

COST WITH TIME CAN YIELD RELIABLE AND RELEVANT FINANCIAL ACCOUNTING INFORMATION+

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Abstract

It is generally accepted that one of the key financial accounting problems of the day is how to make financial accounting reports, as tools for corporate accountability and stewardship reporting, both reliable and relevant. Practitioners, rule makers, and academics are struggling with this dilemma that is inherent in historical cost financial statements. This paper suggests that historical cost, transactions-based accounting data is nominally reliable, which is an attribute of relevance, but it can be made timelessly relevant, if data about the precise date and time the nominal amount of the transaction was measured are made available to users. Furthermore, the presumption that company-related accountants and the auditors need to prepare a set of financial statements, that they need to make relevant to an unknown set of users, should be abandoned. The valuation algorithm, the processes for making historical cost data relevant to situation-specific decision-making, are the prerogative and, most importantly, the responsibility of the users based on their perceptions of the dynamic, quantum world and their unique needs. The paper develops the logical reasons for the positions taken. It also argues that US-GAAP and the resulting financial statements may lead users of accounting information to allege that the financial statements are fraudulent. It is well-recognized by accountants and users that time, the details of which are currently under-reported, is a material fact related to the significance and usefulness of accounting information. Thus, the omission of facts about when the measurements were made, known to be important to understanding the reported information, may be the basis for the allegation of fraud.

Keywords: accounting, cost, relevance, reliability, fraudulent financial statements, time

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*Accounting seems to flourish in a stable environment,
and to languish in an unstable one.*
Maurice Moonitz, 1961

Introduction

This is a time of unparalleled change in society and economics and upheaval in accounting as an instrument of corporate accountability and stewardship reporting. The economic context which is reported on by accounting has undergone, and is undergoing, rapid and unpredictable and unprecedented change in many respects. Almost daily there are shocks and blows being dealt to financial accounting, auditors,

reporting entities, and the public, either as a result of the failure of accounting to adequately reflect economic events or because of misuse, abuse, and/or deceit in the application of accounting principles, standards, and rules.

An extensive body of recent literature identifies and describes the problems (American Institute of Certified Public Accountants (AICPA) 1994, Schneider, 1997). However, little in the way of substantive remedial action has been taken. Most re-

cently, European regulators have questioned the adequacy of the “cook book” approach of United States Generally Accepted Accounting Principles (US-GAAP) versus the emerging “principles” based International Accounting Standards (IAS) (Guerrera and Norman 2002). Thus, accounting has been left to languish, while many investors, employees, and regulators are wringing their hand in anguish. Stephen G. Butler, Chairman of KPMG, has said: “In this context, generally accepted accounting principles don’t do a very good job of describing any modern company” (Hirsch, 2002).

Although there are reasons to suggest that the traditional financial accounting model should be abandoned, no dramatically new, different, clearly superior or acceptable model has emerged over the last five hundred years. The double entry, algebraic model of Paciolo has worked well and is simple and elegant in use. However, the definition of the variables and the measurements used to quantify events recorded in it are far less elegant, stable, and ultimately truthful. These problems are not the fault of the model; they are inherent in the accountants’ definition of the variables and the assumptions made about the rules and nature of measurement.

The title of this paper, in essence, sums up its main thesis. We argue that the only financial reporting that makes sense is the reporting of cost and the precise time it was measured. This will require the abandonment of traditional financial reporting via formal, general purpose financial statements because those reports reflect erroneous, misleading information and lack reliable data about the precise time the reported measurements were made. This data is critical to understanding the data set of measurements, adjusting them to enable and enhance relevance, and facilitating the proper interpretation of the set for decision-making. The rest of this paper develops this argument in the following five sections:

- Basic Framework and Assumptions
- Concept of Cost in Financial Accounting
- The Importance of Time in Accounting Transactions
- The Paciolo Model and Financial Reporting
- Summary, Conclusions and Recommendations.

Basic framework and assumptions

Accounting is a discipline within the social sciences. It is, therefore, subject to the vagaries of the human enterprise, i. e., the dislocations and discontinuities typical of a dynamic, living society. There are two major constraints in financial accounting:

1. The quest for objectivity.
2. The need to satisfy the requirements of the law.

An example of the first constraint can be seen in business transactions. In this context, accountants tend to look for objective evidence, such as support-

ing documents, rather than rely on unverifiable opinion or personal judgment.

To satisfy the requirements of the law, corporate entities are under legal obligation to publish and circulate these reports to their owners (e.g. shareholders) annually. In order to protect the interests of both the shareholders for whom the reports are primarily intended, and others who may make use of the reports in good faith on the basis of their information content, the law attaches great importance to the message, which the report conveys. It therefore takes more than a passing interest in what the reports contain. Thus, the law makes it a criminal offence for companies to publish annual reports and accounts that are false, misleading, and which tend to misrepresent their true financial positions and operational results. In the view of the law, to do otherwise would have encouraged companies to publish reckless annual accounting reports that could ultimately lead to perpetration of fraud on investors and the public (Inanga, 1994).

The setting

A review of some of the historically important and relevant accounting literature reveals that the problems of today have been known and discussed for decades without significant progress and as alluded to by Joel Demski (2001), in his Presidential Address at the American Accounting Association Annual Meeting in August, 2001. In some respects the situation is worse than ever because of the magnitude and high rate of social change and the very real possibility that many of today’s accounting “theorists,” educators, regulators, and practitioners, i.e. the main actors in the accounting establishment, have not read, understood, and internalized the history. In the opinion of the authors, the accounting professionals are well trained in the traditions of the discipline, but under-educated in the sweep, interplay, and dynamics of social, political, economic, regulatory, and technological change processes. Consequently, they tend to repeat the mistakes of the past and have made scant progress towards a better tomorrow.

The discussions set forth and arguments made in this paper are intended to enhance the relevance of accounting information produced by the traditional model, because of need to respond to the realities flowing from change and a reexamination of several of the historic assumptions rooted in a more tranquil past. It is our contention that financial accounting data, based on historical cost transactions, “time-stamped”, provides a stable foundation upon which valuation algorithms and interpretative accounting, suggested by Paton and Littleton (1940), can build a decision-relevant data set, related to the users’ needs and the problem at hand. In our opinion, the Financial Accounting Standards Board (FSAB) has attempted to use US-GAAP to serve two conflicting objectives, reliability and relevance, and has failed to achieve either consistently. Relevance is illusory and

quixotic. It is a function of use, which is unknowable by rule makers, and thus is a function of their untested and untestable assumptions. Reliability, as conceptualized later, is based on verifiable, factual data. The paper suggests that the only financial reporting that makes sense is the reporting of cost and the precise time when it was measured. This will require the abandonment of traditional financial reporting via formal, general purpose financial statements because those reports reflect erroneous, misleading information and lack reliable data about the precise time the reported measurements were made. This data is critical to understanding the set of measurements, adjusting them to enable and enhance relevance, and facilitating the proper interpretation of the set for decision making.

