The Relevance of Value Relevance Research

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1. Introduction

This paper addresses the relevance of value relevance research. Our purpose in doing so is to clarify the motivation, contribution, limitations, and relevance of the value relevance literature. We begin by describing the meaning of value relevance as defined in extant research. We then explain how value relevance research addresses questions of interest to a broad constituency, including academic researchers, standard setters, financial statement preparers and users, and other policy makers. In doing so, we briefly summarize an area of value relevance research, fair value accounting. We next discuss key research design issues facing value relevance researchers, including choosing between a valuation equation approach and an approach examining changes in value, identifying variables to be included in the estimation equation, interpreting measurement error, and determining potential effects of scale on inferences.[1]

This paper is also intended to clarify several misconceptions regarding value relevance research. First, value relevance studies are designed to assess how well particular accounting amounts reflect information that is used by investors in valuing the firm's equity value. Because "usefulness" is not a well defined concept in accounting research, value relevance studies do not and are not designed to assess the usefulness of accounting numbers. Second, value relevance research provides significant insights into questions of interest to standard setters and other non-academic constituents. Although there is no extant academic theory of accounting or standard setting, the Financial Accounting Standards Board (FASB) articulates its theory of accounting and standard setting in its Concepts Statements. Using well accepted valuation models, value relevance research attempts to operationalize key dimensions of the FASB's theory to assess the

relevance and reliability of accounting amounts. Third, value relevance research can accommodate conservatism, a characteristic of accounting practice that might be construed as inconsistent with the FASB's stated criteria. In fact, absent value relevance research, it would be difficult to establish that accounting practice is conservative. Fourth, a primary focus of the FASB and other world standard setters is equity investment. Although financial statements have a variety of applications beyond equity investment, e.g., management compensation and debt contracts, the possible contracting uses of financial statements in no way diminish the importance of value relevance research. Fifth, empirical implementations of extant valuation models can be used to address questions of value relevance, despite the simplifying assumptions underlying the valuation models. Sixth, econometric techniques can be and are applied to mitigate the effects of common econometric issues arising in value relevance studies. Finally, the extent and pervasiveness of the value relevance literature in the leading academic accounting journals, as well as the adaptations of several of the studies in professional publications, including those of the FASB, are testimony to its impact on academic research and accounting practice.

2. What is value relevance research and its role?

Value relevance is defined in the extant literature as the association between accounting amounts and security market values.[2] Although the literature examining such associations extends back at least 30 years (Miller and Modigliani, 1966), the first study of which we are aware that uses the term "value relevance" to describe this association is Amir, Harris, and Venuti (1993). Beaver (1998, p. 116), Ohlson (1999), and Barth (2000) provide formal

[1] This paper makes no attempt to review comprehensively the value relevance literature. When making reference to extant research we frequently cite studies we have authored. We do so because we feel more comfortable interpreting and explaining motivation for our own work rather than the work of others.

definitions that are closely related to one above. The key commonality in the definitions is that an accounting amount is deemed value relevant if it has a significant association with security market value.

2.1. Constituents of value relevance research

Value relevance research is of interest to a broad constituency, comprising academic researchers, standard setters such as the FASB and the International Accounting Standards Committee (IASC), firm managers, financial statement users, including financial and information intermediaries, and other policy makers and regulators such as the Securities and Exchange Commission (SEC) and the Federal Reserve Board. Academic researchers interested in understanding how accounting information affects capital formation and allocation are the primary producers and intended consumers of value relevance research.[3] Most value relevance studies make no reference to any non-academic constituent.

Those studies addressing questions of interest to a particular non-academic constituent often are of interest to a broader non-academic audience. For example, Barth, Beaver, and Landsman (1996) (hereafter BBL96) examines the value relevance of financial instruments' fair value estimates disclosed under Statement of Financial Accounting Standards (SFAS) No. 107. Even though BBL96 does not specify a non-academic audience, one can interpret the study's primary non-academic audience as being the FASB. However, the study's findings are of obvious interest to financial statement preparers, i.e., bank managers, bank analysts, and regulators of financial institutions, because BBL96 examines specific contentions regarding the

[2] Throughout we use security market values and security prices interchangeably. Scaling by number of shares outstanding is a research design issue that we do not specifically address.

[3] Because value relevance research is intended primarily for an academic audience, non-academic constituents likely need assistance in interpreting the studies' implications for questions of interest to them. The need to facilitate this translation process is recognized by academic and non-academics, and motivates many of the FASB's interactions between it and the academic community (Beresford and Johnson, 1995). It also motivates academics to summarize their research in practitioner journals.

inability to estimate accurately loans' fair values. As another example, in examining the value relevance of investment securities, Barth (1994) specifically mentions the FASB as the primary non-academic audience for the research. However, again the findings are of obvious interest to financial statement preparers, i.e., bank managers, bank analysts, and regulators of financial institutions.

As evidence of interest in Barth (1994) and BBL96 by bankers and their investors, a summary of each is published in *Bank Accounting & Finance*, a publication of Institutional Investor, Inc. (Barth, 1994b; Barth, Beaver, and Landsman, 1997). Evidence of the FASB's interest in value relevance research is, in part, reflected in the first two FASB Research Supplements, which summarize published academic accounting research articles "that address a relevant FASB issue and that contain conclusions that could be useful in our [i.e., the FASB's] decision-making process" (FASB Research Supplement, June 29, 1999; see also FASB Research Supplement, September 30, 1999). One-half of the studies cited in these Research Supplements are value relevance studies (Vincent, 1997; Aboody and Lev, 1998; Pfeiffer, 1998; Harris and Muller, 1999).

