

RECOGNITION: AN INFORMATION CONTENT PERSPECTIVE

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Synopsis: This essay offers a synthesis of the varied accounting literature on recognition. First, in a review of the historical evolution of accounting thoughts, two debates on accounting measurements stand out: historical cost as the basis for asset valuation and realization as the basic test for income determination. These debates have specific implications for the recognition issue. Second, we examine the shift from the traditional measurement perspective to an information content perspective in both rhetorical policy debates and academic accounting thoughts. Under the information content perspective, the (strategic) decision-making context becomes particularly important. Lastly, we advocate information content as a combining perspective, not as a replacement of the measurement perspective. In particular, we draw attention to the recent academic studies with an explicit or implicit theme of recognition. These studies combine modern information economics with the accounting measurement structure. This line of research has the potential to provide further understanding of the comparative advantage of accounting as a source of information.

RECOGNITION: AN INFORMATION CONTENT PERSPECTIVE

The purpose of this essay is to provide a synthesis of the varied accounting literature on recognition to accounting scholars, students, and practitioners. Glancing through the accounting literature dating back to early 20th century shows recognition has been a pervasive and fundamental issue in accounting practice and in the accounting academy. Recognition serves a key role in both the traditional measurement perspective in accounting (which stresses the accounting measurement structure) and the newer information content school (which emphasizes the economic use of accounting information). This essay advocates information content as a combining perspective, *not* as a replacement of the traditional measurement approach. Recent studies in accounting have moved to combine the two perspectives in a variety of settings. This approach has the potential to further our understanding of the comparative advantage of accounting as a source of information.

By recognition, we refer to the ubiquitous accounting issue of determining when and how particular items (e.g., transactions) enter the accounting records of an entity. These records are the basis of the entity's financial statements. By specifying what to include, recognition also excludes all other events from the accounting records.¹ Therefore, accounting recognition, manifested in accounting standards, conventions, and in professional judgements by accountants, prescribes the boundaries of accounting records and governs the content of the accounting products (e.g., financial statements).² It is, thus, fundamental to accounting.

¹ For the purpose of this essay, we consider recognition rather broadly. Any items in the annual report that are prepared by the firm's accountants and attested by the outside auditors are considered recognized by accounting. However, we do draw the distinction between recognition and firms' voluntary disclosure which is not audited. Such disclosures (like management earnings forecasts, revenue forecast, or other types of announcements) are not recognized by accounting.

² Demski (1997) uses a library metaphor for accounting, calling accounting as a "well-maintained, structured, and defended financial library." Knowing what is included in the library, along with how to combine the information with information from other sources, is a key skill for professional managers.

Recognition is often at the center of accounting controversies such as recent debates on stock options, R&D, and revenue recognition. Many firms objected to the proposed rule by the Financial Accounting Standards Board (FASB) that would have required recognition of economic costs associated with granting employee stock options. Questionable revenue recognition practices by some firms have drawn the attention of the SEC as well as the financial community. International differences in recognition rules are also well-noted. For instance, in Great Britain and Brazil, accounting practices on assets reevaluation are different from the US, similarly for the recognition of internally generated intangible assets in Japan. Recognition is, thus, a pervasive accounting issue and it is no wonder debates over various recognition issues have had a rich and lengthy history.

We begin with the long and varied standing of accounting recognition in the history of accounting thoughts. First, searching through the historical discussions on recognition uncovers a measurement approach with emphases on asset valuation and income determination. Second, we review the rise of the information school of accounting and its influences on the way recognition questions are framed. Next, the foundation necessary for a “modern” economic analysis of the recognition issue is considered. Finally, we catalog recent advances in the literature that combine information economics and accounting structure.

MEASUREMENT PERSPECTIVE

Although not explicitly articulated, there seemed to be an agreement among mainstream accounting scholars in the first half of the 20th century that accounting serves a measurement function. In particular, income determination and asset valuation were viewed as the main functions of accounting. In his masterful book *Accounting Theory*, Paton (1922, 6) wrote: "the essence of the accountant's task consists of the periodic determination of the net revenue and the financial status of the business enterprise." Alexander (1948, 131) wrote: "[t]he determination of income is the principal task of the business accountants." The approach, mainly analytic, was to derive a measurement basis from some “self-evident” postulates (e.g., entity, continuity, periodicity). Thus, the disagreements arose mainly from different definitions of assets and

income and different postulates about accounting's environment. Naturally, the disagreements produced different procedures to measure the underlying stocks and flows. A number of extensive debates over these issues took place with participants from all interested groups: scholars, practitioners, and regulators.

Asset Valuation Debate

Before the income statement became the dominant financial statement, asset valuation was the main topic of discussion in accounting debates. The most important part of the debate in asset valuation had been over historical cost. Theoretically, one can derive historical cost as the valuation basis for some accounting items from the continuity assumption. Since legally a corporation has an infinite life span, a going concern is assumed. Therefore, fixed assets should be valued at historical cost because they are not intended for sale, while current assets should be valued at current price because the eventual fate of current assets is for sale. Intended uses of the assets were emphasized as the driving force behind valuation procedures. This logic was shared by Lawrence R. Dicksee and Henry R. Hatfield, both prominent accounting theorists in the early 1900s. (See Chatfield 1974, 235)

However, in accounting practice, conservatism was a dominant accounting principle at the time. Items like inventory, a current asset, were not valued at market value (lower-of-cost-or-market was most popular). Reed Storey (1959, 236) called this "an incomplete application of the going concern convention tempered by conservatism." The dominance of conservatism may be influenced by bankers, who at the time were the main readers of financial statements and aggressively demanded conservative accounting rules.