All research and related discussions of necessity are based on a set of fundamental assumptions that provide the pillars on which the subsequent arguments are built. It is accepted that some of these may not be consistent with the readers' paradigms. They are articulated clearly here so that there will be no doubt as to the foundation for the positions taken. Ultimately it is hoped that those interested in the subject matter will challenge and will be challenged by the stated assumptions, the argument and logic developed, and the recommendations and conclusions reached.

The concepts of relevance and reliability

Relevance and reliability have been widely recognized in external financial reporting as two primary qualitative characteristics of financial accounting information that determine its usefulness for decision making (Financial Accounting Standards Board (FSAB), 1980, Carsberg 1984, Davies, Paterson and Wilson, 1997). Staubus (1999) takes credit for providing the foundation for and coining the phrase the "decision usefulness theory" of accounting by observing and concluding in his Ph. D. dissertation that accounting was being done for some reason and it appeared to be used (useful) in decision-making.

Associated with relevance are three sub-qualities of timeliness, predictive value and feedback value. Timeliness requires information to be readily available if it is to be useful for decision-making. Delayed information reduces both its utility and extent of usefulness for decision-making purposes. Predictive value assists users to form estimates of future cash flows and financial performance.

Staubus (1999), reflecting the thinking of the 1950s and 60s, suggests that the interest in predicting cash flows was their relation to expected cash dividend payments and the pricing of common stock as a multiple of expected future dividends, which is at variance with current practices. Feedback value is closely related to predictive value. It enables financial information users to compare actual outcomes with their past predictions, to investigate significant variances, and to revise their expectations of the fu-

ture. Reliable accounting information presents a fair picture of what has occurred. Thus, the information must accurately portray what it purports to represent and give assurance to users about its verifiability, representational faithfulness and neutrality. Verifiability requires that it should be possible to check accounting data independently using accepted standards and methods, e. g., auditing. Representational faithfulness demands that accounting information be truthful and reflects accurately the underlying economic realities. The requirement of neutrality demands the absence of bias in the identification, measurement, and reporting in the information provided. That is to say that the process and methods used to produce the information reported should not favour one interest group at the expense of the others.

From the above we conclude that the usefulness of accounting information data from the accountant's perspective is a function of the process and nature of its preparation. However, a key element, time of measurement, is not considered to be a significant quantitative factor. Yet time is critical in determining when an economic event becomes an accounting (accountable) transaction and when it is quantified. The failure to report the precise moment in time the economic measurement was made is no longer necessary or acceptable. Thus, it can be suggested that US-GAAP systematically omits a material fact, the date/time of measurement, which is both reliable and relevant. Additionally, we can conclude that from the users' point of view no accounting data is (or should be) considered to be reliable a priori. Furthermore, in terms of relevance, the feedback value of current accounting information data is questionable at best. It does not provide any meaningful temporal context for understanding and evaluating the significance of the numerical accounting data. On an overall basis, we conclude that the lack of "time-stamped" accounting data nullifies the assumed qualitative characteristics of the quantifications and constitutes a significant omission of material, reliable, relevant facts.

Fundament assumptions of the authors

1. Assumptions Relate to Cost and Reliability

1. Cost is the fair market value of an economic event at a specific point in time, expressed in monetary terms.
2. Cost is reliable because it is objective, it can be independently verified, and, as such, can be considered neutral.
3. Entities initially account for/record economic events at cost.

2. Assumptions about Accounting and Reliability

1. Accounting is the process of identifying, measuring at historical cost, and recording economic exchange events of interest to the entity.

2. Reporting is a story that management tells about the significance of the accounting data. The story may or may not be reliable and relevant.

3. Assumptions Concerning Contract

1. The economic events of interest to and reported by an entity are the result of implicit or express contracts for the exchange of good and services.
2. A contract becomes effective (enforceable) at the specific point in time which sets the instant of measurement and the measurement, i. e., cost. Both are relevant and material facts.

4. Assumptions Concerning Time

1. Time is a critical factor in measuring and recording economic events as accounting transactions
2. Economic events and the accounting for them occur at specific points in time that may or not be identical, but the time of measurement can be captured or obtained objectively. It is verifiable and, therefore, reliable.

5. Assumptions about Fair Value Revaluation

1. A historic cost measurement may be revalued at a subsequent time. Neither the revaluation measurement, nor the time of re-measurement can be objectively verified, therefore, the data are not as reliable as original cost and original time. These measurements are not neutral.
2. Fair value revaluations at market are time sensitive and, therefore, can change dramatically between the time of measurement and the time of reporting.

6. Assumptions about Relevant Data

1. Relevant accounting data/information is directly related to the users' interests and needs to solve problems and/or make decisions.
2. Production of relevant data is the responsibility of well-informed users of reliable time stamped, historic cost data.
3. Fair value revaluation algorithms are situation specific, time sensitive, and unique to the accounting data set user.
4. Management cannot provide relevant and reliable fair values to accounting information data users.

The concept of cost in financial accounting

... "Costs" are the fundamental data of accounting....

W. A. Paton and A. C. Littleton, 1940

The following discussion is based on ideas developed and discussed at length by Paton and Littleton

(1940), Moonitz (1961), and Sprouse and Moonitz (1962). This literature reflects research and thinking that predates the work of Paton and Littleton. Their monograph is based on the research and discussions that occurred after the market crash of 1929 and during the subsequent depression of the early 1930's and the development of the securities laws in the mid-1930s. The general social, political, economic context and the consequences of a lack of generally accepted accounting standards in the intra-war period are essential factors in their discussion and arguments.

The question of what is the "best" measurement to use for quantifying accounting transactions has been the subject of extensive exploration and discussion. The choice has been made to opt for "historic cost." The development of an in-depth understanding of the concept of "cost" is essential to the operation and functioning of the accounting process, because cost is the basis for all measurements in accounting.