Research questions are often motivated by an aspect of a broad question raised by a non-academic constituent. For example, when it issued SFAS No. 107, the FASB was concerned with questions such as: Are SFAS No. 107 disclosures useful to financial statement users incremental to items already in financial statements? Are fair values, especially loans, too noisy to disclose? However, academic researchers generally do not attempt to answer questions such as these because the questions are normative and require a more comprehensive analysis than is possible in a typical academic study. Instead, value relevance researchers provide insights regarding answers to these questions by asking questions such as: Do SFAS No. 107 fair value

estimates provide significant explanatory power for bank share prices beyond book values? Not surprisingly, there are differing opinions regarding what constitutes an interesting and addressable research question, and different questions result in selection of different research designs. Studies adopting different research designs can result in seemingly different findings and experimental inferences.

Non-academic constituents, including the FASB, find a variety of research topics and approaches to be informative in their activities.[4] For example, because only one-half of the studies cited in the FASB's Research Supplements are value relevance studies, obviously the other half are not (Botosan, 1997; Hirst and Hopkins, 1998; Barth, Landsman, and Rendleman, 1998; and Sengupta, 1998). As another example, bank managers and bank regulators find research addressing bankruptcy prediction and bond ratings (e.g., Beaver, 1966; Altman, 1968; Pinches and Mingo, 1973; Kaplan and Urwitz, 1979; Iskandar-Datta and Emery, 1994; Barth, Beaver and Landsman, 1998) to be relevant to their decisions. No single value relevance research study claims to be either necessary or sufficient for standard setting. Moreover, taken as whole, the value relevance literature should not be viewed as and does not purport to be necessary or sufficient input for standard setting. More generally, the value relevance literature should not be viewed as and does not purport to be the sole source of information for any constituent, academic or non-academic. Nonetheless, the extent and pervasiveness of the value relevance literature in the leading academic accounting journals, as well as the adaptations of several of the studies in professional journals and the FASB Research Supplements, are testimony to its impact on academic research and accounting practice.

[4] See Leisenring and Johnson (1994) and Beresford and Johnson (1995) for descriptions of how the FASB finds academic research to be informative for evaluating the ex post effects of accounting standards and for gaining insight into potential effects of new standards. Both studies emphasize the role of academic research in the FASB's activities.

There are, of course, other uses of financial statements beyond equity investment, e.g., management compensation and debt contracting.[5] Research relating directly to management compensation and debt contracting also can inform standard setting (Watts and Zimmerman, 1986).[6] However, the FASB was created in 1972 as the accounting standard setting body with delegated authority from the SEC. The SEC's authority derives from the Securities Act of 1933, which was enacted as a result of the stock market crash of 1929 to protect investors from misleading and incomplete financial statement information necessary to make informed investment decisions. Although the SEC is concerned about equity and debt investors, the dominant focus of the SEC and, thus, the FASB is on equity investors. Moreover, the current focus of the IASC is acceptance of its standards by the SEC so that non-U.S. entities can register equity securities on U.S. stock exchanges.

2.2. Operationalizing relevance and reliability

One reason value relevance studies are of interest to the FASB is that such studies can provide insight into relevance and reliability of financial statement amounts, the two primary criteria the FASB uses for choosing among accounting alternatives. Under Statement of Financial Accounting Concepts (SFAC) No. 5, an accounting amount is relevant if it is capable of making a difference to financial statement users' decisions; an accounting amount is reliable if

[5] General purpose financial statements are not designed explicitly for these purposes. The objectives of financial reporting by business enterprises as stated in SFAC No. 1 relate to general purpose *external* financial reporting. Therefore, financial statements are not intended to apply directly to management compensation contracts. Although external users of financial statements include creditors, creditors often are concerned with liquidation values. But, a fundamental assumption underlying general purpose financial statements is that the firm is a going concern. Thus, although creditors may be able to obtain some information about firm value in liquidation it is indirect (Barth, Beaver, and Landsman, 1998).

[6] Obviously, research addressing these questions also is neither necessary nor sufficient for standard setting. But, this in no way should be construed as a criticism of this research.

it represents what it purports to represent.[7] An accounting amount will be value relevant, i.e., have a significant relation with share prices, only if the amount reflects information relevant to investors in valuing the firm and is reliable enough to be reflected in share prices.[8] Because in its Conceptual Framework the FASB sets forth its objective criteria for evaluating accounting amounts, researchers need only to operationalize the criteria, and not determine them. That is, researchers view the FASB's Conceptual Framework as a theory of both accounting and standard setting.[9] Value relevance as defined in the academic literature is not a stated criterion of the FASB. Rather, tests of value relevance represent one approach to operationalizing the FASB's stated criteria of relevance and reliability.[10]

Value relevance tests are joint tests of relevance and reliability. Although finding value relevance indicates the accounting amount is relevant and reliable, at least to some degree, it is difficult to attribute the cause of lack of value relevance to one or the other attribute. Note that neither relevance nor reliability is a dichotomous attribute, and SFAC No. 5 does not specify "how much" relevance or reliability is sufficient to meet the FASB's criteria. In addition, it is difficult to test separately relevance and reliability of an accounting amount.

We can identify four approaches that are used in the value relevance literature to provide separate evidence on reliability. The four approaches represent differing degrees of restrictive assumptions imposed by the researcher, but all assume relevance for the accounting amount

[7] SFAC No. 5 notes there are several dimensions of relevance and reliability. Dimensions of relevance include feedback value, predictive value, and timeliness. Dimensions of reliability include representational faithfulness, verifiability, and neutrality.

[8] This statement is conditional on the estimating equation being properly specified. See section 4 below.

[9] To our knowledge, there is no academic theory of accounting that describes accounting as arising from equilibrium forces, and provides a mapping of accounting information into share prices. As a result, there also is no academic theory of standard setting that describes how standards should be "optimally" determined. If and when such a unified theory is developed that conflicts with the FASB's Conceptual Framework, undoubtedly subsequent academic researchers will consider its implications for research questions and designs.

