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Introduction

Accounting is a complex, highly varied, and far from static enterprise. At one level we are familiar with the multitude of options and choices by specific reporting entities: LIFO versus FIFO versus average cost inventory calculation, accelerated versus straight line depreciation, cost pool and "cost driver" specification in an activity based costing system, profit versus investment center reporting at the division level, when to recognize a problematic potential liability, etc. At another level we are equally familiar with the fact accounting comes in many forms: corporate, partnership, municipal, managerial, tax, not-for-profit, national income, etc. And here we see elaborate, ever-changing regulations, such as those of the Financial Accounting Standards Board (FASB), the Government Accounting Standards Board (GASB), the Securities and Exchange Commission (SEC), the Cost Accounting Standards Board (CASB), the International Accounting Standards Board (IASB), the Internal Revenue Service (IRS), etc. At a third level, we also know auditing plays a crucial role in most settings; and here, too, we encounter a multitude of options and choices, as well as a set of elaborate, ever-changing regulations.

Notice the common theme of making choices. An individual reporting entity must specify its accounting method, presumably in accordance with applicable regulations. A regulatory agency must specify the set of admissible accounting methods for some set of activities, for example accounting for research and development activities. Equally clear, the auditor must settle on a particular audit strategy, again presumably in accordance with applicable regulations.

This is where accounting theory enters the picture. Accounting theory is all about understanding, making and improving these choices. It is a guide to responsible, professional quality decision making, responsible, professional quality behavior, in the accounting arena. We know these choices are far from benign. For example, professional training in accounting is wide spread, consultants are often hired to help design and install costing systems, the Financial Accounting Standards Board is periodically threatened with Congressional intervention, and there is wide spread concern over the financial reporting standards that accompany globalization of financial markets.

Accounting theory, then, deals with accounting choices. Even here, though, the path to be taken is not unique. So it is imperative we lay out our approach at the outset. We view accounting as a provider of information. Accounting theory, it then follows, deals with accounting choices from an information perspective.

The key terms are "accounting," "information" and "theory." We take them up in turn.

Accounting

Ask yourself: to what question is accounting the answer? In our view, this is straightforward: accounting provides an answer, be it good or not so good, to the question: what is the temporal financial history of the organization or entity in question? Accounting seeks to answer

such questions as how are we doing, what have we accomplished, what stocks of resources and obligations are before us, and so on.[1] (Be forewarned: this is not to say historical cost is, or is not, an appropriate metric for this purpose.)

Next, we admit history is not an easy subject. Individuals disagree over what to acknowledge, what to stress, and even what happened. Thomas Jefferson, the third president of the United States (and the face on a two dollar bill) remains to this day a fascinating, active, and contentious subject among historians.[2]

Indeed, rendering the entity's financial history is unusually difficult because of the presence of accruals. Cash basis accounting simply tallies the cash flows, appropriately grouped; so we readily compile a systematic narrative of cash-based events. But an accrual system is forward looking. It relies on anticipated future activities. For example, listing receivables as an asset presumes the customer will eventually pay just as the going concern concept presumes the entity will continue to be economically viable for the foreseeable future.

Now, if the organization's financial history were common knowledge to all, there would be little interest in accounting. We would all already know everything accounting might tell us. Of course, reality is a different story. We know very little about what most organizations have done or are doing, just as those inside the organization are less than fully informed about what is going on inside that organization, or in its environment.

Reporting the organization's financial history, again as of some point in time, now has the possibility of telling us something we did not know. For example, are we ever surprised by a corporation's quarterly earnings announcement? Are we being sincere when we ask for an accounting report on the profitability of one of our products, or customers? Does the tax authority know our tax liability before we file our income tax return? Is the manager who forecasts unusually high earnings or claims product market success in any way influenced by the fact an audited financial statement will follow this claim (or boast)?

