equivalent. Third, because bank regulators substantially influence and may even determine the existence and timing of bank failures, and those regulators use financial information in reaching their decisions, it is possible that certain financial metrics may cause bank failures rather than simply predict them.

Fair value predictive ability for loan charge-offs. Cantrell et al. also analyze the relative abilities of loan amortized costs and fair values to predict future credit losses, proxied by nonperforming loans and charge offs. Their design uses analyses of both relative explanatory power and estimated coefficients. First, the authors compare, using Vuong tests, the explanatory power of models predicting credit losses that include either the net carrying values or the fair values of loans. In general, Cantrell et al. find that, during 2005–2009, models predicting $t+1$ credit losses using loan carrying values have significantly greater explanatory power as compared to models using loan fair values. Second, Cantrell et al. test the coefficients of loan carrying values and the incremental difference between loan fair values and carrying values in the prediction of $t+1$ nonperforming loans or loan charge-offs. These tests suggest that loan carrying values, but not the difference between loan fair values and carrying values, are significantly associated with period $t+1$ credit losses.

Cantrell et al.'s sample period, 2005–2009, is both relatively short and potentially unusual. In addition, the possibility exists that the

U.S. GAAP incurred loss model may be applicable mostly or entirely for one-year-out prediction periods. To address these concerns, Cantrell et al. extend their research design to include a longer prediction window and a longer sample period. Specifically, they conduct their relative explanatory power analysis on two- and three-year prediction windows for loan charge-offs (nonperforming loans are not analyzed) on a subsample of 125 randomly chosen banks during 1994–2008. Their results confirm findings of the main tests: prediction models that include carrying values for loans have significantly greater explanatory power than predictive models that include loan fair values for one-, two- and three-year loan charge off accumulation windows. Cantrell et al. also report (i.e., footnote 15) that the long-window results are fragile and may result from unidentified firm-level factors. Specifically, when firm fixed effects are included, there are no significant differences two and three years ahead. Thus, "neither loan fair values nor historical costs are significantly related to future charge-offs once across-firm differences in credit losses and loan values are neutralized via firm fixed effects."

We use Cantrell et al.'s [2014] research design and findings to illustrate empirical challenges associated with testing the predictive ability of fair values. In theory, changes in fair value reflect both the present value of changes in cash flow expectations (a valuation numerator effect) and opportunity costs and benefits (a valuation denominator effect). Opportunity costs and benefits arise when contractual cash flows are fixed over some horizon and changes occur in some or all of market rates, the price of risk, and the risk of the cash flows. Because opportunity costs are not directly reflected in the time series accounting metrics frequently analyzed (loan loss provisions and charge-offs), changes in fair value due to opportunity costs will confound the correlation between fair value changes due to changes in cash flow expectations and subsequent accounting-based realizations. One research design choice that might resolve this difficulty would be to orthogonalize fair value changes with respect to changes in risk, the price of risk, and market interest rates, so as to isolate the portion of value change attributable to changes in cash flow expectations.

However, as previously discussed, identifying the portion of fair value change attributable to changes in cash flow expectations is

not sufficient to establish a relation between fair value changes and future charge-offs or nonperforming assets because charge-offs and nonperforming totals based on contractual cash flows may be recognized when no economic losses have occurred, and economic losses may occur that are not recognized as charge-offs (e.g., when foregone cash flows are recognized in the form of lower interest revenue). The last issue might be partially ameliorated by correlating changes in fair value with net loan revenue, equal to loan revenue less credit losses.

3.3 Research assessing the value relevance of fair values

Maintained assumptions of value relevance research in the context of fair value assessments. Because of the problems associated with testing predictive ability, one stream of literature, sometimes labeled "value relevance" research [e.g., Barth, 1994], seeks to associate fair values with equity prices or equity returns. This research and its link to the FASB's and IASB's conceptual frameworks described elsewhere, for example, Barth et al. [2001], and we do not repeat those descriptions here.

As previously discussed, value relevance requires some amount of predictive ability. Specifically, the two-part assumption underlying traditional value-relevance accounting research is that the accounting information being analyzed is associated with future financial performance, and this expected future performance is priced, in the sense of being impounded in equity values. As noted by Bernard [1993], some value relevance analyses do not provide explicit evidence on the validity of this two-part assumption, that is, whether the accounting information actually is associated with future performance, and whether that future performance actually is reflected in current security prices. Undertaking such an evaluation requires a precise specification of both the relation between the *ex ante* accounting information and the *ex post* measure of financial performance, and the relation between financial performance and security prices.

In the specific context of whether fair values are associated with future financial performance, some have asserted that fair value measurements reduce the informativeness of earnings for share values

because changes in fair value should be unpredictable, and the usefulness of earnings is increasing in its predictability [Dichev and Tang, 2008]. This focus on earnings predictability (i.e., the ability of current earnings to predict future earnings) leads some to conclude that "[f]air value . . . has no predictive quality for earnings" [Bezold, 2009, p. 43], and that "pure mark-to-market accounting produces asset and liability revaluations (or earnings) that are very volatile and have zero persistence, and that such earnings will be of little forward-looking use to investors [Dichev and Tang, 2008, p. 1455]." That is, earnings that contain substantial amounts of fair value changes should not be value-relevant.

Understanding these assertions, and providing empirical evidence on their descriptive validity, requires disentangling the assumptions behind the assertions and analyzing how fair value changes are likely to map into future performance. The first assumption is that including fair value remeasurements in net income will necessarily increase income volatility. The second assumption is that infrequent or volatility-increasing components of income do not convey information that is useful for predicting future financial performance, or that such components cannot be presented in ways that help financial statement users assess the consequences of their differential persistence.

With regard to the first assumption, although fair value remeasurements have the potential to increase earnings volatility, their ultimate effect is a function of the extent to which asset fair value changes are offset by liability fair value changes [Hodder et al., 2006, Barth et al., 2008]. With regard to the second assumption, and as discussed in Section 2, application of the fair value measurement attribute to specific assets and liabilities says nothing about the inclusion, or non-inclusion, of fair value holding gains and losses in net income. Although comprehensive income, the only aggregate income number defined in the conceptual framework, will necessarily include these holding gains and losses, there is no mandate to include these items in net income. In the absence of a conceptually grounded net income definition, standard setters can define net income to meet any number of objectives, including minimizing volatility. Many components of net income have

differential persistence and volatility effects; given sufficient disaggregation, investors, creditors, and accounting researchers can incorporate the differential persistence of income components in forecasts of future performance [Dechow and Ge, 2006].

General structure of value relevance research analyzing fair value measurements. In some empirical research designs, fair value measures are considered useful if they are reliably associated with capital market outcomes such as share returns, share prices or risk, or if their content moderates known associations between firm characteristics and capital market outcomes. The majority of studies demonstrating the usefulness of fair-value-measurement-related disclosures fall into the latter category, which includes "value relevance" and "risk relevance" studies.

An early example of value relevance research that analyzes fair values is Barth [1994]. We discuss this paper because it sets out the assumptions invoked to support the empirical specifications that are estimated to provide evidence on whether share prices reflect banks' disclosures of fair values and changes in fair values of investment securities.[8] Barth uses both a valuation-type regression in which market value of equity is regressed on book value of equity plus carrying values and fair values of investment securities, and a regression of returns on changes in earnings and changes in securities gains and losses computed according to GAAP (that is, realized) and based on changes in fair values (both realized and unrealized changes).

In Barth's specifications, a reliably positive slope coefficient on fair-value-related amounts is evidence of value relevance. She notes that omitted variables (an incomplete specification) or certain correlation structures among measurement errors in the explanatory variables would be expected to affect results and inferences. For example, in a regression of market value of equity on accounting amounts, two requirements for valuation coefficients to equal their theoretical values

[8]Barth [1994] describes additional research design tasks that we do not discuss, for example, how to specify expected earnings, choice of deflator, and whether to estimate regressions in cross sections or in a pooled design, because these tasks are common to value relevance research generally and are not specific to fair-value-related value relevance research.

of 1.0 (assets) or −1.0 (liabilities) are no omitted variables and no measurement error in the included variables. If these assumptions jointly do not hold, deviations of estimated coefficients from their theoretical values may be due to measurement error, omitted variables or the correlation of variable measurement error with the regression error term. As noted by Barth (p. 15) and others, the presence of measurement error is precisely the issue for some critics of fair value measurements. Thus, deviations of coefficients from their theoretical values provide potential indications of relative measurement error, but only to the extent omitted variables bias and the correlation structure of errors are controlled. Also, and as discussed in Section 4, research designs should control for firm-specific differences in assets held and liabilities owed that affect the economic properties of those items.[9]

Barth [1994, p. 15] concludes that (1) "fair value estimates are sufficiently relevant and reliable to be reflected in share prices," and (2) "fair value securities gains and losses' combined relevance and reliability to investors is marginal, but whether the problem is relevance or reliability is not determinable from the reported results." Much of her paper is devoted to analyzing the results for fair value gains and losses, with one objective the exploration of the amount of measurement error as an indicator of unreliability. Given available data, her tests of necessity use proxies and estimation approaches to analyze measurement error.

More recent research designs exploit financial statement disclosures required by ASC 820, specifically, the hierarchical Level 1-2-3 fair value disclosures, to analyze whether information about the way fair values are estimated, including possible measurement error, is useful to investors. For example, in a typical research design, if the disclosed amounts of unrealized gains and losses related to Level 1 assets and

[9]Barth [1994, p. 6] notes that one reason to analyze banks is that they are likely to have "largely homogeneous" asset/liability structures and operations, although they differ with respect to matters such as management expertise and tax status. Barth's estimation approach, and that of many other value relevance studies, assumes such homogeneity. In additional tests, she partitions her sample on bank size and on proportion of investments that are Treasury securities, to take account of heterogeneity that could affect measurement error. She does not interpret her partitions as taking account of differences in the economic properties of investments.

liabilities have systematically different associations with equity prices relative to assets and liabilities estimated using Level 3 inputs, then researchers infer that the ASC 820 hierarchical input disclosures are relevant, that is, useful, for example, in assessing the reliability or verifiability of the fair value measurements.

For example, Kolev [2008] examines ASC 820 disclosures for 172 financial services firms for the first two quarters of 2008 and conducts tests to determine (1) whether the release of ASC 820 disclosures conveys information to the market, (2) whether the association between the fair values of financial instruments and the market value of equity varies across levels of the ASC 820 measurement hierarchy, and (3) whether changes in the fair values of Level 3 assets and liabilities are associated with quarterly stock returns.

Kolev [2008] finds a positive and significant association between amounts reported in ASC 820 disclosures and three-day stock returns centered on Form 10-Q filing dates, consistent with ASC 820 disclosures conveying new information. With respect to the second question, Kolev finds evidence that stock prices are associated with amounts disclosed across all three levels of the ASC 820 hierarchy, and the magnitude of the relation varies across the three levels. The finding that Level 3 measures are value relevant suggests that these measures are sufficiently reliable and representationally faithful to be reflected in equity values. According to Kolev, the difference in coefficients across various levels of the hierarchy suggests that ASC 820 categorical disclosures include information that differentiates the measurements included in each of the categories. Finally, Kolev finds that the required ASC 820 Level 3 gain and loss disclosures are positively associated with quarterly stock returns. The author concludes that, overall, ASC 820 model-input-related disclosures convey relevant and reliable information to market participants that is useful for assessing equity value.

Related to Kolev [2008], Song et al. [2010] examine three quarters of ASC 820 disclosures for 431 firms filing first quarter financial statements for the quarter ended March 31, 2008. In contrast to the Level 3 gain and loss disclosures analyzed by Kolev, Song et al. examine the association of fair value *levels* with the market value of equity. They

find that the value relevance of Level 3 fair values significantly differs from the value relevance of Level 1 and Level 2 fair values. Their conclusion about value relevance is based on a comparison of regression coefficient magnitudes, taking the view that smaller magnitude means less relevance. Evaluating this conclusion requires, however, that the assumptions underpinning value relevance research, as described by Barth [1994] and others, are met in the data and the empirical specification.

Song et al. [2010] also examine whether disclosed hierarchical values reflect information not otherwise reflected in required disclosures about financial instrument type. Specifically, they control for the financial instrument categories that were already disclosed in the banks' disclosures (e.g., AFS securities, derivatives.). The authors conclude that the input-hierarchy disclosures required by ASC 820 reflect information that is relevant to equity pricing decisions, incremental to other available information.

Viewed as a whole, value relevance research, including the extensive research stream not discussed here, typically finds evidence that fair values of financial items held by banks and other financial services firms are reliably associated with stock prices, even when the fair values are estimated using Level 3 inputs. Evidence that changes in fair values are also value-relevant is more mixed. As discussed in Section 4, some researchers attribute differences in value relevance, as captured by differences in valuation coefficients, to differences in information qualities of the numbers, specifically, reliability.

3.4 Research assessing the risk relevance of fair values

Whereas value relevance research often uses equity prices or equity returns to calibrate the usefulness of accounting numbers, risk relevance research uses risk measures from equity or debt markets as the benchmark. The validity of this research requires, among other things, an empirical measure of (unobservable) risk with high construct validity and in some cases a design that separates information risk from underlying economic risk.

Riedl and Serafeim [2011] use an equity-beta-decomposition approach to separate the information-risk component of ASC 820 input-hierarchy disclosures from the real (e.g., cash flow) risks that might be inherent in those categories. They decompose equity beta into two components: (1) ρ, the correlation of a firm's stock return with the market return, multiplied times (2) the ratio of the standard deviation of the firm's stock return to the standard deviation of the market return. According to the authors, the "synchronicity" proxy, ρ, is designed to capture information risk by "directly measuring the comovement between a firm's stock return with [sic] the market" (Riedl and Serafeim (p. 1095), with greater returns comovement indicating greater information risk). Results suggest that the percentage of disclosed Level 3 assets is associated with higher implied betas and higher levels of synchronicity, ρ, relative to Level 1 and Level 2 assets. Riedl and Serafeim (p. 1101) conclude "[i]f this component [ρ] isolates information risk, this provides corroborating evidence that more opaque financial assets, reflected in the level 3 designation, lead to greater information risk."

