Woman C.P.A.

Volume 38 | Issue 2 Article 12

4-1976

# Woman CPA Volume 38, Number 2, April 1976

American Woman's Society of Certified Public Accountants

American Society of Women Accountants

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American Woman's Society of Certified Public Accountants and American Society of Women Accountants (1976) "Woman CPA Volume 38, Number 2, April 1976," *Woman C.P.A.*: Vol. 38 : Iss. 2 , Article 12.
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# Peer Reviews of Quality Control in Auditing

Tommie G. Cummings
Birmingham, Alabama

**The author reviews the development of peer review in auditing and discusses its most important advantages and disadvantages.**

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*Ms. Cummings is a member of NAA, Beta Gamma Sigma, Omicron Delta Kappa, and the Birmingham Chapter of ASWA.*

For years manufacturing organizations have recognized the importance of quality control over their output. Surely control over the quality of the product of the accounting profession is equally important. Yet, recent SEC censures, liability suits, and the "feeling" that financial statements are inadequate have caused many to doubt the creditability of the profession and its control procedures. The entire profession has ". . . come under heavy criticism in recent years as a result of the collapse of the Penn Central Railroad, Equity Funding, and other business disasters, of which the public had little or no warning."[1]

The purpose of this article is to summarize the current status of quality control within the accounting profession. Attention is given to peer review requirements of the SEC, and opinions of a limited sample of practitioners concerning desirability of reviews.

**Elements of Quality Control**

The Auditing Standards Executive Committee of the AICPA took a giant step forward in the promotion of quality control by issuing *Statement on Auditing Standards No. 4*, "Quality Considerations for a Firm of Independent Auditors." The Statement is not meant to be all-inclusive, but the following nine elements of quality control are suggested for consideration, depending on the size, organizational structure, and so forth of the firm:

1. *Independence* — hold no financial interest in clients, i.e., be independent in fact and appearance.
2. *Assigning Personnel to Engagements* — assign only those staff persons technically competent to perform the engagement.
3. *Consultation* — seek assistance where needed from knowledgeable authorities.
4. *Supervision* — review and supervise all organizational levels to assure that performance meets predetermined standards.
5. *Hiring* — require a minimum level of competence by all staff accountants employed.
6. *Professional Development* — require periodic technical training as part of each employee's development.
7. *Advancement* — base promotions on technical competence rather than length of service.
8. *Acceptance and Continuance of Clients* — review and evaluate a firm's reputation before acceptance as a client and re-evaluate at regular intervals.
9. *Inspection* — develop "checklist" to assure maintenance and compliance with standards.

**Peer Reviews of Quality**

A peer review is an examination of another's performance by someone in the same field with comparable education, training, and experience. The purpose of such a review is to ". . . enhance the technical proficiency of the profession and increase public confidence in the standards of the profession."[2] Peer reviews have been used in the accounting profession to study quality control procedures believed

to exist, to check for compliance with such procedures, and to comment on the adequacy of procedures.

Peer reviews are not new to the profession. They have gained recent attention because of SEC requirements for quality control reviews of selected firms and because of the new AICPA Voluntary Program for Reviews of Quality Control Procedures of Multi-Office Firms.

**AICPA Program**

The AICPA Voluntary Program for Reviews of Quality Control Procedures of Multi-Office Firms was adopted by the Board of Directors of the AICPA on April 26, 1974. "This program is designed to help improve the quality control procedures of multi-office firms by reviews of those procedures by other members of the profession familiar with the operation of multi-office firms."[3] Highlights of this program follow:

