

Perspectives on Recent Capital Market Research

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I. INTRODUCTION

The purpose of my remarks is to provide one perspective on major areas of capital markets research that have made important contributions to our understanding of accounting numbers, with an emphasis on those published during the past ten years. I do not intend these remarks to be a survey;¹ instead, I select the five research areas I believe have made the greatest contribution to our knowledge over the past ten years. These areas illustrate the degree to which capital market research has become interconnected. My remarks address why these areas are important, briefly summarize what we have learned, highlight some of the links between these areas, and raise some unresolved issues. Within each area, I identify major issues and some of the key papers, but I do not attempt to be comprehensive. In the process, I have sacrificed depth for breadth.

The five areas I have selected are market efficiency, Feltham-Ohlson modeling, value relevance, analysts' behavior, and discretionary behavior. The first two areas, market efficiency and Feltham-Ohlson modeling, are basic platforms that permit us to organize our thinking about the role of accounting in capital markets. The last three areas are applications that incorporate some form of accounting structure or individual behavior.

II. MARKET EFFICIENCY

Market efficiency is, of course, an important field of study. Much of the regulation of financial reporting is premised on the notion that once firms make accounting data publicly available, the implications will be widely appreciated and reflected in security prices. If the market is inefficient, then financial reporting and disclosure are not as effective, at least with respect to prices fully reflecting that information. Questions for regulators then arise as to whether altering the presentation of the data could mitigate this deficiency.

If investors trade in an efficient market, then they can rely on prices reflecting a rich set of the total mix of information, including financial statement information, and they need

¹ Kothari (2001) provides an excellent recent survey of capital markets research.

Editor's Note: The Executive Committee of the American Accounting Association has recommended the commission of a series of Presidential Research Lectures, to be delivered at annual meetings of the Association. To encourage broad dissemination, the Committee has requested that *The Accounting Review* publish this lecture given at the 2001 American Accounting Association Annual Meeting in Atlanta, GA.

Author's Note: I am pleased and honored to be the third Presidential Lecturer, following two distinguished colleagues, Shyam Sunder two years ago and Bill Kinney last year. I thank Mary Barth, Wayne Landsman, Maureen McNichols, and Stephen Ryan for many helpful suggestions on earlier drafts of this paper.

not process all of that information directly. In other words, investors become indirect beneficiaries of that information, even if they do not literally process it themselves. Efficient capital markets also have implications for resource allocation and production efficiency, so it is not surprising that market efficiency was one of the earliest areas studied.

Market efficiency is also of interest to researchers because, if they can assume market efficiency in the research design, then researchers can draw a different (and potentially more powerful) set of inferences. Assumptions about market efficiency affect the researchers' choice of the length of the window over which to compute abnormal returns in an event study. Market efficiency also affects the interpretations the researcher places on observed associations between security prices and accounting numbers.

There was a time when we thought that the issue of market efficiency with respect to publicly available data was "resolved." Early capital markets studies largely supported market efficiency. Both Ball and Brown (1968) and Beaver (1968) examined the post-announcement behavior of security returns and tentatively concluded that market efficiency was a reasonable approximation of the empirical results. Early studies examined changes in accounting methods (Archibald 1972; Ball 1972) and reached similar conclusions. Researchers also examined differences in accounting methods (e.g., Beaver and Dukes 1973) and concluded that the market prices behaved in a manner consistent with market efficiency.

Recent studies have reexamined market efficiency, and several have concluded that capital markets are inefficient with respect to at least three areas: post-earnings announcement drift, market-to-book ratios and its refinements, and contextual accounting issues.

Post-Earnings Announcement Drift

Post-earnings announcement drift was one of the first areas to suggest that markets may not be efficient with respect to accounting data. Several studies (Foster et al. 1984, among others) found evidence of post-earnings announcement drift in spite of attempts to control for at least some of the confounding factors. One reason for the finding of post-announcement drift is that the availability of daily return data enhances the power of the tests relative to prior research that used only weekly or monthly return data. The post-announcement drift studies culminated in Bernard and Thomas's (1989, 1990) research, which is an econometric tour de force. Their studies represent a classic example of excellent research design. The studies tenaciously pursue competing explanations, such as transaction costs vs. omitted risk factors, and find them lacking in many respects. Moreover, their studies, along with Freeman and Tse (1989), also explicitly develop an alternative hypothesis as to the nature of the market inefficiency and establish that the subsequent abnormal returns tend to cluster around subsequent earnings announcement dates. Their evidence that the abnormal returns are associated with some inefficient processing of earnings announcements is compelling.

An important extension is Abarbanell and Bernard (1992), whose study examines the question of whether a portion of the post-earnings announcement drift is attributable to the behavior of analysts' earnings forecasts and deficiencies in their processing of accounting data. This study reaches two important conclusions:

- (1) The analysts' forecasts appear to underestimate the persistency in earnings, and forecast errors based on analysts' forecasts are serially correlated. If analysts efficiently processed information, then the unconditional expected value of the forecast error would be zero, and the expected serial correlation would be zero.

- (2) This phenomenon explains some, but not all, of the post-earnings announcement drift. We would not expect analysts' behavior to be the complete explanation because post-earnings announcement drift is most pronounced in the small capitalization firms, which are not as heavily followed as larger capitalization firms are. Bartov et al. (2000) suggest that institutional holdings are also an important explanatory variable. In a further extension, Bhattacharya (2001) concludes that trade size, a proxy for less wealthy and less informed investors, may also be a factor. These studies represent a key link between market efficiency and the role of information and financial intermediaries.

Studies of post-earnings announcement drift are particularly compelling because earnings changes and earnings forecast errors have lower serial correlation than other candidates for market efficiency, such as market-to-book ratios. High serial correlation raises suspicion that the variable is a proxy for an omitted factor that is priced by the market.