[10] There are, of course, other approaches for assessing relevance and reliability of accounting amounts. See Barth, Landsman, and Rendleman (1998) and Aboody, Barth, and Kasznik (1999), among others.

being studied. The first and most restrictive approach, adopted by Barth (1991) and Choi, Collins, and Johnson (1997), is to model reliability to make specific predictions on how reliability affects coefficient estimates. The second most restrictive approach is to compare the estimated valuation coefficient on the accounting amount being studied with a theoretical benchmark coefficient (Landsman, 1986; Barth, Beaver, and Landsman, 1992). The third most restrictive approach is to compare the estimated valuation coefficient on the accounting amount being studied to that on other amounts already recognized in financial statements (Barth, Clement, Foster, and Kasznik, 1998; Aboody, Barth, and Kasznik, 1999). The fourth and least restrictive approach is to interpret a significant coefficient of the predicted sign on the accounting amount being studied as evidence of reliability (Barth, 1994; BBL96; Eccher, Ramesh, and Thiagarajan, 1996; Nelson, 1996).

2.3. Use of valuation models and prices

Value relevance studies use various valuation models to structure their tests, and typically use equity market value as the valuation benchmark to assess how well particular accounting amounts reflect information used by investors.[11] This approach does not require assuming market efficiency because share prices reflect investors' consensus beliefs, regardless of whether these beliefs are well founded. That is, the research does not assume that equity market values are "true" or unbiased measures of the "true value" of common equity, nor that they reflect unbiased measures of "true" economic values of firms' assets and liabilities or income generating ability. Rather, the benchmark for assessing the characteristics of accounting

[11] In its Concepts Statements, the FASB makes no direct mention of individual investors; rather, they refer to investors and creditors as groups of financial statement users. Although studies examining investment behavior of individual investors could provide insights relevant to standard setters, Ball and Brown (1968) recognize that examining security price behavior is an effective way to study investment behavior for large groups of investors. Moreover, using stock prices removes the effects of idiosyncratic investor behavior that could confound analysis of a particular standard's effects.

amounts is the amount implicitly assessed by investors, not some "true" underlying value.[12] Accounting researchers adopting this approach are interested in studying how well accounting amounts reflect investors' consensus beliefs.

It is important to note that value relevance studies do not use valuation models to estimate firm value. The objective of value relevance studies contrasts with that of fundamental analysis studies, which use accounting numbers to value the firm (e.g., Penman, 1991; Frankel and Lee, 1998). These differing objectives result in differing specifications of the estimating equations. In fundamental analysis studies, researchers seek to include all variables that can help explain current or predict future firm value. In value relevance studies, researchers selectively include variables to learn about the valuation characteristics of particular accounting amounts. This mirrors the FASB's focus on values of individual assets, not of the firm as a whole. For example, a fundamental analysis researcher is indifferent whether information useful for valuing patents appears in financial statements or can otherwise be estimated. In contrast, the FASB and, by implication, the value relevance researcher seeking to provide input to the FASB are interested in determining whether value relevant information relating to patents is included in financial statements. Section 4.2 below develops this point in the context of studies examining financial instruments' fair values.

Because equity market values lead accounting amounts in reflecting value relevant information (Beaver, Lambert and Morse, 1981; Beaver, Lambert, and Ryan, 1987), equity market values could reflect information other than that accounting standard setters deem appropriate for inclusion in financial statements, calling into question the applicability to

[12] For example, Barth (1994) refers to "true" variables as those amounts implicit in share prices as a means of assessing measurement error in the accounting amounts being studied. The amounts implicit in share prices are not assumed to be unbiased and error-free measures of economic assets or liabilities; they represent the benchmarks against which measurement error is assessed. Typically, in measurement error models, the benchmark amounts are

standard setters of the inferences drawn from value relevance research (Lee, 1999). However, this does not imply that value relevance research cannot address standard setting issues. First, even though the FASB's Conceptual Framework embraces the concept of recognizing the economic effect of past transactions and events, past transactions have predictive ability for future events.[13] For example, Barth, Beaver, Hand, and Landsman (1999; 2000) and Barth, Cram, and Nelson (2001), among others, show that accruals have predictive ability in explaining future earnings and future cash flows. Equity market value can be represented as the present value of expected future cash flows or earnings. Thus, using equity market value as a benchmark for assessing value relevance of accounting amounts is consistent with SFAC No. 1 stating that an objective of financial statements is to aid investors in estimating the amounts and timing of future cash flows.

Second, by focusing on recognition of financial statement amounts based on fair values, the FASB is effectively moving towards financial reporting that incorporates the effects of future transactions and events. The FASB makes this clear in their definition of fair value when they state that the best measure of fair value is a market price, when it is available (FASB, 1991). Much of extant value relevance research focuses on fair value estimates (see section 3.1 below). Currently, the FASB is actively considering extending fair value accounting to all financial instruments and some related non financial assets, including core deposits intangibles and credit card relationships. The FASB's agenda also includes consideration of accounting for all

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labeled as "true," and the amounts under study are assumed to be measured with error relative to the benchmark amounts. See section 4.4 for further discussion of measurement error in value relevance research.

[13] The point at which the past ends and the future begins is not well defined. For example, there is controversy over whether the past transaction or event triggering a provision for a loan loss is the failure of the debtor to make scheduled loan payments, the debtor losing his employment, which likely will result in loan payments default, or the company at which the debtor is employed announcing that it will lay off most of its workforce.

intangible assets.[14] In the extreme, if all intangible assets are recognized at fair value, expectations of all future events will be recognized in the financial statements and equity market and book values will be equal.

