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Information Economics and Accounting Measurement: A Blueprint for Scholarly Research

Pierre Jinghong Liang  
*Carnegie Mellon University*, liangj@andrew.cmu.edu

Xiao-Jun Zhang  
*Carnegie Mellon University*

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In this essay, we wish to make a single, simple argument. That is, if information problems are the primary root of the accounting problems, then modern information economics should be the center of accounting research. In making this argument, we plan to first revisit a somewhat elementary accounting question. Using the question as a spring-board, we retrace the rise of information economics in the accounting discipline. Finally, we argue that to answer similarly posed questions, accounting theory needs a (modern) information-economics core. It also needs to build accounting measurement structure based on the core. Such an accounting theory, hopefully, connects with the existing framework of accounting practice at a fundamental level and ought to guide accounting research, education, and policy-making.

The authors are Associate Professors on the faculty of the Tepper School of Business of Carnegie Mellon University and Haas Business School of University of California at Berkeley respectively. The essay is written for a plenary speech given by the first author at the Sixth International Symposium on Empirical Accounting Research held at Xiamen, China on December 14-16, 2007. The essay benefited from conversations with Jeremy Bertomeu and Jon Glover of the Tepper School, Joel Demski of University of Florida, John Fellingham of Ohio State University, TJ Wong of Chinese University of Hong Kong. At the same conference, another plenary speech by Professor Dan Simunic of UBC focused on research methodology. Our focus is on accounting thoughts. We believe methods and thoughts are of extreme importance to any scholarly discipline.
A Motivating Question

Let us start with a somewhat naive question on accounting:

What are the economic substance of, and the distinction between, balance sheet and income statement?

There are several approaches to an answer:

• First, a textbook approach, balance sheet reports economic stocks and income statement reports economic flows. When pressed further, one may say a few words on the valuation basis (historical cost, Lower-of-Cost-or-Market rule, Fair Values on balance sheet) and GAAP revenue recognition rules (and the associated matching principle) on the income statement.

• If one follows the current rhetoric of the US standard-setter, one may notice their reemphasizing the asset-liability view versus revenue-expense view of accounting. In their current drive to revise the concept statements, they advocate the primacy of balance-sheet (i.e., asset-liability view) to promote a particular way of approaching income measurement (that is, defining assets and liabilities followed by applying Hicksian income formula to produce an income number). Some have suggested that an elimination of the net income is possible.

• If one follows the financial press and its headlines, from time to time, one may notice some headlines involve balance-sheet issues (such as this summer, the US banks’ off-balance-sheet investments such as SIVs were very news-worthy) while some others involves income statement issues such as revenue

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2 According L. Todd Johnson of the FASB (2004), Asset-Liability View “focus on the reporting entity’s wealth as reflected in its economic resources and its obligations to transfer those resources. Income results from changes in those resources and obligations that increase the entity’s wealth and losses result from changes that decrease its wealth,” while the Revenue-Expense View focuses “the performance of the reporting entity as depicted by its reported income. In their view, income (or loss) for a period would be distorted unless it results from the proper matching of revenues and expenses in the period. Thus, assets and liabilities are the residuals of the matching process, %the debits and credits that remain on the books after they have been closed.”
recognition (such as recent restatement of earnings by Dell). Suppose we, as researchers, look upon modern accounting research for answers. An immediate reaction is that the contribution appears to be limited and indirect. Take valuation research such as large sample linear-regression-based work, we may be able to say earnings as well as book value explain some part of stock returns and/or price levels (Haulthausen and Watts 2001, Beaver 2002, and references therein). Take stewardship research, we may be able to document and explain the existence of earnings management (and sometimes balance sheet management). There appears to be a gap between the type of research questions in our work and the type of questions similar to the one posed earlier. The few exceptions include Beaver and Demski (1995) and Ohlson (2006). This gap is also reflected in a disconnect between the teaching of accounting (which focuses on the measurement mechanics) and accounting research (which focuses on information properties) in U.S. universities. So what is the role of researchers like us in dealing with the