1. The Program is voluntary and available only to U.S. offices.
2. Multi-office firms are asked to nominate audit partners with SEC experience to serve on a review panel.
3. A firm requesting a review must submit a written description of its quality control procedures to a Supervisory Committee.
4. The Supervisory Committee schedules the review, selects a Review Team Captain, and approves a Review Team Executive Committee.
5. The Captain of the Review Team submits a proposal to the reviewed firm stating the scope of the review, the time of review, and the estimated cost.
6. Reviews are conducted in the months of April through October of each year.
7. Fees, not including expenses, include $300 per day for each Review Team Member, and $400 per day for each Executive Committee Member.
8. The Review Team reviews the quality control procedures at the reviewed firm's national office and at selected practice offices; it also reviews certain audit engagements.
9. The Review Team's report includes an opinion on compliance and adequacy of the reviewed firm's quality control procedures using *Statement on Auditing Standards No. 4* as a guideline. It states problems encountered and suggestions for correction. The report goes only to the reviewed firm.
10. After the review, the Review Team gives the Executive Committee its suggestions for improving the AICPA Program.

The above policies do not cover the entire program but give a broad overview as to how the program is implemented. This Voluntary Program for Multi-Office Firms is in the trial stage; therefore, the results cannot be evaluated at this time.

**Other Review Programs and Requirements**

In 1974 Arthur Andersen & Co. established a Public Review Board consisting of five part-time members from diversified fields. "The general purpose of this Board is to review the professional operations of our firm, including the manner in which our firm is managed and financed, the scope of our practice and how the quality of work is controlled."[4] AA & Co. has opened its files to the Board and has given permission for development of whatever review program the Board feels is needed. "This Board should bring an outside, independent viewpoint to the professional practice of the firm in its service to clients, investors and others who have an interest in the public responsibilities of the firm as independent accountants and auditors."[5]

The Securities and Exchange Commission has required "voluntary" quality control reviews in disciplinary actions taken against specific accounting firms. All of the cases "... underline a growing aggressiveness at the SEC toward large public accounting firms that fail to detect fraud in the records of the companies they audit."[6] The SEC feels that the responsibility of the auditor goes beyond its client, and extends to investors and creditors who may rely on financial statements. *The New York Times* stated that the "... primary criticism directed at accountants is that they have been at pains to protect the interests of their corporate clients but not those of the outside public."[7]

Peat, Marwick, Mitchell & Co. (PMM) was the first "Big Eight" firm to volunteer for the AICPA quality control review conducted by peers. As specified in the AICPA Program, the results of the quality control reviews are to be kept confidential within the reviewed firm, with the partners of PMM to be furnished the *only* copy of the quality review report. Since PMM wanted the results of their quality control review to be made public, they took a step forward and hired Arthur Young & Co. to perform the review.

Arthur Young & Co. recently completed their quality control review of PMM. The results, made public as requested by PMM, were favorable. The review, taking 12,000 hours and costing $500,000, concluded that Peat, Marwick, Mitchell & Co. generally exercised good quality control as set forth in *Statement on Auditing Standards No. 4.*


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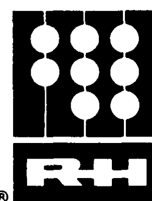


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A Philadelphia firm, Laventhol, Krekstein, Horwath & Horwath received a complaint by the SEC that it . . . "was not independent and was not qualified . . ."[8] to certify the financial statements of one of its clients. LKH&H did not admit or deny the complaint, but agreed to a peer review. In *Accounting Series Release No. 144* the SEC specified that the investigation was to be conducted by:

a. A team of qualified professional accountants composed of persons selected for such purpose by the American Institute of Certified Public Accountants (AICPA); or

b. A team of qualified professional accountants composed of persons selected for such purpose by the Chief Accountant of the Commission . . . or

c. Members of the staff of the Commission.

The SEC also filed a complaint against Touche Ross & Co. in 1974 because of the way it dealt with its client, U. S. Financial, Inc. The SEC said that "while it appears that Touche was deliberately misled in many respects by USF's management . . . Touche's failure in a number of respects to conduct these engagements in accordance with generally accepted auditing standards makes Touche responsible for certifying financial statements which proved to be materially false and misleading."[9] Touche Ross & Co. agreed to a quality control review ordered by the SEC ". . . solely for the purpose of settlement without admitting or denying the SEC's findings."[10] Once Touche Ross & Co. learned they had been furnished false information, they withdrew their opinion.