With the emphasis of accounting shifting to the income statement, other accounting principles like objectivity and matching were used to support historical-cost accounting. American Accounting Association (AAA 1936, 188) supported the view that "accounting is thus not essentially a process of valuation, but the allocation of historical costs and revenues to current and succeeding fiscal periods." Attaching historical cost to assets was thus a residual consequence. In fact, Paton and Littleton (1940) viewed assets as unallocated costs awaiting their destiny. Accountants were essentially "costers," not valuers.

On the other hand, criticisms of historical-cost accounting had also been prevalent. Canning (1929) sees assets as expected future services and the only logical measurement is the properly discounted future receipts from their uses. Changes in the asset value during the entity's ownership must be recognized in the accounts accordingly. This conclusion was shared by Paton (1922) and Alexander (1948). In the preface of *Accounting Theory*, Paton wrote: "[t]he liberal view that, ideally, all bona fide value changes in either direction, from whatever cause, should be reflected in the accounts has been adopted without argument. . . . this logical position is the proper one for the professional accountant, at least as a starting point." (p. vii)

After the two World Wars, historical-cost accounting was also under attack by the public due to the fact that inflation had become more important. During a period with relatively high inflation, historical-cost-based financial statements were becoming more and more meaningless, or so it was argued. Edwards and Bell (1961) suggested using replacement costs (or buyer's price) as substitutes for historical prices in valuing assets. Chambers (1966) proposed the "continuously contemporary accounting" system, which relies on realizable market value (or seller's price) as the valuation basis. Based on a single-trader's decision model, Sterling (1970) uses information criteria (e.g., verity and relevance) and the quantitative theory of communication to support present market value as the proper valuation basis. For a contemporary discussion of asset valuation, see Holthausen and Watts (2000, 31)

Income Determination Debate

Regarding income determination, heavy influences from legal decisions (e.g., corporate law and tax codes) and economic theories (e.g., economic theory of income) had been pervasive in the income debates. The adoption of the realization principle, as the main tool to deal with accounting income recognition (i.e., income may be booked only when it is realized), was strongly influenced by income tax legislation and court decisions (e.g., the Supreme Court's 1920 *Eisner vs. Macomber* decision³). As a result, income was

³ The high court ruled that receipt of common stock dividends did not constitute effective realization of income for tax purposes. It is the court opinion that income could not arise without (1) an effective addition to the wealth of the recipient, and (2) a "severance" of the gain from capital.

directly associated with the separation from capital (i.e., realization), which usually requires an exchange transaction such as the sale of an asset.

The realization principle also received wide acceptance by accountants. Paton and Littleton (1940, 49) wrote: "[a]s a basis for revenue recognition in accounts, realization is in general more important than the process of earning." The matching principle, an intuitive and companion concept that essentially determines the expenses to be deducted from realized (therefore recognized) revenue, had also gained more acceptance for its expediency and convenience. As a result, accounting income does not have an intrinsic definition and is operationally defined as the result of applying the realization and matching principles. It offered the accounting profession the much-needed protection against potential liabilities from the law or public perception. In short, the realization test had become one of the most important and durable concepts in income determination.⁴

Economists, on the other hand, were critical in this income debate. The lack of an intrinsic definition of income in accounting literature frustrated economists like Canning, who wrote: "[a] diligent search of the literature of accounting discloses an astonishing lack of discussion of the nature of income." (Canning 1929, 93) In addition, he observed that "what is set out as a measure of net income can never be supposed to be a fact in any sense at all except that it is the figure that results when the accountant has finished applying the procedure which he adopts." (p. 98-99) He suggested adopting economic income, defined by Irving Fisher (1930) as the starting point for analysis. Alexander (1948) began his monograph with a definition of income (influenced by Hicks 1941): "a year's income is, fundamentally, the amount of wealth that a person, real or corporate, can dispose of over the course of a year and remain as well off at

⁴ Chatfield (1974, 260) noted on its wide acceptance: "Income finding depended on a series of interlocking assumptions which included historical costs, continuity, conservatism, and periodicity as well as matching and realization. These were made compatible by the ascendancy which income measurement had attained over asset valuation, and by the fairly stable prewar price structure. If not exactly elegant, they generally corresponded to the perceived reality as reflected in the periodical literature. It would prove very difficult to alter any one of them without changing their conglomerate effect. Those who accepted these assumptions confronted a closed and self-justifying system which, like the laws of Newtonian physics at the turn of the century, seemed to leave little to be discovered."

the end of the year as at the beginning." (p. 127) Additionally, the neoclassical theory of the firm (in particular, the cost function of a multi-period firm) suggests that income at the firm level is nothing but the return to a factor of production: the capital. Under these economic approaches, all changes in asset value, realized or unrealized, must be included as income.