Third, even though some accounting amounts are based on historical cost, research addressing their value relevance can be of interest to the FASB. For example, Barth, Beaver, and Landsman (1992) examines the value relevance of the components of pension cost. Consistent with predictions, the study finds amortization of the historical cost-based transition asset has no significant relation with equity market value. This finding was of interest to the FASB in developing disclosures for postretirement benefits other than pensions. Unlike SFAS No. 87, SFAS No. 106 requires separate disclosure of this amount. Thus, the FASB found the study's findings interesting not because it led them to abandon the historical cost method for calculating the component of pension cost associated with the transition asset. Rather, the FASB found them interesting because the findings suggest that investors might find separate disclosure of amortization of the transition amount helpful when valuing equity.[15]

Although value relevance researchers use equity market prices as a benchmark, because as noted above, the objective is not to estimate firm value, the proportion of variance explained, i.e., R^2, is not necessarily the objective of a value relevance study. Whether R^2 is an important issue in a particular study depends upon the research question being addressed. In some studies, e.g., those addressing relative value relevance of competing measures (Beaver, Griffin, and Landsman, 1982; Beaver and Landsman, 1983), comparisons of R^2 naturally arise. However, as

[14] Under current U.K. and Australian Generally Accepted Accounting Principles, some intangibles are recognized at fair value. See section 4.1 for a discussion of associated research.

[15] Some studies examining the value relevance of historical cost-based accounting amounts make explicit adjustments in the research design to control for expectations of future events reflected in equity market values that could confound inferences. See, e.g., Aboody, Barth, and Kasznik (2000). Other studies use historical cost amounts in studying the value relevance of unrecognized intangible assets (Abdel-Khalik, 1975; Hirschey and Weygandt,

noted above, equity market value is used to assess how well particular accounting amounts reflect information that is used by investors. For example, many studies are interested in examining whether particular accounting amounts reflect values of the firms' assets, liabilities, and earnings as assessed by investors and, thus, are reflected in equity prices.

2.4. Policy implications of valuation relevance research

Although findings from the value relevance literature often have implications for issues of interest to non-academic constituents, the authors of value relevance studies typically do not draw normative conclusions or makes specific policy recommendations. In fact, several studies explicitly provide caveats that policy inferences cannot be drawn. For example, Barth (1991) states, "The focus in this research is on relevance and reliability of the alternative measures for investors' use. The definitions of relevance and reliability are complex and judgmental, and may not be fully captured in their operationalization in the research design." As another example, Barth, Clement, Foster, and Kasznik (1998) note that "Because brand values likely are relevant to investors, finding that estimates of brand values are reflected in share prices and returns calls into question concerns that estimates of brand values are unreliable. Whether their reliability is sufficient to warrant financial statement recognition is left to accounting standard-setters to determine."

3. Findings from value relevance research

In this section, we summarize findings from fair value accounting research, which addresses questions of interest to a broad constituency, including academic researchers, standard setters, financial statement preparers and users, and other policy makers.[16]

1985; Bublitz and Ettredge, 1989; Landsman and Shapiro, 1995; Lev and Sougiannis, 1996; Aboody and Lev, 1998; Bell, Landsman, Miller, and Yeh, 2000).

[16] Other topics of current interest to accounting academics and practitioners include global harmonization of accounting standards, cash flows versus accruals, and recognition versus disclosure (see Barth, 2000), as well as

Fair value accounting is a longstanding major agenda item of the FASB. SFAS No. 33, which required supplemental disclosure of current cost and constant dollar estimates of tangible nonfinancial assets, can be viewed as an initial attempt at current or fair value accounting. More recently, the FASB has focused its fair value accounting efforts on financial instruments (SFAS Nos. 105, 107, 114, 115, 118, 119, 125, 133, and 138, and Preliminary Views, 1999).

There is a large and growing literature related to fair value accounting. Consistent with the FASB's focus, the primary focus of this literature is financial instruments. Overall, this literature provides substantial evidence that financial instruments' fair values are value relevant. This conclusion applies to pension and other postretirement liabilities (Landsman, 1986; Barth, 1991; Amir, 1993; Choi, Collins, and Johnson, 1997), debt and equity securities (Barth, 1994; Bernard, Merton, and Palepu, 1995; Petroni and Wahlen, 1995; BBL96; Beatty, Chamberlain, and Magliolo, 1996; Eccher, Ramesh, and Thiagarajan, 1996; Nelson, 1996; Barth and Clinch, 1998), and bank loans and core deposits (BBL96; Eccher, Ramesh, and Thiagarajan, 1996; Nelson, 1996). There also is evidence that the fair values of derivatives are value-relevant (Venkatachalam, 1996; Schrand, 1997; Wong, 2000).

Although fair values of intangible assets are not yet a focus of the FASB, some studies document their value relevance. Such studies include those related to research and development (Lev and Sougiannis, 1996; Healy, Myers, and Howe, 1997; Chambers, Jennings, and Thompson, 1998), capitalized software (Aboody and Lev, 1998), advertising, i.e., brands (Barth, Clement, Foster, and Kasznik, 1998; Kallapur and Kwan, 1998; Muller, 1999), patents (Deng, Lev, and Narin, 1999), and goodwill (Jennings, Robinson, Thompson, and Duvall, 1993; Higson,

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accounting for business combinations, including goodwill, consolidations, asset impairment, and liabilities, particularly those associated with long-lived assets.

1998). Research also finds that Australian intangible asset revaluations are value relevant (Barth and Clinch, 1998).

Regarding fair values of tangible long-lived assets, research also finds that Australian and U.K. asset revaluations are value relevant (Barth and Clinch, 1998; Aboody, Barth, and Kasznik, 1999). In contrast, research examining value relevance of current cost and constant dollar estimates of tangible assets provided under SFAS No. 33 generally fails to find value relevance. Beaver and Landsman (1983), Beaver and Ryan (1985), and Bernard and Ruland (1987), among others, find evidence that SFAS No. 33 value estimates are not value relevant. Bublitz et al. (1985), Murdoch (1986), Haw and Lustgarten (1988), Hopwood and Schaefer (1989), and Lobo and Song (1989) find value relevance in particular settings.