Fundamentally, then, we view accounting as having the potential to tell us something, yes, something about the organization's financial history, that we did not know. This might be in a financial reporting context, where valuation of the reporting firm's common stock is the issue; it might be in a performance evaluation context, where the management team's performance evaluation and compensation is the issue. The list is endless. But an interest in the organization's history is not an interest in novelty or voyeurism. It is an interest in solving a resource allocation problem. The organization's history carries "information" to this as yet unspecified but broadly interpreted resource allocation exercise.

Information

This is critical. If the accounting system tells us something we did not know, then initially we were uncertain about something. In formal terms, being uncertain about something is

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[1]We call this an historical statement because it is an attempt to assess where the organization has been and what its prospects are. It is, so to speak, a reckoning of the state of the firm as of some time. Naturally, this leads to questions such as what will the organization's history be if it does such and such? For example, what would this product cost to produce? The point is we place a broad interpretation on what it means to report on the organization's financial history.

[2]The University of Florida's Smathers Library holds over 100 books dealing with Jefferson.

expressed in terms of a listing of things that might happen, coupled with a probability assessment over these possibilities. So the work horse is a set of events, or listing of things that might happen, and a probabilistic description thereof. Information, in turn, is some observable that reveals something, leading to a change in the probability assessment. Examples are all around us: tomorrow's weather forecast, an analysts' consensus forecast of some firm's earnings, the latest consumer price index, or your score on the midterm examination. In each case we are initially uncertain about something (the weather, the firm's prospects, the inflation rate or your performance) and in principle, in each case, we can think of the information release triggering a revision of our probabilistic assessment.

This will all be formalized in due course. For the moment we simply put forward the idea that information tells us something, reduces uncertainty; and in some way, by reporting an organization's financial history the accounting system has the potential to tell us something we did not know about that organization.[3]

Our view, we should acknowledge, is not universal. Surely accounting is a formal financial measurement system. It uses a unit of account, e.g. dollars, and reports measures of accounting stocks, the balance sheet, and accounting flows, the income statement. It also reports less aggregate measures such as revenue, the cost of some product or the totality of some type of liability.

Viewed so, the formal financial measurement system is designed to record the organization's financial history, as it marches through time. But in what manner? What particular details of this history are to be recorded?

A popular idiom is accounting is, or should be, designed to measure value. Ideally, the argument goes, assets would be stated at fair value, income would be a fair and true measure of economic accomplishment relative to the net asset base employed, and so on. In this way, the organization's history is expressed in terms of a periodic stock, a stock of well measured value, and associated flow, a flow of well measured changes in value, or income.

Once market structure departs from the textbook extreme of a perfect and complete set of markets the very notion of a well defined concept of value disappears. At that point, price guides are not available for all activities. Real estate, problematic liabilities, specialized capital equipment, and privately placed financial instruments are illustrative. In each case there is simply no well function market whose current price can be relied upon as an indicator of value. Thus the independent guideline for the accounting valuation has vanished. Moreover we then see concern for, say, stakeholders in an organization, simply because the imperfect market structure does not sort out the various demands on and conflicts over the organization's resources.

We hasten to add that if valuation is the purpose, accounting is an abject failure, on a world wide basis. Economic and accounting values, where we have data, are virtually never well aligned.

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[3]We will learn this casual description masks considerable, important subtlety. An important service provided by accounting is providing a veracity check of other sources of information. For example, the management team's claim that demand has improved will be followed by an audited report of revenue. The larger story is modeled in equilibrium terms and, you will come to appreciate, an important consideration in such a setting is what might be reported if the management team misbehaves, or plays, so to speak, off the equilibrium path.

The information perspective, the notion that accounting is designed to provide information, views accounting as using the language and algebra of valuation, but for the purpose of conveying information. The distinction between the two views is subtle, but profound.

The "measure value" approach stresses the importance of a formal measurement system that well measures value. The "information content" approach stresses the importance of a formal measurement system that well conveys information.[4]

The value school, then, views the task as one of reasonably well approximating value, of designing a financial measurement system that will measure value. The information content school, by contrast, views the financial measures as measures of informative events, not of value. What is being measured, then, differs in a most fundamental sense between the two approaches.