Market-to-Book Ratios and Extensions

A second area of research is abnormal returns associated with portfolio strategies based on market-to-book ratios. Two early studies in this area are Fama and French (1992) and Lakonishok et al. (1994). The negative association between market-to-book ratios and subsequent returns appears to be significant and persistent and not explainable by conventional risk measures or their proxies. This is a controversial area; Fama (1991), among others, suggests that market-to-book ratios may represent some (otherwise unidentified) pricing factor, and Fama and French (1992) have posited a three-factor pricing model that includes the market-to-book ratio. As a result, recent market efficiency tests control for the market-to-book ratio and still find evidence of abnormal returns.

Major extensions of this work refine the market-to-book analysis by computing market-to-value ratios. At its simplest level, the argument for the market-to-book ratio as being a measure of market inefficiency is that the market prices either fail to reflect some factor related to the underlying value, which is reflected in book value, or that they include some factor unrelated to the underlying value. For example, high market-to-book ratio stocks represent so-called "glamour" stocks that are overpriced. From this perspective, one can extend the concept of value to include accounting "fundamentals" in addition to book value. Two major examples are Frankel and Lee (1998) and Dechow et al. (1999). Both studies employ modeling motivated by Feltham-Ohlson to predict the intrinsic value based on book value, earnings, and analysts' earnings forecasts. Both studies conclude that market-to-value ratios are associated with even higher subsequent abnormal returns than are the simpler market-to-book ratio strategies, which is consistent with these value estimates' being better proxies for underlying fundamentals and, hence, being better able to identify overpriced and underpriced stocks. As with research on post-earnings announcement drift, the abnormal returns here appear to be more prevalent in small capitalization stocks.

In another extension of the market-to-book research, Dechow and Sloan (1997) find that stock prices appear to reflect naively analysts' biased forecasts of future earnings growth, and reliance on analysts' earnings growth forecasts can explain over half of the higher returns associated with pursuing "contrarian" (e.g., market-to-book and price-earnings-based) strategies.

Contextual Accounting Issues

A key feature of the previous two areas is that they require little, if any, knowledge of the distinctive characteristics of how financial statements are prepared. They are based on

generic treatments of earnings and book value. Our comparative advantage as accounting researchers is in incorporating the richness of our knowledge of accounting institutions, reporting standards, and the composition of accounting numbers. Several recent studies have examined market efficiency based on some key feature of financial reporting.

Sloan (1996) is an excellent example of research that exploits our knowledge of one key feature: accrual accounting. Important aspects of the Sloan (1996) study are (1) an examination of the "consistency" between the weight placed on accruals and cash flow components in forecasting earnings and the implicit weight investors placed on the cash flow and accrual components of earnings in a valuation equation, and (2) the examination of portfolio strategies based on the magnitude of the accruals. Sloan (1996) concludes that capital markets overestimate the persistency of accruals and underestimate the persistency of cash flows from operations, because accruals are more subject to uncertainty of estimation and more subject to management and manipulation. Xie (2001) supports this conclusion by showing the mispricing documented by Sloan (1996) is largely due to abnormal accruals.

Moreover, in an attempt to address the "IPO puzzle," Teoh et al. (1998a, 1998b) and Teoh, Wong, et al. (1998) find that unusual accruals occur at Initial Public Offering dates and subsequently reverse. The accruals appear to be associated with at least a portion of the negative abnormal returns identified in the IPO research. These findings are consistent with those of Sloan (1996), as well as Xie (2001) and DeFond and Park (2001), that security prices do not fully reflect either the nature of accruals or their implications for future earnings and valuation.

However, not all accruals are associated with abnormal returns. Research also indicates that the supplemental disclosures with respect to specific accruals can permit capital markets to form unbiased estimates of the implications of the accrual for future earnings and hence for valuation. For example, Beaver and McNichols (2001) show that increased disclosure regarding the history of policy loss reserves in the property casualty insurance companies can make the accruals transparent to investors, and that revisions policy of loss accruals (development) are not associated with subsequent abnormal returns.

Unresolved Issues

The magnitude and length of the abnormal returns is surprising. For example, Frankel and Lee (1998) report that in the 36 months after portfolio formation, the abnormal returns associated with market-to-value strategies are 31 percent, whereas strategies that also exploit the predictability of analysts' forecasts are associated with abnormal returns of 45 percent.

There are several unresolved issues:

- (1) How can widely disseminated and examined data used with simple portfolio strategies that require no knowledge of accounting be associated with abnormal returns? From an economic perspective, widely disseminated data are not likely candidates.
- (2) How can studies of arcane disclosures (e.g., nonperforming loans and pensions, as in Beaver et al. [1989] and Barth et al. [1992]) find that such disclosures are apparently reflected in prices, yet more visible variables, such as earnings and book value, are not?
- (3) How can studies of security returns in the very short run (e.g., intraday returns, as in Patell and Wolfson [1984]) show evidence of relatively rapid response (within hours, if not minutes), and yet have evidence of abnormal returns that appear to persist for years after the portfolio formation date?

- (4) How can the body of research in aggregate show that prices both lead (e.g., Beaver et al. 1980; Beaver et al. 1987; Collins et al. 1997; Ryan 1995) and lag accounting data?

III. FELTHAM-OHLSON MODELING

For better or for worse, capital markets research is primarily empirical, rather than theoretical. One major exception is the modeling by Feltham and Ohlson (hereafter F-O). As one of the few attempts during the last ten years to develop a "theory of accounting" (i.e., a formal representation of value in terms of accounting numbers), the F-O approach is, in my opinion, one of the most important research developments in the last ten years (important articles are Ohlson [1995, 1999] and Feltham and Ohlson [1995, 1996]). F-O modeling is also one of the more controversial research areas in accounting. I will discuss the key features, empirical applications, major criticisms, and prospects for future research.