Cost reflects the fair market or exchange value of an economic event at a specific point in time. Paton and Littleton (1940) suggested that the term "price-aggregate" be used as a more generic label for amounts determined in exchange transactions of all types: the sales of goods and services (revenue), borrowing (liabilities), the sale of an equity interest (capital stock), and the purchase of goods and services (assets and expenses). The word "cost" will be used in this paper in the broadest sense, consistent with the concept of "price-aggregate."

Compelling reasons for the use of historic cost

There are two compelling reasons for the use of historic cost in the development of an accounting data set:

1. The first is that it is a reliable number. It can be verified independently of information source in "arm's - length" economic event, where there is agreement between two parties as to what the market value is.
2. Secondly, cost is what management has incurred on behalf of the enterprise in the course of producing revenue (Ijiri, 1975).

Thus cost is the economic driver that links a business entity's purpose of wealth creation with a measure of management's performance in terms of net income, which is generally considered to be a measure of management's stewardship. In considering the stewardship aspect of financial reporting, a distinction is often made between the legal and economic conceptions of stewardship. Emphasis in the legal conception, which is the basis of statutory, auditing, is on "the scrutiny of a person's report of the discharge of his responsibilities" (Littleton and Zimmerman, 1962, p.104). The focus here is on custody and maintenance of resources.

In contrast, the economic conception, which Chen (1975 p.153) refers to as "a higher form of stewardship", lays emphasis on effective use of re-

sources. This view is similar to that of the American Institute of Certified Public Accountants (AICPA p.25), which, in 1973, defined stewardship as “the efficient administration of resources and the execution of plans for conserving and consuming them”. These two conceptions of stewardship form part of what Lehman (1995) sees as accounting’s changing role in society that is dynamic.

The exchange transactions executed in this context at fair market value, i. e., cost, are part of a market-driven economy. Costs may arise in other economic contexts, but they are not of the same reliability as those that result from a truly negotiated exchange captured in accounting records.

In measuring income, accountants tend to match historical costs against revenue. This practice, as well as what is often seen as the apparent lack of appreciation of the distinction between fixed and variable costs in the economic sense, has attracted strong criticism by economists whose concept of cost is deeply rooted in opportunity cost theory. This theory uses the value of sacrificed alternative as a measure of economic cost (Gould, 1977). It would, however, be difficult to reconcile the economist’s subjective cost concept with the financial accountant’s quest for objectivity, reliability and relevance in the determination of costs arising from negotiated exchange transactions.

Non-economic influences and constraints in accounting sometimes make it difficult, if not impossible, for the accountant to accommodate some of the prescriptions of the economist within the accounting framework, even if such prescriptions have economic merit (Inanga, 1994). The use of accounting rather than economic concept of “cost” as the basis of income measurement is intuitively appealing since it has face validity. That is, when describing an economic event, explicit reference can be made to the monetary amount required in cash to settle the transaction immediately. The amount can be easily understood, readily evaluated, and conveniently verified.

Subsequently, the accounting problems of proper classification, (e.g., assets versus expense), and categorization within the classification, (e. g., prepaid insurance expense or insurance expense), are trivial in the long term, since all costs regardless of their initial treatment will ultimately become expenses. Similarly, in the long run, all costs are variable and the distinction between fixed and variable costs become irrelevant. The key here is the realization that the real purpose of the incurrence of a cost, paid for or not, fixed or variable, is related to the production of revenue. The critical issue, then, is one of matching costs with revenue. The difference between the two is net income, which is a measure of the success of management in achieving organizational objectives and its efficient and effective use of economic resources measured in money terms. The concept of economic net income will be discussed in the next section.

Matching and reporting problems relating to costs

There are at least two obvious matching and reporting problems related to cost:

1. There may not be a clear linkage between cost and revenue.
2. The economic value reflected by cost may be different from the economic value represented by revenue.

The first problem is a matter of timing, tracing, allocations, and aggregations. It is a function of the accounting process itself. It will most likely be trivial and self-correcting in a relatively short period of time. This problem is not the subject of this paper.

The second is more troubling, because it reflects a systemic problem outside of accounting. The economic values reflected by the cost of assets acquired in the distant past are reclassified and allocated to expenses and matched with revenue measured in terms of current economic values. Thus, to use the terminology of Paton and Littleton, the “price aggregates” are inherently non-comparable.

The literature suggests that the measurement of “price aggregate” at cost is based on the assumption that the monetary unit of measurement reflects a constant economic exchange value. For example, a dollar measurement made in 2002 measures and means exactly the same thing, in terms of economic exchange value, as a dollar measurement made in 1902. This is a simplifying assumption made as a matter of convenience. It is not reliable as a basis of decision - making (Anao, 1991).

Common sense argues that a historic cost is not comparable to current economic value. This systematic mismatch of economic values between current revenue and the historic cost weakens or destroys the relevance and reliability of accounting data as prepared under US-GAAP. In the United States, historic cost based accounting does not measure, i.e. require the recognition of the change in economic values, i. e., does not account for the consequences of changes in price levels. The adjustment procedures are described in GAAP (FAS #89, 1986). However, because they are not required, they are not applied. It is assumed, as a matter of convenience, that the economic measurement errors are trivial.

The problem results in the matching of historic measurements with current revenues with the result being a measurement of performance that does not reflect net income in the Hicksian sense (Hicks, 1939) and may not even reflect a meaningful accounting net income. Furthermore, the US-GAAP income statement is laden with a variety of cost adjustments buried in income before interest and taxes and specific valuation adjustment captured in “comprehensive income,” which is less than comprehensive (Schneider, Inanga, and Rodi 1999). Thus, in the view of the authors’, the net income number is neither reliable, nor relevant.

Price level adjustment techniques, e.g., general or specific indexes, have been developed to compensate for the obvious differences in economic value, but they are simplistic algebraic fixes for a more fundamental problem: the need for a dynamic system of accounting. Some of the problems related to the algebraic accounting model of Paciolo are discussed in a later section.

Until a dynamic system of accounting is developed, entities and managements will continue to record and report historical cost data, modified by efforts to report some accounts at current market value, and user/decision-makers will continue to search for relevance, while struggling with concerns about reliability.

Additionally, the current balance sheet, even after marking some accounts to market, is a mixed bag of values: accounts receivable are at net realizable value, inventories are at the lower-of-cost or market or, perhaps, the last-in, first out (LIFO) cost flow assumption; long-term assets are at net book value or restated after adjustment for impairment; investments may be at market or cost depending on their characterization; and goodwill is at "cost" less adjustment(s) for impairment. Minter (1996) has identified three deficiencies inherent in the balance sheet:

1. It fails to track changes in the value of the measurement unit.
2. It ignores the fact that "the value of the constant dollar changes irregularly in relation to different kinds of assets and liabilities".
3. It fails to account for many external events, which, while not involving exchange transactions, can affect net assets of the reporting entity and earnings measurement.