### Sentiments Concerning Peer Reviews

To determine the current feelings of selected practitioners concerning peer reviews, interviews were held with partners in the Birmingham office of four "Big Eight" accounting firms. Partners' responses to the following questions do not necessarily reflect their firms' policies or sentiments.

*1. What is your firm's procedure for reviewing audit engagements?*

Audit work at every level, from staff through partner, is reviewed by other persons within the firm. Within each office, partners review audit engagements for which they were not responsible. In most firms at approximately two year intervals, one or more partners from another office within the firm reviews the entire Birmingham office.

*2. Has your firm taken any steps toward outside peer reviews?*

Two of the firms interviewed have taken no action, one firm has been recently ordered by the SEC to conduct a peer review, and another firm has developed a special review team for quality control.

*3. Do you feel that outside peer reviews should be mandatory?*

All partners agreed that peer reviews should not be mandatory. They felt that unless unusual circumstances prevail, peer reviews should be conducted only on a voluntary basis.

*4. Do you believe the SEC will require peer reviews for all accounting firms auditing companies listed on stock exchanges?*

Two partners saw a trend toward such a requirement because of recent SEC actions (censures and "voluntary" reviews mentioned above). The other partners did not perceive such a trend. They felt peer reviews would probably remain voluntary unless serious quality control deficiencies occurred.

*5. How do you think the accounting profession benefits from peer reviews?*

One partner stated that the benefits depend on how the peer review program is carried out. He felt that his firm's own quality control review would benefit the profession, but he doubted that reviews by partners of outside firms could be very beneficial. Another partner said there were too many unanswered questions about the current peer review program for it to benefit the profession. The third partner suggested that the program had possibilities. He felt that peer reviews would increase public confidence in a firm that had recently experienced law suits, but he also felt that there was a problem with keeping client information confidential. The last partner felt that it would increase the quality of the work of the profession.

*6. What is your opinion concerning peer reviews?*

Most partners agreed that there were a lot of problems to be solved to perfect peer reviews; none liked the idea of another firm's partner auditing their firm. However, some agreed that peer reviews would be useful if deficiencies in quality control were corrected.

Conclusions similar to the above were obtained by Hermanson, Loeb, and Taylor in a sample of 425 partners of CPA firms.[11]

### Additional Advantages and Disadvantages of Peer Reviews

Advantages to be gained from a properly administered peer review include: (1) Useful suggestions and recommendations might result from bringing in a competent person from outside the firm. (2) The firm would be forced to reduce its quality control procedures to written form in order to participate in a review. This, in itself, would be a step in the right direction. (3) Public confidence could be gained because the public would feel that a firm conducting peer reviews is concerned about the public and wants to uphold high standards to better benefit users of financial statements.

Disadvantages of peer reviews include: (1) The cost could be prohibitive to some accounting firms. To other firms that already maintain a high level of quality control, the cost would be an extra expense that would have to be passed on to clients. (2) There are still many questions to be answered about the legal liability of the reviewer. (3) Confidential client information might be disclosed accidentally.

### Summary and Conclusions

Evidence is needed as to whether the advantages of peer reviews outweigh the disadvantages. Unanswered questions exist concerning the AICPA Program, but it is hoped that the Review Team will be able to suggest some improvements as the program progresses. In order for peer reviews to benefit the accounting profession, they must fulfill their purpose of increasing public confidence in accounting standards and enhancing the technical proficiency of the profession.

### Notes

[1]"Auditing the Auditors," *The New York Times*, (November 5, 1973), p. 38.

[2]Joseph T. Boyle, and Thomas L. Holton, "Peer Reviews in the Accounting Profession — Who Audits the Auditor?" *CPA Journal*, XLV (January, 1975), p. 15.

[3]*Plans For Implementation of AICPA Voluntary Program For Reviews of Quality Control Procedures of Multi-Office Firms*, AICPA Special Committee to Study Quality Review for Multi-Office Firms, (AICPA, 1974), p. 1.