Key Features of F-O Modeling

One feature is the common set of assumptions that pervades the work. The assumptions include a valuation assumption that the value of equity is equal to the present value of expected future dividends, the clean surplus relation, and some form of a linear information dynamic. Feltham and Ohlson have derived a rich set of implications from these parsimonious assumptions.

In contrast to prior attempts to link accounting data and equity value, the F-O approach is neither a theory of information nor a theory of measurement. However, it permits a representation of the value of equity in terms of accounting numbers (most prominently, book value and expected abnormal earnings), relying essentially on the present value of expected dividends and clean surplus relation assumptions.

The F-O approach provides a role for many important features of the accounting system, including clean surplus, book value as well as earnings, transitory components of earnings, conservatism, and delayed recognition. For example, we can clearly see a progression in adding key features of the financial-reporting system. Early modeling assumed unbiased accounting and the clean surplus relation, while later extensions incorporated conservative accounting (Feltham and Ohlson 1995; Zhang 2000). Feltham-Ohlson alter the assumptions regarding the linear information dynamics to allow for "other information." In doing so, the model provides a role for information that is currently known and reflected in price, but is reflected with a lag in the accounting numbers. The model provides a representation for delayed recognition. By enriching the linear information dynamics, Feltham and Ohlson (1996) construct a theory of depreciation, which distinguishes between two potential sources of conservatism: accelerated depreciation and positive net present value projects. Ohlson (1999) decomposes earnings into permanent and transitory components. In the process, he clearly distinguishes between the concepts of forecasting relevance and the time-series persistence of an earnings component, and he demonstrates how each relevance concept affects valuation relevance of that earnings component. Extensions alter the linear information assumptions to incorporate additional conditioning variables (e.g., different decompositions of earnings, such as cash flows and accruals, Barth et al. [1999]). Thus the F-O approach provides a potentially rich platform for further modifications of the linear information dynamics to address additional accounting issues of interest.

The F-O approach has stimulated considerable empirical research. Frankel and Lee (1998) and Dechow et al. (1999) use the approach in testing market efficiency, which is a very ambitious application of the model. Studies employing a combined book value and

earnings approach that either literally relies on the F-O model or is motivated by it are Barth, Beaver, and Landsman (1996, 1998), Barth and Clinch (1998), Burgstahler and Dichev (1997), Aboody et al. (1999), Barth, Beaver, Hand, and Landsman (1999), Collins, Maydew, and Weiss (1997), and Collins, Pincus, and Xie (1999). Other empirical applications include direct tests of the F-O model (e.g., Myers 1999; Barth, Beaver, Hand, and Landsman 1999). Major findings of this literature include the following:

- (1) Both book value and earnings are significant pricing factors.
- (2) The relative importance of book value is inversely related to the financial health of the firm.
- (3) The coefficient on earnings is lower for firms with low return on equity.
- (4) The coefficient on positive earnings is positive and significant, while the coefficient on losses is insignificantly different from zero.
- (5) Accrual vs. cash flow components of earnings are priced significantly differently from one another. In general, the accrual components are associated with a lower coefficient.

Criticisms of the Feltham-Ohlson Approach

One major criticism is that the model has no endogenous demand for accounting data, but how serious is this charge? The modeling can be informative without including an endogenous demand for accounting, and I believe the criticism is somewhat misplaced or misdirected. By analogy, the Capital Asset Pricing Model (CAPM) has no demand for financial institutions, yet we observe financial institutions empirically. What do we conclude? Do we conclude that the risk-return trade-off derived from the CAPM is of no interest or relevance to investors or to managers of financial institutions? I think not. The F-O models do not attempt to derive a demand for accounting. The F-O approach provides a framework for representing valuation in terms of accounting numbers, while taking accounting as given exogenously. This framework relates published accounting data to equity valuation, allows us to interpret the coefficients on the valuation equation, and allows us to relate the coefficients from the valuation equation to coefficients from the time-series of earnings equation. With contextual accounting arguments added to the general framework, researchers can predict how accounting numbers would relate to value (e.g., predictions on how the coefficients for the cash-flow and accrual components of earnings would be expected to differ in an earnings forecasting equation and a valuation equation).

Another criticism is that there is no information asymmetry, and that hence no strategic uses of accounting data arise within the F-O framework. To be sure, many financial-reporting issues arise out of concern over information asymmetry and incentives to "manage" the accounting numbers. For example, the research on analysts' behavior and discretionary behavior address issues of information asymmetry and incentives. However, the F-O approach is a beginning. As a prelude to developing models that incorporate information asymmetry and strategic uses of accounting data in valuation, it is helpful to start with a model of the relation between the valuation and accounting numbers in a nonstrategic setting. Moreover, not all issues of interest in accounting involve information asymmetry. A large body of research examines empirically the relation between valuation and publicly available accounting numbers in a nonstrategic setting (e.g., value-relevance studies). A conceptual framework, such as the F-O approach, guides the specification and interpretation of the empirical estimating equations.

Of course, it would also be desirable to have a theory where demand for accounting data is endogenous, and to have models of information asymmetry where incentives to

report strategically are endogenous. However, it is unreasonable to expect the F-O model to be rich enough to encompass all issues of interest to accounting research. Parsimony is a virtue in modeling. The model focuses attention on specific variables of interest, and the trade-off between insight and comprehensiveness is common in modeling exercises.

Some aspects of the models are unsupported by the empirical data (e.g., Myers 1999; Joos 2000; Barth et al. 1999), such as the linearity properties and the consistency among the coefficients in the system of linear information dynamics and valuation equations. However, the conflicting evidence highlights one of the important features of the F-O framework. Most accounting research is conducted in "reduced form." In other words, we estimate intuitively plausible relations that we hope will allow us to predict the sign of the coefficient. Rarely do we predict the magnitude of the coefficient. Even more rare are opportunities to test structural relations among the coefficients across different equations in the system. The F-O models permit us to predict how the coefficients within and across equations in the system are related. In particular, the coefficients in the valuation equation are a function of the coefficients in the linear information dynamics equations.