That the traditional financial statements present a picture of the entity is undeniable, but whether that picture is an impression, a reflection, or a distortion is virtually impossible to assess as they are currently assembled. The numbers add up arithmetically, but they do not in terms of economic reality. They are not reliable and can hardly be deemed to be relevant. The fundamental problem is that the current financial statements lack the qualitative characteristic of representational faithfulness.

There is, however, at this time one piece of reliable data, which probably is not recognized, in the accounting database: the precise date/time of measurement. Thus, the first step toward more reliable accounting data is to report cost at the transaction level, as originally measured AND dated. Those data points are the only "facts" the entity knows for sure and can verify, i.e., report reliably. All efforts by the management of the reporting entity to enhance relevance by revaluing historic cost data destroy any semblance of reliability.

Since measurements are made as of a specific point in time, the precise time when a measurement was made and, perhaps recorded, is a critical, material fact. This has always been of critical importance in accounting because of revenue recognition criteria

and legal imperatives. It is also important to financial statement users who need to know when an event was recognized, so that knowledge based judgments and decisions can be made. The next section discusses the importance of time in the production of reliable historical cost data.

The importance of time in accounting transactions

There is no doubt that time is a fact of fundamental importance in the accounting process. Three aspects of time relating to accounting transactions will be explored in this section. These are:

1. The moment when the original historic cost is measured,
2. The moment the cost is recorded in the accounting records; and
3. The moment a revaluation measurement is estimated.

It is possible that the time of original measurement and recording are the same; however, the time of re-measurement must be different and must be later, i. e., more recent.

Historically, it has not been possible to provide users of financial accounting data with the precise details of when each original cost measurement was made. The date/time data may not have been kept in the accounting database and, more importantly, there was practical way to give users, inside or outside the reporting entity, convenient access to the data, if it was available.

Traditionally, as a function of the accounting and reporting process, data is grouped and reported cumulatively by periods of ever increasing aggregation, e.g., day, week, month, quarter, and year. This lack of detailed information about when the nominal amounts was set is a major failing in current reporting. It can and must be overcome, since time data is relevant to understanding the historical cost data and properly revaluing and/or evaluating it for decision-making purposes.

The time of the original cost measurement is the most important of the three times. The market or exchange value of an economic exchange is determined in the market as the result of an arm's length agreement. The nominal amount at that precise time reflects the economic value, expressed in monetary terms, as a function of a particular context and a specific buyer and a specific seller. The amount and the time of measurement are two of several elements, terms or conditions of an agreement, which is in effect either an implied or express contract. Essentially, contracts specify a "give and get" relationship (Ingram and Baldwin 1998), involving three legal ingredients of offer, acceptance and consideration, which constitute necessary and sufficient conditions for a valid contract (Gower, 1970). The monetary amount of the consideration becomes the quantitative basis for the accounting transactions. They reflect sets of commitments and expectations monetized at

cost, determined at various points in time, to be realized by future performance.

It is the nature of the economic events that determines when the accounting transaction is effective in the law. One must look back at the fundamentals of accounting at this point. Accounting is based on the assumption that accounting is done for an "entity", however it is defined or understood in the law, e. g., corporation, partnership, sole proprietorship. The entity is one of the parties to the contractual situation described above. Thus, from an accounting and legal standpoint, an accounting transaction reflects a change in a legal or contractual relationship that occurs at a particular point in time.

For example, a purchase recognizes the transfer of ownership of a legal object, an asset, to a different owner. Legally there is a precise point in time when the transfer occurs. The amount of the legal obligation incurred by the buyer is measured by the cost of the legal object transferred. The obligation is either settled immediately, that is the contract is completed, or the amount owed is recognized. (A sale transaction is a mirror image.) The ultimate payment transaction is a legal act that completes the initial transaction and closes the contract. Therefore, at any given moment, the accounting equation is simply: Assets = Liabilities. In simplified legal terms the accounting equation is: What is owned by the entity = What is owed by the entity. As a point of clarification, there are two classes of entities to which the entity owes monetary amounts: "outsider"—classic creditors, e.g., vendors, lender, employees, etc., and "insiders": the owners of the entity.

Care is taken in law to distinguish between ownership and possession, which probably accounts for the adage that, "possession is nine points of the law", especially as regards the sale of goods. Thus, in accounting, sales revenue (or the cost of a purchase) is not recognized as income in a sales contract until the title to the goods passes from the seller to the buyer or, in the case of services performed, the services are rendered and all the conditions incident to performance have been substantially completed. In corporate enterprises for example, financial reporting must be responsive to the relevant provisions of the Companies Act (Gower 1970), including identification of the moment in time when the consideration was set and performance was completed. Failure to do so will result in adverse legal consequences, e.g., allegations of fraud by omission of material facts.

The attestation function of the external auditor and the fiduciary duties of the directors are considerably important in this regard, as clearly demonstrated over a century ago in *Re London and General Bank No.2* (1887) 2 Ch. D. 673. In this case, the bank had made unsecured advances to customers and credited interests to the profit and loss account, although these were neither paid by the customers nor provided for in the accounts. The auditors reported the transactions in the domestic report to the board of

directors, who successfully persuaded him to exclude the information from the auditor's report to the bank's shareholders. The auditors subsequently complied but stated in the report that, "The value of the assets as shown in the balance sheet [was] dependent on realization", a statement which the judge viewed as a truism and means of information instead of information.

According to the judge, Lord Justice Lindley (At p.675), "An auditor who gives shareholders means of information, instead of information, in respect of the company's financial position... runs the very serious risk of being held, judicially, to have failed to discharge his duty". The auditor was found guilty of malfeasance, having failed to carry out his legal duty. The judge then proceeded to spell out in detail the legal duties of an auditor and the ethical standards to which the auditor must adhere in the course of performing these duties (Ibid.): "An auditor must be honest- that is, he must not certify what he does not believe to be true, and he must take reasonable care and skill before he believes that what he certifies is true". To do otherwise would expose the auditor to liability, under common law, for any damages arising from his/her negligence.