Although management preferences and incentives play no role in the FASB's Concepts Statements, value relevance researchers are cognizant that management incentives can affect accounting amounts and, thus, their relation with share prices. In fact, the effect of management discretion on the value relevance of accounting amounts often is the subject of study. For example, extant fair value research consistently shows that fair values that are more subject to discretion are somewhat less value relevant. However, discretion does not completely eliminate the value relevance of fair value estimates of financial instruments (BBL96; Beaver and Venkatachalam, 2000), asset revaluations (Brown, Izan, and Loh, 1992; Whittred and Chan, 1992; Cotter, 1997; Lin and Peasnell, 1998; Aboody, Barth, and Kasznik, 1999), and brands (Muller, 1999).

4. Research design issues

4.1 Choice of valuation model

A primary research design consideration for value relevance research is the selection of the valuation model that is the basis of the tests. Currently, the most frequently employed model is that based on Ohlson (1995) and its subsequent refinements (e.g., Feltham and Ohlson, 1995; 1996; Ohlson, 1999; Ohlson, 2000). The Ohlson model represents firm value as a linear function of book value of equity and the present value of expected future abnormal earnings. The model assumes perfect capital markets, but permits imperfect product markets for finite number of periods. With additional assumptions of linear information dynamics, firm value can be re-expressed as a linear function of equity book value, net income, and dividends.[17] Ohlson (1995) shows that balance sheet-based and earnings-based valuation models represent the two extreme cases resulting from limiting assumptions regarding the persistence of abnormal earnings.

The Ohlson model, as with all models, is based on simplifying assumptions that permit parsimonious representations of the complex real world. Consistent with this, it is a partial equilibrium model that takes the accounting system as given. It does not derive an "optimal" accounting system. To do so would require deriving a general equilibrium in a multi-person, regulatory context. Although none of the valuation models explicitly derives an optimal accounting system or even provides a role for accounting, this does not preclude use of such models to assess the value relevance of accounting amounts. By analogy, even though the capital asset pricing model does not include a role for financial intermediaries, this does not

[17] Note that the Ohlson model does not depend on a concept of "permanent" earnings. Rather, the Ohlson model is expressed in terms of accounting earnings and equity book value. Thus, empirical implementations using the Ohlson model do not require specifying a link between accounting amounts and economic constructs such as permanent earnings.

preclude financial intermediaries from viewing as relevant the risk-return predictions and evidence derived from that model.

A key feature of the Ohlson model and its extensions (e.g., Feltham and Ohlson, 1996) is that the notion of economic rents, i.e., returns in excess of the cost of capital for a finite number of periods, are captured in the persistence parameter on abnormal earnings. Although economic rents can be viewed within the Ohlson framework as being reflected in the persistence of abnormal earnings, rents also can be reflected in the model by including the present value of the future cash flows attributable to those rents—incremental to those cash flows attributable to recognized assets—as a component of equity book value. In fact, many intangible assets, e.g., customer lists, core deposit intangibles, research and development, are attributable to economic rents.

Although the Ohlson model represents firm value as a linear function of equity book value and abnormal earnings, the persistence of abnormal earnings enters into the model nonlinearly. Studies that permit valuation coefficients to vary cross-sectionally are explicit attempts to control for nonlinearity, and can be viewed as being implicitly based on the nonlinearity in abnormal earnings in the Ohlson model. Many empirical studies that adopt such methodologies (see, e.g., Barth, Beaver, and Landsman 1992; 1996; 1998; and Aboody, Barth, and Kasznik, 1999, among many others.

The Ohlson model yields a particular form of nonlinearity in the valuation equation. However, because perfect and complete capital markets and the discounted cash flow model are assumed, the resulting relation is linear in discounted cash flows. If the perfect and complete capital markets assumption is relaxed, then the linear relation does not necessarily hold. There is no well accepted model of equity valuation in imperfect and incomplete markets. Thus, value

relevance researchers use perfect and complete market models (e.g., the Ohlson model) as a basis for their tests, but often make modifications to estimating equation specifications to incorporate potential effects of nonlinearities in the particular setting being examined. For example, Barth, Beaver, and Landsman (1992) permits coefficients on nonpension earnings components to vary by industry, risk, and taxpayer status to determine whether its inferences relating to pension cost coefficients are robust to these forms of nonlinearity. Relatedly, Barth, Beaver, and Landsman (1998) permits coefficients on earnings and equity book value to vary with financial health and industry membership. Permitting coefficients to vary cross-sectionally with these factors relaxes the linearity assumption in a particular way, and maintains linearity within each partitioning.

Note that with market incompleteness, assets of the firm may not be additively separable. This is likely to be particularly true in the case of assets for which active markets do not exist. For example, active markets exist for many financial instruments, resulting in financial instruments being additively separable from other assets and, thus, separable from the firm. However, for many intangible assets, active markets do not exist and, hence, they may not be additively separable from other assets or separable from the firm. Note that lack of additive separability for a particular asset in no way implies it is not an asset of the firm. Consistent with this, separability is not a criterion in the FASB's definition of an asset. In SFAC No. 6, an asset is defined as "probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events…That is, assets may be acquired without cost, they may intangible, and although not exchangeable, they may be usable by the entity in producing or distributing other goods or services." Research assessing the value relevance of assets for which active markets do not exist address this problem by including in the regression estimates of their fair values. To the extent that assets under study are not separable from other assets of the firm,

the resulting regression coefficients capture only the incremental effect on firm value of the assets under study.

Valuation models used in value relevance research also reflect the effects of accounting conservatism. For example, the Ohlson model reflects in the abnormal earnings term both unrecognized assets and assets with fair values in excess of book value. Subsequent refinements of the Ohlson model explicitly model the effects of conservatism (Feltham and Ohlson, 1995; 1996). Empirical value relevance studies directly incorporating the effects of conservatism include Barth, Beaver, Hand, and Landsman (1999), Beaver and Ryan (2000), and Stober (1994), among others.[18] More generally, empirical studies seeking to explain why equity market value exceeds equity book value, including those examining the value relevance of fair value estimates and intangible assets (see section 3), can be viewed as examining conservatism in accounting. One reason fair value estimates and intangible assets currently are not recognized in financial statements is that FASB is concerned about the reliability of such amounts. Thus, in these contexts, conservatism is a result of applying the reliability criterion, and not a distinct criterion in and of itself.