Although it may seem disappointing that we can reject the null hypothesis that the predicted coefficients equal the empirically observed ones, it is progress to be in a position to specify a predicted relation among the coefficients. We make further progress by asking what modifications would permit a consistency between the systems of equations. Introducing nonlinearity in information dynamics is a likely candidate. For example, the F-O model does not incorporate bankruptcy or other option-related phenomena that might introduce nonlinearities into the relation. Research is currently underway to incorporate nonlinearities (Yee 2001).

The F-O modeling is one of the few attempts to pursue accounting theory. It is no coincidence that the terminology of accounting (e.g., *income*) is similar to that used in economics and finance. We could have called the difference between revenues and expenses by another name, but we did not. The semantics of accounting was chosen because income theory asserts that the resulting measure is an indicator of firm performance. Hence, it is natural to focus on a theory of measures of accounting net income and their relation to value.

Empirical studies applying the F-O framework often append a contextual accounting theory regarding differences in cash flows vs. accruals, the fair value of financial instruments, or the nature of pension obligations to guide the empirical predictions. Such contextual richness can help fill in some of the substance omitted from the parsimonious F-O representations. Once these contextual theories are appended, the combination of parsimonious modeling and contextual richness provides a rich basis for empirical testing. One of the major applications of the F-O models is the value-relevance literature.

IV. VALUE-RELEVANCE RESEARCH

Value relevance is major area of empirical research in the last ten years.² Holthausen and Watts (2001) identify 54 value-relevance studies, only three of which were published before 1990. Value-relevance research examines the association between a security price-based dependent variable and a set of accounting variables. An accounting number is termed "value relevant" if it is significantly related to the dependent variable.³ Defined in this most

² A more complete review of the literature appears in Barth, Beaver, and Landsman (2001).

³ Beaver (1998, 116), Ohlson (1995), and Barth (2000) provide closely related formal definitions. The key commonality is that an accounting amount is deemed value relevant if it is significantly associated with equity market value.

general sense, value-relevance research has a long history (Miller and Modigliani 1966); however, the term came into common usage in the early 1990s (Easton et al. 1993). Papers by Ohlson (1995, 1999) also use the term "value relevance," in a manner consistent with empirical studies. As with the other research areas, value-relevance research is controversial (Holthausen and Watts 2001; Barth, Beaver, and Landsman 2001).

In this paper I address some basic questions: What distinguishes value-relevance research from other capital market research? Why is timeliness not a key issue in many value-relevance studies? What is the conceptual foundation of the value-relevance studies? What have we learned? What is the role of value-relevance research? What are some major unresolved issues?

What Are the Distinctive Characteristics?

Value-relevance research has two major characteristics. The first is that, more than any of the other four areas discussed, value-relevance research demands an in-depth knowledge of accounting institutions, accounting standards, and the specific features of the reported numbers. This knowledge includes the stated objectives of financial reporting, criteria standard setters use, the basis for specific standards, and details of how to construct the accounting numbers under a given standard (pension reporting is an excellent example). Incorporating the accounting context gives value-relevance research its richness and provides a basis for empirical predictions (Barth 1991), and vividly illustrates accounting researchers' comparative advantage in examining relations between equity value and accounting numbers.

A second distinguishing characteristic is that timeliness of information is not an overriding issue. Although value relevance research encompasses event studies, it also includes studies that examine the relation between the *levels* of stock prices and the accounting data. The timing of the information is of primary concern in the event-study research design. Event studies examine the stock price reaction over short windows of time centered on the announcement date. They identify the date of the public disclosure of the item being studied and examine the price change (usually in percentage terms and adjusted for market-wide movements) surrounding the event date.

In contrast to event studies, levels studies identify drivers of value that may be reflected in price over a longer time period than assumed in event studies. For example, prices may reflect the information before the announcement date. The value-relevance research characterizes market value at a point in time as a function of a set of accounting variables, such as assets, liabilities, revenues, expenses, and net income. This research design does not address timeliness, in contrast to "event-study" research design.

Why Is Timeliness Not the Key Issue?

The accounting system recognizes events later than security prices do (e.g., Ryan 1995). Delayed recognition is a natural implication of accounting standards, such as the revenue recognition principle. Moreover, we know that earnings announcements are largely, but not entirely, preempted by the disclosure of other information (Ball and Brown 1968; Beaver 1968). Landsman and Maydew (2002) conclude this finding has not changed over the last 30 years. Imagine a world in which earnings is the only information relevant to the value of the firm. With no private information search or prior public disclosures that preempt the earnings announcement, we would observe large spikes in price changes at earnings announcement times, in response to the unexpected earnings. However, this prospect creates incentives for private information search to obtain prior information about the forthcoming accounting earnings. To the extent that private information and prior public announcements

are reflected in prices before the public earnings announcement, the price reaction at the earnings announcement date is reduced. In the limit, a search for prior information can completely preempt the earnings announcement; however, such preemption does not eliminate the importance of reported earnings. The primary barrier to the complete preemption of earnings is the cost of obtaining the prior information. This cost includes not only the out-of-pocket cost of the information search, but also indirect costs imposed by the legal liability for selectively disseminating or obtaining nonpublicly available information. As the costs approach zero, the announcement effect can approach zero.

Models by Demski and Feltham (1994), McNichols and Trueman (1994), and Kim and Verrecchia (1994) formalize this process. For example, in Demski and Feltham (1994) the sole role of the information obtained before the earnings announcement is to provide information about forthcoming earnings. In short, these models imply there is more to the price-earnings relation than only the short-term price reactions at the announcement date. In fact, the magnitude of price change at the announcement date is informative about the costs of obtaining predisclosure information, but provides limited evidence about how value-relevant earnings are.