Riedl and Serafeim's 2011 conclusion about information risk rests on the assumption that the synchronicity proxy, ρ, is a good measure of unobservable information risk. While empirical research suggests that better functioning markets have lower levels of synchronicity [Morck et al., 2000], this does not necessarily imply that returns synchronicity has anything to do with measurement error in reported balance sheet amounts, *per se*. In addition, Durnev et al. [2003] suggest that return synchronicity is an inverse proxy for the firm's *total* information environment, including private information production, and not the measurement error included in reported or disclosed accounting information.

The research designs in Kolev [2008], Song et al. [2010], and Riedl and Serafeim [2011] do not control for differences in the economic properties of the financial instruments categorized as Level 1, 2, and 3. The intrinsic riskiness of the assets held by an entity is expected to be associated with both equity beta and the decomposed correlation of the entity's returns with the rest of the market. Absent controls for differences in economic characteristics of instruments classified as Level 1 versus Level 2 versus Level 3, it is not possible to discern the reason

for the reported associations; in particular, the results do not speak to the differences in information characteristics of measurements of financial instruments reported in the three categories of the ASC 820 fair value input hierarchy.

Arora et al. [2014] evaluate the association between short-term credit spreads and the fraction of total assets reported for each of the three levels of the ASC 820 measurement hierarchy. They use Duffie and Lando's [2001] model of credit risk spreads which suggests that incomplete information about entities' assets will lead to non-zero credit risk spreads that are more pronounced for shorter-term yields. This result in Duffie and Lando is primarily caused by opacity about the type of assets held by the firm (i.e., real effects) and is not specifically tied to measurement uncertainty, *per se*. Despite this difference from the model, Arora et al. conjecture that the Level 3 designation includes incremental information uncertainty that is relevant to creditors. They find that assets measured using Level 2 and Level 3 fair value inputs are more highly associated with shorter-term credit spreads than Level 1 assets, and that the disaggregation of assets required by ASC 820 levels reflects information incremental to that reflected by other indicators of credit risk. They conclude that ASC 820 hierarchical input disclosures reflect information about measurement uncertainty that is relevant for assessing credit risk, with the reliability of fair value measures decreasing monotonically from Level 1 to Level 2 to Level 3.

Duffie and Lando [2001] acknowledge that they do not have empirical evidence on the type or amount of incompleteness that exists in accounting reports, but they presume that the noise in accounting signals would "vary with the nature of the firm" (p. 643). This suggests that the extent to which incomplete information is provided to creditors depends on the characteristics of an entity's assets, and is not necessarily a function of the amount of measurement error in reported asset values. Therefore, despite Arora et al.'s [2014] thorough attempts to control for underling asset quality and other sources of credit risk, the study faces the same design issue as Riedl and Serafeim [2011], specifically, the possibility that the different assets included among the different ASC 820 hierarchical input categories have differing levels of

uncertainty regarding the amount and timing of (real) payoffs, and that differences in this economic characteristic drive the reported results.

In contrast to these studies, Altamuro and Zhang [2013] propose that, compared to mortgage servicing rights (MSRs) estimated using Level 2 inputs, MSRs estimated using Level 3 inputs will have lower levels of information risk and better estimation quality. Their prediction is based on the fact that the fair value of MSRs is calculated as the sum of the discounted expected future cash flows for pools of loans associated with the MSRs, and that, as compared to adjustment of generally available pricing indices (i.e., Level 2 inputs), managers possess superior information about loan prepayments and other factors that affect the cash flows from loans. In a test of the predictive ability of MSR fair value measurements, Altamuro and Zhang show that the persistence of future servicing fee revenues is higher for Level 3 MSRs than for Level 2 MSRs, on average. The authors propose that the "results suggest that, when an asset is infrequently traded, fair values based on market inputs may not reflect the underlying cash flows. Instead, fair values based on managerial inputs incorporate firm-specific information more effectively and better reflect the underlying economic characteristics of the assets/liabilities" (Altamuro and Zhang, p. 836).

As noted by Hendricks and Shakespeare [2013], the MSR setting used by Altamuro and Zhang [2013] is a source of research-design strength because it focuses on a single financial instrument. The setting also includes features that impede drawing clear conclusions about the relative reliability of Level 2 versus Level 3 fair value measurements. For example, 80 percent of the U.S. MSR market is held by the largest five mortgage servicers, all of whom follow the Federal Housing Finance Association and Mortgage Bankers Association recommendations that MSRs are most appropriately valued using a Level 3 fair value input approach. In addition, Altamuro and Zhang "find that those banks recording the MSRs as Level 2 assets are relatively smaller, carry riskier loan portfolios, and are less likely to use a big four auditor. These results are consistent with certain banks lacking the technology to value these assets" (Hendricks and Shakespeare, p. 863). In other words, had these banks instead used a Level 3 valuation approach, the resulting fair

value estimates would have been of lower quality (i.e., the causal factor is the bank applying the measurement attribute, not the attribute itself). More importantly, Hendricks and Shakespeare conclude that Altamuro and Zhang did not adequately control for the level of risk in the underlying loan portfolios being serviced.

3.5 Operationalizing fair value amounts in research assessing the decision usefulness of fair values

In this subsection, we consider two practical, operational issues in using the fair value measures that appear in financial reports. The first issue is whether the display of a fair value measurement in the notes (disclosed) as opposed to on the face of financial statements (recognized) affects research designs and inferences. The second issue is whether the substitution of non-fair-value measures for required fair value measures, as permitted by U.S. GAAP in certain circumstances, affects results and inferences.

Recognized versus disclosed fair values. As discussed in Schipper [2007], both research and anecdotal evidence suggest that financial statement users sometimes process disclosed amounts differently from recognized amounts either because of differing information properties or because of cognitive factors, or both. In addition, and as discussed below, in the specific context of fair value note disclosures, U.S. GAAP permits practicability exceptions for disclosed fair values but not for recognized fair values. Thus, the possibility exists that disclosed amounts *generally* and fair value disclosures *specifically* have lower reliability/verifiability than the same amounts would have if recognized.

The implication for archival analyses of fair value measures is that the disclosure versus recognition condition may be a confounding variable with direct implications for both conclusions about value relevance and, as discussed in Section 4, for verifiability. The issue is particularly important for analyses of fair value measures, because many archival studies compare disclosed fair value amounts required by FASB Accounting Standards Codification (ASC) 825 SFAS 107,

Disclosures about Fair Value of Financial Instruments) with recognized non-fair-value amounts for the same items, for example, loans and HTM securities.

Non-fair-value measures substituted for fair value measures in financial reports. ASC 820 (SFAS 157, *Fair Value Measurements*) both clarifies that the measurement objective for fair value is an estimated exit price and provides for practicability exceptions to fair value measurement as required by certain other accounting pronouncements including ASC 825. If management determines that fair value measurement is impracticable for particular items required to be recognized or disclosed at fair value, ASC 825-10-50 requires the firm to (1) describe the item and explain why estimating fair value for that item is impracticable, and (2) provide information about the item that would assist users of the financial statements to form their own assessments of value. A review of financial reports suggests that some financial statement preparers interpret ASC 820 as allowing substitution of measures similar to fair value in place of required fair values, thereby negating the requirement to explain why estimation of fair value is impracticable and the need to provide supplemental disclosures.

Two of the more common types of assets and liabilities for which firms present measures other than fair value are loan assets held for investment and deposit liabilities. The justification for reporting values other than fair value for these items is not clear from reading ASC 820. Although paragraphs C23-C24 of SFAS 157 permit the use of measures similar to fair value for a certain class of items, loan assets and deposit liabilities are not among these items. Paragraph ASC 820-10-15-3(b) describes ASC 825's practicability provisions as exceptions "to the requirement to measure fair value if it is not practicable to do so." This suggests that fair values will not be reported for loans and deposits if the entity finds doing so impracticable, and that the magnitudes of these items will be disclosed together with supplemental information useful for assessing fair value.

However, some firms substitute measures other than fair value for required fair values, failing to provide supplemental disclosures. For example, in its 2012 10-K, Bryn Mawr Bank Corporation (total assets $2.1 billion) discloses that loans held for investment are valued using

an estimated entry price. The company does not explain why obtaining estimates of exit values is impracticable, or quantify the amount of loans valued using entry prices rather than exit prices:

> For variable rate loans that reprice frequently and which have no significant change in credit risk, estimated fair values are based on carrying values. Fair values of certain mortgage loans and consumer loans are estimated using discounted cash flow analyses, using interest rates currently being offered for loans with similar terms to borrowers of similar credit quality and is [sic] indicative of an entry price. The estimated fair value of nonperforming loans is based on discounted estimated cash flows as determined by the internal loan review of the Bank or the appraised market value of the underlying collateral, as determined by independent third party appraisers. This technique does not reflect an exit price (Source: Bryn Mawr Bank Corporation 2012 Form 10-K, SEC File No. 0-15261, p. 99).

Identifying deviations from fair value measurement is important in designing, executing and evaluating, archival studies that purport to assess the value relevance or predictive ability of fair value measurements, including, for example, research that shows a weak association between disclosed loan fair values and equity prices [e.g., Eccher et al., 1996, Nelson, 1996]. These results have been interpreted as evidence of low relevance and/or low reliability of disclosed loan fair values [Nissim, 2003]. However, an alternative interpretation is that reported loan fair values are less relevant and/or reliable because they sometimes or frequently reflect measurement attributes other than fair value.

Incomplete descriptive disclosures in financial reports preclude a comprehensive analysis of the extent to which reporting entities use alternative, non-fair-value measurement bases in fair value disclosures. However, consistent with the conjecture that reported loan fair values, on average, reflect attributes other than fair value, Chee [2013] finds that reported loan fair values lag proxies for the market value of loans, and loan fair values do not subsume nonperforming loans in explaining future realized loan losses. Chee concludes that reported loan fair

values do not reflect market values, or readily available credit risk information, and interprets results as evidence that fair values for loans are not sufficiently relevant and reliable to be recognized in the financial statements; the paper does not discuss the possibility that what appear to be disclosed loan fair values may in fact reflect measurements other than fair value (e.g., entry prices).

4

Verifiability of Fair Value Measurements

In this section, we discuss verifiability, an enhancing characteristic of useful financial reporting information that has been both the subject of academic research and the focus of criticism directed at fair value measurement, for example Ramanna [2008] and Ramanna and Watts [2012]. Our discussion is intended to aid researchers in identifying and analyzing maintained assumptions in research on the verifiability of fair value measurements, and in identifying ways to test those assumptions.

In Subsection 4.1, we describe verifiability as originally defined in the FASB's conceptual framework.[1] This discussion should be useful to scholars who wish to design and execute research studies relevant to accounting standard setting. Subsection 4.1 also explains the evolution of the concept of verifiability in FASB SFAC 8: Chapter 1, *The Objective of General Purpose Financial Reporting*, and Chapter 3,

[1]Because most of the empirical research we discuss was written and/or includes sample periods that predate the issuance of SFAC 8 in 2010, we describe verifiability in the context of the now-superseded SFAC 2 and the currently in-effect SFAC 8. Although this approach leads to expositional complexity, it provides the most accurate portrayal of the conceptual framework (1) that was in existence when the described research was conducted and (2) that will be in effect as new research is designed and executed.

Qualitative Characteristics of Useful Financial Information. In Subsection 4.2, we describe three maintained assumptions about verifiability and the fair value measurement attribute that we believe present unresolved research questions that deserve empirical examination. In Subsection 4.3, we illustrate research design issues using, as an example, Ramanna and Watts' [2012] investigation of goodwill impairments.

4.1 Verifiability in the FASB's conceptual framework

The now-superseded FASB SFAC 2, *Qualitative Characteristics of Accounting Information*, in effect between May 1980 and September 2010, defined relevance and reliability as "primary decision-specific qualities" of decision-useful accounting information. This conceptual specification provides the basis for empirical analyses of relevance and/or reliability of reported and/or disclosed accounting information [e.g., Barth et al., 2001, Landsman, 2007]. SFAC 2 defined relevance as information that possesses feedback value and/or predictive value, and that is also timely. One common operationalization of relevance in accounting research, discussed in Section 3, is the statistical association of recognized and/or disclosed accounting information with equity prices or returns [e.g., Barth, 1994] or with other market-based metrics, for example, debt prices or credit spreads [e.g., Arora et al., 2014].

SFAC 2 defined reliability as "the faithfulness with which [an accounting measure] represents what it purports to represent, coupled with an assurance for the user, which comes through verification, that it has that representational quality" (par. 59). As defined in SFAC 2, reliability has three components — representational faithfulness, neutrality, and verifiability — none of which is determinative. In addition, SFAC 2 makes clear that verifiability relates directly to representational faithfulness. That is, verifiability does not refer solely to the ability to reproduce a given number, but rather to the ability to confirm that a given number represents what it purports to represent. This distinction means that even the highest level of reproducibility cannot compensate for lack of representational faithfulness. However, some accounting scholars have accorded primacy to verifiability, even

at a sacrifice of neutrality or representational faithfulness, for example, in advocating conservative accounting. One justification for focusing on verifiability, even if it results in non-neutral accounting outcomes, is to counteract inherent biases in the way accounting standards are implemented, particularly in contracting contexts.[2]

Even if one accepts contracting as a legitimate basis for selectively biased financial reporting, this context provides only one perspective among many alternative perspectives that should influence the content and form of general purpose financial statements. Contracting parties can define the performance and financial condition metrics in any way they see fit, and are not limited to general purpose financial statements when they can demand the application and/or reporting of contract-specific accounting procedures and adjustments [Lambert, 2010, p. 293]. However, SFAC 8, par. OB5 indicates that standard setters intend for general purpose financial statements to be responsive to the needs of stakeholders who have no other information channel with the company: "[m]any existing and potential investors, lenders, and other creditors cannot require reporting entities to provide information directly to them and must rely on general purpose financial reports for much of the financial information they need. Consequently, they are the primary users to whom general purpose financial reports are directed." Consistent with the financial-accounting-standards-setting goal of the FASB and IASB, we evaluate the information properties of accounting measures, particularly verifiability, in the context of general purpose financial statements.