Such liability derives from the general principle of law that, where a person has legal duty to take care, but fails to do so, he/she will be held liable to anyone to whom he/she owes a duty, in any loss or damages resulting from his/her action or inaction. Lord Justice Lindley applied this principle eight years later in *Leeds Estate Building and Investment Co. v. Shepherd* (1895) 36 Ch. D. 787, in which it was held that an auditor who fails to satisfy himself/herself that certain transactions are *ultra vires* the directors is guilty of negligence.

It is important to note that, in financial accounting, influence of the law dominates economic concepts as a guide to the preparation and publication of corporate financial statement (Inanga, 1994). Accounting and disclosures should, therefore, reflect both the legal concepts of ownership and obligation, and report precise details about when the events occurred, which are inextricably tied to the measurement of the nominal valuation. It is these relationships that cause accounting recognition, but which currently is not fully reported.

In accounting, economic measurements are made and information about resources given up and benefits received are determined. These become the factual basis for the original historical cost recording of the event in the form of an accounting transaction. Essentially the nominal measurements are classified and categorized in a database based on the decision of management. The contracts are also the result of decisions and commitments by management to expend or receive resources and to perform.

The accounting database may hold information about when the transaction was entered or recorded, e.g., the date of the journal entry or posting run. It may not contain information about the precise time

when the related contract became effective. The task of accumulating the data is not simple, but it is not impossible. There is always a cost/benefit issue, but the price for not having high quality reliable data and not making good decisions can be extremely high. Both times may be informative, but it is the time of the original cost measurement that is critical for revaluation.

Precise details about when the original historical cost was measured are important when it is compared to a revaluation amount determined at another point in time. In order to determine the significance of and, possibly, the causes for the nominal amount to differ from current market, a time reference is essential. The arithmetic difference is readily determinable, but the cause(s) for the difference is/are rooted in the context where market values are determined. Thus a change in a nominal amount determined at time "t" may differ from the market value of the same item at "t+1" merely as the result of changes in price level, i. e., inflation/deflation. In many, but not all countries, this is a change determined in a well documented, reasonably stable systematic process.

On the other hand, the change in value might be the result of a "random" catastrophic event, such as the terrorist attacks in the US on September 11, 2001. For example, if you owned the World Trade Center (WTC) at 8.00 AM (EDT) on "911" and you prepared a balance sheet and then just two hours later prepared another, the value change would be dramatic. In this situation, the cause is widely known. Usually, however, value changes are hidden, subtle, and the result of processes that are not routinely, if ever, recorded or reflected in financial accounting and, perhaps, are not well understood, if recognized at all by management.

The traditional financial reporting argument would then proceed that the reporting entity should take the responsibility to report the change in the economic value. But again time and circumstances would suggest that any valuation assigned by the reporting entity would reflect the entity's assessment at a point in time, would probably be self-serving, and of necessity would be reported well after the event and the date of re-measurement or revaluation. Again time would have intervened to alter values and render the reported "current market value" data questionable in terms of both relevance and reliability. The only real facts are: the nature of the item reported (the WTC), its historic cost (at the time of the purchase contract), the date the building was completed and put into service, and the time and date of a material subsequent event. The revaluation amount would be anybody's guess and would not be reliable, nor would it be generally relevant to the needs of any or all users.

At this point, the valuation implications are in the eye of the beholder. Whatever revaluation amount is assigned by the entity is irrelevant for all practical purposes. The market and situation specific

revaluators, not the reporting entity, will set the new value. Issues related to revaluation will be discussed in the next section. Only original cost information with additional information about the precise time the measurement was made is reliable. Without the time stamp the reliability and subsequent usefulness is degraded.

The authors suggest that the reporting of the precise time is both practical and necessary, since accounting reports the status of contracts, which became effective at a specific point in time. Furthermore, any subsequent evaluation and revaluation of a reported measurement is most intelligently done when the time of the prior measurement or revaluation is known. Financial accounting data is time sensitive. Not only should it be available promptly, but it should also provide precise, not summary information (month, quarter, year) about the time when the reported events occurred.

In order to more comprehensively understand the importance of historical cost and time data, it is necessary to look at the algebraic accounting model set forth by Paciolo over 500 years ago. It is also important to keep in mind that the objective of this discussion is to suggest a means for obtaining reliable accounting data that provides a basis for the development of accounting data with enhanced relevance.

The Paciolo algebraic model and financial reporting

Luca Paciolo, a Venetian mathematician and a reputable academic, is often regarded as the father of modern accounting. He came into prominence in 1494 after publishing a book, *Summa de Arithmetica Geometrica, Proportioni et Proportionalita*, the first printed work on Algebra and one of the earliest great treatises on mathematics (Hatfield, 1977). It also contained a chapter titled, *Particularis de Computis et Scripturis* (Yamey, 1949), which was the first printed exposition of double entry bookkeeping known as the Italian method, probably as a result of its wide practice in Venice and other commercial centers of Italy.

Critics have questioned the originality of Paciolo's *Particularis de Computis ET Scripturis* (Sweitz, 1987; Power, 1994). They argue that the work was based on some earlier manuscript that was widely used in the commercial schools of Venice. But the alleged manuscript has yet to be produced in support of the critics' argument. The strength and durability of the Paciolo algebraic model of accounting equation has been demonstrated for over 500 years.

There is no doubt that algebra works and that an algebraic-based model has value. Its dual entry requirement and the fact that it must always be in balance provide a static simplicity that is both strength and a weakness. The model is easy to understand and

use. However, there are profound limits to the burden it can carry and the work it can do.

The Paciolo model and the real world

The real world to be accounted for is significantly at variance with the assumptions that provide stability and usefulness in algebra. An algebraic model/equation is not appropriate for a context which is dynamic; where the unit of measurement is unstable; and where there is a complex of forces affecting the nominal amounts recorded, including correlations and auto-correlations. One need only reflect on the causes for the behavior implicit in the movement along and between the supply and demand curves, assuming no price level changes due to inflation or deflation, in microeconomics. The model assumes that there is perfect knowledge and, of necessity, correlated behavior.

The monetary unit of measure used to quantify cost in accounting is not stable over time. It is subject to a myriad of forces that essentially change the inherent economic values reflected by the monetary unit of measurement. That is, the market value, i. e., the cost of goods and services changes from moment to moment because it is a function of a complex set of forces acting in a particular way at the time of measurement. The significance of, cause(s) for, and implications of the difference can be understood and evaluated at a subsequent point in time, if the precise time of the original measurement is known. In other words, time provides a critical referent for the interpretation of recorded and reported historical cost accounting measurement.