[4]Harvey Kapnick, "Arthur Andersen & Co. Establishes Public Review Board," *Arthur Andersen & Co. Executive News Briefs*, II, viii (June, 1974), p. 1.

[5]"Statement of General Purpose, Organization and Functions of Public Review Board of Arthur Andersen & Co.," *Arthur Andersen & Co. Executive News Briefs*, II, viii (June, 1974), p. 2.

[6]"The Cloud Over the Summit Planner," *Business Week*, (August 31, 1974), p. 22.

[7]*The New York Times*, November 5, 1973, p. 38.

[8]"Laventhol, Krekstein, Horwath & Horwath," *Accounting Series Release No. 144, Commerce Clearing House*, (May 23, 1973), p. 62375.

[9]"Touche Ross & Co.," *Accounting Series Release No. 153, Commerce Clearing House*, February 26, 1974, p. 62398.

[10]"Touche Ross & Co. Censured Over Audit of U.S. Financial," *The New York Times*, February 26, 1974, p. 49.

[11]Roger H. Hermanson, Stephen E. Loeb, and Martin E. Taylor, "CPAs' Views on Mandatory Quality Review by Outsiders," *CPA Journal*, April, 1975.

# The Current Crisis in Financial Accounting: A Failure of Philosophy

Dr. Frederick D. Whitehurst, CPA
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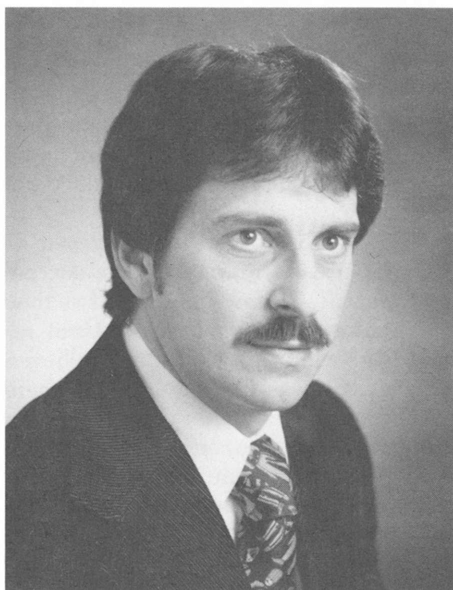
**This article is adapted from a speech Dr. Whitehurst gave at the April 1975 meeting of the Tidewater Chapter of ASWA.**



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There was a time in economic analysis when income theory was widely discussed. Nineteenth Century economists typically treated the distinctions between capital and income at length. Recently, however, the measurement of income and related income concepts have been all but ignored by economists. It is the accountant who now debates the differential merits of alternative income concepts.

It was relatively early in the development of their discipline that economists came to realize that the measurement of income, as well as the related propositions termed "income concepts," were illusory doctrines with slippery operational directives. It is surprising, in a sense, that economists, who are often thought of as ivory tower isolationists uninfluenced by the practicalities of real world constraints, would abandon the conceptual analysis of income as an ineffectual tool which "breaks in our hands,"[1] while accountants, who constantly face the problem of implementing a so-called abstract theory in an operational or practice-oriented setting, steadfastly adhere to income measurement as their primary societal function.

## The Quest for "Real Income"

The primacy of income measurement is evidenced by the relative emphasis placed upon income determination rather than asset valuation. This is obviously an unsound contention in view of the algebraic impossibility of changing income measurement rules without also affecting asset or liability valuations on the balance sheet. The point is, however, that recent arguments have had as their thrust the refinement of the income measure with asset valuations falling to be made consistent therewith by default. A case in point, of course, is the adoption of artificial LIFO as an accepted accounting treatment rule. Its chief proponent was more interested in the "realistic" statement of income than in anything else.[2]