However, literal application of the economic definition of income implies consideration of all changes in present value of future net receipts, including those caused by revision of expectation of future events like discount rates. This all-encompassing concept of income turned out to be too subjective for accountants to accept as a whole. Comparisons of the two income concepts (i.e., the operational accounting income and the intrinsic economic income) had become a major line of theoretical research in accounting. For example, Edwards and Bell (1961) introduced the notion of "entry" (i.e., buyer) and "exit" (i.e., seller) prices and build a system of income reporting that emphasizes the distinctions between operating and holding gains, between realized and unrealized gains. (Also see Lee 1974, and Parker, Harcourt, and Whittington 1986.)

Challenges to the realization principle also came from accounting theorists who believed that the realization principle is too arbitrary and narrow. In the *Accounting and Reporting Standards Underlying Corporate Financial Statements*, AAA (1957, 3) states that "[t]he essential meaning of realization is that a change in an asset or liability has become sufficiently definite and objective to warrant recognition in the accounts," which caused Sprouse (1965) to argue that this definition had made realization "merely a synonym for *recognition*." (p. 522). The 1964 AAA committee on the Realization Concept recommended a shift from liquidity to measurability as the test of recognition, further lessening the importance of realization. Horngren (1965) offered a compromise proposition which has a liberal recognition rule (for change in asset value) coupled with a strict realization rule (for earnings purposes). Myers (1959) proposed a critical-event notion as an alternative guide to recognition,⁵ which is still used in the policy and practical

⁵ Myers (1959, 528) proposed a critical event principle "which is both (1) as clear and uniform in its applicability as that of matching cost and revenue and (2) sound from an economics standpoint."

arenas (Johnson and Storey 1982). Finally, FASB abandoned realization as a major accounting concept in favor of a more general recognition concept (Concepts Statement No. 5) while realization is installed as one of two tests for recognition of revenue.

Although some practitioners at the time had proposed some alternative, market-based valuation models,⁶ the primary concerns of practicing accountants were not necessarily reporting economic income. Alexander (1948, 128) noted "Choice among various concepts of income is not governed only by considerations of which measure best serves the ends in view." Further, he considered the profession's attempt to minimize responsibility for human judgements as another powerful factor. "This desire to avoid responsibility has led accountants to set up two requirements for sound accounting that somewhat limit the choice of methods. These are the requirements of objectivity and conservatism. To the extent that accountants have achieved objectivity and conservatism they have made the measurement of income safer but they have also made it yield a result that only partially achieves the end sought." Devine (1985) made a similar observation that the accounting profession yielded to demands from liquidity-minded bankers more than the calls for economic theories.⁷ The changing business environment has been the major force in changing accounting practices, not only the evolution of normative accounting theories.

Recognition in the Asset and Income Debates

Within the modern framework of the FASB conceptual statements, the operative issues in the two debates outlined above are considered as recognition and measurement issues. They specifically deal with

⁶ See, for example, the selected speeches by then Arthur Andersen Chairmen, Spacek (1969) and Kapnick (1974).

⁷ Devine (1985) wrote, in the essay titled "Recognition Requirements -- Income Earned and Realized," that "the accounting profession has been subjected to conflicting forces and demands. Economists have tended to assume that income is management's chief concern with only minor financial problems and have long been enemies of the realization concepts. . . . Lenders, on the other hand, have insisted on realization tests and have had little interest in measures of income not supported by current assets. The latter group has been so convincing that many accountants still are reluctant to show acknowledged increase in value even as footnotes."

the questions of what economic events to consider for asset valuation or income determination purposes.⁸ For example, the historical cost debate can be rephrased as choosing between past transactions (which leads to historical costs) or current (or potential) transactions (which leads to market value) to recognize on the balance sheet. The (income) realization debate can be thought of as when should accountants recognize sales in the accounting records: at the time of the sale, the time of collection or some other point.

Given that accounting was commonly thought of as serving a measurement function, what to recognize depended upon what is the "right" measure. In Chapter XIX of *Accounting Theory*, entitled "Criteria of Revenue," Paton (1922, 468) wrote: "the determination of a satisfactory evidence or test of revenue is essentially one aspect of the problem of valuation." Then he laid out the measurement consequences of various revenue recognition rules. For example, "if sale is to be used as the exclusive criterion, this means that all stock on hand must be priced at cost" (because they are not sold yet). Indeed, measurement was the focus in the analysis. In turn, recognition, and accounting procedures in general, were evaluated on the merit of measurement. Again, Paton (1922, 469) noted that the "accounting procedure or principle is best which most nearly preserves the integrity of the statements for each fiscal period. . . . with respect to the allocation of gross revenue to each year (or other accounting period), and the amount of the periodic net revenue, each method varies. And these are important matters."

The main arguments in the challenges to the realization principle were also based upon the "right" measure of assets and net income. For instance, on the issue of unrealized changes in assets, the AAA Concepts and Standards Research Committee (1965) recommended that "unrealized" changes in the value of assets should not be included in the computation of reported net income, but should be shown on the income statement below the net income line. Therefore, these changes are recognized on the balance sheet (i.e., part of the right measure of assets), but not recognized on the income statement (i.e., not part of the right measure of income).