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3 On November 26, 2007, Wall Street Journal’s David Reilly reports “A $41 billion question mark is hanging over Citigroup Inc. ... That is the amount, in a worst-case scenario, of potentially shaky securities the bank would need to bring onto its balance sheet. Citi has already taken billions of dollars of such securities onto its balance sheet and expects to take big write-downs on those holdings.” On October 31, 2007, WSJ’s Christopher Lawton reports “In August, Dell said it would restate four years of results ... %after an internal investigation found that senior executives and other employees manipulated the company’s financial statements to give the appearance of hitting quarterly performance goals. The cumulative effect of the restatements was a $92 million reduction in net income over the restatement period, Dell disclosed yesterday.”

4 In their paper titled "Income Measurement and Valuation," Beaver and Demski (1995) remarked on the gap between research and practice. They wrote: “The nature of income measurement and valuation remains as elusive as when we were graduate students. Yet issues of income measurement and valuation continue to be a central focus of the institutional setting of financial reporting, not to mention the practice and use of accounting throughout the economy. The resources and regulations of the FASB, for example, are predominantly devoted to recognition and measurement issues. Even so, academic research in accounting devotes relatively few resources to issues that resemble recognition or measurement. Smoothing is a notable exception, yet even here we stray from income or balance-sheet links.”

5 In his presidential research lecture, Ohlson (2006) proposes a "practical" earnings measurement approach, which advocates the primacy of the income statement.

6 In Demski et al (2002), Fellingham made the remark that measurement mechanics, especially double-entry bookkeeping, has a "core" property, due to its prevalence in
two gaps?

**The Rise of Information Idea in Accounting**

Looking back, researchers in the first half of the 20th century may have an easier time answering the question. During that time, mainstream accounting scholars seemed to agree that accounting serves a measurement function. In particular, income determination and asset valuation were viewed as the main functions of accounting. This viewpoint is evident in the writings of Paton (1922), Alexander (1962) and the AAA (1936). The users, and their preferences, of these measurements are not the major subject of analysis. We would like to term this the measurement world-view of accounting. 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. For example, on asset valuation side, historical cost was the key concept and on the income statement side, realization principle and matching are the key. Conservatism was the dominant rule in practice. These key concepts combine to create a somewhat robust system which achieved wide

most introductory curricula, but lacks a superstructure containing fundamental research results. On the other hand, "the concept of information has superstructure, but not a discernible core" in the introductory curriculum (p. 163).

7 In his masterful book Accounting Theory (1922/1962, page 6), Paton 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 (1962, page 131) wrote: "the determination of income is the principal task of the business accountants." American Accounting Association pronounced "accounting is thus not essentially a process of valuation, but the allocation of historical costs and revenues to current and succeeding fiscal periods." in its 1936 A tentative statement of accounting principles affecting corporate reports.

8 In a tribute volume in honor of Joel Demski, edited by Rick Antle, Froystein Gjesdal, and Pierre Jinghong Liang (2006), Jerry Feltham wrote that "Up through the fifties, and into the sixties, classical accounting thought viewed accounting as a measurement activity that provides truthful descriptions of events -- statements of fact that can be used by a variety of decision makers. There was little or no explicit exploration of the impact of accounting reports on the resulting decisions and consequences."
acceptance. Some likened the stability of the systems of accounting concepts to that of the Newtonian physics at the beginning of 20th century.9

With the rise of an economic theory of information, an information perspective appeared in accounting thoughts.10 It began to set foot in empirical research (e.g., Ball and Brown 1968; Beaver 1968) as well as analytic research (e.g., Demski 1972; Butterworth 1972; 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. We would like to term this the information world-view of accounting. Compared to the measurement world-view, the distinctive change is the explicit attention on users.11 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. Accounting policy issues like standard-setting are treated as government regulation, as one of many economic forces which

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9Chatfield (1974) 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. (p. 260)

10The AAA's (1957, page 1) Accounting and Reporting Standards Underlying Corporate Financial Statements, begins its introduction with the following: The primary function of accounting is to accumulate and communicate information essential to an understanding of the activities of an enterprise. Similar and more expansive statements are repeated by subsequent pronouncements in AAA's (1966) A Statement of the Basic Accounting Theory (ASOBAT) and the subsequent FASB concepts statements.