[2]It is an empirical question as to whether non-neutral and highly verifiable accounting achieves the contracting benefits proposed by its supporters. Gigler et al. [2009] demonstrate that the biased application of accounting recommended by Watts [2003a,b] and others necessarily leads to information loss. Moreover, optimal contracts are not static and will be *ex ante* restructured because of expected bias in the accounting reports (Gigler et al.) and decision makers will apply strategic information-processing strategies, like "sophisticated skepticism," when attempting to use signals provided by interested parties [e.g., Milgrom and Roberts, 1986]. Additional research could shed light on (1) the existence and magnitude of contracting benefits and costs associated with selectively biased reporting, (2) how rational economic agents deal with self-interested counterparties, and (3) the overall quality of information when information is not unbiased and representationally faithful.

As of September 2010, SFAC 8 superseded SFAC 2, retained relevance as a primary quality of decision-useful information in general purpose financial statements, and replaced reliability with the criterion that accounting information should be representationally faithful. As originally described in SFAC 2, reliability was indistinguishable from faithful representation. However, as noted by the FASB, "[t]he comments of respondents to numerous proposed standards indicated a lack of a common understanding of the term *reliability*. Some focused on *verifiability* or *free from material error* to the virtual exclusion of faithful representation" [FASB, 2010, par. BC3.23]. We comment later in this section on the relation between verifiability and faithful representation.

As previously discussed in this paper and elsewhere, accounting research has not provided systematic and pervasive empirical evidence on the separate qualitative characteristic relevance to the exclusion of reliability, or *vice versa*. That is, decision-relevant information must be sufficiently reliable to be detected as relevant in empirical tests, and the relative reliability of accounting information cannot be detected without sufficient levels of relevance. The FASB and IASB acknowledge this mutual dependence in the basis for conclusions to SFAC 8, noting that "[e]mpirical accounting researchers have accumulated considerable evidence supporting relevant and faithfully represented financial information through correlation with changes in the market prices of entities' equity or debt instruments. However, such studies have not provided techniques for empirically measuring faithful representation apart from relevance" [FASB, 2010, par. BC3.30]. Separate assessments of relevance and faithful representation seem to us to be a worthy pursuit for researchers, but as a purely practical matter, the FASB and IASB note that "[i]nformation must be both relevant and faithfully represented if it is to be useful. Neither a faithful representation of an irrelevant phenomenon, nor an unfaithful representation of a relevant phenomenon, helps users make good decisions" [FASB, 2010, par. QC17].

SFAC 8 also includes four enhancing qualitative characteristics of financial accounting information: comparability, verifiability, timeliness, and understandability. According to paragraph QC19, these

qualitative characteristics can enhance the usefulness of accounting information that is sufficiently relevant and faithfully represented. SFAC 8 is clear that greater verifiability is preferred for a given level of relevance and representational faithfulness. That is, greater verifiability is *not* unconditionally preferred if it results in diminished relevance and/or diminished faithful representation.

SFAC 8 also clarifies that the usefulness of accounting information should not necessarily be judged by the extent to which accounting reports express estimates as point estimates, as opposed to ranges. As noted in SFAC 8, quantified information in accounting reports, including both a point estimate and a range of possible amounts and their related probabilities, can be verified [FASB, 2010, Par. QC26]. Thus, verification is conditional on the type of information presented, with the goal that the information is both relevant and faithfully represented.

Many accounting estimates contain measurement error, and users require additional disclosures to understand the properties of the reported amounts.[3] An important point is that applying the joint, primary criteria of relevance and faithful representation will provide information that is, conceptually, the most decision useful. Additional information about, for example, underlying assumptions and methods of estimation allows financial statement users to decide the extent to which — or whether — they want to use the reported information [FASB, 2010, QC28].

A strictly verifiability-focused view of accounting could lead to reporting highly verifiable amounts that may not faithfully represent the financial statement elements they purport to represent. For example, the definition of assets as probable future economic benefits controlled by the entity is silent on the appropriate measurement

[3]Some accounting estimates are more faithfully represented by point estimates because they have lower levels of measurement/estimation error (e.g., cash balances all denominated in the reporting currency). Even an account like cash is subject to nontrivial measurement error if the reporting entity does business in multiple currencies that must be converted to the reporting currency at some spot rate that is determined by management.

attribute. Assets have many attributes that may be informative if sufficiently described, for example, the square footage of a building, its location, its business use, and its cost. However, accounting concepts require recognition of an amount that represents the probable future economic benefits of controlling an asset. If there is a significant difference between the historical cost of an asset and the future economic benefits associated with controlling the asset, then the amount paid for the asset, its cost, although potentially highly verifiable, fails to provide the highest *combination* of relevance and faithful representation. We note that not all expenditures represent assets, and, conversely, not all assets can be faithfully represented by expenditures.

4.2 Three maintained assumptions about verifiability and accounting measurement

We discuss three measurement-related assumptions found in the academic literature, and pose empirical questions suggested by these assumptions. The first assumption may seem obvious, and not requiring rigorous testing, specifically, that historical-cost-based accounting measurements are inherently more verifiable than fair-value-based accounting measurements. The second assumption is that an empirical finding of differential value relevance is caused by differential measurement verifiability. The third assumption is that, compared to fair-value-based financial information, historical-cost-based financial information is superior for contracting purposes in an agency setting (refer to footnote 2 in Subsection 4.1). We describe examples of research that uses these assumptions and suggest research designs that can provide evidence about verifiability of accounting measurements.

Maintained assumption #1: Historical-cost-based accounting information is inherently more verifiable than fair-value-based accounting information. As is evident from analysis of accounting textbooks, accounting and auditing standards, and financial reports, both fair value and historical cost include varying and sometimes substantial measurement uncertainty. As noted by Lambert [2010, p. 288]: "[v]irtually every item on a balance sheet involves some degree of subjective unverifiable projections by managers. This includes such

'simple' assets as accounts receivable (what percent won't be collected?) and property plant and equipment (what is the correct useful life and residual value?)." Because most if not all financial statement items vary in the extent to which they are verifiable, we believe that the only inferentially valid way to test the assertion that fair values are less verifiable than historical costs is to compare *identical* assets and/or liabilities that differ only in how they are measured. This can be achieved either through experimenters' comparative advantage of random assignment or archivists' technique of statistical control.

Because verifiability is an enhancing characteristic under SFAC 8, a comparison of the verifiability of fair values versus historical costs would need to control the levels of relevance and representational faithfulness in the reported assets and liabilities. We illustrate this point using the following example. According to its 2013 Securities and Exchange Commission (SEC) Form 10-K, E. I. du Pont de Nemours and Company (DuPont) "was founded in 1802 and was incorporated in Delaware in 1915." According to Note 10 of its December 31, 2013 10-K, DuPont's consolidated land balance is $671 million, carried at original cost, per Note 1. During its first century of existence, DuPont purchased parcels of land around Wilmington, Delaware, and opened its corporate headquarters building in Wilmington at 10th and Market Street in 1905. Although it has gone through significant renovations since that time, DuPont's headquarters are still on that parcel of land (i.e., officially, 1007 Market Street). Its financial report indicates that DuPont's headquarters parcel of land is carried at its pre-1905 purchase price (i.e., a pure historical cost measurement, consistent with current GAAP and Note 1 of DuPont's 2013 Form 10-K). A pre-1905 historical cost measurement for the land is certainly not relevant for a user of the company's general purpose financial statements in 2014, regardless of whether that use is for investment, lending, contracting, or stewardship.

In an investment context, and assuming that the value of DuPont's shares impounds the fair value (and, as described in Section 2, the value in use) of the land, the reported pre-1905 land value is irrelevant for both prediction and feedback purposes. For lending, the pre-1905 land value does not represent a reasonable estimate of the collateral value

of the land or the cash flow generating potential (i.e., for debt service) of using the land. For contracting (e.g., management compensation) purposes, the pre-1905 carrying value represents an opportunity for a self-interested manager to distort the company's performance measures and realize gains on a sale-leaseback of the land. Finally, for stewardship purposes, the pre-1905 value of the land provides no relevant information for evaluating management performance. A good steward of the land will earn a commensurate return, based on the value of the land when that land was endowed to the steward. Generations of executive managers retired since the parcel was originally purchased. Attempting to link the company's 2013 financial performance to the pre-1905 carrying value of the land provides an accounting return measure that is uninformative about current management performance. In addition, this value is non-comparable for a financial statement user who wishes to compare DuPont's management performance to management performance at other companies.

In addition to the lack of relevance of DuPont's pre-1905 value for land, we also propose that the historical-cost carrying value does not comport well with the conceptual framework definition of an asset. In particular, we note that SFAC 6, *Elements of Financial Statements*, defines assets as "probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events" (par. 25). We propose that the recorded land value, its historical cost, is unlikely to capture the future economic benefits embodied in the land asset. Indeed, as acknowledged by Whittington [2007], a staunch opponent of recognized fair values in the financial statements, historical cost "does not provide either a timely or a comparable basis for measuring the economic benefits conferred by the ownership of assets" (p. 189).

As long as an auditor can access the public archive of property-transfer records in Wilmington, Delaware, the pre-1905 land cost would be highly verifiable, subject to judgments about the amount of transaction fees to be included in cost. However, while this highly verifiable reported amount probably faithfully represents original cost, the amount is wholly decision irrelevant. This is why relevance and faithful representation are considered primary qualities, and the

enhancing characteristic verifiability should be determinative only after the desired combined levels of relevance and faithful representation are achieved. Our point is that only after financial statement measures have achieved acceptable levels of relevance and faithful representation can we evaluate relative verifiability of alternative measurement bases.

As previously discussed, the notion of verifiability depends on the nature of the measurements being verified. "Quantified information need not be a single point estimate to be verifiable. A range of possible amounts and the related probabilities also can be verified" [FASB, 2010, Par. QC26]. Ranges of values and probabilistic outcomes may be the most relevant and representationally faithful depictions of assets and liabilities that involve uncertain future payoffs. Imposing a deterministic single-dimension point-estimate format on these probabilistic, multi-dimension items diminishes the joint relevance and representational faithfulness of the depiction.

Some assert that fair values are inherently "unverifiable" because, for example, they are a "function of management's future actions, including managers' conceptualization and implementation of firm strategy" [Ramanna and Watts, 2012, p. 750]. The dependency of reported financial statement amounts on future actions and on management estimates is not the exclusive purview of fair value measurement, and fair values can in some cases be highly verifiable; for example, in the case of land fair values, the appraisal process and valuation model inputs can be verified. To elaborate, accrual-based historical-cost-type measurement is predicated on a going-concern assumption for the reporting entity, recorded carrying values that may themselves be based on estimates, and the anticipated realization of recorded net assets. Virtually every account in the financial statements includes nontrivial estimation and assumptions about the occurrence of future events [Beaver, 1991, Barth, 2006, Lambert, 2010]. Indeed, the use of estimates in accrual accounting is so pervasive that at a September 2004 meeting of the Public Company Accounting Oversight Board's (PCAOB) Standing Advisory Group "[p]articipants expressed the opinion that accounting estimates pose broader problems beyond computing fair values, and investors need to be educated about the role of estimates in financial statements" [Glover et al., 2005, p. 268].

Consistent with Beaver's 1991 observation, a review of examples included in U.S. auditing standards [AICPA, 1989, AU 342.16] reveals more than 40 significant estimates, the majority of which relate to non-fair-value-based accrual accounting (e.g., receivables, revenue recognition, inventories, fixed assets, loss reserves, pensions and tax allocation). Thus, significant estimates are not new to financial reports, and have been prevalent in many of the measurements reported in accounts that many accountants would consider to be historical-cost-based. Evidence shows that the vast majority of SEC Accounting and Auditing Enforcement Releases (AAERs) [Dechow et al., 2011] and financial reporting restatements [General Accounting Office, 2003] are related to traditional accrual accounts, like revenues, expenses, cost capitalization, accounts receivable, and inventory. Further, less than five percent of AAER companies investigated by Dechow et al. had misstatements in accounts that could be construed as fair-value-based accounts (e.g., marketable securities).

What does the concept of verifiability mean in the context of uncertain realization of reported amounts? According to the FASB, "[v]erifiability helps assure users that information faithfully represents the economic phenomena it purports to represent" [FASB, 2010, QC26]. Faithful representation requires full financial statement disclosure of the source(s) of uncertainty in reported amounts and the range of possible amounts that could be realized. In addition, financial statement users will likely find useful historical information about the differences between accounting estimates and realized outcomes [e.g., Hirst et al., 2003, Lundholm, 1999]. Bell and Griffin [2012] provide a proposal for representationally faithful disclosures of uncertain accounting estimates and related auditing procedures that enhance the verifiability of such disclosures.

Having presented the *ex ante* argument that fair values are not *inherently* less verifiable than historical costs, we turn to the empirical evidence. In this regard, we are not able to identify any inferentially valid empirical evidence that, holding informational relevance and faithful representation constant, fair values are *inherently* less verifiable than historical costs. We suggest that accounting scholars should attempt to focus research efforts on whether, and how, various

measurement attributes present information that faithfully represents decision-relevant economic phenomena in the financial statements. For example, FASB Accounting Standards Codification Topic 820 (ASC 820) prescribes a hierarchical order of inputs to be used in arriving at fair value measurements, according the highest priority to unadjusted quoted market prices in active markets for identical assets and liabilities (Level 1 inputs), the second highest priority to adjusted quoted market prices for similar assets and liabilities (Level 2 inputs) and the lowest priority to unobservable inputs (Level 3 inputs). Holding the underlying reported asset or liability constant, these categories should communicate information to users about the estimation process embodied in reported amounts. Research on whether, and how, financial statement users adjust the weights they assign to information from each of these categories would be useful in understanding how financial statements communicate, and financial statement users process, information about how reported amounts are arrived at. In addition, better understanding of the models, processes and related assurance should lead to more efficient use of financial accounting information.