⁸ Sorter (1966) advocated this "events" approach to accounting theory in contrast to what he called the "value" approach to accounting.

Conclusion on Measurement Perspective

The majority of the early accounting writers adopted a measurement perspective. They treat accounting notions (e.g., assets and income) as measures of some underlying economic stock or flow. However, the literature on accounting measurement exhibits a lack of concerns for the demand for accounting measures. Most of the discussions concern the measures themselves (e.g., asset and income), as opposed to the nature of empirical relation system (in the sense of the formal measure theory) that is being represented by such measures.⁹ Therefore, the measurement function of accounting is assumed, rather than derived.

INFORMATION CONTENT PERSPECTIVE

With the rise of an economic theory of information, an information perspective appeared in accounting thoughts. It began to set foot in empirical research (e.g., Ball and Brown 1968 and Beaver 1968) as well as analytic research (e.g., Demski 1972, Butterworth 1972 and Feltham 1972). This information paradigm acknowledges information as a scarce resource, just like other resources that are used in production and exchange in the economy. It recognizes that demand for (and thus the value of) information is derived from improved decision-making under uncertainty. Accounting, in turn, is treated as one of many information sources, each with its unique characteristics and comparative advantage.

The shift in perspective was well articulated by Beaver and Demski (1979). They argued that income measurement loses its economic foundation in a world with imperfect and incomplete markets. They “offer a reinterpretation of income reporting and accrual notions in terms of a ‘cost-effective’

⁹ Some exceptions do exist. There have been attempts to establish an axiomatic foundation for accounting using this measurement perspective (e.g., Mattessich 1964, Mock 1976, and Ijiri 1978). Ijiri (1965) constructed axioms upon which a conventional, historical-cost-based measurement system can be derived. Vickrey (1970) and Mock (1976) also tried to apply formal measure theory (e.g., Krantz et al. 1971) to accounting. Under such an approach, an empirical relation system (ERS) among objects is hypothesized to exist and a measure is nothing but a numerical relation system (NRS) that assigns numerals to objects. The properties of a measure (e.g., homomorphism or isomorphism) are examined through representation theorems. Other attributes of the measure (e.g., uniqueness, and meaningfulness) are also discussed.

communication procedure.” (p. 38) Therefore, under this information content approach, the logical function for accounting in such a world is to carry information. Accounting notions like assets, liability, and earnings are treated as informative signals which tell the users something new about the entity. The usual connotations attached to these accounting labels are of less significance. In turn, different uses of accounting information and the existence of other information sources besides the accounting source become important in understanding accounting.¹⁰ We defer the review of the technical development of the information content approach to the next section. The rest of this section concerns the influence of this perspective on policy and practical discussions.

Influence of Information Content in Policy Discussions

The information concepts found their way into the policy and practice arena in accounting. The AAA’s 1957 Statement, *Accounting and Reporting Standards Underlying Corporate Financial Statements*, begins its introduction with the following statement: "The primary function of accounting is to accumulate and communicate information essential to an understanding of the activities of an enterprise." (p. 1)¹¹ It also considers the two important uses of accounting information: valuation and stewardship. "The use by investors of published financial statements in making investment decisions and in exercising control over management should be considered of primary importance." (p. 7) The importance of other information also received specific mention. "Therefore, accounting data ordinarily are most useful if supplemented by other types of statistical data and by relevant non-quantitative information." (p. 1) These

¹⁰ The idea of multiple uses is, of course, not new. Alexander (1948) recognized that there may be a number of uses of income measures and that the best for one purpose might not be the best for other purposes. He wrote: "Because different interpretations are possible, and because any concept of income can be justified only by reference to the use to which it is put, the only criterion by which a choice may be made among various methods of measuring income is the relative effectiveness of the different methods in serving the purposes for which the concept of income is to be used. But the concept is in fact used for many different purposes, so it is only natural that the measure of income best for one purpose should not be well suited to another." (p. 127)

¹¹ Notice the sharp contrast to the 1936 AAA statement in which accounting is considered a process of allocating historical costs to future periods.

important observations have been reiterated in other documents such as the AAA's *A Statement of the Basic Accounting Theory* (ASOBAT) and the FASB concept statements.

As to the accounting recognition issue, the discussions are carried out with the same information content theme. During the FASB Conceptual Framework project, recognition issues received extensive investigation (see Ijiri 1980, Jaenicke 1981, Johnson and Storey 1982, and FASB Concept Statement No. 5). In its Concept Statement No. 5, *Recognition and Measurement in Financial Statements of Business Enterprises*, the FASB first defines recognition as the process of formally recording an economic item onto the financial statements. Then it establishes four fundamental criteria for accounting recognition (subject to the materiality threshold and the cost-benefit constraint): (1) definition; (2) measurability; (3) relevance; and (4) reliability. As a throwback, two specific guidelines are prescribed for the recognition of the revenue item: revenue may be recognized when it is (1) realized or realizable; and (2) earned.