11Here are some relevant quotes from ASOBAT: The greatest accounting need both at present and in the future is the determination of the nature of information needs of users of accounting communications. No one really knows what individuals or any organization wants, or what they should want, and there is a need for some fundamental research on this question. ... Research here should ... involve investigating the interrelations of the decision models of the users with the nature and form of the information required and of the accounting model itself.
are subject to economic analysis. The shift in perspective was well articulated by the seminal work of 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’ communication procedure (Beaver and Demski 1979, 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 that 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. One major lesson from studying the strategic use of information has been that the mere production of information about some behavior may change the behavior being measured. As a result, some likened the information role of accounting to the instability of Quantum physics (see Fellingham and Schroder 2006).

Here are some examples of the new paradigm and new language:

- Intuitive concepts such as relevance and reliability in FASB concept statements;
- The statistical inference function of double-entry bookkeeping (see Butterworth 1972, Arya, et al. 2000);
- agency models in managerial settings; and
- disclosure in partial equilibrium capital market.

**AN INFORMATION-ECONOMICS CORE OF ACCOUNTING THEORY**

Accounting researchers in the U.S. have almost abandoned the measurement approach. Academic effort has been devoted to establish

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12 For a historical perspective and a modern synthesis of these axiomatic arguments on the existence of income measurements, see Bertomeu and Liang (2006).

13 Among scholars in the later half of the 20th century, Yuji Ijiri remains as an exception.
a completely new system of accounting knowledge based on information economics. Significant progress has been made and the discipline has developed answers to many questions on about the role of information with properties shared by accounting numbers. So we know a lot more about users and their preferences over (or reaction to) different information properties (such as statistical correlation or likelihood ratios). But are we closer to answering the naive accounting question? Yes, but not quite there yet. It seems that the speed of progress has slowed down significantly, and yet we are quite far away from having a new system of knowledge to completely replace the existing framework that was developed more than 50 years ago based on the measurement world-view of accounting. The evidence is the two gaps mentioned earlier.

As researchers, we have two paths to follow, in our opinion. First, go back to the measurement world-view and treat accounting as mainly an engineering task. Following this path requires us to believe/admit that there is something well-defined (such as Hicksian income) to be measured and let's do our best to find the measure (of "truth"). We may recognize information problems but leave them as more or less as second-order

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14 For a survey of empirical work, see volume 31 of the Journal of Accounting and Economics. For analytic work, see two recent volumes by Christensen and Feltham and by Christensen and Demski (2002).

15 A sign of maturing academic discipline is its ability to answer academic as well as policy questions. Take macro-economics for example, in his presidential address, Robert E. Lucas Jr. declared the success of macro-economics by giving significant preference to supply-side policies over short-run demand management. He wrote:"Macroeconomics was born as a distinct field in the 1940s, as a part of the intellectual response to the Great Depression. The term then referred to the body of knowledge and expertise that we hoped would prevent the recurrence of that economic disaster. My thesis in this lecture is that macroeconomics in this original sense has succeeded: Its central problem of depression-prevention has been solved, for all practical purposes, and has in fact been solved for many decades. There remain important gains in welfare from better fiscal policies, but I argue that these are gains from providing people with better incentives to work and to save, not from better fine tuning of spending flows. Taking U.S. performance over the past 50 years as a benchmark, the potential for welfare gains from better long-run, supply side policies exceeds by far the potential from further improvements in short-run demand management."
effects or as issues to be resolved by law, contracts, or market forces outside the domain of accounting. The FASB’s current drive toward Fair Value can be viewed as a return to path toward a particular measurement world-view. The alternative is to push forward with the information world-view. Following this path requires us to believe/admit information imperfections as the key problem we face and then place information economics at the center of accounting theory. However, instead of trying to completely abolish the measurement perspective, efforts should be made to make connection with it. In other words, we need to build an accounting "measurement" structure on the core. After all, the current accounting measurement system has proven to be intuitive, sensible, capable of self-correction, and gained wide acceptance. The more fundamental the connection point is, the better off we are at solving the pressing questions at hand.