In an example of research related to auditor assurance of fair value measurements, Ettredge et al. [2014] document that the proportion of commercial bank Level 3 assets is positively associated with audit fees. Using a sample of 1,022 bank-year observations between 2008 and 2011, the authors find that audit fee increases per unit of Level 3 measures exceed audit fee increases per unit of Level 1 or 2 measures. The authors conclude that results are consistent with audit effort and fees increasing in the difficulty of verifying asset fair values. In contrast, Goncharov et al. [2014] find that higher amounts of Level 3 assets are associated with lower audit fees. In this study, the comparison group consists of firms reporting similar assets at amortized cost. Goncharov et al. report that, for a sample of European real estate firms during 2001–2008, auditors charge lower fees for auditing firms with property assets reported at fair value than for auditing firms recognizing property assets at amortized cost. The authors argue that this difference is driven in part by the costs of auditing impairments to real assets recognized at historical cost, and conclude that recognizing assets at fair value can decrease monitoring costs. These studies suggest that

auditors adjust their fees and procedures to gain assurance about complex estimates, including complex estimates not specific to fair values.

Maintained assumption #2: Differential value relevance is caused by differential measurement verifiability. In some empirical research designs, fair value measures and disclosures about fair values are considered useful if their release is associated with a measurable market participant response, or if their content moderates known relations between other observable firm characteristics and market participants' responses to these characteristics, or if asset and liability fair values are reliably associated with market value of equity or some other market outcome. The majority of studies demonstrating the usefulness of fair-value-measurement-related disclosures fall into the third category, which includes "value relevance" and "risk relevance" studies. In this subsection, we revisit the examples discussed in Section 3 in the context of differential measurement reliability. Specifically, we ask whether empirical analyses of the value relevance or risk relevance of Level 1 versus Level 3 fair value measurements provide evidence that differences in value relevance are caused by differences in verifiability.

One interpretation of the results reported by Kolev [2008] and Song et al. [2010] is that fair value measurements using Level 3 inputs have lower reliability (i.e., higher measurement error) than fair value measurements using Level 1 inputs. That is, the differential pricing of fair values reported in the two categories is due to the measurement technology and not to differences in the economic attributes of the instruments included in the categories. The difficulty is that the research designs in these studies do not take account of economic differences in instruments that are correlated with inputs used to measure fair values. For example, a factor that can cause a financial instrument to migrate from Level 1 inputs to Level 3 inputs is the evaporation of an active market for the instrument. In terms of economic attributes, financial instruments for which there is an active market generally have lower levels of liquidity risk and counterparty-performance risk as compared to financial instruments for which there is no active market.

To support the inference that differential reliability or verifiability of the fair value measurement, in and of itself, is the cause of differential

pricing of Level-1- versus Level-3-disclosed financial instruments, the research design must hold constant the real economic attributes of the instruments within those categories. Neither Kolev's nor Song et al.'s research designs control for these real factors; thus, whether Level 1 versus Level 3 fair values have differential amounts of measurement error is still an open question. Similarly, tests of information-risk-relevance of Level 1, 2, and 3 fair values also require controls for the underlying economic risk of items included in the three categories. Associations ascribed to information risk (or information uncertainty, or unreliability) may in fact arise from economic differences in the uncertainty of payoffs.

To summarize, although accounting researchers sometimes frame their research questions in terms of the ability of ASC 820 disclosures to reveal information risk or estimation risk, the results are susceptible to alternative explanations. For example, one potential reason for some findings is that Level 3 estimates are composed of items with significantly greater outcome risk rather than significantly greater estimation risk, as compared to Level 1 items.

Using a design that proposes real economic differences in instrument composition across the three levels of the ASC 820 fair-value-input hierarchy, Lev and Zhou [2009] argue that the ASC 820 measurement hierarchy categories not only reflect relative estimation uncertainty, but also are correlated with differences in liquidity. Because an entity's sensitivity to systematic shifts in market liquidity is relevant to valuation, investors potentially can use ASC 820 disclosures to assess the effect on firm value of unexpected shifts in liquidity. To assess whether ASC 820 disclosures inform about liquidity risk, Lev and Zhou measure stock price reactions of 645 financial firms and 1,687 nonfinancial firms to liquidity events between September 1 and December 31, 2008. Liquidity-contracting events include revelations of major financial firm failures. Liquidity-expanding events include government actions such as liquidity injections, rate cuts, and direct capital infusions to financial institutions. Consistent with their conjectures, Lev and Zhou find that negative equity market reactions to liquidity-contracting events, and positive reactions to liquidity-expanding events, are strongest for firms holding high levels of Level 3 items. They conclude that ASC 820

hierarchical disclosures are informative about liquidity risk, an economic risk that is distinct from estimation uncertainty and that is a characteristic of the item, not a characteristic of the measurement of the item.

Taken together, empirical research tends to support the notion that the hierarchical Level 1, 2, and 3 fair value disclosures are decision useful, in the sense that they convey and reflect information that is relevant to market participants in assessing some combination of firm value, equity risk, credit risk, liquidity risk, and information or estimation risk. Separating information risk, or the unreliability/unverifiability of fair value measures, requires controls for the other risks. We view this as an area where rigorous and carefully controlled empirical studies can make substantial contributions.

Maintained assumption #3: Compared to fair-value-based financial information, historical-cost-based financial information is superior for contracting and stewardship purposes in an agency setting. Gjesdal [1981, p. 209] notes that some streams of research on stewardship and contracting reflect the belief "that the stewardship objective implies a preference for historical cost over current cost alternatives (or, more vaguely, for information about the past over information about the future)." Similarly, Kothari et al. [2010] propose stewardship and contracting are the primary objectives for general purpose financial reporting information, and that conservative and verifiable information is desirable for contracting and managerial incentive purposes. Some argue that information relevant for incentive and control purposes necessarily focuses on completed transactions and past performance, rather than future-oriented estimates and projections [Ijiri, 1975, Barclay et al., 2005, Kothari et al., 2010].

We agree that designing incentive contracts to include realized observable outcomes can mitigate costly *ex post* "settling up" for inequitable incentive payments [e.g., Leone et al., 2006]; we do not agree that these benchmarks provide appropriate incentives for optimal *ex ante* actions. If their incentive compensation is based on realized outcomes, then, in the face of outcome-risky alternatives, risk-averse managers may be unwilling to accept certain positive net present value projects [Weiss, 2011]. As noted by Lambert [2010, p. 296], "[i]n theory,

conservative performance measures can help with incentives of managers to (i) hold on to bad projects too long, and/or (ii) over-state the profitability of their projects. However, conservative performance measures create (or make worse) underinvestment problems when projects have costs that are incurred now but whose benefits do not occur [until] far into the future."

The literature on management control and incentive compensation does not focus on *ex post* "settling up" as the primary role of accounting information in agency settings. Instead, this literature suggests that the incentive features of management compensation contracts should induce managers to make expected-future-cash-flows-increasing decisions while the control features of these contracts should reduce uncertainty about managers' actions during the period [Gjesdal, 1981, Paul, 1992]. Thus, accounting information should be included in management-compensation contracts to the extent that it provides information relevant to these two overlapping objectives. Because fair value measurements of assets and liabilities will, by definition, include the present value of cash flow effects of managerial actions, managers should be more likely to take actions that appropriately balance risk and return when their incentive contracts are based on fair values. Under the downwardly biased application of historical cost accounting required by current U.S. GAAP and IFRS, for example, in lower-of-cost-or-market rules, or measurement at the lower of cost or fair value, it is unclear how accounting-based contracts provide appropriate managerial incentives. Ultimately, the incentive effect of reported fair value versus historical-cost-based accounting measurement is an empirical question that should be investigated in inferentially valid empirical research designs.

With respect to the control aspects of accounting measurement, we suggest that, compared to historical-cost-based information, the reduction of uncertainty about managers' actions should be greater in the presence of fair value information. Our suggestion is based on two observations. First, because principals cannot directly observe agents' actions without incurring prohibitive monitoring costs, they look to accounting reports to infer those actions. Second, while investors and creditors are generally interested in knowing whether their claims

increased or decreased in value, with respect to rewarding or punishing managers, they are most interested in knowing whether the changes in their claims' values are more a result of the manager's actions or more a result of external, non-manager forces. While the investor/creditor is ultimately concerned with the value of his/her investment irrespective of the contributors to that value (i.e., manager versus external forces), from the perspective of managerial control, the task is to isolate the change in value caused by managerial action from the change in value caused by all other factors. Specifically, Paul [1992, p. 472] states, "to provide optimal incentives in a principal-agent problem, we need to weight information according to its informativeness about the manager's contribution, or value-added, to the firm."

In addition to verifiability-related challenges that exist in *both* historical cost and fair value measurement systems (Glover et al., 2005), we note that both types of measurement will confound the effects of managerial actions with the effects of other exogenous events. However, by construction, fair-value-based measurements should have greater transparency than historical-cost-based measurements, and prior research suggests that the extraction of decision useful information improves when financial statement transparency is enhanced [e.g., Hirst and Hopkins, 1998]. Ultimately, however, we propose that the relative contracts-related superiority of one measurement approach over another is an empirical question that should be addressed in future accounting research.

4.3 Illustration of research design issues in verifiability-related research

To illustrate several research design issues in verifiability-related research, we discuss Ramanna and Watts' [2012] analysis of goodwill impairments under SFAS 142, *Goodwill and Other Intangible Assets*, codified as ASC Subtopic 350-20.[4] Research on verifiability of reported

[4]Given Ramanna and Watts' [2012] exclusive reference to pre-codification accounting standards in their study, we primarily refer to pre-codifications standards in our discussion of their study. To assist the reader, we provide occasional reference to the ASC location for current GAAP.

amounts is linked to the specifics of the applicable guidance, so we begin with an analysis of requirements for the post-acquisition accounting for purchased goodwill; such an analysis is essential for motivating verifiability research, for generating predictions and hypotheses, and for establishing priors. We analyze Ramanna and Watts' empirical design including their proxies for unobservable constructs and discuss their conclusions in the context of our analysis of SFAS 142.

Post-acquisition accounting for goodwill. Ramanna and Watts [2012] describe the SFAS 142 approach to goodwill accounting as "a significant innovation over prior practice and standards in that it relies solely on management estimates of goodwill's current value" and describe the goodwill impairment test as "particularly unreliable" (p. 750). We interpret this description as implying an over-time shift in the recognition and measurement of goodwill that makes the asset less verifiable, because the importance of management estimation increased. To evaluate this implication, we describe the evolution of the recognition and measurement of goodwill and goodwill impairment pursuant to SFAS 142.

SFAS 142 was issued concurrently with SFAS 141, *Business Combinations* (ASC Topic 805) in June 2001. Initial recognition of goodwill is determined by application of SFAS 141 and subsequent evaluation of goodwill for impairment is determined by application of SFAS 142. Prior to the issuance of SFAS 141, goodwill was initially recognized as a noncurrent intangible asset pursuant to application of APB Opinion No. 16, *Purchase Accounting* [APB, 1970b].[5] SFAS 141 abolished pooling-of-interest accounting and retained APB 16 purchase accounting and the resulting determination of goodwill, except for substantially increased required recognition of separately identifiable (i.e., non-goodwill) intangible assets, including detailed implementation guidance on the types of intangible assets that should be separately recognized. Thus, SFAS 141 introduced a structural change in the application of purchase accounting that should have increased the number and amounts of separately identifiable intangible assets, and, holding the

[5]Purchase accounting was replaced by "acquisition accounting" under SFAS 141R, *Business Combinations* (ASC Topic 805) in December 2007.

overall value of business combinations constant, should have decreased the relative amount of recognized goodwill in a business combination.

Prior to issuance of SFAS 142, post-acquisition accounting for recognized goodwill was governed by APB 17, *Intangible Assets* [APB, 1970c] and SFAS 121, *Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to Be Disposed Of* (FASB, 1995). Paragraphs 28–29 of APB 17 required goodwill to be amortized using the straight-line method ("unless a company demonstrates that another systematic method is more appropriate") over a period not to exceed 40 years. In addition, prior to the effective date of SFAS 121 in 1996, paragraph 31 of APB 17 included a provision that companies should subsequently review the appropriateness of goodwill amortization, and stated that "[e]stimation of value and future benefits of an intangible asset may indicate that the unamortized cost should be reduced significantly by a deduction in determining net income." Beginning in 1996, SFAS 121 required that goodwill be included in the general evaluation of asset impairment.[6] Thus, prior to SFAS 142, goodwill was (1) arbitrarily amortized over a period that probably did not reflect the diminution of its value, (2) judgmentally evaluated for impairment and (3) judgmentally allocated to asset groups when economic conditions warranted the evaluation of the asset groups for potential impairment.[7] With respect to the last requirement, management has significant flexibility in defining asset groups (under both SFAS 121 and its successor SFAS 144) and in the allocation of goodwill to those asset groups (under SFAS 121).

[6]Specifically, paragraph 12 states that "[i]f an asset being tested for recoverability was acquired in a business combination accounted for using the purchase method, the goodwill that arose in that transaction shall be included as part of the asset grouping . . . in determining recoverability. If some but not all of the assets acquired in that transaction are being tested, goodwill shall be allocated to the assets being tested for recoverability on a pro rata basis using the relative fair values of the long-lived assets and identifiable intangibles acquired at the acquisition date unless there is evidence to suggest that some other method of associating the goodwill with those assets is more appropriate."

[7]SFAS 144, *Accounting for the Impairment or Disposal of Long-Lived Assets* (issued in August 2001 and codified in ASC Section 360-10-35), supersedes SFAS 121 and eliminates the requirement to allocate goodwill to asset groups for the purposes of impairment testing.