In FASB's related studies (e.g., Johnson and Storey 1982) and related concept statements (e.g., Concept Statement No. 2, 4, 6), information emphases are also prevalent. Uncertainty is explicitly acknowledged as part of the business environment that accrual accounting must deal with. In fact, uncertainty is claimed to be the "enemy of accrual accounting" (Johnson and Storey 1982, 19). Two kinds of uncertainty are considered: element uncertainty and measurement uncertainty,¹² which are the origins of the first two fundamental criteria for accounting recognition. Furthermore, the consumers of accounting information are given explicit attention (e.g., relevance) while the integrity of the accounting product (e.g., reliability) is also to be maintained. In fact, reliability is claimed to be especially important in recognition issues. Johnson and Storey (1982, 4) wrote that "[u]ncertainty is the primary source of reliability problems and that is why accounting recognition concepts focus on the reliability (representational faithfulness and verifiability) of the accounting information."

¹² It needs to be pointed out that these discussions of uncertainty are not completely consistent with the way uncertainty is formally modeled by statisticians or economists.

Further, the discussions of recognition issues seem to revolve around the reliability/relevance trade-off¹³ (Concept Statement No. 5 par. 77). They may require the accountant to choose among alternative recognition policies, which, according to Johnson and Storey (1982), include (1) non-recognition; (2) use of conventions; and (3) use of estimates and approximations. In choosing among these alternatives, they warned accountants to use "care and attention to the circumstances at hand. Otherwise, their application may result in a reduction in the reliability (and sometimes the relevance) of financial statement information. Accountants must be continually mindful of whether what is gained by using those alternatives more than offsets what may be lost by their application." (p. 8) This typical cost-benefit rhetoric on recognition issue reflects a fundamental influence of the information perspective on the development of the contemporary accounting concepts.

However, implied in these rhetorical policy discussions is the notion that there exists a set of abstract criteria (e.g., relevance, reliability) which one can use to select desirable method among a set of alternatives. The general impossibility theorem in Demski (1973) refutes such a notion. Based on a more general version of the Blackwell Theorem, Demski argued that universal comparison among all accounting alternatives (i.e., comparison without details of the decision-making context and/or preferences of the economic agents involved) is impossible.

Summary

Accounting recognition, as the fundamental accounting device that governs inclusion and exclusion, has been under intense scrutiny over the past century. Participants in the debates have come from the academics, the practice, and standard-setting bodies. Diverse approaches are taken because of the different fundamental concerns of the parties involved. To the academics, logical cohesion and internal consistency

¹³ This notion is not new either. It can be traced back to Canning (1929, 108): "[t]he two tests of convenience, reliability and timeliness, are, of course, opposed to one another. In any given set of circumstances the further back into the operating cycle one goes, the more difficult it becomes to make reliable estimates of what future final gross income will prove ultimately to be a fact. Just how far timeliness should be sacrificed to reliability is necessarily a matter to be left to that elusive and intangible thing called judgement."

have been important, as professional protection and client relationships have been to the practitioners. To standard-setters, other economic (e.g., inflation) and political factors have played major roles.

The language of the debates has been transformed from the proper measurement of accounting stocks and flows into an explicit consideration of the information content and the demand from its users. Contemporary discussions of the recognition issue have been carried out in the platform of the trade-off between the relevance and reliability of accounting information.

Somewhat curiously, few contemporary scholarly studies have been done on the subject of recognition.¹⁴ To better understand the issue, one must examine accounting recognition, part of the rich accounting structure, in a meaningful economic setting (especially a decision-making context), where demand for information is endogenous. In other words, it requires an economic foundation.

MODERN ECONOMIC FOUNDATIONS

We now turn to the economic foundation of information content and related studies on recognition and on the broader accounting measurement structure.¹⁵ These studies provide a framework to formulate accounting recognition questions in economic settings and to assess the comparative advantages of accounting over other sources of information.

Information Content and Value of Information

In modern economic theory, information can be treated as a factor of production at a very general level (Kihlstrom 1974). Economists are interested in the private or social value of information. Just like other scarce resources, information has private (resp. social) value if a person (resp. society) is willing to pay something for it. However, the information good is somewhat different from conventional goods.

¹⁴ Antle and Demski (1989, 424) attribute this to "the increasing social science perspective of the scholarly literature," among other reasons.

¹⁵ Due to the theoretical nature of the recognition issue, most studies mentioned here use mathematical modeling as the main research methodology. The length of the essay dictates that related studies using experimental or archival methods are excluded.

Specifically, the value of information is derived from the use of the information, in an uncertain world, to improve the decision made by an individual or society (to allocate productive resources). Decision-making under uncertainty and the value of information are intimately linked.

Use of information in strategic vs. non-strategic settings

There has been a long line of economic research on the value of information. The Blackwell Theorem (Blackwell 1951) in statistical decision theory establishes the necessary and sufficient conditions for one information system to be more valuable than another system regardless of the decision-making context. This important result has widespread influence in many fields including information economics (Marschak and Miyasawa 1968) and accounting (Demski 1973, Butterworth 1972 and Feltham 1972). Empirically, Ball and Brown (1968), among others, document the famous “fan diagram” indicating that accounting numbers do provide information content, on an *ex post* basis, about stock returns of the entities. All the information content studies in this early literature are within a single-person (non-strategic) decision-making setting.