Although some critics of value relevance research cite conservatism as undermining what can be learned from the research, it is interesting to note that it would be difficult to learn whether accounting is conservative without value relevance research (see e.g., Basu, 1997). That is, it is inconsistent for critics to assert on the one hand that value relevance research cannot inform standard setting, and, on the other hand, to cite value relevance research as showing that

[18] In a similar vein, although extant valuation models do not explicitly incorporate the effects of dirty surplus, which can be large for some firms, empirical research indicates that adjusting for dirty surplus has negligible effects on estimates or inferences (Hand and Landsman, 2000). Although modeling dirty surplus as arising from an equilibrium model of accounting standard setting is potentially interesting, it is not a question addressed by value relevance research.

accounting is conservative, a characteristic of accounting amounts of obvious interest to standard setters.

4.2 Value or changes in value?

Value relevance research examines the association between accounting amounts and equity market values. This suggests testing whether accounting amounts explain the cross-sectional variation in share prices. For the most part, the valuation models that form the basis for tests in the valuation literature are developed in terms of the level of firm value (e.g., Miller and Modigliani, 1966; Ohlson, 1995).[19] Examining changes in stock prices or returns is an alternative approach. Selection of which approach to use depends on the research question and econometric considerations (Landsman and Magliolo, 1988). Arbitrarily restricting the research design choice limits the breadth of questions that can be addressed and inferences that can be drawn.

The key distinction between value relevance studies examining price levels and those examining price changes, or returns, is that the former are interested in determining what is reflected in firm value and the latter are interested in determining what is reflected in changes in value over a specific period of time. Thus, if the research question involves determining whether the accounting amount is timely, examining changes in value is the appropriate research design choice. However, non-academic accounting constituents are interested in a wide variety of questions, most of which do not involve timeliness. For example, the FASB identifies timeliness as an "ancillary aspect relevance" (SFAC No. 2). Thus, limiting research questions to those relating to timeliness severely limits the set of value relevance research questions that can be addressed.

[19] A limited number of studies base their tests on price-level versions of the capital asset pricing model, which is developed in terms of stock returns (Litzenberger and Rao, 1971; Bowen, 1981).

Value relevance research studies using price levels and returns specifications have been characterized as adopting a "measurement" and an "informational" perspective, respectively (Beaver, 1998). A strict interpretation of this distinction is that under the informational perspective accounting amounts provide new information to the markets, i.e., incremental to information available from other public sources. Under the measurement perspective, accounting amounts measure assets, liabilities, revenues, and expenses, even though such information may not be "new" to the market. An alternative way to view the measurement perspective is that accountants summarize or aggregate information that might be available from other sources. Although such information may not be new, it does summarize information that investors use when valuing the firm. For example, whereas disclosure of depreciation expense may not provide new information to the market, it is a component of income and hence is part of the information system used by investors when valuing the firm. Moreover, as pointed out by Lambert (1996) in his review of the value relevance literature: "It seems clear to me that the FASB is not interested in confining financial reporting activities to include only those items that are not already adequately conveyed by other sources on a more timely basis…Stated in more extreme fashion, would they eliminate items from the annual report if they were already available from other sources? Probably not." In fact, the FASB's Concepts Statements embrace both an informational perspective in SFAC No. 1 and a measurement perspective in SFAC No. 5.

Because price levels and price change approaches address related but different questions, failure to recognize these differences could result in drawing incorrect inferences. For example, consider Easton, Eddey, and Harris (1993) and Barth and Clinch (1998), which address the value relevance of asset revaluations under Australian Generally Accepted Accounting Principles (GAAP). Both studies find a significant association between the level of revaluation reserves

and the level of share prices, but a weak association between the change in the valuation reserves and returns. Australian GAAP permits considerable discretion in the timing of revaluing assets. As a result, Easton, Eddey, and Harris (1993) appropriately conclude that asset revaluations are value relevant but not timely. Had the asset revaluation studies only estimated returns specifications, they likely would have concluded erroneously that asset revaluations are valuation irrelevant.

In addition to noting that value and changes in value approaches address different research questions, it is important to note that each raises econometric concerns. Econometric concerns associated with specifications based on price levels are the subject of several research studies. These concerns include coefficient bias induced by correlated omitted variables, measurement error, and cross-sectional difference in valuation parameters, and inefficiency and potentially incorrectly calculated coefficient standard errors induced by heteroskedasticity. Fortunately, the literature not only acknowledges these problems, but also is replete with the potential remedies (Miller and Modigliani, 1966; White, 1980; Bernard, 1987; Landsman and Magliolo, 1988; Barth and Kallapur, 1996; Barth and Clinch, 2000).

Econometric concerns associated with specifications based on changes in value, or returns, have been less well studied. In addition to being subject to many of the same econometric concerns as price levels studies, returns studies potentially suffer from additional problems that may cloud experimental inferences. First, implementing a returns design requires matching the period in which the accounting amount becomes known to the market and the period in which the economic event the accounting amount measures occurs. For example, in the case of asset revaluations discussed above, the asset revaluation probably was recognized (the accounting amount became known to the market) years after the change in asset value (the

economic event) occurred. A related problem is the need to specify the market's expectation of all variables used in the returns specification. Identifying expectations is difficult for most accounting amounts, particularly identifying when the economic event affecting the accounting amount occurs.

In the extreme case of short return intervals, as is the case in event studies, which represent an operationalization of a strict information perspective, the difficulty of this task is magnified because it requires identifying a particular date. More importantly, the vast majority of accounting amounts are not announced, making such endeavors fruitless, except for the few items that are announced, i.e., earnings and sales.