The pre-SFAS 142 impairment test required by SFAS 121 appears to be anti-conservative (in the sense of Watts 2003a, 2003b) because it requires that a weak recoverability test be failed before an impairment is recorded. The recoverability test is weak because it is based on an asset group's *undiscounted* value-in-use-type cash flows, with impairment indicated when the undiscounted cash flows are less than the carrying value of the asset group (i.e., inclusive of the allocated goodwill). As the forecasting horizon extends beyond a few years, failing a non-discounted-future-cash-flows recoverability test becomes increasingly unlikely. If the recoverability test is failed, management must write down the asset group from carrying value to fair value.

SFAS 142 requires the assignment of purchased goodwill to reporting units, defined in par. 30 as "an operating segment or one level below an operating segment (referred to as a component). A component of an operating segment is a reporting unit if the component constitutes a business for which discrete financial information is available and segment management regularly reviews the operating results of that component." In contrast to the flexibility available in the pre-SFAS 142 definition of asset groups and assignment of goodwill to those groups, SFAS 142 requires management to define reporting units upon acquisition and does not allow post-acquisition transfers of goodwill between reporting units.

SFAS 142 also eliminated periodic goodwill amortization and required an annual two-step goodwill impairment evaluation.[8] In step 1, the fair value of each reporting unit is compared to its respective carrying value. If the carrying value of a reporting unit exceeds its fair value, then goodwill impairment is estimated via the second step. In step 2, management computes the current fair value of goodwill at the reporting unit level in a manner similar to the way goodwill was initially computed, as a residual. That is, the sum of estimated fair values for all identifiable net assets in the reporting unit is deducted from the fair value of the entire reporting unit to arrive at the implied fair

[8]In 2011, the FASB revised the requirement for the two-step goodwill impairment testing to allow companies the annual option to assess qualitative factors to determine whether it is necessary to perform the quantitative two-step impairment test. The guidelines for the qualitative test are in ASC 350-20-35.

value of goodwill. If the implied fair value of a reporting unit's goodwill is less than the carrying value of that reporting unit's goodwill, a goodwill impairment is recognized to write down goodwill to its fair value. Compared to the goodwill impairment analysis required by SFAS 121, the SFAS 142 goodwill impairment test is more conservative (i.e., *ceteris paribus*, more likely to result in recognized impairments) and includes fewer entity-specific value-in-use-type inputs to the impairment evaluation.

We characterize the SFAS 142 goodwill impairment approach as *conditionally conservative* [Beaver and Ryan, 2005]. The measurement attribute for goodwill is unamortized historical cost (i.e., like land), subject to impairment based on an annual evaluation of whether fair value is less than carrying value. While it is mechanically different, this approach is conceptually similar to the impairment approach applied to all other (i.e., non-goodwill) non-current nonfinancial assets. Unlike the requirements for AFS and trading marketable security investments (ASC 320), derivatives (ASC 815) and items subject to the fair value option (ASC 825-10-25), SFAS 142 does not require annual fair value adjustments.

Based on this analysis of the SFAS 141/SFAS 142 requirements for initial recognition and subsequent impairment of goodwill, we question the view, taken in Ramanna and Watts [2012] that SFAS 142 made goodwill less verifiable, either in comparison to goodwill before SFAS 142 or in comparison to other financial statement items that must be remeasured to fair value under specified conditions. It would, therefore, be an empirical question as to whether goodwill became less verifiable, or more verifiable, or did not change in verifiability, either compared to itself or compared to other items, after the issuance of SFAS 141/142. As discussed in the next two subsections, Ramanna and Watts' research design is cross-sectional, uses only post-SFAS 142 data and does not compare goodwill verifiability with verifiability of other financial statement items.

Ramanna and Watts' [2012] empirical design. Ramanna and Watts investigate the determinants of goodwill impairments for 124 Compustat firms that, during 2003–2006, have recognized goodwill greater than $1 million in period t-2 relative to the impairment year and

have equity book value (before goodwill impairment charges) greater than equity market value in each of years t, $t-1$ and $t-2$ relative to the impairment year (i.e., book-to-market [BTM] > 1 across all three years). The BTM > 1 restriction is included to limit the analysis to firms for which "the market expects goodwill impairments" (p. 751). Of 124 firms, 38 (31%) reported goodwill impairments in year t, and 86 (69%) did not.

Ramanna and Watts propose that a construct called "unverifiability" is more prevalent in the goodwill accounting mandated by SFAS 142 than in previously required accounting, and that the unverifiability of goodwill is increasing in the unverifiability of the entity's non-goodwill net assets, proxied in two ways. The first proxy is an unverifiability index, UNA, equal to a computed verifiability index, VNA, ([cash + all investments and advances — debt — preferred equity]/[assets − liabilities]), multiplied by -1. Because of the high variance and kurtosis of UNA, the authors define final values of UNA as the in-sample ranks of -1 times the VNA scores. Mechanically, firms with higher balances of equity-method investments, higher balances of Level 2 and Level 3 marketable securities, and lower levels of debt financing have more verifiable non-goodwill net assets and therefore more verifiable goodwill balances. The second proxy is the rank of each firm's industry-average debt-to-assets.[9]

Ramanna and Watts' design includes controls for determinants of post-SFAS-142 goodwill impairments, including (1) managers' conveyance of private information, proxied by company share repurchases and insider purchases of company stock; (2) contracting motives, proxied by [a] the product of the ratio of current period debt to prior period assets and an indicator if the firm has an outstanding net worth or net

[9]Ramanna and Watts [2012] justify ranked industry leverage as an indicator of relative verifiability as follows: (1) "Fabricant [1936] reports that in a sample of 208 large listed industrial U.S. firms for the period 1925 through 1934, property, plant, and equipment write-ups were more numerous (70) than investment write-ups (43). Watts (2006, p. 54) argues the property, plant, and equipment written up were likely to be general, non-firm-specific assets for which market prices were more observable," and (2) "The higher the industry's average leverage, the more likely the nature of assets in a firm are such that they can be reliably valued and thus the less likely the unverifiability of net assets" (p. 762).

income based debt covenant, [b] an indicator for whether the CEO received a cash bonus during the year in question, and [c] listing on the NASAQ or AMEX, which have accounting-based delisting requirements; (3) reputation motives, proxied by CEO tenure; (4) valuation motives, proxied by the firm's earnings response coefficient over the prior 16 to 20 quarters; and (5) management's ability to manipulate the impairment computation by increasing the number and decreasing the size of reporting units, proxied by the log of reportable segments and a variant of the Herfindahl–Hirschman index.[10]

To test their predictions, Ramanna and Watts use ordinary least squares regression analysis to regress the *level* of goodwill impairment at the end of year t, scaled by beginning of year assets, on the independent and control variables for all sample firms. Recall that all sample firms have at least \$1 million of goodwill in year $t-2$ and BTM > 1 in each of years $t, t-1$ and $t-2$. The idea is that all sample firms have material non-recoverable goodwill and that managers of non-impairing firms use the discretion inherent in unverifiable goodwill estimations to avoid an impairment charge. However, the statistical model regresses the level of impairment — nonzero amounts for 31% and zero for 69% of the sample, respectively — on levels of predictive variables for the entire sample. The theoretical discussion leading to the tests and the preponderance of zero-value dependent variable realizations suggests

[10]As is often the case when accounting researchers select or create proxies for unobservable constructs, the empirical proxies are subject to alternative interpretation, have unknown construct validity and appear to have very low power. In the specific case of the proxy for management's ability to manipulate the impairment computation, we can evaluate the proxy *ex ante* by evaluating the likely effects of management increasing the number of reporting units. Because the reporting unit concept is defined based on operating segments in SFAS 131, *Disclosures about Segments of an Enterprise and Related Information* (ASC 280), an increase in the number of reporting units increases the likelihood that a consolidated entity is in economically uncorrelated sectors. Because SFAS 142 requires that goodwill is assigned to reporting units in the year of acquisition, and cannot be shifted between reporting units thereafter, then, in the years after acquisition, there is a higher likelihood that one of those sectors will suffer an impairment-triggering downturn. *Ceteris paribus*, if those sectors were all aggregated into fewer reporting units (in the limit, a single reporting unit), then better-performing industries can offset worse-performing industries, making an impairment trigger less likely.

an empirical design that uses a probabilistic regression technique, not least squares.

Inferences about verifiability of goodwill under SFAS 142. Ramanna and Watts' research design requires a proxy for non-recoverable, that is, economically impaired, goodwill. They choose BTM > 1, reasoning that this condition "suggests the market expects goodwill impairments; however the condition can also be generated by certain GAAP rules on contingent losses, deferred taxes, and the impairment of (non-goodwill) long-lived assets. To mitigate this possibility, we require sample firms to have two consecutive years of BTM > 1. Under such a restriction, we argue goodwill is likely to be economically impaired and an accounting write-off is due" (p. 751).

The difficulty with using the BTM ratio to indicate the existence of an economic goodwill impairment is that the proxy does not reflect the way GAAP impairment models for assets other than goodwill function. As previously described, the noncurrent asset impairment model in SFAS 121, carried forward to SFAS 144 and codified as ASC 350-10-35, is applied at the asset group level. Under this model, impairments for fixed assets held for use and noncurrent definite-lived intangible assets are recorded after (1) an economic indicator necessitates an impairment test and (2) failure of a weak recoverability test based on the aggregate non-discounted future cash flows of the asset group. Compared to the fair-value-based recoverability test required for goodwill impairment evaluation, the recoverability test for non-goodwill noncurrent assets is biased toward non-recognition of material economic impairments. Given the differences in the thresholds for impairment assessment for goodwill versus non-goodwill noncurrent assets, there is a higher likelihood that a persistent BTM > 1 reflecting an economic impairment that is not recognized for accounting purposes is related to a non-goodwill asset group. The reason is that, unlike goodwill, non-goodwill noncurrent assets *do not use fair value estimates* to infer the existence of impairments.

A second difficulty in drawing inferences from Ramanna and Watts' analysis derives from the Compustat treatment of asset impairment data. Specifically, research suggests that Compustat data on asset impairments are incomplete and sometimes inaccurate. First, as noted

by Gordon and Hsu [2014], Compustat does not include data fields for fixed-asset or identifiable-intangible-asset impairments and thus does not separately present asset impairments by type. Although Compustat includes data fields for "goodwill impairment," the data in this field are not always reliable. For example, although Nike, Inc.'s December 31, 2012 annual report indicates a $70 million goodwill impairment and a $164 million impairment for trademarks and other identifiable intangible assets, the Compustat database includes no values in the goodwill impairment-related fields. As another example, Compustat reports $68 million of goodwill impairment charges for Dish Networks Corp. (Dish) for the year ended December 31, 2012, while Dish's December 31, 2012 annual report shows impairments only for financial assets and not goodwill. Note 8 to Dish's annual report states, "In conducting our annual [goodwill] impairment test in 2012, we determined that the fair value is substantially in excess of the carrying value." Given data issues of unknown number and amounts, the only solution we can offer is to hand collect information related to impairments.

Finally, we return to the motivating question that supports Ramanna and Watts' research question, whether fair value measurements are inherently less verifiable than other accounting measurements. Because empirical proxies for verifiability are difficult to interpret, to provide the strongest evidence on this point, a research design should directly compare the verifiability of fair value measurements to the verifiability of other measurement bases, holding constant the nature of the item being measured. In addition, because verifiability is an enhancing qualitative characteristic in the conceptual framework, the alternative measurement bases should be equalized along the dimensions of relevance and representational faithfulness. Ramanna and Watts provide evidence as to whether the magnitudes of goodwill impairments are associated with a battery of potential explanatory variables, not a direct comparison of measurement bases. Thus, the fundamental question about fair value measurement remains: holding relevance and faithful representation constant, are fair value measurements inherently less verifiable than other measurement bases?

5

Fair Value Measurement and Real Effects: Pro-cyclicality and Contagion

This section considers *ex ante* arguments that link fair value measurement with two real effects in the financial services sector, pro-cyclicality and contagion (Subsection 5.1), and discusses issues that arise in designing empirical tests of these posited links (Subsection 5.2). Our discussion is motivated by criticisms of fair value measurement as a factor in the liquidity and credit crisis that began in 2007–2008. Specifically, the application of precodification SFAS 157, codified in ASC Topic 820, combined with the absence of orderly markets, was blamed for exacerbating and even causing the crisis. Robak [2009] argues that the scope, intensity, and standard-setting consequences precipitated by the credit crisis were largely unforeseeable: "Our accounting standard-setters might well be forgiven for wondering what hit them. It must have been hard to imagine how controversial FAS 157 would become when its adopting release was published in 2006. It has since been blamed for everything from bank failures to the sharp downturn in structured credit markets. And all this for a new accounting standard that did not require a single new fair value measurement" (p. 57). In this section, we aim to shed light on the empirical validity of these criticisms.

5.1 Arguments linking fair value measurement to pro-cyclicality and contagion

The contention that fair value measurement increases systemic risk, broadly, the risk of instability or even collapse of an entire market or financial system because of idiosyncratic conditions in financial intermediaries, is relatively new to the literature and is based largely on a combination of analytic models and anecdote.[1] Critics of fair value measurement who blamed financial statement recognition of fair values for bank failures during the crisis asserted that fair value measurement and recognition, combined with minimum regulatory capital ratios, cause undesirable pro-cyclicality in the banking industry. If increases in fair value are correlated with economic expansions, then higher fair values provide more capital to fuel growth; in recessions, fair value losses and concomitant declines in regulatory capital may cause banks to contract their asset bases to maintain required capital ratios [Adrian and Shin, 2008]. Similarly, in periods of declining prices, banks are hypothesized to sell marketable assets with declining values to avoid further write downs that would reduce regulatory capital. These assumed sales are believed to depress prices further, resulting in a downward price spiral.