In strategic settings, the decision-maker operates in a stochastic environment with other rational decision-makers (the opponents) whose decisions may affect his welfare. This causes a change in the nature of the value of information. For example, in non-strategic settings one can always choose not to use the information and be as well-off as without the information since no reactive behavior exists. Therefore, the value of an information system is at least zero. However, in a strategic setting, this “free disposal of information” is not always possible. The opponents may act differently depending upon whether the decision-maker has access to a particular information system. This reactive behavior by the opponents may change the prospects the decision-maker is facing. Therefore, it is possible, for example, that a particular source of information has negative value.¹⁶ Indeed, the roles of information in non-strategic and strategic

¹⁶ A take-home exam is a good example. Some students may not like a take-home exam (i.e., an exam that gives them access to additional information sources) because the exam may be harder.

settings are different. Demski and Feltham (1976) called these decision-influencing and decision-facilitating roles. Also see Baiman (1975) on the strategic reaction to the choice of an internal information system.

Different types of demand for information

While the use of information can be different across strategic and non-strategic settings, demand for information can also arise for different reasons. In general, economic agents may demand information for production purposes (e.g., choosing which project to pursue), for consumption/investment purposes (e.g., choosing how much to save) and for contracting purposes (e.g., choosing the best sharing rules).

The role of information in capital market and product market settings have been studied in the accounting literature. Kanodia (1980) brings corporate investment decisions, consumer consumption decisions, and capital market assets pricing into a dynamic general equilibrium and analyzes the equilibrium effects of differential accounting systems. Gonedes (1980) considers capital market equilibrium when mandated public (accounting) information and discretionary private information acquisition interact. Demski and Feltham (1994), Kim and Verrecchia (1994), and McNicols and Trueman (1994) consider the capital market effects of public (accounting) information disclosures in noisy rational expectation models. Verrecchia (1983) and Dye (1985) developed voluntary disclosure models where the manager may choose to report his private information.¹⁷ All these accounting-oriented works have their roots in modern economics (e.g., Akerlof 1970, Lucas 1972, Green 1973, Ghez and Becker 1975, Grossman 1976, 1981, Milgrom 1981, Grossman and Stiglitz 1980, and Verrecchia 1982).

Informational frictions in labor markets also create demand for information. Agency models have been used extensively to study the use of information in contracts between the shareholders (or owners) and the managers of a representative firm. Originating in the principal-agent literature (e.g., Stiglitz 1974, Harris and Raviv 1979, Holmstrom 1979, Shavell 1979), Gjesdal (1978, 1981) considers a general agency setting

¹⁷ The extant accounting literature following Verrecchia and Dye's pioneering work on voluntary disclosure is outside the scope of this paper, which focuses on recognition. See Koch (2000) for a review of analytic papers in this area.

in which the demand for stewardship information (e.g., how hard the manager works) and the demand for valuation information (e.g., the prospect of the firm) coexist.¹⁸ One important insight from this distinction is that, typically, the ranking of information systems for valuation purposes is different from that for stewardship purposes.¹⁹ This theme is also present in Magee (1978) who shows that, in an agency setting, a current value accounting system may not be superior to a historical cost system because of their different effects on the managerial allocation of effort.

Feltham and Xie (1994) expand this idea into a multi-task agency setting, where the agent has more than one productive, but personally costly, act. The insight is while an information source (e.g., the stock price of a firm) may efficiently aggregate publicly available information for valuation purposes, it is not likely to be an efficient aggregation for incentive purposes. This justifies the demand for additional performance measures (e.g., an accounting signal) to evaluate employees even though some other aggregate information (e.g., the stock price) has already been used in the contract. The driving force behind the result is, again, the difference between the valuation and the stewardship uses of information. Similar results are obtained in variant models in Paul (1992), Bushman and Indjejikian (1993) and Baiman and Verrecchia (1995).

Accounting Measurement Structure

From centuries of accounting practice, accountants have accumulated a large collection of accounting procedures and techniques to collect and process the recording of economic items regarding an

¹⁸ Gjesdal (1978) called this *decision-making* purposes. We believe the word *decision-making* should be reserved for general uses that include decision-making in both strategic and non-strategic settings. So we use *valuation* instead of *decision-making* here.

¹⁹ The reason for this difference is roughly the following. In valuation (non-strategic) settings, the value of the information system depends on how well the signal updates the prior beliefs of the decision-maker. As a result, the value of the information system depends upon the properties of the joint probability structure. In incentive settings, stochastic properties associated with the other party's behavior both *on and off* equilibrium paths are important. Consequently, the value of information hinges on the properties of the likelihood ratios of equilibrium versus off-equilibrium behavior. In Holmström (1979), inclusive information systems (information system A includes information system B if B provides a signal x and A provides the same signal x and an additional signal y) are compared in an principal-agent setting. He developed an informativeness criterion for an additional signal to be valuable. His results were further augmented by Kim's (1995) mean-preserving-spread (MPS) criterion.

accounting entity. This has led to recognizable patterns in the practice of accounting. Ready examples are the fundamental accounting equation, double-entry bookkeeping, clean surplus relation, and conservatism. Collectively, we call these common procedures and practices the accounting measurement structure. Despite the significant shift toward information content, these measurement issues continue to receive systematic investigation by academic accountants. The following is an incomplete, but suggestive, sample of such work.