For example, the value school would treat income as well measured if that measure well corresponded with some (vague) notion of fair, true, or economic income. The information school would treat income as well measured if that measure well corresponded with some underlying event structure we wished to communicate.

In the process, we routinely speak of assets, liabilities, cost and income, for example, terminology rooted in economic valuation. Likewise, we think of income as change in value, adjusted for capital transactions, thereby using the algebra that underlies economic stocks and flows. This is why we say the information content school uses the language and the algebra of valuation.

But the information perspective stops short of claiming the resulting accounting measures are explicit value, or value related, measures. Sometimes they are (e.g., the cash balance) and sometimes they are not (e.g., fully expensed research and development). Rather, these measures are the result of specific calculations based on explicit procedures, explicit transactions by the reporting organization and some, but only some, of what the reporting organization knows.

For example, suppose the organization knows it faces a potential liability. At this point the odds are low, and the eventual amount, should it materialize, is highly conjectural. The accounting system records nothing. Similarly, suppose the organization invests heavily in product development and advertising, and subsequently learns its new product design has been market tested with spectacular results. While the investment itself will be recorded, none of the subsequent good news enters the accounting measures at this time. The organization routinely knows more than it discloses in its financial history.[5]

Our task, then, is to construct a theoretical perspective, a "theory," that treats accounting as a source of information, and that well-explains these and many other institutional details, including its very survivorship.

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[4]In a deeper sense, to measure something means we have a set of objects (e.g., sports cars), some relationship among those objects (e.g., esthetic appeal), and then assign numbers to those objects to represent the noted relationship. So one sports car has more esthetic appeal than another if (and only if) its "esthetic score" is higher than that of the other. To measure means, simply, to assign numbers to represent some underlying relationship. Though this is getting well ahead of the story, it is important to acknowledge a measure might not exist; and when it does it may be far from unique. This latter issue is called scaling, and will play an important role in our forthcoming study.

[5]It is also important to take a broad view of what we mean by financial history. The reporting organization, as we shall stress, conveys part of what it knows through its accounting system, and supplements the formal rendering with, say, footnote disclosures.

Theory

Theory refers to a set of knowledge that explains, or purports to explain, a set of phenomena. It is a coherent description, or set of principles, that illuminate or explain some particular set of phenomena. Newtonian physics, the efficient markets hypothesis, and Darwin's theory of evolution are ready examples.

The idea is to provide a coherent description, a coherent synthesis, without losing much accuracy in the process. Sims [1996] is particularly eloquent:

> Advances in the natural sciences are discoveries of ways to compress data concerning the natural world -- both data that already exists and potential data -- with minimal loss of information. For example, Tycho Brahe accumulated large amounts of reliable data on the movements of the planets. Kepler observed that they are all on elliptical orbits with the sun at a focus, thereby accomplishing a sharp data compression. Newton found the inverse-square law, allowing still further compression and also allowing the same formula to organize existing data and predict new experimental or practical data in areas remote from the study of planetary motion. [pp 105-106]

The idea of parsimonious compression is central to this view. This is what makes theory useful, it provides structure for organizing our thoughts about some set of phenomena. This structure, this parsimonious compression, though, is not, in general, without error. A theory is unlikely to be perfect, especially in the social sciences. This means the theory with which we work is an approximation. If you like metaphors, theory comes with an error term.[6]

Newtonian physics is the classic illustration. It remains useful across a wide variety of applications, but certainly not in sub-atomic matters. Closer to home the efficient markets hypothesis has proven to be useful across a variety of settings, such as understanding the pricing of derivatives. It also has its limitations, such as the apparent anomalies in pricing initial public offerings. Classical price theory, with its emphasis on equating at the margin, is highly useful, but not without its limitations. For example, we continue to struggle to understand the impact of increasing the minimum wage, though classical price theory is quite compelling on this point.