Building an extensive accounting structure on the information economics core is difficult but necessary. Accounting is an artificial structure (or activity) that is designed to solve practical problems confronted by the economy of a society; so first, we need to understand the fundamental nature of the problems we face: we face information problems, not (just) engineering problems. Here are some examples of underlying information problems we face:

- record-keeping in early human societies;
- reporting for income taxes (tax accounting);
- reporting for external financing (financial accounting); and
- reporting for internal management (managerial accounting).

To take these problems seriously, we must take seriously the information imperfection. For example, the existence of financial accounting must have, in its root, a demand for external financing. In a world of perfect market (with perfect information), no financial accounting problem would arise because fund suppliers (would-be lenders or shareholders) know everything there is to know about the fund users (firms). Financial accounting is only an issue because there are potential moral hazard and adverse selection problems in the capital market. What is reported (either
mandatory or voluntary) can have an effect on prices for funds (and thus on the optimal choice of funds sources). Similarly managerial accounting is only an issue because there are potential moral hazard and adverse selection problems in the labor market. What is reported (either mandatory or voluntary) can have an effect on prices for labor (and thus on the optimal choice of performance metrics).

What this example points to is a theory of accounting based on a modern theory of the firm. The foundation of this theory of firm is asymmetric information. It consists of three major branches:

- the theory of corporate finance,
- the theory of corporate governance, and
- the theory of organizational design.

The theory of corporate finance addresses the issue of how a modern firm would raise capital. The theory of corporate governance addresses the issue of how decisions are made in a modern firm. The theory of organizational design addresses the issue of how a modern firm would assign tasks internally. The common aspect of three branches is that in the traditional theory, none of the three questions matters because they are perfectly and costlessly resolved. In the modern theory, all three questions are complex due to asymmetric information and that fact that the three interact among one other. Accounting is a key element in all three branches and it is no wonder accounting research appears in all three areas.

Back to the spring-board question on balance-sheet and income statement, a theory of corporate (e.g., Tirole 2005) finance is a logical starting point. We speculate addressing the problem involves the following process.

- Starting point of a frictionless world: perfect and complete markets;
- Miller-Modigliani result applies and accounting is easy and irrelevant;

16 See a more expansive discussion in Joseph Stiglitz’s 2001 Nobel lecture. The new theory represents a fundamental shift in economics. This new economics does not have neoclassical economics at its core with information issues on the margin. Instead, it is a whole-sale change in every aspect of economics.
• Introduce information frictions, accounting is hard but relevant;
• balance sheet (or net worth) may become critical for bank finance;
• income statement (or earnings growth and risk) may become critical for equity finance;
• solving the information problems (on the debt market and on the equity market) may require different emphasis on balance sheet or income statement. This problem is made harder when there is a conflict between management and debt (or equity) holders; between major and minority shareholders; between debt-holders and equity-holders;
• In the end, the differential emphasis in the content of balance-sheet and income statement may be one of many battlegrounds in the multi-party, long-run, repeated game.

The broader picture we wish to paint is how central information economics is toward building a modern theory of accounting. But it is also necessary to build accounting measurement structure (such as the B/S and I/S in the example). This would also go a long way to bridge the two gaps mentioned earlier and to shorten the distance between current analytic and empirical work in the U.S. This does not represent a radical shift in current status of information economics in accounting. This is simply a call for continued effort. We need to complete the mission started in 1950-60s by earlier generation of accounting scholars.

REFERENCES


Fellingham, John, and Doug Schroeder. 2006, "Synergies, Quantum Probabilities, and Cost of Control," chapter 4 (pp. 73–96) in Essays in Accounting Theory in Honour of Joel