The informational approach states that a signal is informative only if the signal can alter beliefs conditional upon the other information available. This would require that the accounting number have some unique component that is not preempted by other information available prior to or simultaneous with the accounting number. This perspective is consistent with event study research designs, which control for other information publicly available prior to and concurrent with the accounting announcement.

However, accounting numbers are not unique representations of the underlying constructs they are designed to capture. It is often possible to find a vector of publicly available information that, collectively, is highly correlated with a particular accounting number. For example, the fair value of bank loans is a function of default risk and interest rate risk (Barth et al. 1996). Some linear combination of book value of the loans, proxies for default risk, and proxies for interest rate risk may be highly correlated with fair value measures, even if those measures "perfectly" capture the underlying construct. However, a key role of financial statements is to summarize relevant information parsimoniously and in a manner consistent with the underlying concept. It is informative to know how well accounting numbers play this role, even if vectors of competing proxies for the same underlying construct exist. In fact, if the accounting number (e.g., fair value of bank loans) is capturing the underlying construct, then we would expect other proxies for the construct (e.g., default risk and interest rate risk) to be correlated with the accounting number. Such correlation would indicate that the accounting number is capturing the underlying construct.

To choose another example, assume that an alternative set of data could produce a variable that is perfectly correlated with depreciation expense. Would this imply that one could exclude depreciation from the calculation of net income? Lambert (1996) concluded that the FASB probably would not exclude depreciation. The balance sheet and income statements are not intended to list only those assets, liabilities, revenues, and expenses not preempted by other publicly available information. The financial statements are intended instead to be "complete" within the constraints and definitions of generally accepted accounting principles. In this broader view of the role of financial statements, timeliness is only one dimension.

This broader view has implications for research design. For example, researchers often use first differences, rather than levels, of a stock-price-related dependent variable to mitigate some econometric problems, such as correlated omitted variables or serial dependency in the regression residuals (Landsman and Magliolo 1988). However, changing the form of

the variable may fundamentally change the question addressed. One chooses the levels design when the problem is to determine what accounting numbers are reflected in firm value, whereas one chooses the first differences research design when the problem is to explain changes in value over a specific period of time. Hence, in the first differences formulation, the issue of timing of the information is important. Thus, if the researcher is interested in whether the accounting amount is timely, then examining changes in value can be the appropriate research design choice. However, for the reasons discussed earlier, researchers are interested in a variety of questions, many of which do not involve timeliness.

What Is the Conceptual Foundation of Value-Relevance Research?

The theoretical foundation of value-relevance studies is a combination of a valuation theory plus contextual accounting arguments that allow researchers to predict how accounting variables relate to the market value of equity. There are three major types of valuation models. The oldest is an earnings-only approach—Miller and Modigliani (1966) characterize value as the present value of permanent future earnings. The research of Landsman (1986), Barth (1991), and Barth et al. (1996) adopts a balance-sheet approach. The Feltham-Ohlonson model discussed earlier represents firm value as a linear function of book value of equity and the present value of expected future abnormal earnings. Value-relevance studies have relied heavily on a combined book value and earnings approach (Barth, Beaver, and Landsman 2001).

However, the valuation assumption is only half the story. Value-relevance studies typically incorporate contextual accounting arguments to predict the relation between accounting variables and market value. For example, the prediction that pension assets and obligations are priced as if they are assets and obligations of the company is based on the conceptual argument offered by the FASB (among others) regarding the economic substance of the pension contract between the company and employees, under a defined benefit plan (Landsman 1986).

The predictions of the way fair value of financial instruments will be priced in a valuation equation draws upon conceptual arguments concerning relevance and reliability of fair value vis-à-vis historical costs. This is an accounting theory, albeit one couched in terms of measurement of specific assets or obligations rather than a global statement that unequivocally predicts how all assets and liabilities would be measured and priced. Although the lack of a general theory of accounting can frustrate researchers (and others), researchers can use contextual accounting arguments to aid in predicting valuation-accounting number relations.

What Have We Learned?

The hallmark of value-relevance studies is that their execution requires an investment in and understanding of the institutional details of the way financial statements are prepared and of contextual arguments regarding the properties of various measures. What we have learned relates to three questions regarding an accounting number: Is it priced (i.e., does it have a coefficient that is significantly different from zero)? Is it priced consistently with some theoretical value (e.g., for a balance sheet number, is its coefficient equal to 1)? Is a particular accounting number priced equal to or differently from similar accounting numbers (e.g., do all components of net income have the same valuation multiples)? Here are some examples of what we have learned.

Evidence indicates that unrecorded pension assets and liabilities (unrecorded but disclosed in the footnotes) are priced. Landsman (1986), Barth (1991), and Barth et al. (1992) find that the unrecognized portion of pension assets and liabilities is priced in a manner

consistent with the capital market viewing pension assets as assets of the company and pension obligations as liabilities. Similar findings with respect to other post-retirement benefits (Amir 1993; Choi et al. 1997) are observed. Fair values of financial instruments are priced (Barth et al. 1996). However, the results are mixed with respect to the fair value of bank loans (Beaver and Venkatachalam 2000; Eccher et al. 1996; Nelson 1996). Moreover, Barth (1994a) shows that pricing multiples vary with the type of investment security in a manner related to the ease with which bank management can estimate the fair values.

Footnote information is often not as prominently displayed and may contain complex, arcane data (concerning such items as pension disclosures) that can be difficult to interpret. The pricing of footnote data is a nontrivial issue. The pricing of pension assets and obligations and the fair value of financial instruments is of interest in its own right. However, they are two prominent examples of the broader issue of whether footnote information is priced. Another example is nonperforming loans, which is footnote information on the default risk of bank loans. Empirical evidence indicates nonperforming loans are significant in explaining the value of bank common equity (Beaver et al. 1989; Wahlen 1994; Beaver and Engel 1996; Barth, Beaver, and Landsman 1996; Venkatachalam 1996).