The Financial Accounting Standards Board's *Conceptual Framework* is another illustration. Here the idea is to begin with qualitative characteristics of good or useful information, such as relevance and reliability, and proceed from there to a coherent view of financial accounting. Yet, as we shall see, when we focus on choice of accounting method and use economic theory to model that choice, it turns out these characteristics are not well functioning guidelines. We cannot use economic theory to structure that choice and at the same time cling to relevance and reliability. Nevertheless, the *Framework* remains an important device for organizing regulatory

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[6]The error term metaphor is based on statistical analysis. Suppose we have reason to think crop production, y, is related to rainfall, x. In simple terms we think of a linear model, $y = \alpha + \beta x$, where α and β are constants. Looking at the data, we notice they don't quite plot in a straight line, so we then get serious and write down a linear model of the form $y = \alpha + \beta x + \epsilon$, where the additional term, ϵ, is an error term. It is a random variable that injects some slippage, some error, in the deterministic relationship of $y = \alpha + \beta x$. The model has an error term, it is not exact.

matters. (We will revisit these cryptic comments in Chapter 19.)

In short, theory is an organizing device, one that is designed to illuminate without introducing too much error. We often phrase this in terms of effects that are of major importance, these are called first order effects, and effects that are of minor importance, called second order effects. Theory focuses on first order effects, to highlight the central issues in understanding a set of phenomena. Parsimony is essential; and we must remember to allow for an error term, to allow for effects outside the formal theory with which we are working.[7]

Turning to the subject matter at hand, the set of phenomena with which we are concerned, what is it about accounting that we want to illuminate? The short answer is we want to study, to illuminate, the choice of accounting method. Our focus is on the choice, not on how to do the accounting per se.

Moreover, we view this choice in terms of the information that is subsequently provided, and as consequential. It may, for example, affect activities within the organization, the financial market's perception of the organization, or the management team's compensation. This leads us to use economic theory, and in particular the economic theory of choice under uncertainty, as the workhorse in studying this accounting choice. This allows us to treat accounting activity on a par with other activity. It has the further advantage of treating financial market use, labor market use, and intra-organization use of the accounting product with the same perspective and tools. It has the disadvantage of relying on systematic, rational behavior by those who design and implement the accounting system, as well as by those who use that system's product.

Now you know why we stress the notion of theory as a parsimonious compression.

The Road Ahead

Our work is organized in the following fashion. Initially, in Part I, we invest in building blocks that will be important in our work. First, it will be important to envision the organization or entity for whom we account as explicitly making resource allocation decisions. For example, to study depreciation it is important to begin with a setting where the organization finds it rational to acquire a long-lived asset in the first place. The same holds for, say, inventory or financial instruments. Likewise, to study the use of accounting measures in evaluating a manager it is important to begin with an organization that finds it rational to acquire the services of a manager in the first place.

So we begin, in Chapter 2, with a sketch of a firm that combines factors of production, given its technology, to produce output. Three factors are highlighted: capital, labor, and management. This provides, as we shall see, a rich context in which to explore the usual variety of accounting issues, coupled with presence of a management that, itself, must be well motivated.[8]

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[7]We even have colloquialisms to help sort these matters out. "True in theory and in fact" is an unusually strong statement; just as "it works only in theory" is an unusually weak statement.

[8]Accounting, of course, is not any old source of information; it is highly structured, uses notions of asset, liability, equity, revenue and expense. And it reports on the activities, so to speak, of a reporting entity. This entity might be an individual, a partnership, a corporation, a not for profit organization, a government entity, or even an entire economy. Take your pick. But accounting reports about some reporting entity, tautologically. For convenience, we will emphasize a firm that acquires factors of production in factor markets, sells its output in product markets, and is organized as a corporation with identifiable residual

From here we turn to the question of how this firm would be portrayed in a classical valuation exercise (Chapter 3), one where economic value and economic income are well defined. So equipped, we then contrast this portrayal with that of a classical accounting rendering (Chapter 4), one where accounting value and accounting income are highlighted. This provides an opportunity to formally define accounting, and to link, in explicit form, the economic and accounting valuation renderings.