Second, returns approaches require additionally assuming that valuation parameters are intertemporal constants (Landsman and Magliolo, 1988). Failure to recognize the resulting coefficient bias can lead to incorrect experimental inferences. One type of study particularly prevalent in accounting research is examination of the value relevance of recently required disclosures or changes in recognition rules. In these settings, investors may require several years to understand fully the valuation implications of the new disclosures. Similarly, preparers may take several years to develop expertise in measuring the new accounting amounts, resulting in the measurement characteristics of the disclosed amounts changing over time. This makes the task of investors determining the value relevance of the disclosures even more difficult. As a result, in studying the value relevance of pension disclosures in the first few years after issuance of SFAS No. 87, Barth, Beaver, and Landsman (1992) relies on price levels and not returns specifications. BBL96 makes the same choice in studying the value relevance of banks' fair value estimates in the period shortly after issuance of SFAS No. 107. Future researchers must

recognize that the learning process of preparers and investors will affect the evolution of the value relevance of derivatives disclosures released under SFAS Nos. 133 and 138.

Third, it is important to recognize that using a returns approach can exacerbate some econometric problems that are common to both price levels and returns specifications. Barth (1994) provides a good illustration of this point that relates to measurement error. Barth (1994) finds that banks' investment securities' fair value estimates are value relevant using a price levels specification, but are value irrelevant using a returns specification. Barth (1994) shows that even with relatively modest amounts of measurement error, this apparent inconsistency in findings can be attributable to exacerbation of the effects of measurement error when calculating differences in fair value estimates in the returns specification.[20]

4.3 Identification of included variables

As with most non-controlled experiments, value relevance research designs are subject to inferential problems stemming from correlated omitted variables. A critical issue to value relevance research design choice is determining which variables to include in the estimation equation. Selection of included variables depends on the research question, and often is guided by the valuation model that forms the basis for the estimation equation. It is important to note that not all omitted variables pose inference problems. Omitted variables that are uncorrelated with variables of research interest, i.e., the accounting amounts under study, do not pose inference problems, unless estimation efficiency is an issue. Omitted variables that are correlated with the variables of research interest do not pose inference problems if either their omission is a feature of the research design or the accounting amounts under study are intended to summarize the information contained in the omitted variables. Any remaining omitted

[20] See Landsman and Magliolo (1988, p. 600) for another illustration of the same point in the context of pension footnote disclosures.

variables potentially can cause inference problems. Therefore, it is necessary to determine whether inferences are affected by their exclusion.

An example of a study that describes this variable selection process is BBL96, which examines the value relevance of banks' financial instruments' fair value estimates disclosed under SFAS No. 107. Specifically, BBL96 examines whether differences between fair value estimates and book values for assets and liabilities covered by SFAS No. 107 explain differences in market and book values of equity. BBL96 conditions inferences regarding the fair value estimates only on book values, i.e., financial statement amounts, because the FASB's primary interest is financial statements, not all publicly available information. That is, the FASB is concerned with whether financial statements contain relevant and reliable information about all assets and liabilities, regardless whether such information can be obtained elsewhere.

BBL96 identifies three sets of variables: (i) the SFAS No. 107 fair value estimates, which are the subject of the study, (ii) variables that are potential competitors to the fair value estimates because they reflect key determinants of fair value, and (iii) assets and liabilities specifically excluded from the provisions of SFAS No. 107. The competitor variables BBL96 identifies include nonperforming loans, which reflects default risk, and interest sensitive assets and liabilities, which reflect interest rate risk. Default risk and interest rate risk are two major factors associated with changes in financial instruments' fair values. Among the assets and liabilities excluded from SFAS No. 107, BBL96 identifies the core deposit intangible asset, net pension assets, and nonfinancial assets and liabilities.

Excluding the competitor variables from the estimating equation permits determining whether the fair value estimates are value relevant. That is, omission of these variables is dictated by the research question, and their omission does not cause inference problems.

Whether the competitor variables reduce or eliminate the value relevance of the fair value estimates when they are included in the estimating equation provides additional insights into how well the fair value estimates reflect default risk and interest rate risk. Note that if the fair value estimates lose explanatory power in the presence of the competitor variables, then the fair value estimates reflect default risk and interest rate risk, as they should. To the extent that the fair value estimates retain explanatory power, they reflect dimensions of fair value beyond default risk and interest rate risk as reflected in the competitor variables.[21]

The core deposit intangible asset, net pension assets, and nonfinancial assets and liabilities comprise variables whose omission could lead to inference problems relating to the fair value estimates because they likely are correlated with the fair value estimates and financial instruments' fair values are not intended to summarize the information they contain. As a result, these variables are included in the estimating equation in the BBL96 estimating equations. BBL96 also examines the sensitivity of inferences to omitted variables that potentially could cause inference problems. Among the variables considered are equity book value, growth, and return on equity. As is common in price levels-based value relevance research, BBL96 also estimates a first-difference specification as an alternative approach to control for potential correlated omitted variables (see Landsman and Magliolo, 1988). Although estimation in first differences mitigates effects of correlated omitted variables under particular circumstances, as noted in section 4.2, estimation in first differences can create or exacerbate inference problems.

4.4 Interpretation of measurement error

[21] Note that although net income is a potential competitor variable, inclusion of it would provide little insight into the interest rate and default risk characteristics of the fair value estimates. That is, whereas nonperforming loans and interest sensitive assets and liabilities are proxies for default and interest rate risk, net income is a generic summary measure.