The value-relevance literature also addresses questions relating to nonfinancial intangible assets. These studies generally find that intangible assets (e.g., capitalized software, brands, and goodwill) are priced (e.g., Aboody and Lev 1998; Barth, Clement, et al. 1998; Barth and Clinch 1998; Chambers et al. 1999). Studies also find that investors perceive research and development and advertising expenditures and bank core deposits as assets of the firm (e.g., Abdel-khalik 1975; Hirschey and Weygandt 1985; Bublitz and Ettredge 1989; Landsman and Shapiro 1995; Barth et al. 1996; Eccher et al. 1996; Lev and Sougiannis 1996; Healy et al. 1997; Joos 2000). Barth and McNichols (1994) and Hughes (2000) find that unbooked environmental liabilities are also priced.

One would expect various components of earnings to be associated with different pricing multiples based on the persistence of that earnings component (Sloan 1996; Ohlson 1999). Empirical evidence indicates that the accrual components of earnings are not only less persistent than the cash-flow components in forecasting future earnings, but also that the accrual components are associated with a lower earnings multiple (Barth et al. 1999). Also for banks, earnings before security gains and losses is associated with a higher pricing multiple than security gains and losses (Barth et al. 1990).

The Role of Value-Relevance Research

Accounting research can play three roles:

- (1) Research can help articulate the nature of the issues, and can provide a paradigm or language with which to frame the questions of interest. The paradigm of the value of information is not a predictive theory in itself, but provides a definitional and taxonomic framework for formulating the informational role of accounting numbers.
- (2) Research can provide a theory. This theory can be normative, which leads to prescriptive statements, or positive, which provides hypotheses and testable predictions.
- (3) Research can provide empirical evidence.

Empirical evidence is a signal from an information system. The study's research design describes the features of the information system. The researcher forms priors with respect to the relationships of interest (e.g., probabilities that either of two alternative hypotheses is true). The evidence is a signal that leads to a posterior distribution, which must differ

from the prior for at least one possible signal for the research to be informative. As the power of the research design increases, the signals generated by the design become more informative.

Value-relevance research provides evidence as to whether the accounting numbers relate to value in the predicted manner. In the pension context, the predictions are based on contextual theory that pension assets are assets of the firm and pension obligations are obligations of the firm. A plausible prediction is that pension assets (obligations) are priced as assets (obligations). A study's findings represent only one of many possible outcomes. However, the subsequent discussions and the subsequent research conducted are informed by and conditioned on the observed evidence.

Unresolved Issues

Some of the unresolved issues affecting the inferences drawn from value-relevance research include market efficiency, econometric issues, and other purposes of financial statements. Does market efficiency affect interpretation of the results? I believe it does, but the findings are important even if markets are inefficient. Are the standard econometric issues more serious with respect to this research area than elsewhere? Most, if not all, of the econometric issues faced here are common to other areas of accounting research. Moreover, value-relevance research incorporates design features to mitigate these concerns. Finally, what other purposes of financial statements should be explored as a complement to the value relevance research? Accounting for contracting purposes is a major candidate (Watts and Zimmerman 1986).

V. RESEARCH ON ANALYSTS' BEHAVIOR

Another major research area is analysts' forecasting abilities and their coverage decisions. Analysts' behavior is important to accounting research, because analysts are among the major information intermediaries who use and interpret accounting data (Schipper 1991). As a result, security prices reflect the results of their analysis. Because the average prudent investor may lack the time, skill, or resources to analyze and interpret financial statements, analysts can be a major way in which accounting data become reflected in security prices. Efficient analysts' information processing can facilitate the efficiency of security prices, as well. If there are limitations and inefficiencies in the analysts' information processing, and if capital markets do not draw on other aspects of the total mix of information to circumvent analysts' limited information processing, then prices may not fully reflect the financial statement data. To the extent that analysts rely on a rich set of publicly available data, their forecasts can be a natural way to incorporate other information into the research design of valuation studies (e.g., via the application of the F-O models). An investigation of analysts' forecasts can assess the importance of accounting data relative to the total mix of information.

The history of analysts' forecasts is rich (Brown 1993). In some respects, it is the successor to the time-series of earnings literature (Beaver 1970; Ball and Watts 1972). The early literature focuses on which time-series model most accurately forecasts earnings. Identifying the process tells us something about the general characteristics of the accounting numbers (e.g., seasonality and adjacent quarter-to-quarter effects). Moreover, researchers use earnings forecasts derived from these models as inputs into other forms of research (e.g., we can use earnings forecast errors in security returns studies). Analysts' earnings forecasts are natural candidates for more accurate forecasts because they can reflect a richer information system than simply the past earnings series. One of the original purposes, learning about the features of the accounting system, has withered. However, the literature

has examined issues beyond those related to finding the most accurate earnings forecast. Biases, processing limitations, and strategic considerations have been addressed.

What Have We Learned?

Much prior research has concluded that analysts' forecasts are optimistic (O'Brien 1988, among others), although there appears to be secular reduction in the optimistic bias (Brown 2001). The degree of bias is related to underwriter affiliation. Analysts employed by investment firms that are associated with the underwriting of the firm's securities issue more optimistic forecasts (Lin and McNichols 1998). Analysts' (initially optimistic) forecasts tend to be revised downward during the year (Kasznik and McNichols 2001). Analysts with better forecasting ability appear to have a higher probability of survival (Mikhail, Walther, and Willis 1999; Clement 1999).