With the stage so set, we turn to the modeling of information (Chapter 5) and its use in a resource allocation context (Chapter 6). Importantly, information rests on the formal presence of uncertainty, and from this point forward uncertainty plays a prominent role in the development. Moreover, information does not arrive in pre-digested, easily accessible format. It must be gleaned or extracted from the carrier, just as we interpret a newspaper story or a firm's financial statements. We model this interpretation, or information extraction, from the point of view of a sophisticated user, one whose interpretation is described in terms of systematic probability revision. This places economic forces at the center of our modeling.[9]

The center piece of the information content perspective now comes into play (Chapter 7). If accounting uses the language and algebra of valuation to report the firm's financial history, what does it mean for the accounting system to be a source of information? Are the language and valuation algebra restrictive? Are degrees of freedom present in the historical rendering?

With these foundation items in place, we turn in Part II to the explicit information content perspective. This requires a focus on the use of the information provided by the accounting system. Initially we focus on information that is used to value the firm in question (Chapters 8, 9 and 10). Following some initial setup work on highly stylized valuation settings under uncertainty, and the role of information therein, we examine the case where accounting is the only source of information for the "valuation machine." Following this we co-mingle accounting and non-accounting sources of information, and review the empirical evidence on the relationship between security prices and accounting measures. This co-mingling of information sources is a theme that remains with us throughout the remainder of the study.

From here, we move (in Chapters 11 and 12) to a managerial evaluation setting, where information is potentially useful in contracting with a manager. And in Chapter 13 we combine the evaluation and valuation themes, where inherent conflict between the two settings comes into view. We cannot confine our study to a setting where information is being supplied solely for valuation purposes. We know accounting information is used for valuation and for evaluation purposes; and information content in the valuation setting does not imply information content in the evaluation setting, and vice versa. In a deeper sense, this is as it should be. Information sources interact. What we learn from one source generally depends on what we have learned from other sources. So, we cannot hope to understand accounting as a source of information without putting on the table, so to speak, other sources of information. Similarly, what is useful in one

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claimants, or common shareholders.

[9]Sophisticated, systematic use, then, is the first order effect we highlight. To quote the FASB's *Concepts Statement No. 1* , "... The information should be comprehensible to those who have a reasonable understanding of business and economic activities and are willing to study the information with reasonable diligence." (FASB [1978], paragraph 24) Cognitive and social considerations are considered in Chapter 20.

setting is not necessarily useful in another. Indeed, it is possible to have information useful in a valuation setting while at the same time it is harmful in an evaluation system (intuitively, because the presence of the information, while informative for valuation purposes, worsens the underlying control problem).

In Part III we explicitly deal with the theme of co-mingling sources of information by examining the comparative advantage of accounting as a source of information. We stress the feature that it is audited, is reasonably well protected against serious error and serious manipulation. We begin with an information content portrayal of recognition (Chapter 14). Here we stress the question of what subset of what the firm knows, or might know, should be admitted into the accounting system, at any given point in time. The auditing connection is established in Chapter 15, where we mix self-reporting by the manager with an audited rendering of the firm's financial history.

This leads to conditional recognition (Chapter 16), where what information is produced and admitted into the accounting system depends on what the manager has self-reported. A picture of conservatism emerges here, based on the simple idea it is better to check "good news" rather than "bad news" when this news is being self-reported by the manager. Inter-temporal issues, e.g., "income smoothing," (Chapter 17) and intra-temporal accruals, e.g., transfer pricing, (Chapter 18) round out the picture.

Finally, in Part IV we connect this theoretical structure to institutional details. We begin, in Chapter 19, by sketching important institutional features of multiple reporting firms, coordinating institutions, such as regulatory bodies, and the rhetoric of regulation. We also contrast the economic foundation on which we rely with the more macro view of accounting information being well described by qualitative characteristics such as relevance and reliability.