Additionally, economic events in our opinion are almost always correlated, because of the complex social context within which the measured events occur. Thus, not only is there a complex multi-variate equation related to each measurement, but there are complex multi-variate equations that describe the relationship between and among variables, some of which affect each other, and some of which are affected by variables common among them. The consequence is that nominal recorded amounts do not reflect the same economic or exchange values over time.

The simple additive attribute with and between variables in algebra is based on the assumption that the unit of measure is stable through time and the same for all variables. This assumption does not hold for accounting measurements expressed in monetary terms, not because the numbers used to label the quantity of units is unstable, but the value of the monetary units, what it will “buy” in an economic event, is unstable. Therefore, although in terms of arithmetic process the numbers add up, they do not in terms of what they reflect. This raises serious doubts about the comparability, reliability, and relevance of accounting measurements over time.

The fact that accounting must use an unstable unit of measure cannot be overcome without totally

abandoning the use of a monetary unit of measure or assuming the effects of the instability and the correlations over time are trivial. Common sense would seem to militate against such a simplifying assumption. The task then is to provide additional reliable data that can be used to effect the adjustment of the measurements made at various times, reflecting differing market conditions, to a common base, accepting some degree of error.

A time stamp, directly related to the “instant” when the recorded economic event became effective and the measurement was made, i. e., the cost was determined, can facilitate the adjustment process. A set of simultaneous, multi-variate equations could result in a more meaningful, relevant set of data. Implicitly what is suggested is that a valuation algorithm applied to the highly reliable historical cost accounting data, reflecting values at known points in time, could result in accounting data whose relevance is enhanced.

Algebraic accounting and economic reality

The central question then is whether the algebraic accounting equation can provide an adequate and appropriate representation of the economic reality captured by transactions using historical cost measurements. The answer would seem to be no, since the assumptions essential to the validity of the model are violated by the use of an unstable monetary unit of measurement between variables and over time and the fact of correlations. Furthermore, the valuation algorithm is essentially an algebraic “fix” that remedies gross valuation errors, but it does not deal the more fundamental problem of the need for a dynamic system of accounting, which will not be discussed in this paper.

The need for revaluation algorithms raises yet another set of issues which will not be developed here: how should the revaluation algorithm be determined and what are the inherent risks related to various revaluators and the other users of revalued historical cost data? The authors take the position in this paper that entity management should not do and report revaluations in financial statements in an attempt to make the underlying historical cost accounting data more relevant.

Whether management has the expertise and knowledge to do meaningful revaluations is not the issue. Management has the burden of a moral hazard—a conflict of interest between its personal objectives and those of the owners of the entities and/or its lenders and or other stakeholders. In the interest of self-preservation, management with the complicity of the board of directors and/or auditors may incorrectly revalue recorded values and report them in traditional financial statements. There is a considerable risk that such statements contain innocent distortions at best or self-serving fantasies at worst. The reader need only reflect on the recent accounting

deceptions identified at Enron, Global Crossings, WorldCom, and Xerox to name just a few.

The responsibility for reliable and relevant accounting data must be split between reporting entity management and users. The primary responsibility for reliable financial reporting rests with top management, i. e., the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO). This was set forth in the COSO Report (1992) and clarified in Sarbanes-Oxley (2002) and the implementation regulations of the Securities and Exchange Commission (SEC 2003). Those documents also address the role of the board of directors and the audit committee of the board that have a supervisory, i. e., a monitoring role with respect to the top management. The independent auditors' role, that of "attester to" the fairness of the reporting in accordance with prevailing accounting pronouncements, is set in auditing standards and is also clarified and expanded in Sarbanes-Oxley (2002), the implementing regulations of the SEC (2003), and the regulations of the Public Company Accounting Oversight Board (PCAOB 2003). These are not issues of concern in this paper, however, since neither GAAP nor corporate governance is the subject of the paper.

The relevance of financial reports cannot be assured by any of those responsible for the preparation of the reports. The current reporting model is based on the untested assumption that financial statements prepared in accordance with "generally accepted accounting principle" are relevant. Reporting entities cannot know what is relevant to users, because they do not know and cannot know the data/information needs of any one or all users. Reporters can only know the facts, historical costs and times, and a description of management's intentions and purposes for the contracts recorded/reported by accounting.

The effort to prepare general-purpose US-GAAP financial statements, that are inherently inaccurate and probably irrelevant, is a waste of time and resources. What management can and must do is ensure that the cost and time data in its transaction database is correct and verified. It can make the details of the database available on a controlled basis to independent outsiders. Further, management must report in informative, descriptive terms what costs have been incurred, why they have been incurred, and how they are related to revenue. This is related to the concept of accountability developed by Epstein and Birchard (1999).

The user of historical cost and time data can adjust the accounting facts to a common base on a time sensitive basis, study and interpret the reports of management, and apply his/her own judgment and criteria to the situation at hand at a point in time known only to that particular user. Presumably users know or can determine what is useful and relevant without the blind intervention of the reporting entity and its management.

Part of the valuation algorithm may be statistically substantiated through the use of a robust system

of multi-variate equations. However, the primary burden for establishing, testing, and applying these equations must rest with the users of the revalued accounting data. Perhaps, some general-purpose revaluation equations can be developed that have both face and statistical validity. However, their use, the quantification and weighting of variables and the interpretation of the error term, rests with revaluators/user. That is, the most important affective "equations" are highly unique to the data user/decision maker, the situation at hand, and a specific decision time. These factors are subjective in nature and not subject to objective testing for face or statistical validity. The interpretation and meaning of the reported data in a decision situation is for the decision maker. The valuation algorithm is dependent on the judgment of the valuator and the specific time when the valuation is made, neither of which can be objectively verified.

Thus the recorded historical costs can be added up, but the total does not make much sense. Only if the recorded, reported accounting data is date stamped can the user attempt to properly revalue the data so that it can be understood and utilized for current decision-making. Thus, only the revaluation of the user can add up in terms of relevance. Furthermore, the current qualitative characteristic of "representation faithfulness" assumed in US-GAAP is effectively an impossible objective.

In the final analysis a management that does not produce reliable cost and time data and that does not report credible, honest stories, that enable users to understand its intentions and hold it accountable for performance, will pay a high price in the marketplace: the entity's cost of capital will increase and shareholder value will decrease (Byrd, Perrino and Pritch, 1998). The litany of financial accounting reporting failures, especially during the latter part of 2001 and early 2002, has devastated financial and stock markets worldwide. Individuals, companies, and nations have suffered huge financial losses.