Analyses that link fair value measurement to pro-cyclical bank behavior are based on assumptions that can, at least in principle, be empirically verified or refuted. One assumption, that asset sales are responses to fair value information in that bank managers will sell depreciated assets to avoid further fair value write downs and declines in regulatory capital, is contradicted by Badertscher et al. [2012], who document that aggregate sales of investment securities were not economically significant during the crisis, that fair value losses had minimal effects on regulatory capital during the crisis, and that banks with lower capital ratios tended to sell fewer securities than those with

[1] Kane [2010, p. 253] describes systemic risk as the potential for spillovers of contagious defaults across counterparties in the financial sector to breakdowns in the real economy, and traces its causes to a combination of "individual firms' overexposure to common risk factors (underdiversification) or to a nexus of derivative contracts that result in an unobservable web of debt that highly leveraged financial institutions owe to one another (contagion)."

higher ratios. These findings are not consistent with assumptions in theoretical models supporting a connection between fair value measurement and systemic risk. The authors conclude that fair value measurement did not materially contribute to the credit crisis. In contrast, Bhat et al. [2011] document a positive association between changes in mortgage-backed securities (MBS) holdings and MBS prices and conclude that banks tend to sell MBS holdings as prices decline, because of "feedback" resulting from the use of Level 2 inputs for valuation.[2] The authors acknowledge that "the magnitude of these effects makes it unlikely that such feedback leads to significant economy-wide consequences" (Bhat et al., p. 154).

A second approach to analyzing the assumptions of models that link fair value measurements to bank pro-cyclical behavior is to take account of other factors that affect bank behavior. Modeling the relation between changes in fair value and changes in leverage, Amel-Zadeh et al. [2014] demonstrate that leverage is pro-cyclical and driven by regulatory uses of risk-weighted assets in leverage ratios, not by recognition of fair value measurements. Empirical analyses of the relation between fair value changes and leverage through the business cycle are consistent with their simulations. Amel-Zadeh et al.'s finding that regulatory capital ratios, but not fair values, are associated with pro-cyclicality is consistent with Heid's [2007] demonstration that dynamic regulatory capital requirements that increase with measures of credit risk are alone sufficient to lead to pro-cyclical lending. Similarly, Beatty and Liao [2011] find that untimely loan loss provisions result in higher charges against capital in recessionary periods leading to pro-cyclical lending. Their study suggests that the delayed recognition of credit losses arising from the GAAP requirement that losses must be both incurred and probable may have adverse systemic effects.

Outside the banking sector, and still within the regulated financial services sector, Ellul et al. [2014] use detailed data on insurance firm portfolio transactions to assess how tying regulatory capital to fair value affects firm behavior during the crisis. Results show that

[2]However, firms may sell these assets for economic reasons, for example to reduce credit risk exposure. See Ellul et al. [2011].

firms with regulatory capital based on amortized cost continue to hold assets that would result in realized losses if sold, and sell less risky assets with unrealized gains to bolster regulatory capital. In contrast, firms subject to fair-value-based regulatory capital regimes tend to sell riskier assets because their regulatory capital is unaffected by realized losses. The selective selling by firms subject to amortized cost-based capital regulations creates distortions in their portfolio choices. In particular, firms with the lowest regulatory capital retain the highest level of risk while other firms, including those subject to fair-value-based regulatory regimes, tend to reduce the risk of portfolio holdings. Importantly, Ellul et al. [2014] document that regulatory reliance on amortized cost measurement can result in "gains trading" that places price pressure on assets not subject to downgrades. In this way, downgrades in asset-backed security markets spill over into unrelated, previously unimpaired markets, a form of contagion, discussed next.

While empirical research on banks and insurance firms does not support the conclusion that fair value measurement and recognition is *per se* a material causal factor in procyclical behavior by financial institutions, there could still be effects of fair value measurement from other sources. We first consider whether fair value measurement contributes to "contagion" which refers to the spread of economic shocks from a relatively small number of entities originally affected to other entities, sectors and economies. The spread occurs because of interconnectedness among the originally affected entities and other entities. For example, Allen and Carletti [2010] link contagion to the effects of overlapping claims among banks while others [Greenberger, 2010, Paletta and Patterson, 2010] refer to interconnectedness of financial institutions arising from derivative counterparty risk. Interconnectedness occurs by contract or transaction and is therefore a real phenomenon as opposed to a financial reporting phenomenon.

We argue that interconnectedness is likely positively correlated but not causally linked to the use of fair value measurements. Our reasoning derives from the FASB's and IASB's conclusions that fair value is the only relevant measurement attribute for certain risky items (e.g., derivatives) and is the most relevant measurement attribute for many financial assets. For example, derivatives give rise to interbank

counterparty risk and both U.S. GAAP and IFRS require them to be measured at fair value, but it is the derivative contracts and not the way they are measured that links the counterparties. Similarly, trading securities, AFS securities, residuals from securitization activities, and loans warehoused for sale or securitization must be recognized at fair value, and some of these instruments are associated with both risk and interconnectedness. In contrast, loans held to collect contractual cash flows are recognized at amortized cost and do not create interconnectedness.

We conclude that the non-meaningful correlation between risky activities and fair value measurement undermines inferences about potential real effects of fair value measurements on firm-level or market-systemic risk. This conclusion is supported by Brunnermeier [2009], who attributes the crisis to changes in bank business models from originate-and-hold to originate-and-distribute, and points to increases in securitization activities funded by short-term liabilities. Both of these factors relate to real business activities and are independent of financial reporting measurement. Another real economy factor is exposure to common risk factors, for example, changes in real estate prices, which increases the correlation of bank returns. In addition, Kiyotaki and Moore [1997] show that collateral-based borrowing can amplify economic shocks. For example, a shock to home prices that reduces the value of mortgages will collectively also reduce the collateralized borrowing capacity of banks, resulting in less credit availability to the rest of the economy.

Finally, inferences about how fair value measurements are linked to contagion or pro-cyclicality sometimes refer to use of fair market value measurements in intercorporate contracts, a use that is wholly unconnected to financial reporting requirements. For example, Brunnermeier [2009] documents that contractual requirements to provide additional collateral in response to declining asset values precipitated liquidity crises at many banks. Although some fault "fair value accounting" for these margin calls, contracts that specify borrower behavior when asset prices change are private arrangements, independent of financial reports.

To summarize, parsing out the effect on risk of recognized financial statement fair value measurement requires taking account of both

non-causal correlations between fair value measurement and real investment decisions, and the actual behavior of bank managers and regulators. The finance literature supports multiple economic causes of the financial crisis, including increased exposure to a common risk factor, changes in business models, increased reliance on collateralized borrowing, and increased interconnectedness among financial institutions. Although some of these factors are correlated with asset values on bank balance sheets, they are caused by real economic forces and not by how assets are measured

5.2 Research design issues in analyses of the link between fair value measurement and real effects

In this subsection, we first discuss issues that arise in designing tests of the link between fair value measurement and real effects. We then illustrate some of these design issues using an example from existing research.

An ideal setting for testing the effect of fair value measurement on economic contagion would vary the accounting-measurement regime and hold all else constant. In such a setting it would be possible to compare the pervasiveness of contagion in an economy without fair value measurement with the pervasiveness of contagion in an independent, otherwise identical economy with required fair value measurement. In the absence of such a setting, the researcher's design task is to structure a research design to provide reasonable assurance that outcomes, including contagion, are caused by fair value measurement rather than, for example, real net asset holdings that happen to require fair value measurement. The lack of otherwise similar economies that use and do not use fair values means that archival researchers must compare regimes that have more or less fair value measurement.

Assuming it is possible to identify material differences in measurement requirements across economies, comparing outcomes across those economies requires controls for inherent non-comparability that would preclude attributing differences in outcomes to accounting measurement. For example, research identifies cultural, legal, and enforcement factors that affect the way accounting standards are applied in different

jurisdictions. In addition, economic sectors are increasingly interconnected within and across jurisdictions so that effects emanating from one economic sector subject to one measurement basis are likely to affect other sectors subject to other measurement bases.

Research that analyzes the associations between the extent of fair value measurement and economic outcomes compares firms in a particular economy or industry based on how extensively fair value measurement is used, controlling for economy or industry. Comparing firms that recognize more items at fair value to firms that recognize fewer items at fair value must address both comparability problems and selection bias. As previously discussed, fair value measurements arise in two circumstances: (1) firms may invest in assets or incur liabilities that *must* be recognized at fair value, raising comparability concerns, or (2) firms may *choose* fair value measurement for assets or liabilities permitted to be recognized at fair value, raising selection bias concerns.

Circumstance (1) results in noncomparability because for any item measured at fair value there is, by definition, no identical item recognized using another measurement basis. To see this, suppose that federal regulations require trailer tanks of water to be measured by weight, and trailer tanks of gasoline to be measured by volume; attributing a higher probability of explosion to the use of volume measures without considering the differences between gasoline and water would be nonsensical. In the context of financial instruments, research supports the notion that derivatives, required to be measured and recognized at fair value, have fundamentally different risk characteristics than, for example, property, plant, and equipment, required to be measured and recognized at amortized cost subject to impairment. Similarly, private mortgage-backed securities held by a bank's counterparties have different implications for contagion than agency or treasury securities. To yield valid inferences, archival research should control for the fundamental characteristics that require certain financial statement elements to be measured at fair value.[3]

[3]As previously discussed, a similar type of inherent non-comparability arises in comparing items classified as Level 3 under the fair value measurement hierarchy to items classified as Level 2 or Level 1. Firms must classify measurements according to the observability of the inputs used for valuation. Therefore, Level 3 items and Level

In circumstance (2) financial statement elements are recognized at fair value because of management choice, that is, selection. Current GAAP permits free, or nearly free, choice among measurement bases for identical or nearly identical instruments. For example, ASC Topic 320 permits identical bonds to be classified as trading (measured at fair value through net income), available for sale (AFS, measured at fair value through other comprehensive income), and held to maturity (HTM, measured at amortized cost). Regardless of measurement basis, interest income is measured at amortized cost, meaning that it is measured at the historical rate. The fair value option, ASC Section 825-10-25, permits free choice of fair value as a measurement basis for specified items.

Although the free choice of measurement basis might, in theory, allow researchers to hold balance sheet composition constant while varying measurement basis, it also introduces other confounding factors because measurement bases are correlated with management choices and subsequent actions. For example, choices about measurement bases may be correlated with managers' appetite for either or both risk and earnings management. In addition, once an item is classified in a way that determines its measurement basis, that classification choice may itself affect future choices. For example, penalties associated with selling HTM securities, but not AFS securities, effectively impose a liquidity discount on HTM securities. Selection bias and real actions that are correlated with measurement bases will confound inferences about the effect of measurement basis on outcomes.

We illustrate research design difficulties using Khan's [2010] test of the hypothesis that application of fair value measurement increases contagion during economic crises. The reasoning is that recognizing fair value losses precipitates selling of assets, which in turn depresses

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1 and 2 items are inherently non-comparable. This difference confounds inferences about properties of Level 3 measurements with properties of the items themselves. For example, if items are classified as Level 3 because there are no observable transactions (a thin market), differences in the pricing of Level 3 items will reflect the illiquidity inherent in the items as well as the information risk associated with the measurement of the items.

asset prices, resulting in additional fair value losses. Khan's identification strategy relies on the assertion that financial statement recognition and disclosure rules for U.S. banks have become more fair-value-based since the 1990s. To support the notion of a structural shift in accounting and disclosure Khan presents Figure 5.1, reproduced below. This Figure shows banks' assets and liabilities recognized or disclosed at fair value divided by total assets. The upward trend is taken as evidence in support of the assertion that accounting standards have become more fair-value-based over time. We next analyze Khan's Figure 5.1 evidence in the context of our previous discussion.

First, Khan [2010] identifies SFAS 115 in 1993 and SFAS 119 in 1994 as changes that coincide with upward trends in his measure of assets and liabilities recognized or disclosed at fair value. However, SFAS 115, which pertains only to certain investment securities, did *not* require more investments to be recognized or disclosed at fair value. Although Khan's measure of fair-valued assets and liabilities excludes most investment securities prior to 1993, the fair value of investment securities has been disclosed since the 1970s [Barth, 1994]. In addition, Khan's measure excludes material effects of SFAS 107, effective for most firms in 1992, which requires disclosure of the fair values of all financial instruments, including loans and long-term debt. To illustrate the effects of adjusting for disclosed fair values, Figure 5.2 replicates Khan's graph, but modifies the measure to include all items that are recognized or disclosed at fair value. The revised figure shows that the only (visual) evidence of a structural shift is the adoption of SFAS 119 in 1994 which required disclosure of the fair value of derivatives.

The increasing trend in percentage of assets recognized or disclosed at fair value after 1994 largely is due to growth of derivatives holdings of certain large banks, rather than changes in accounting rules that require more fair value measurements. This growth illustrates circumstance (1), in which fair value measurements appear in financial reports because entities choose to hold (or owe) items that must be measured at fair value.[4] We believe that Khan's research design does

[4]To provide a sense of the size of this effect, the notional amount of all derivatives increased by 1,013% between December 31, 1993 and December 31, 2006, with the

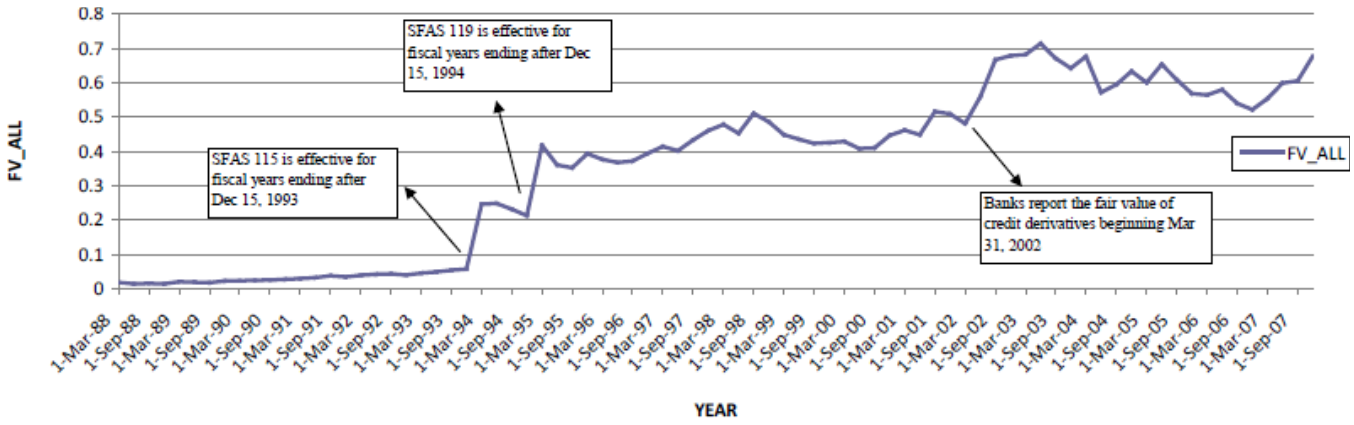

Figure 5.1: (Reproduced from Kahn (2010)) Trends in the extent to which the accounting regime is fair value-oriented over time.