Chapter 20 concludes the odyssey with a discussion of the importance of judgment and professional responsibility. Detailing the firm's financial history is no easy matter, just as continual management of that recording and reporting exercise is no easy matter. Resources are at stake, both resources devoted to the recording and reporting enterprise and in terms of the consequences that follow from the reporting. Theory cannot tells us how to best manage this game. It can only structure the important choices. That is why we stress the ever-present theme of how to do the accounting, and the importance of professional skill and judgment in that exercise. How could it be otherwise?[10]

Summary

To claim accounting provides information is so commonplace it is nearly colloquial. Yet, it is no easy matter to put substance on this claim, to think about accounting in a way that is logically consistent with the claim that information is being provided.

This requires we be serious about what we mean by "information" and what we mean by

[10]This hints at the issue of where we draw the line between where theory ends and judgment begins. In the information content school, theory structures the choices to be made, but the choices themselves require judgment and professional skill. Dieticians, even those equipped with state of the art nutrition knowledge, do not prescribe precisely what one should eat (and when). The same holds for accounting. A contrary view, one associated with the value measurement school, holds that theory per se is nearly definitive, with judgment being far less important. Universal application of fair value is illustrative.

"accounting information." We build a simple model for this purpose, one that allows us to well identify information, accounting information, use of that information, and so on. The model, the theoretical construction, is designed to be clarifying, and to sharpen our thinking. Three caveats should be understood before we proceed. First, any model, any theory of this sort, must focus on substantive details, on first order effects, and leave the rest to chance. Otherwise, substance becomes lost in the details. We will revisit this theme at the end of our study. Second, the information perspective necessitates we look to the users of that information. Studying accounting choice without a focus on users of the accounting product is devoid of substance. It blinds us to first order effects and thus places far too much weight on the error term, so to speak. Third, theory alone cannot identify the most desirable accounting system or accounting treatment. Rather, the best choice is inherently contextual. No universal prescription is to be found, and there is no getting around the fact that professional judgment is an essential component of the exercise. Indeed, it is our hope that studying accounting theory will deepen and sharpen the reader's professional focus.

Selected References

Accounting thought has a long history. Luca Pacioli's 1494 publication, *Suma de Arithmetica, Geometria, Proportione, et Proportionalita*, provided the first coherent description of double entry recording. The first half of the 20th century witnessed a deep interest in using classical economics to better understand and refine accounting measurements. Favorite examples are Paton [1922], Clark [1923], Canning [1929], Vatter [1947] and Edwards and Bell [1961]. Hendriksen and Van Breda [1992] and Wolk and Tearney [1996] synthesize this tradition, and its connection to U. S. GAAP.

More explicitly and more formally viewing and treating these measures as information then arrived on the scene. Examples are Feltham [1972], Ijiri [1975], Demski and Feltham [1976], Scott [1996], Sunder [1997] and Beaver [1998]. Sorter's [1969] paper is particularly prescient, as is Watts and Zimmerman's [1986] stress on the reporting firm's choice of accounting method. Sterling [1970] offers an expansive view of the role of theory in accounting thought, and helps place our reliance on Sims' [1996] view in perspective.

Key Terms

Our study rests on three ideas, expressed in three key terms. *Uncertainty* means not definitely ascertainable, or known, as tomorrow's weather or market success. *Information* is some observable that has the potential to lessen this uncertainty, as with a weather forecast or management's forecast of future market success. *Theory* is a coherent explanation of some set of phenomena, as the efficient markets theory. We stress the central idea of compressing the explanation into a parsimonious, coherent, and useable description that concentrates on the major issues, the first order effects.

Problems and Exercises

1. What is the connection between information and uncertainty? Give several illustrations of this connection.

2. Provide three examples of accounting valuation, one where accounting value is below "real" value, one where it is above, and one where the two are approximately equal. What, in your mind, explains the respective patterns?

3. Sims [1996] argues that a theory is a parsimonious, useful portrayal of some class of phenomena. Perfection is not the state of the art; rather, a useful model that explains "most" or "the first order" portions of the class of phenomena is what is sought. Prepare a short paragraph that illustrates this argument. You should identify the class of phenomena you have in mind, the central idea of the theory or model in question, and what in general terms that theory or model explains or captures. Also provide a brief illustration of where it goes astray.

17 May 2001, Joel