The authors believe that, at least in part, these losses are the consequences of the move from historical cost to market valuations based on the self interest motivated guesses of management and the outright abuse of the accounting process. There is little doubt that the financial markets are brutal places. Ultimately, it is the market place, where accounting information users operate, that holds management accountable for its stewardship of the costs incurred in the pursuit of revenue. Failure to perform, either through incompetence or malice, carries with it a high price for all concerned.

Ultimately there must be a split responsibility for reliable and relevant accounting data. Management is and can only be responsible for reliable, verified cost and time data and comprehensive reports on performance and accountability. As noted previously, the board of directors in general; the audit committee composed of outside directors, one of whom should be an expert in GAAP; top manage-

ment consisting of the CEO and the CFO; and the independent, external auditor share responsibility for assuring the appropriate reporting in accordance with the prevailing GAAP. However, this paper is not about the selection or application of GAAP in general or in the particular. We merely assert that cost and time data, created at the time of the economic event and the accounting transaction, can be verified and reported with great reliability. It is this data that can and should be provided to users. Users are responsible for valuation algorithms that when applied to the reliable accounting data serve their needs for relevant time-sensitive data for decision-making.

Summary, conclusions, recommendations

Summary

This is a time of unparalleled change in society and upheaval in accounting. The economic context, which is reported on by accounting, is undergoing rapid, unpredictable, and unprecedented change. An extensive body of recent literature identifies and describes the problems with financial accounting and reporting, however, little in the way of substantive remedial action has been taken.

The argument made in this paper suggests a means to enhance the relevance of the accounting data produced by the traditional model, because of need to respond to the realities flowing from change and a reexamination of several of the historic assumptions rooted in a more tranquil past. The assertion was made and defended that the only financial reporting that makes sense is the reporting of cost and the precise time when it was measured. Failure to do so may result in allegations of fraud by omission of material facts: time and cost.

This will require the abandonment of traditional financial reporting based on existing US-GAAP in general purpose financial statements, because those reports reflect erroneous, misleading information and lack reliable data about the precise time the reported measurements were made. This data is critical to understanding the set of measurements, adjusting them to enable and enhance relevance, and facilitating the proper interpretation of the set for decision making.

The question of what is the "best" measurement to use for quantifying accounting transactions has been answered in practice by the decision to use "historic cost." Cost reflects the fair market or exchange value of an economic event at a specific point in time. Thus, the first step toward more reliable accounting data is to report cost at the transaction level, as originally measured. That is the only amount the entity knows for sure and can verify. All efforts by the management of the reporting entity to enhance relevance by revaluing historic cost data destroy reliability.

The time of the original cost measurement is the time when the market or exchange value of an economic exchange is determined in the market as the

result of an arm's length agreement. The amount and the time of measurement are two of several elements, terms or conditions of an agreement, which is in effect either an implied or express contract. Thus, accounting and disclosures should reflect not only the legal concepts of ownership and obligation, but should also report precise details about when the events occurred, which are inextricably tied to the measurement of the nominal valuation.

The strength and durability of the Paciolo algebraic model of the accounting equation has been demonstrated for over 500 years. However, the real world to be accounted for is significantly at variance with the assumptions that provide stability and usefulness in algebra. An algebraic model/equation is not appropriate for a context that is dynamic.

The central question then is whether the algebraic accounting equation can provide an adequate and appropriate representation of the economic reality captured by transactions using historical cost measurements. The answer would seem to be no, since the assumptions essential to the validity of the model are violated by the use of an unstable monetary unit of measurement between variables and over time. The valuation algorithm is essentially an algebraic "fix" that remediates gross valuation errors, but it does not deal the more fundamental problem of the need for a dynamic system of accounting, which was not be discussed in this paper. Ultimately there must be a split responsibility for reliable and relevant accounting data. Management is responsible for reliable, verified cost and time data and comprehensive reports on performance and accountability. Here the role of auditors and non-executive directors must be emphasized. This is because of the degree of independence expected of them. Users are responsible for valuation algorithms that when applied to the reliable accounting data serve their needs for relevant, time sensitive data for decision making.

Conclusions

The discussion and argument set forth in the preceding sections lead to the following general conclusions:

- Reliable time stamped, historical cost data provides a stable basis for users to apply their unique, situation specific, time sensitive revaluation algorithms and interpretation.
- The failure to disclose the precise time of the cost measurement, i. e., when a contract became effective, may lead to allegations of fraud as the result of the omission of a material fact.
- Relevant information is the result of the revaluation and interpretation of reliable information at a point in time, for a specific decision situation, by a specific data set user. It cannot be the responsibility of management.

Recommendations

The discussion in the prior sections and the conclusions suggested above lead to several recommendations.

- The FASB and the Securities and Exchange Commission in the US and the International Accounting Standards Board (IASB) must abandon all efforts and requirements to “mark-to-market” recorded historical cost data.
- Entities using XBRL to report their accounting data should capture in their accounting database date/time data and make it available to outsiders, to facilitate external revaluation and decision-making.
- Alternatives to traditional financial statements must be developed to ensure that reliable data and comprehensive accountability reports are available to users. Research and action are necessary to improve what management says about its performance and the way it communicates to outsiders.
- Efforts need to be made to enhance and ensure the quality of valuations made by individuals and entities, especially those used by third parties. Perhaps a valuation “science” or profession will emerge in response to market needs. Careful consideration needs to be given to the problem of independence.
- Efforts need to be made to develop a method of reporting reliable and relevant accounting information that is consistent with the dynamic context within which economic exchanges occur. Perhaps models of living systems found in biology and concepts from Chaos Theory and Quantum Mechanics can provide a starting place.
- Future research on financial reporting and the development of a more modern system of accounting needs to be conducted.