Looking at a specific accounting structure, Brief and Owen (1970, 1973) phrase the accounting depreciation problem in a statistical estimation setting. Optimal depreciation schedules are derived under the assumption that users of the accounting information want to estimate the economic rate of return. Statistical estimations (e.g., least-square methods) are employed as the theoretical framework.

The work of Edwards and Bell (1961), with further development by Peasnell (1982) and Feltham and Ohlson (1995), gives valuation meaning to the clean surplus accounting relationship. This line of work theoretically links the economic variables (e.g., expected present value of future cash flows) and the accounting variables (e.g., book value and abnormal accounting earnings). Under mild assumptions, the clean surplus relation preserves the valuation equivalence of the two. Implicitly, valuing the firm using accounting numbers is the objective of the users, although this demand is exogenous to the models.

Demski and Sappington (1990) construct an accounting model with explicit accounting features such as accruals and valuation language. They identify the conditions under which the accounting income measurement fully reveals the underlying information about the firm. They suggest that the accounting accrual notion does not interfere with (and better yet, may be essential for) providing underlying information to the audience.

The works of Ryan (1995) and Beaver and Ryan (2000) feature accounting structures such as delayed recognition and conservatism. For example, Beaver and Ryan (2000) study the effect of these features on the Book-to-Market ratio and the predictability of security prices. Also in a valuation setting, Antle, Demski, and Ryan (1994) consider the interaction between accounting and non-accounting sources of

information. In a neoclassical setting, Zhang (2000a, 2000b) focuses on accounting conservatism and underlying firm growth and studies their effects on future accounting measures (like ROE). Although these studies have the appeal of accounting structure, demand for information with such a structure was not the focus of the attention or the purpose of the studies.

THE NEXT STEP

The field of information economics has provided a framework to ask interesting questions regarding the use of information. It emphasizes the decision-making context, which renders the demand for (and the processing of) information endogenous. Its profound influence in accounting thought has advanced our discipline. However, one fair criticism of this approach is its emphasis on how informational aspects (or specifications) of accounting measures affect market or non-market interactions, *not* on the measurement process followed by practicing accountants every day which presumably gives rise to such information content. Accounting is unique in that it is an information source that uses distinguishing recognition and measurement processes and is heavily and professionally managed by managers, auditors, and regulators. These characteristics must have something to contribute to the information content of accounting measures, which is precisely what accounting scholars should capture in their research.

Studies on accounting measurement structure have made specific accounting apparatus (e.g., depreciation, clean surplus, and accruals) the focus of attention. They have helped us better understand how accounting measures interrelate and how they are related to other economic variables. They have also advanced our discipline. However, lack of economic context is an obvious shortfall of this type of studies. Without putting these measurement structures into a meaningful economic context with competing information sources, the emphasis on structure (for the sake of structure) does not provide insights in our understanding of the comparative advantage of accounting as a source of information. The logical next step is to combine these two branches in order to formulate accounting questions in an explicit decision-making context. The literature has clearly moved toward this direction and progress has been made.

Returning to the topic of recognition, Antle and Demski (1989) explicitly model revenue recognition rules within a particular decision-making context. In their model, revenue recognition is framed as an early production of information about the prospect of the future cash flow. The recognition problem is the trade-off between the quality and the timing of the information. The value of this early information production (or early resolution of uncertainty) is derived from better consumption planning. The financial market is highlighted, although labor market frictions (e.g., moral hazard and asymmetry of information) are also present. The main result of their paper is that straightforward characterization of optimal revenue recognition rules (e.g., early or late recognitions) is not apparent even in elementary settings. Following this line of work, Baldenius and Reichelstein (2000), Dutta and Zhang (2000) and Liang (2000) continue the emphasis on recognition.

Along with these studies on recognition, there have been a number of academic studies that combine information economics with explicit accounting structure. Their analyses are set in economic settings (e.g., capital market, product market, or labor market context) while some accounting structure is treated as a channel through which information is conveyed. As a result, most of these studies reflect a recognition theme explicitly or implicitly. The following offers a suggestive categorization of recent accounting studies with the underlying recognition theme. Our purpose is to illustrate how this approach is carried out; it is not to provide a comprehensive survey of all related studies.

Flexible Recognition Policies

One feature of recognition is that managers have partial control over its implementation. At year-end, the recognition of certain revenue and expenses can be easily postponed. Most studies in the extant literature on earnings management and on reporting flexibility exhibit this recognition theme. Here the key feature is the (limited) managerial discretion over recognition policies. In Demski (1998), a manager's choice among reporting alternatives (borrowing or lending reported outputs on the margin) clearly resemble choices among alternative recognition rules (early or late recognition of revenue). Similar features are present in other earnings management literature such as Dye (1988), Dye and Verrecchia (1996), Ayra,

Glover, and Sunder (1998), Demski and Frimor (1999), Christensen, Demski, and Frimor (2000), and Liang (2001). All of these studies use stylized principal-agent models in which the agent has partial control over the performance measures, mimicking the fact most managers have partial control over various revenue or expense recognition rules.