Analysts' forecasts outperform the best statistical models (Brown et al. 1987a, among others), which is not surprising, since the analysts can use a richer information set than the past earnings series. However, a model that incorporates both statistically based forecasts and analysts' forecasts outperforms analysts' forecasts alone, which implies that the analysts' forecasts do not reflect all of the information in the past earnings series (Brown et al. 1987b). The forecast errors based on analysts' forecasts are serially correlated, which is also consistent with the idea that analysts' forecasts do not fully reflect all the available information (Dechow et al. 1999; Frankel and Lee 1998). This evidence is also consistent with analysts' underestimating the persistency of earnings (Abarbanell and Bernard 1992).

These findings would be of mild interest in their own right even if capital markets fully adjusted for this behavior. However, they take on added significance, to the extent that capital markets do not appear to unravel these biases and processing inefficiencies. Capital markets appear to reflect naively analysts' forecasts in prices. This finding appears to explain (at least partially) the abnormal returns associated with market-to-book and market-to-value strategies (Dechow and Sloan 1997; Frankel and Lee 1998). Analysts' forecasts appear to be a parsimonious way to capture "other information" (at least in part) in the Ohlson sense of the term (Dechow et al. 1999). Analyst coverage is greater for firms with more institutional investors (O'Brien and Bhushan 1990) and more intangible assets (Barth, Kasznik, and McNichols 2001).

Unresolved Issues

Researchers need a better understanding of the incentives of analysts with respect to forecasting. In particular, why do analysts form biased forecasts? Even in the face of evidence that the bias is associated with underwriter affiliation, there are multiple explanations for the bias. Is it intentional, or is it a manifestation of self-selection (McNichols and O'Brien 1997)? Why do analysts misestimate the persistence of earnings? Why do forecasts not fully reflect the available information?

Do analysts learn over time? Are they more accurate with experience (Clement 1999)? Does the capital market learn over time in its processing of analysts' forecasts? How do analysts make decisions regarding the allocation of their efforts across the firms covered? How does analysts' behavior vary with the financial-reporting environment? For example, Barth, Kasznik, and McNichols (2001) find that analyst coverage increases with the presence of unrecorded intangible assets. What other financial-reporting features are important? Furthermore, what are the mechanisms by which analysts' forecasts are incorporated into price? Why do errors in analysts' forecasts appear to result in the mispricing of securities? Why does the market price appear not to adjust fully for these documented regularities in analysts' forecasts?

Another major issue is to identify the other information besides accounting data that influences analysts' forecasts. Frankel and Lee (1998) and Dechow et al. (1999) have used analysts' forecasts as a proxy for other information. However, from the context of a broader system, analysts' forecasts are endogenous and are a function of underlying exogenous variables. The dimensionality of such other information is quite large. However, it is important to identify at least some of the major exogenous variables that explain analysts' forecasts. Amir and Lev (1996), Deng et al. (1999), Ittner and Larcker (1998), Lev and Sougiannis (1996), and Joos (2000) explore the ability of nonfinancial measures, such as population within licensed areas, penetration ratios, patents, FDA approvals, concentration ratios, and market share to aid in predicting future earnings and in explaining prices. Is this information reflected in analysts' forecasts as well?

VI. RESEARCH ON DISCRETIONARY ACCRUALS

Management can improve or impair the quality of financial statements through the exercise of discretion over accounting numbers.⁴ Discretionary behavior includes voluntary earnings forecasting, voluntary disclosure, choice of accounting methods, and estimation of accruals. While research exists in all these areas, I will focus on the management of accruals (also known as earnings management). Accrual accounting is the heart of our financial-reporting system. I will discuss several aspects of earnings management: motives for earnings management, major findings, estimation of discretionary and nondiscretionary components, and unresolved issues.

Motives for Accrual Management

Motives fall into two broad categories: opportunistic or signaling. We tend to perceive the latter as benign, but not the former. Motives for managing accruals relate to compensation contracts, debt covenants, capital market pricing, taxes, litigation, and regulatory behavior (Watts and Zimmerman 1986; Beaver and Engel 1996). Each motive constitutes a broad category that encompasses a variety of specific behaviors. For example, capital market effects include management's attempts to influence the offering price in equity offerings, the terms or the value of stock options, and prices at which management-held securities are sold.

These motives can operate in either opposing or reinforcing ways, often making it difficult to isolate the primary motive (Healy and Wahlen 1999). For example, both capital market and compensation contracts can lead to incentives to overstate earnings. As a result, many researchers have not specified the precise nature of the underlying motivation, seeking instead to determine whether an empirical estimate of the discretionary accrual is related to some firm characteristic (e.g., financial difficulty, loss avoidance, income smoothing, big baths).

What Have We Learned?

Managers exercise discretion in response to a rich set of forces. Researchers use three major approaches to identify earnings management: generic models of discretionary accruals (e.g., Healy 1985; Jones 1991), tests based on discontinuities in the reported earnings distribution (e.g., Burgstahler and Dichev 1997), account-specific models of discretionary behavior (McNichols and Wilson 1988; Petroni 1992; Beatty et al. 1995), and combinations of these approaches (Beaver, McNichols et al. 2000).

⁴ McNichols (2000) reviews recent research in earnings management and discretion with respect to accounting data. Schipper (1989) provides an early perspective on earnings management.

Management appears to manage earnings to avoid a loss, to avoid an earnings decline (Burgstahler and Dichev 1997), and to avoid falling below analysts' forecasts (Burgstahler and Eames 1998). Firms that issue earnings forecasts tend to manage earnings toward meeting those forecasts (Kasznik 1999; Matsunaga and Park 2001). Earnings management appears to be widespread and relatively easy to detect, at least as estimated by extant techniques. Loan loss reserves in the banking sector and policy loss reserves in the insurance sector appear to be two major accounts subject to management. Accrual management is only one form of earnings management. Others include hedging activities (Barton 2001) and altering research and development expenditures (Bushee 1998). In the banking sector, management appears to manage the loan loss reserves jointly with other forms of earnings management (Beatty et al. 1995).