References

1. Alexander, Sydney S. “Income Measurement in a Dynamic Economy”, Revised by David Solomons in W. T. Baxter and S. Davidson (ed.) *Studies in Accounting*, pp.35 – 85, The Institute of Chartered Accountants in England and Wales, 1977.
2. American Institute of Certified Public Accountants, *The Special Committee on Financial Reporting (The Jenkins’s Report) (1994) Improving Business Reporting – A Customer Focus*, New York, NY, AICPA
3. American Institute of Certified Public Accountants, *Objectives of Financial Statements: Report of the Study Group on the Objectives of Financial Statements*, New York, 1973
4. Anao, A. R. *The Measurement of Well-being in Accounting Methodology*, University of Benin Inaugural Lecture, Benin City, Nigeria, 1991.
5. Baxter, W. T. “Income: a will-o’ –the wisp” in G. Macdonald and B.A. Rutherford (ed.), *Accounts, Accounting and Accountability*, pp. 35 – 46. Van Nostrand Reinhold (International)/The Institute of Chartered Accountants in England and Wales, 1989.
6. Byrd, John, Robert Perrino and Gunnar Pritsch, “Stockholder – Manager Conflicts and Firm Value”, *Financial Analysts Journal*, May/June 1998, pp.14 - 30
7. Carsberg, Bryan, “The Quest for a Conceptual Framework for Financial Reporting”, in Carsberg, B. and Susan Dev (ed.), *External Financial Reporting*, Prentice Hall International, London, 1984.
8. Chen, Rosita, S. “Social and Financial Stewardship”, *The Accounting Review*, July 1975. Pp 535 – 543.
9. Committee of Sponsoring Organizations of the Treadway Commission (COSO). 1992. *Internal Control Integrated Framework: Framework*, American Institute of Certified Public Accountants. Jersey City, New Jersey. 1992
10. Davies, Mike, Ron Paterson and Alister Wilson, *Generally Accepted Accounting Practice in the United Kingdom*, Fifth Edition, Macmillan Reference Limited, London, 1997.
11. Demski, Joel S. (2001) “Some Thoughts on Accounting Scholarship”, Presidential Address, American Association Annual Meeting, August 22, 2001.
12. Epstein, Marc J. and Bill Birchard, *Counting What Counts*. Reading, Massachusetts: Persus Books, 1999
13. Financial Accounting Standards Board, SFAC #2, *Qualitative Characteristics of Accounting Information*, Figure 1, 1980.
14. Financial Accounting Standards Board, SFAS #89, *Changing Prices: Reporting Their Effects in Financial Reports*. Stamford, CT: 1986
15. Guerrero, Francesco and Peter Norman, “Accounting rules in US under attack from Europe.” *Financial Times*, February 20, 2002 <http://specials.ft.com/enron/FT3AHWRLXXC.html>
16. Gould, J. R., “The Economist’s Cost Concept and Business Operations”, in Baxter, W.T. and S. Davidson, (ed.), *Studies in Accounting*, pp.141-155, The Institute of Chartered Accountants in England and Wales, 1977
17. Gower, L. C. B *Modern Company Law*, Third Edition, London, Stevens and Sons, 1970.
18. Hatfield, Henry Rand, “An Historical Defense of Bookkeeping”, in Baxter, W. T. and S. Davidson, *Studies in Accounting*, pp.1 – 10, The

- Institute of Chartered Accountants in England and Wales, 1977).
19. Hicks, J. R. *Value and Capital*, Oxford University Press, Oxford, 1939.
 20. Hirsch, Jerry, "Accountants Can't Keep Up With Financial Complexity." *Los Angeles Times*, Section C—Business, February 24, 2002
 21. Ijiri, Yuji, *Theory of Accounting Measurement*, Studies in Accounting Research # 10, American Accounting Association, 1975.
 22. Inanga, Eno L. "Accounting, Economics and the Law", *Nigerian Current Law Review*. Pp.54 – 72, Lagos, Nigerian Institute of Advanced Legal Studies, 1994
 23. Ingram, Robert W. and Bruce A. Baldwin, *Financial Accounting Information for Decisions*, 3rd Ed. Cincinnati, Ohio: South-Western College Publishing, 1998
 24. Lehman, Cheryl R., *Accounting's Changing Role in Social Conflict*, Paul Chapman Publishing, London, 1995.
 25. Littleton, A.C. and V. K. Zimmerman, *Accounting Theory, Continuity and Change*, Englewood Cliffs, Prentice-Hall, 1962.
 26. Minter, Frank C. (ed.), *Handbook of Accounting and Auditing*, Warren, Gorham and Lamont, New York, 1996
 27. Moontiz, Maurice. *The Basic Postulates of Accounting*. Accounting Research Study, No. 1. New York, NY: American Institute of Certified Public Accountants, 1961
 28. 107th U.S. Congress. 2002. *Sarbanes-Oxley Act of 2002*. Public Law 107–204, Senate and House of Representatives of the United States of America in Congress assembled. Washington, D.C. July 30
 29. Paton, W. A. and A. C. Littleton, *An Introduction to Corporate Accounting Standards*. Iowa City, Iowa: American Accounting Association, 1965
 30. PCAOB. 2003. Rel. No. 2003-025. "Auditing Standard No. 1—References in Auditors' Reports to the Standards of the Public Company Oversight Board." Public Company Accounting Oversight Board. December 17
 31. Power, Michael, (ed.), *Accounting and Science*, Cambridge, Cambridge University Press, 1994.
 32. Power, Michel, "Introduction: from the Science of Accounting to Financial Accountability of Science", in Michael Power, (op.cit.)
 33. Schneider, Wm. Bruce, "The Jenkins' Committee Report: Where Do We Go from Here?" *MSM Research Papers*, Vol. XVII, Nos.1&2, June-December 1997, pp.1-7, Maastricht School of Management.
 34. Schneider, Wm. Bruce, Eno L. Inanga and John Rodi "Price-Level Changes and Financial Reporting: A Discussion of the Consequences of the FASB's Failure to Consider the Effect of Price-level Changes on the Determination of Comprehensive Income" Paper presented at the European Accounting Association Congress, 1999
 35. SEC. 2003. Rel. No. 33-8238. "Final Rule: Management's Reports on Internal Control Over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports." U.S. Securities and Exchange Commission. 11 June
 36. Sprouse, Robert T. and Maurice Moonitz, *A Tentative Set of Broad Accounting Principles for Business Enterprises*. Accounting Research Study, No. 3. New York, NY: American Institute of Certified Public Accountants, 1962
 37. Staubus, George J. *The Decision-Usefulness Theory of Accounting*. Berkeley, CA: University of California Press. 1999.
 38. Swetz, Frank, *Capitalism and Arithmetic: The New Math of the Fifteenth Century*, La Salle, Ill.: Open Court, 1987.
 39. Yamey, Basil, "Scientific Bookkeeping and the Rise of Capitalism", *Economic History Review* II 1(2,3), 99 – 113
 40. Yamey, Basil *The Historical Development of Accounting*, New York, Arno Press, 1978.

Court cases cited

1. *Leeds Estate Building and Co. v Shepherd* (1895) 36 Ch. D. 787
2. *Re London and General Bank No.2* (1887) 2 Ch. D. 673