Comparison of Alternative Accounting Methods in Imperfect Markets

In a typical policy debate on recognition, alternative rules are considered. To provide theoretical guidance, academic accountants evaluate these rules in settings with imperfect capital, product, and labor markets. In contracting settings, Gigler and Hemmer (1998) study frequency (quarterly vs. annually) aspect of accounting reports in a principal-agent model. Kirschenheiter (1999) considers historical-cost and market-value standards in a contracting framework. Dutta and Reichelstein (1999) consider choice of asset valuation rules (fair value vs. realized value) in a multi-period managerial control setting. With a capital market orientation, Lundholm (1999) examines the historical nature of accounting in an adverse selection setting. Kirschenheiter (1997) also examines the fair value notion in disclosure settings developed by Verrecchia (1983). In oligopoly-type market settings, Hughes and Kao (1991, 1994) focus on alternative recognition rules of R&D costs.²⁰ Melumad, Ziv and Weyns (1999) and Kanodia, et al (1998) consider how mandated information disclosure affects firms' hedging activities in commodity market settings. These alternative accounting methods (with difference in frequency or valuation bases) reflect the deeper connection to recognition since they come down to what and when to include in (or exclude from) the accounting measures.

Accounting versus Non-accounting Information

One major lesson from information economics is the conditional nature of the value of any particular information source. The existence of other, non-accounting, information sources is important in

²⁰ Studies of the role of information in product market with oligopolistic competition are too numerous to thoroughly review here. These studies include those with emphasis on voluntary nature of disclosing private information (e.g., Darrough and Stoughton 1990, Wagenhofer 1990, Feltham and Xie 1992, Newman and Sansing 1993, etc.), which may be viewed as somewhat different from recognition issues.

our understanding of the value of the accounting source, especially in today's economy with an ever decreasing cost of producing and transmitting information. Accounting and non-accounting information sources must be explicitly modeled so as to single out the comparative advantage of accounting. The aforementioned studies by Antle and Demski (1989), Antle, Demski and Ryan (1995), and Gigler and Hemmer (1998) all have such considerations. Ohlson (1999) studies the stewardship function of accounting representation (earnings, book values, and dividends) in incentive settings. Liang (2000) focuses on the timing aspect of accounting recognition (early vs. late recognition) and its interaction with managerial voluntary communication in a principal-agent model. One insight here is that accounting may not be useful for its expediency in providing timely valuation information to the security market, but for its ability to provide a veracity check on other, unaudited sources of information. In all these studies, the emphasis is on what is in the accounting records versus what is outside of the accounting records, which is what recognition is all about.

CONCLUSIONS

Recognition has been a pervasive and fundamental issue in the historical and contemporary landscapes of accounting. The traditional measurement perspective in accounting stresses connotations of accounting items like assets and income. Without modern analytic methods, earlier writers "skipped" the step of developing an explicit, economic demand for accounting measurements; so they focused on the specific aspects of accounting structure, including recognition rules. As a shift away from the measurement perspective, the information content theme stresses the use of accounting numbers in decisions under uncertainty. Issues like alternative uses and alternative sources of information are carefully studied. However, explicit accounting structure, like recognition, has been, unfortunately, neglected.

One important implication of the famous "fan diagram" in Ball and Brown (1968), confirmed by subsequent studies with refined research methods and by studies in security markets outside the United States, is that most of the security price adjustments are made prior to the announcement of accounting

numbers. Other information sources appear to be more timely in conveying information to the security market than the typical accounting source. This empirical regularity motivates both practicing and academic accountants to think deeper about what makes accounting special and about what is the comparative advantage of accounting (as a source of information) over other sources.²¹ To address the issue in a scholarly fashion, it would be beneficial to bring the two literatures (i.e., information content and accounting structure) together. Without an explicit consideration of the structure of accounting measurements, no conclusions can be drawn about accounting specifically. Without the decision-making paradigm, one cannot assess the economic usefulness of accounting information, let alone its comparative advantage over other sources.

In this essay, we take the position that the information content perspective should serve as a combining perspective, *not* as a replacement of the measurement perspective. It is encouraging that accounting literature has begun to combine salient features of both the economic context and the accounting structure. In particular, recognition has been an underlying emphasis in recent accounting studies in earnings management, revenue recognition, and competition among accounting methods. These studies have rested their analyses in sound economic settings and have, at the same time, returned to the older theme that pays more attention to accounting details. Notable progress has been made while far more work remain to be done in pursuit of this combining perspective. With the promise of a better understanding of accounting as a source of information, this literature contributes to the establishment of a deeper foundation for accounting, a foundation that is firmly grounded in the fields of modern information economics and the accounting measurement structure.

²¹ One proposal comes from Professor William R. Kinney, Jr. In his Presidential Lecture (Kinney 2001), titled “Accounting Scholarship: What is Uniquely Ours?” at the 2000 AAA annual meeting, Professor Kinney calls for accounting scholars to focus on the “knowledge about the costs and benefits of standardized accounting measurement structures for individual decision-makers and in the aggregate” as our core-competency.

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