Note to Figure 5.1:

FV_ALL — Sum of assets and liabilities (held-to-maturity securities, available-for-sale securities, trading assets, mortgage servicing rights, other financial assets, derivative contracts, trading liabilities, other financial liabilities and servicing liabilities) disclosed or recognized at fair value by the banks in the sample scaled by the sum of total assets of these banks.

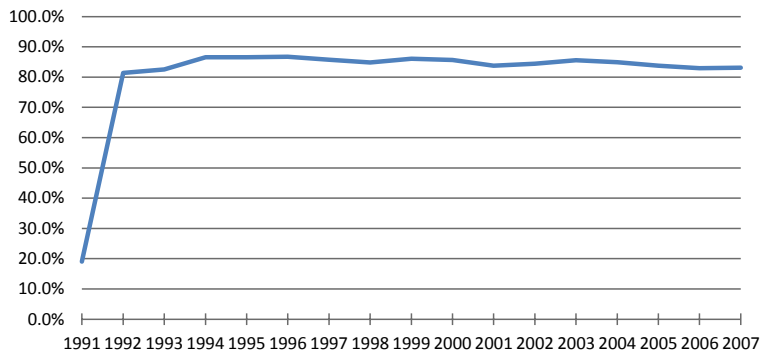

Figure 5.2: Percentages of assets recognized or disclosed at fair value including fair values of financial instruments (SFAS 107).

not control for these effects, or for changes in systemic risks associated with derivatives, securitizations, and common exposures to real estate-based loans [Brunnermeier, 2009, Stulz, 2009].[5] If increased exposure to fair value measurement is correlated with systemic risk-increasing holdings or activities because the assets and liabilities that result from those holdings or activities must be measured at fair value, then the amount of assets and liabilities measured at fair value conflates the effect of measurement with the effect of risk-taking in a setting where risk-taking is of first order importance.

majority of the increase in larger banks. (Source: Federal Deposit Insurance Corporation, Statistics on banking; http://www2.fdic.gov/SDI/SOB/.) With regard to credit derivatives in particular, Minton et al. [2009] report that the notional amount of credit derivatives of 395 banks with total assets in excess of $1 billion increased from $630 billion in 2002 to $5.5 trillion in 2005, concentrated in 23 bank holding companies. The amount of credit derivatives held by these 23 banks is very large relative to total banking assets: in 2005, the notional amount of credit derivatives was 61% of total assets of all banks (Minton et al., Table 2).

[5] As Minton et al. [2009, p. 22] conclude with respect to credit derivatives, "(e)vidence from 2008 suggests that the mere existence of these positions creates systemic risk . . . ."

6

Conclusion

In this monograph, we discuss practical and conceptual issues related to fair value measurement in financial reporting, and illustrate our discussion using examples from research. Our goal is to assist researchers and others in better understanding the fair value measurement attribute in the context of the both the FASB's and IASB's conceptual frameworks and existing authoritative guidance, and in producing and evaluating research related to fair value measurement.

We begin Section 2 of this monograph by defining and describing the structure of fair value measurement in both U.S. GAAP and IFRS. We distinguish fair value measurement from "fair value accounting," a term which, we believe, incorrectly implies that fair value represents a system of accounting.[1] As a measurement attribute, the use of fair value neither favors nor disfavors any particular display format or location

[1]Ryan [2009, p. 215] is an exception, and is careful to precisely define what he means by "fair value accounting."

for presenting changes in net assets measured at fair value, nor does it imply that the FASB or the IASB have adopted a "balance sheet approach" in promulgating financial reporting standards. Indeed, we note that the conceptual primacy of defining assets and liabilities is completely independent of any measurement basis, whether it be fair value, historical cost, or some other measurement basis. We also compare fair value to other measurement bases and discuss criteria that a standard setter might apply in deciding whether to require or permit fair value measurement. We conclude Section 2 by discussing the evolution of fair value measurement in financial reporting in the U.S.

We begin Section 3 by discussing why fair values are relevant. We provide examples that illustrate the information properties of fair value and help to differentiate fair value from other measurement bases. We next describe empirical research that examines the decision usefulness of fair value measurement; specifically, we discuss research related to predictive ability, value relevance and risk relevance. We conclude Section 3 by discussing challenges faced by researchers when using fair value measurements obtained from financial reports.

In Section 4, we address the claim that fair value measurements are inherently "unverifiable." We begin by describing the evolution of the enhancing qualitative characteristic verifiability in the FASB's and IASB's conceptual frameworks. In these conceptual frameworks, verifiability is considered in setting accounting standards only after threshold levels of relevance and faithful representation are achieved. We note that faithful representation might necessitate the reporting of ranges of possible outcome amounts and their related probabilities, and verification should be responsive to these properties of reported and/or disclosed information. We address common misconceptions about verifiability, discuss examples of research studies that investigate verifiability and provide suggestions for sharpening verifiability-related conclusions in future research.

In Section 5, we evaluate claims that fair value measurement caused pro-cyclical behavior and contagion among financial institutions during the recent economic crisis. We note that empirical research has not detected a causal relation between use of the fair value measurement

attribute (i.e., independent of the financial instruments that happen to be recorded at fair value) and financial institutions' pro-cyclical behavior. Finally, we discuss claims that recognition and disclosure of fair value measurements have significantly increased during the last two decades.

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References

D. Aboody, M. E. Barth, and R. Kasznik. Revaluations of fixed assets and future firm performance: Evidence from the UK. *Journal of Accounting and Economics*, 26(1–3):149–178, 1999.

Accounting Principles Board. *A Tentative Set of Broad Accounting Principles for Business Enterprises*. American Institute of Certified Public Accountants, Accounting Research Study No. 3. New York, 1962.

Accounting Principles Board. *Basic Concepts and Accounting Principles Underlying Financial Statements of Business Enterprises*. American Institute of Certified Public Accountants, Statement No. 4 New York, 1970a.

Accounting Principles Board. *Business Combinations*. American Institute of Certified Public Accountants, Opinion No. 16. New York, 1970b.

Accounting Principles Board. *Intangible Assets*. American Institute of Certified Public Accountants, Opinion No. 17. New York, 1970c.

T. Adrian and H. Shin. Liquidity and financial cycles. Bank for International Settlements, Working Paper no. 256, 2008.

F. Allen and E. Carletti. The role of liquidity in financial crises. Working Paper presented at the 2008 Jackson Hole Symposium on Maintaining Stability in a Changing Financial System, 2010.

J. Altamuro and H. Zhang. The financial reporting of fair value based on managerial inputs versus market inputs: Evidence from mortgage servicing rights. *Review of Accounting Studies*, 18(3):833–858, 2013.

A. Amel-Zadeh, M. E. Barth, and W. R. Landsman. Does fair value accounting contribute to procyclical leverage? (March 4) Rock Center for Corporate Governance at Stanford University Working Paper No. 147. Available at SSRN: http://ssrn.com/abstract=2300497 or http://dx.doi.org/10.2139/ssrn.2300497, 2014.

American Accounting Association. *A Statement of Basic Accounting Theory*. AAA, Evanston, IL, 1966.

American Institute of Certified Public Accountants. *Auditing Accounting Estimates*. American Institute of Certified Public Accountants, AU Section 342. New York, 1989.

N. Arora, S. Richardson, and I. Tuna. Asset reliability and security prices: evidence from credit markets. *Review of Accounting Studies*, 19(1):363–395, 2014.

Arthur Andersen & Co. *Objectives of Financial Statements for Business Enterprises*. Arthur Andersen & Co, Chicago, 1972.

B. A. Badertscher, J. J. Burks, and P. D. Easton. A convenient scapegoat: Fair value accounting by commercial banks during the financial crisis. *The Accounting Review*, 87(1):59–90, 2012.

M. J. Barclay, D. Gode, and S. P. Kothari. Matching delivered performance. *Journal of Contemporary Accounting and Economics*, 1:1–25, 2005.

B. Barlev and J. R. Haddad. Fair value accounting and the management of the firm. *Critical Perspectives on Accounting*, 14(4):383–415, 2003.

M. E. Barth. Fair value accounting: Evidence from investment securities and the market valuation of banks. *The Accounting Review*, 69(1):1–25, 1994.

M. E. Barth. Including estimates of the future in today's financial statements. *Accounting Horizons*, 20(3):271–285, 2006.

M. E. Barth, W. H. Beaver, and W. R. Landsman. The relevance of the value relevance literature for financial accounting standard setting: Another view. *Journal of Accounting and Economics*, 31(1–3):77–104, 2001.

M. E. Barth, L. D. Hodder, and S. R. Stubben. Fair value accounting for liabilities and own credit risk. *The Accounting Review*, 83(3):629–664, 2008.

A. Beatty and S. Liao. Do delays in expected loss recognition affect banks' willingness to lend? *Journal of Accounting and Economics*, 52:1–20, 2011.

W. H. Beaver. Problems and paradoxes in the financial reporting of future events. *Accounting Horizons*, 5(4):122–134, 1991.

W. H. Beaver and S. G. Ryan. Conditional and unconditional conservatism: Concepts and modeling. *Review of Accounting Studies*, 10(2–3):269–309, 2005.

T. B. Bell and J. B. Griffin. Commentary on auditing high-uncertainty fair value estimates. *AUDITING: A Journal of Practice and Theory*, 31(1): 147–155, 2012.

V. L. Bernard. Discussion of an investigation of revaluations of tangible long-lived assets. *Journal of Accounting Research*, 31(Supplement):39–45, 1993.

A. Bezold. The subject matter of financial reporting: The conflict between cash conversion cycles and fair value in the measurement of income. Occasional Paper, Center for Excellence in Accounting and Security Analysis. Columbia University, 2009.

G. Bhat, R. Frankel, and X. Martin. Panacea, pandora's box, or placebo: Feedback in mortgage-backed security holdings and fair value accounting. *Journal of Accounting and Economics*, 52:153–173, 2011.

E. Blankespoor, T. Linsmeier, K. Petroni, and C. Shakespeare. Fair value accounting for financial instruments: Does it improve the association between bank leverage and credit risk? *The Accounting Review*, 88(4): 1143–1177, 2013.

M. K. Brunnermeier. Deciphering the liquidity and credit crunch 2007–2008. *Journal of Economic Perspectives*, 23:77–100, 2009.

I. C. R. Byatt. Accounting for economic costs and changing prices. A report to HM Treasury, HMSO, 1986.

B. W. Cantrell, J. M. McInnis, and C. G. Yust. Predicting credit losses: Loan fair values versus historical costs. *The Accounting Review*, 89(1):147–176, 2014.

R. J. Chambers. *Accounting, Evaluation and Economic Behavior*. Prentice-Hall, New York, 1966.

M. Chatfield. *A History of Accounting Thought*. The Dryden Press, Hillsdale, IL, 1974.

S. Chee. The information content of commercial banks' fair value disclosures of loans under SFAS no. 107. Working Paper, University of Oregon. Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2158499, 2013.

Committee on Accounting Procedure. *Report of the Committee on Terminology*. American Institute of Accountants, Accounting Research Bulletin No. 9, New York, 1940.

Committee on Accounting Procedure. *Inventory Pricing*. American Institute of Accountants, Accounting Research Bulletin No. 29, New York, 1947.

P. M. Dechow and W. Ge. The persistence of earnings and cash flows and the role of special items: Implications for the accrual anomaly. *Review of Accounting Studies*, 11(2–3):253–296, 2006.

P. M. Dechow, W. Ge, C. R. Larson, and R. G. Sloan. Predicting material accounting misstatements. *Contemporary Accounting Research*, 28(1):17–82, 2011.

H. Demsetz. Industry structure, market rivalry and public policy. *Journal of Law and Economics*, 16(1):1–9, 1973.

I. Dichev and V. W. Tang. Matching and the changing properties of accounting earnings over the last 40 years. *The Accounting Review*, 83(6):1425–1460, 2008.

I. D. Dichev. On the balance sheet-based model of financial reporting, Center for Excellence in Accounting and Security Analysis, Occasional Paper Series. Columbia Business School, 2007.

A. L. Dickinson. *Accounting Practice and Procedures*. Ronald Press, New York, 1913.

G. J. Dillon. Corporate asset revaluations: 1925–1934. *The Accounting Historians Journal*, 6(1):1–15, 1979.

D. Duffie and D. Lando. Term structures of credit spreads with incomplete accounting information. *Econometrica*, 69(3):633–664, 2001.

A. Durnev, R. Morck, B. Yeung, and P. Zarowin. Does greater firm-specific return variation mean more or less informed stock pricing? *Journal of Accounting Research*, 41(5):797–836, 2003.

E. Eccher, K. Ramesh, and S. Thiagarajan. Fair value disclosures by bank holding companies. *Journal of Accounting and Economics*, 22(1–3):79–117, 1996.