Capital markets appear to price differently the nondiscretionary and discretionary components of an accrual. In the banking sector, capital markets treat additional loan loss reserves as good news, not bad news, consistent with signaling interpretations of discretionary reporting of estimated loan losses. In particular, financially stronger banks signal they can afford to take the hit to earnings (Beaver et al. 1989; Wahlen 1994). Capital markets price discretionary components of loan loss reserves differently than nondiscretionary portions (Beaver and Engel 1996).

In the property and casualty sector, the development of policy loss reserves is consistent with earnings management (Beaver and McNichols 1998). The stock prices of property and casualty firms appear to reflect fully the predictability in the policy loss development (Beaver and McNichols 1998, 2001). However, the evidence from the generic accrual studies suggests a different picture with respect to market efficiency and the pricing of accruals. Accruals, considered to be more subject to discretion, are less persistent than stock prices of existing securities imply, whereas cash flow from operations is more persistent than stock prices imply (Sloan 1996; Xie 2001). Unusual accruals occur at initial public offering dates and reverse themselves subsequently. These unusual accruals appear to be correlated with the negative abnormal returns observed in the initial public offering literature (Teoh et al. 1998a, 1998b; Teoh, Wong et al. 1998).

Estimation of Discretionary and Nondiscretionary Accruals

A major issue with respect to the power of this research is the ability to identify proxies or conditioning variables that reflect the discretionary and nondiscretionary components of the accrual. In the Jones (1991) model, sales is the key nondiscretionary variable driving current accruals, and capital expenditures is the key variable driving noncurrent accruals. Needless to say, this is a parsimonious model. Research investigating sector-specific accruals, such as the loan loss provision, typically uses sector-specific variables, such as nonperforming loans, to increase the precision with which one can measure the nondiscretionary component.

Identifying proxies for discretionary accruals can be a challenge. Often, studies regress total accruals on only the nondiscretionary variables and assume the residual is discretionary (e.g., applications of the Jones model). Of course, failure to identify fully the nondiscretionary component implies the regression residual contains both discretionary and nondiscretionary components, and the researcher has measured the estimated discretionary and nondiscretionary components with error. Typically, the explicit conditioning variables for discretionary accruals, such as earnings or leverage, are generic. These generic variables can be proxies for many firm characteristics, which make the interpretation of coefficients of the discretionary accruals in valuation equations challenging.

The development of policy loss reserves in the property-casualty sector provides a unique opportunity to identify the discretionary component of an accrual (Petroni 1992).

Property-casualty firms must report *ex post* estimation error for reserves reported in earlier years, where the amount of this error is called development. Researchers can estimate the discretionary component without a specification of either discretionary or nondiscretionary variables. Development includes *ex post* surprises of a nondiscretionary nature. However, if development is not subject to discretion, then it has an expected value of zero, and, by implication, zero serial correlation. As discussed earlier, empirically, development has a positive expected value for financially weaker firms, implying an understatement of the loss reserve (Petroni 1992), and development is highly positively serially correlated over time, consistent with management recognizing information slowly over several years (Beaver and McNichols 1998). Petroni et al. (2000) further decompose the development into discretionary and nondiscretionary components and find they have different implications for future profitability, risk, and market value.

Unresolved Issues

Much of this discussion implies that extant methods for the identification of discretionary accruals are of potentially low power. Using an empirical simulation, Dechow et al. (1995) provide evidence that extant models are not very powerful. Yet, empirically, the majority of studies observe earnings management. Moreover, many forms of earnings management appear to be identifiable not only by researchers, but also by the capital markets.

Why is it relatively easy to detect earnings management empirically if the models are of low power? One might conjecture that effective earnings management (at least of the opportunistic type) would not be easy to unravel. Why is it relatively easy for the researchers to detect earnings management, typically using contemporaneous (not future) data? Is management naïve? Does earnings management achieve its goals (often unstated) even if it is invertible? What incentives for earnings management are consistent with the capital market's ability to invert the discretionary portion and price it differently? Is discretionary behavior a natural manifestation of contracting in incomplete markets (Demski and Frimor 1999)? The nature of the discretion may be known but not contractible. Incentives and costs to eliminate discretionary behavior are unclear, and discretionary behavior may be an equilibrium outcome, albeit not a "first best" solution.

These questions, of course, raise the possibility that what looks like earnings management may not be. Perhaps what researchers observe is not discretion or management at all, but is a proxy for some other factor. If so, then what might those factors be? McNichols (2000) offers evidence that discretionary accruals are correlated with growth and that the mispricing of accruals may in fact be the "glamour stock" phenomenon (i.e., the mispricing of high-expected-growth stocks) in disguise. In particular, she shows that aggregate accruals models that do not incorporate long-term earnings growth are potentially misspecified and can result in misleading inferences regarding earnings management. The implication is differential behavior observed in prior studies may relate to the performance characteristics of the firms (e.g., correlated with growth) rather than to differential incentives to manage earnings.

VII. CONCLUDING REMARKS

Market efficiency, Feltham-Ohlson modeling, value relevance, analysts' behavior, and discretionary behavior not only have had the greatest impact on capital market research over the last ten years, but they also have the greatest potential to contribute significantly to our knowledge over the next five to ten years. These areas address important questions. They are linked together and build upon one another's knowledge and research designs.

They raise major issues that remain unresolved. Three recurring themes are markets (efficiency, valuation), individual behavior (investors, analysts, managers), and accounting structure or context. Accounting research is distinct and important only insofar as it confronts the first two themes with the third—an observation similar in spirit to the point made by my predecessor (Kinney 2001).

Each of these research areas is controversial in terms of either findings or research method. Is important research by nature controversial? I believe controversy is a natural consequence of conducting important research, especially in the early stages of the research. Innovative research is likely to be the most controversial of all. Thirty-five years ago, many questioned whether capital market research with respect to accounting numbers was legitimate accounting research.

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