Value relevance research designs also can be subject to inferential problems stemming from measurement error. However, whether measurement error poses an econometric problem or is the subject of study depends on the research question. If measurement error is the subject of study, then it is necessary to specify the underlying construct that is the object of measurement. Two constructs are used in the extant literature. The first construct is economic assets, liabilities, and income (e.g., Miller and Modigliani, 1966; Bowen, 1981; Landsman, 1986). Using this construct requires making specific assumptions about the economic characteristics of markets, e.g., that they are perfect and complete, which subsumes market efficiency. Measurement error is the difference between these economic amounts and the related accounting amounts such as book values of assets and liabilities and accounting net income. Accounting researchers adopting this construct are interested in studying how well these accounting amounts reflect their corresponding economic amounts. The second construct is the asset, liability, and income amounts that are implicitly assessed by investors when valuing the firm (e.g., Barth, 1991; Barth, 1994; BBL96). Using this construct requires only that accounting amounts summarize information investors use to set share prices. As noted above, doing so does not require assuming market efficiency because share prices reflect investors' consensus beliefs, regardless of whether these beliefs are well founded. Accounting researchers adopting this construct are interested in studying how well these accounting amounts reflect investors' consensus beliefs.

Many value relevance researchers operationalize reliability in terms of measurement error and seek to determine the extent of measurement error in particular accounting amounts (e.g., Barth, 1991; Easton, Eddey, and Harris, 1993; Barth, 1994; Petroni and Wahlen, 1995; BBL96; Venkatachalam, 1996; Choi, Collins, and Johnson, 1997; Aboody and Lev, 1998; Aboody,

Barth, and Kasznik, 1999, among others). In these studies, measurement error is the subject of the study and not an econometric problem. As discussed in section 2 in connection with tests of reliability, there are alternative ways to structure tests to obtain inferences about the extent of measurement error. Measurement error that causes inference problems can be mitigated by using well established econometric techniques such as instrumental variables (Miller and Modigliani, 1966).

4.5 Potential effects of scale

Value relevance research designs also can be subject to inferential problems stemming from scale effects, which is the subject of several studies (Miller and Modigliani, 1966; White, 1980; Bernard, 1987; Barth and Kallapur, 1996; Barth and Clinch, 2000). Before determining the effects of and potential remedies for scale differences across firms, it is necessary to specify what scale is in the context of the particular research question. Scale effects that cause inference problems arise from a correlated omitted variable related to scale that results in accounting amounts being associated with equity market values simply because of failure to include this omitted variable. Often, this correlated omitted variable is assumed to be the result of a multiplicative scale effect (see Barth and Kallapur, 1996).

The literature offers several potential remedies for econometric problems arising from multiplicative scale effects, including deflation by a scale proxy, and inclusion of the scale proxy as an additional independent variable. Note, however, that deflation by lagged equity market value, as a proxy for scale, transforms the specification from price levels to returns, which as explained in section 4.2 results in transforming the research question. Barth and Clinch (2000) show that in the context of the Ohlson (1995) valuation model, scale effects are not necessarily multiplicative and investigate potential remedies for non-multiplicative scale effects.

Research has yet to provide convincing evidence that scale affects inferences in extant value relevance studies. Typically, value relevance studies report that their inferences are unaffected by conducting a battery of sensitivity checks aimed at eliminating scale effects. Moreover, several studies estimate coefficients on accounting amounts that are highly positively correlated and yet obtain estimated coefficients of differing signs and magnitudes consistent with the studies' predictions. For example, in a regression of equity market value on assets and liabilities, the coefficients on assets and liabilities are positive and negative, respectively (Landsman, 1986; Barth, 1991), despite the fact that assets and liabilities are highly positively correlated. Similarly, in a regression of equity market value on revenues and expenses, which also are highly positively correlated, the coefficients on revenues and expenses are positive and negative (Barth, Beaver, and Landsman, 1992). These findings are inconsistent with spurious inferences attributable to scale effects.

5. Summary and concluding remarks

This paper addresses the relevance of value relevance research by clarifying the motivation, contribution, limitations, and relevance of the value relevance literature. After describing the meaning of value relevance, we explain how value relevance research addresses questions of interest to a broad non-academic constituency. To illustrate this, we summarize an area of value relevance research, fair value accounting. Finally, we discuss key research design issues facing value relevance researchers, including the choice between a valuation equation approach and an approach examining changes in value, identifying variables to be included in the estimation equation, interpretation of measurement error, and potential effects of scale on inferences.

This paper also clarifies several attributes of value relevance research that sometimes are misconstrued. First, value relevance studies are designed to assess how well particular accounting amounts reflect information that is used by investors in valuing the firm's equity value. Second, value relevance research provides significant insights into questions of interest to standard setters and other non-academic constituents. Using well accepted valuation models, value relevance research attempts to operationalize key dimensions of the FASB's Conceptual Framework to assess the relevance and reliability of accounting amounts. Third, value relevance research can accommodate conservatism. In fact, absent value relevance research, it would be difficult to establish that accounting practice is conservative. Fourth, a primary focus of the FASB and other world standard setters is equity investment. Although financial statements have a variety of applications beyond equity investment, the possible contracting uses of financial statements in no way diminish the importance of value relevance research. Fifth, empirical implementations of extant valuation models can be used to address questions of value relevance. Sixth, econometric techniques can be and are applied to mitigate the effects of common econometric issues arising in value relevance studies. Finally, the extent and pervasiveness of the value relevance literature in the leading academic accounting journals, as well as the adaptations of several of the studies in professional publications, including those of the FASB, are testimony to its impact on academic research and accounting practice.

It is important to reemphasize that conducting value relevance research that provides insights into questions of interest to academics and non-academics alike is not an easy task. It takes considerable time and effort to learn about questions of interest to various financial reporting constituencies and to develop research designs capable of addressing research questions that correspond to questions of interest to non-academic constituents. Doing this well

can be beneficial to researchers, standard setters, and other capital market participants. The demand for high quality value relevance research will only increase in the future as the financial markets expand and become more complex and accounting standards attempt to keep pace with these changes. It is a challenge to accounting researchers to meet this demand.

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