E. O. Edwards and P. W. Bell. *The Theory and Measurement of Business Income*. University of California Press, Berkeley, 1961.

A. Ellul, C. Jotikasthira, and C. Lundblad. Regulatory pressure and fire sales in the corporate bond market. *Journal of Financial Economics*, 101(3): 596–620, 2011.

A. Ellul, P. Jotikasthira, C. Lundblad, and Y. Wang. Is historical cost accounting a panacea? Market stress, incentive distortions and gains trading. (May 8, 2014) Available at SSRN: http://ssrn.com/abstract=1972027 or http://dx.doi.org/10.2139/ssrn.1972027, 2014.

M. Ettredge, Y. Xu, and H. Yi. Fair value measurements and audit fees: Evidence from the banking industry. *AUDITING: A Journal of Practice and Theory*, 2014. forthcoming. doi: http://dx.doi.org/10.2308/ajpt-50701.

M. Evans, L. D. Hodder, and P. E. Hopkins. The predictive ability of fair values for future financial performance of commercial banks and the relation of predictive ability to banks' share prices. *Contemporary Accounting Research*, 31(1):13–44, 2014.

S. Fabricant. Revaluations of fixed assets: 1925–1934. National Bureau of Economic Research, Bulletin No. 62, New York, 1936.

Financial Accounting Standards Board. Objectives of financial reporting by business enterprises. Statement of Financial Accounting Concepts No. 1, Norwalk, CT: FASB, 1978.

Financial Accounting Standards Board. Financial reporting and changing prices. Statement of Financial Accounting Standards No. 33, Norwalk, CT: FASB, 1979.

Financial Accounting Standards Board. Qualitative characteristics of accounting information. Statement of Financial Accounting Concepts No. 2, Norwalk, CT: FASB, 1980.

Financial Accounting Standards Board. Accounting for certain mortgage banking activities. Statement of Financial Accounting Standards No. 65, Norwalk, CT: FASB, 1982.

Financial Accounting Standards Board. Recognition and measurement in financial statements of business enterprises. Statement of Financial Accounting Concepts No. 5, Norwalk, CT: FASB, 1984a.

Financial Accounting Standards Board. Financial reporting and changing prices: Elimination of certain disclosures — an amendment of FASB statement no. 33. Statement of Financial Accounting Standards No. 82, Norwalk, CT: FASB, 1984b.

Financial Accounting Standards Board. Elements of financial statements. Statement of Financial Accounting Concepts No. 6, Norwalk, CT: FASB, 1985.

Financial Accounting Standards Board. Financial reporting and changing prices. Statement of Financial Accounting Standards No. 89, Norwalk, CT: FASB, 1986.

Financial Accounting Standards Board. Disclosures about fair value of financial instruments. Statement of Financial Accounting Standards No. 107, Norwalk, CT: FASB, 1991.

Financial Accounting Standards Board. Fair value measurements. Statement of Financial Accounting Standards No. 157, Norwalk, CT: FASB, 2006.

Financial Accounting Standards Board. Chapter 1, the objective of general purpose financial reporting and Chapter 3, qualitative characteristics of useful financial information. Statement of Financial Accounting Concepts No. 8, Norwalk, CT: FASB, 2010.

J. L. Gadd. Defining value in use. *Valuation*, 34(2):13–19, 1989.

O. Gellein. Primacy: Assets or income? *Research in Accounting Regulation*, 6:198–199, 1992.

General Accounting Office. *Financial statement restatements: Trends, market impacts, regulatory responses and remaining challenges.* Government Printing Office, GAO-03-138. Washington, D.C., 2003.

O. Georgiou and L. Jack. In pursuit of legitimacy: A history behind fair value accounting. *The British Accounting Review*, 43(4):311–323, 2011.

F. Gigler, C. Kanodia, H. Sapra, and R. Venugopalan. Accounting conservatism and the efficiency of debt contracts. *Journal of Accounting Research*, 47(3):767–797, 2009.

F. Gjesdal. Accounting for stewardship. *Journal of Accounting Research*, 19: 208–230, 1981.

J. C. Glover, Y. Ijiri, C. B. Levine, and P. J. Liang. Separating facts from forecasts in financial statements. *Accounting Horizons*, 19(4):267–282, 2005.

I. Goncharov, E. J. Riedl, and T. Sellhorn. Fair value and audit fees. *Review of Accounting Studies*, 19(1):210–241, 2014.

E. A. Gordon and H.-T. Hsu. Long-lived asset impairments and future operating cash flows under U.S. GAAP and IFRS, april 22, 2014. Available at SSRN: http://ssrn.com/abstract=2127868 or http://dx.doi.org/10.2139/ssrn.2127868, 2014.

M. Greenberger. The role of derivatives in the financial crisis–credit default swaps and the economic meltdown. Testimony to the Financial Crisis Inquiry Commission Hearing in Washington D.C, 2010.

H. R. Hatfield. *Accounting: Its Principles and Problems.* D. Appleton and Company, New York, 1927.

F. Heid. The cyclical effects of the BASEL II capital requirements. *Journal of Banking and Finance*, 31:3885–3900, 2007.

B. E. Hendricks and C. Shakespeare. Discussion of "The financial reporting of fair value based on managerial inputs versus market inputs: evidence from mortgage servicing rights". *Review of Accounting Studies*, 18(3):859–867, 2013.

D. E. Hirst and P. E. Hopkins. Comprehensive income reporting and analysts' valuation judgments. *Journal of Accounting Research*, Supplement:47–75, 1998.

D. E. Hirst, K. E. Jackson, and L. Koonce. Improving financial reports by revealing the accuracy of prior estimates. *Contemporary Accounting Research*, 20(1):165–193, 2003.

L. Hodder, P. E. Hopkins, and J. Wahlen. Risk-relevance of fair value income measurement for commercial banks. *The Accounting Review*, 81(2):337–375, 2006.

R. W. Holthausen and R. L. Watts. The relevance of the value-relevance literature for financial accounting standard setting. *Journal of Accounting and Economics*, 31(1–3):3–75, 2001.

Y. Ijiri. *Theory of Accounting Measurement*. American Accounting Association, Sarasota, FL, 1975.

L. T. Johnson and K. R. Petrone. Is goodwill an asset? *Accounting Horizons*, 12(3):293–303, 1998.

E. J. Kane. Redefining and containing systemic risk. *Atlantic Economic Journal*, 38(3):251–264, 2010.

U. Khan. Does fair value accounting contribute to systemic risk in the banking industry? (November 15) columbia business school research paper. Available at SSRN: http://ssrn.com/abstract=1911895 or http://dx.doi.org/10.2139/ssrn.1911895, 2010.

D. J. Kirk. Looking back on fourteen years at the FASB: The education of a standard setter. *Accounting Horizons*, 2(1):8–17, 1988.

N. Kiyotaki and J. Moore. Credit chains. *Journal of Political Economy*, 99: 220–264, 1997.

K. Kolev. Do investors perceive marking-to-model as marking-to-myth? Early evidence from FAS 157 disclosure (December 31). Available at SSRN: http://ssrn.com/abstract=1336368, 2008.

S. P. Kothari, K. Ramanna, and D. J. Skinner. Implications for GAAP from an analysis of positive research in accounting. *Journal of Accounting and Economics*, 50(2–3):246–286, 2010.

R. Lambert. Discussion of implications for GAAP from an analysis of positive research in accounting. *Journal of Accounting and Economics*, 50(2–3):287–295, 2010.

W. R. Landsman. Is fair value accounting information relevant and reliable? Evidence from capital market research. *Accounting and Business Research*, 37(Special Issue):19–30, 2007.

J. Leisenring, T. Linsmeier, K. Schipper, and E. Trott. Business-model (intent)-based accounting. *Accounting and Business Research*, 42(3):329–344, 2012.

A. J. Leone, J. S. Wu, and J. L. Zimmerman. Asymmetric sensitivity of ceo cash compensation to stock returns. *Journal of Accounting and Economics*, 42(1–2):167–192, 2006.

B. Lev and N. Zhou. Unintended consequence: Fair value accounting informs on liquidity risk. Working Paper, New York University. Available at: http://ssrn.com/abstract=1466009, 2009.

R. J. Lundholm. Reporting on the past: A new approach to improving accounting today. *Accounting Horizons*, 13(4):315–322, 1999.

K. MacNeal. *Truth in Accounting*. University of Pennsylvania Press, Philadelphia, 1939.

R. V. Mattessich. *Accounting and Analytical Methods*. Richard D. Irwin, Homewood, IL, 1964.

P. Milgrom and J. Roberts. Relying on the information of interested parties. *The RAND Journal of Economics*, 17(1):18–32, 1986.

B. A. Minton, R. Stulz, and R. Williamson. How much do banks use credit derivatives to hedge loans? *Journal of Financial Services Research*, 35(1): 1–31, 2009.

R. Morck, B. Yeung, and W. Yu. The information content of stock markets: Why do emerging markets have synchronous stock price movements? *Journal of Financial Economics*, 58(1–2):215–60, 2000.

K. Nelson. Fair value accounting for commercial banks: An empirical analysis of SFAS 107. *The Accounting Review*, 71(2):161–182, 1996.

D. Nissim. Reliability of banks' fair value disclosure for loans. *Review of Quantitative Finance and Accounting*, 20(4):355–384, 2003.

D. Nissim and S. Penman. Principles for the application of fair value accounting. Center for Excellence in Accounting and Security Analysis, White Paper No. 2, Columbia Business School, 2008.

D. Paletta and S. Patterson. Deal near on derivatives. *The Wall Street Journal*, April, 26 2010.

M. S. Park, T. Park, and B. T. Ro. Fair value disclosures for investment securities and bank equity: Evidence from SFAS No. 115. *Journal of Accounting, Auditing and Finance*, 14(3):347–370, 1999.

W. A. Paton. The significance and treatment of appreciation in the accounts. In G. H. Coons, editor, *Michigan Academy of Science, Twentieth Annual Report*. University of Michigan, Ann Arbor, 1918.

W. A. Paton. Depreciation, appreciation and productive capacity. *Journal of Accountancy*, 30(1):1–11, 1920.

W. A. Paton. Statement by William A. Paton. *The Accounting Review*, 55 (4):629–630, 1980.

W. A. Paton and A. C. Littleton. *Monograph No 3: An Introduction to Corporate Accounting Standards*. American Accounting Association, Chicago, 1940.

J. Paul. On the efficiency of stock-based compensation. *Review of Financial Studies*, 5(3):471–502, 1992.

S. Penman. Financial reporting quality: Is fair value a plus or a minus? *Accounting and Business Research*, 37(Special Issue):33–44, 2007.

K. Ramanna. The implications of unverifiable fair-value accounting: Evidence from the political economy of goodwill accounting. *Journal of Accounting and Economics*, 45(2–3):253–281, 2008.

K. Ramanna and R. L. Watts. Evidence on the use of unverifiable estimates in required goodwill impairment. *Review of Accounting Studies*, 17(4):749–780, 2012.

J. Richard. The secret past of fair value: Lessons from history applied to the French case. *Accounting in Europe*, 1(1):95–107, 2004.

E. Riedl and G. Serafeim. Information risk and fair values: An examination of equity betas. *Journal of Accounting Research*, 49(4):1083–1122, 2011.

E. Robak. Fair value of illiquid securities: Are we there yet? *Journal of Alternative Investments*, 11(4):57–66, 2009.

S. G. Ryan. *Financial Instruments and Institutions: Accounting and Disclosure Rules*. John Wiley and Son, Hoboken, NJ, 2007.

S. G. Ryan. Fair value accounting: Policy issues raised by the credit crunch. In M. Richardson and V. Acharya, editors, *Chapter 9, Restoring Financial Stability: How to Repair a Failed System*. John Wiley & Sons, New York, 2009.

S. G. Ryan. Financial reporting for financial instruments. *Foundations and Trends in Accounting*, 6(3–4):187–354, 2011.

Sandilands Committee. Inflation accounting: Report of the inflation accounting committee. F. E. P. Sandilands Esq., CBE, Chairman (London: Her Majesty's Stationery Office, Cmnd 6225), 1974.

K. Schipper. Required disclosures in financial reports. *The Accounting Review*, 82(2):301–326, 2007.

W. Schuetze. What is an asset? *Accounting Horizons*, 7(3):66–70, 1993.

C. Song, W. Thomas, and H. Yi. Value relevance of FAS 157 fair value hierarchy information and the impact of corporate governance mechanisms. *The Accounting Review*, 85(4):1375–1410, 2010.

R. K. Storey and S. Storey. *The Framework of Financial Accounting Concepts and Standards*. FASB, Norwalk, CT, 1998.

R. Stulz. Credit default swaps and the credit crisis. Working Paper, Ohio State University, 2009.

H. W. Sweeny. *Stabilized Accounting*. Harper, New York, 1936.

J. Tschirhart, J. O'Brien, M. Moise, and E. Yang. Bank commercial loan fair value practices. Federal Reserve Board, Washington, DC. Available at http://www.federalreserve.gov/pubs/feds/2007/200729/200729pap.pdf, 2007.

R. L. Watts. Conservatism in accounting, part i: Explanations and implications. *Accounting Horizons*, 17(3):207–221, 2003a.

R. L. Watts. Conservatism in accounting, part ii: Evidence and research opportunities. *Accounting Horizons*, 17(4):287–301, 2003b.

D. Weiss. Examining shareholder value creation over CEO tenure: A new approach to testing effectiveness of executive compensation. *Journal of Management Accounting Research*, 23:29–36, 2011.

G. Whittington. Alternatives to fair value. In P. Walton, editor, *The Routledge Companion to Fair Value and Financial Reporting*. Routledge, Abingdon, United Kingdom, 2007.

S. A. Zeff. The evolution of the conceptual framework for business enterprises in the United States. *Accounting Historians Journal*, 26(2):89–131, 1999.

S. A. Zeff. The SEC rules historical cost accounting: 1934 to the 1970s. *Accounting and Business Research*, 37(Special Issue):49–62, 2007.