If the accountant had succeeded in refining income measurement beyond the point at which economists appear to have given up, the financial press does not yield persuasive evidence that this accomplishment has been effectively communicated to the public. It is abundantly clear to even the most casual financial observer that income reporting, financial accounting, and independent auditing in particular have fallen into a significant degree of disrepute among the financial community. This degeneration of confidence stems in part from criticism originating from disenchanted financial statement readers. There is, however, a noteworthy barrage of criticism imputable to the academic and practitioner wings of the society. There is even an indication of a pervasive frustration.[3]

Most criticism appears to be a consequence of the apparent inability of the accounting discipline to isolate and identify that set of propositions with which the term "generally accepted accounting principles" is associated. The root cause may also be seen as a failure to relate what might be termed a "grand design" for financial accounting. Most public criticism, however, arises as a consequence of accounting diversity. In many cases, diversity of accounting treatment has resulted in an awareness that corporate earnings may be stated at almost any amount depending in large measure upon what particular set of accounting principles one selects from the aggregate of accepted practices. Some time ago Chambers, in commenting on the *Inventory of*

*Generally Accepted Accounting Principles for Business Enterprises,* estimated that due to the diversity of accepted accounting principles, a reader of financial statements faces a myriad of over thirty million possible combinations of accepted treatments for any comparison of financial statements in which a significantly diverse transactions base might be encountered.[4] Even though this statement was made several years ago, developments since then have not reduced diversity to a significantly lower level.

The intense preoccupation with earnings per share figures, which started with the merger movement of the 1960s, finally led the public at large to realize what practitioners have known all along: that it is possible to "manage" earnings per share. We are clearly beyond the point of mere suspicion that accounting treatment is decided upon the basis of the effect alternatives are likely to have on the "holy writ" of reported income.

Aside from the diversity in its measurement, the heavy emphasis on reported earnings has caused some writers to suspect that a serious misallocation of economic resources might be taking place because managements are thought to act at times more consistently with reflecting a certain orderliness of earnings growth rather than with the long-range interests of their shareholders.[5] Hence, we have a resource allocation problem in addition to the procedural chaos evident in the financial press. And at the center of this state of affairs in financial accounting rests a basic yet unanswered question: What do we intend to convey through the presentation of income?

Upon the resolution of this question will hinge many far-reaching consequences for the auditing function. For, it is conceivable that the practice of lending independent attestation to the fairness of reported income might constitute a gross inconsistency with the developing role of the Certified Public Accountant in our society. There is evidence that the interpretative character or subjective quality of income as a success indicator is poorly understood by every segment of society. This deficiency is evidenced by the implications of recurring statements dealing with an asserted distortion which certain accounting practices have on income. It is an extremely subtle implication which requires a degree of patience to recognize. For example, several years ago Sidney Davidson stated in an interview: "I realize that we'll probably never get a method that will come up with a firm's *real* income. But investors are going to demand that we come closer to *reality.*"[6] The implication of this statement is that income is singular and that there is a real income which is measurable as an absolute existential status awaiting the accountant's grasp. It will be argued in this paper that this implication and its related belief rest at the center of the current chaos.

The financial community relies upon the independent auditor to intervene in situations involving an inevitable conflict of interest between "insiders" and "outsiders." The ostensible objective of this intervention is to give independent credibility to the *facts* relating to the financial affairs of the enterprise as they are presented by management. This is the unique function of the profession of public accountancy.

Yet, what the facts are with respect to an income measure, if viewed as a success indicator, are not as easily stated as they are commonly thought to be. Until recently, investors appear to have believed that income was income and that there existed one immutable existential reality which was subject to conceptual grasp and practical measurement and to which the term "income" could be applied. This belief was probably fostered by pre-depression literature which showed a definite tendency towards a belief in a singular income concept. In the last three decades, however, academic and professional literature has contained many discussions of the various distinctions drawn among a plurality of income concepts. But today's investor is coming to know of such a plurality, not by virtue of a painstaking examination of research efforts designed to identify the various distinctions, but because modern accountancy has been unable to stem the tide of increasing diversity brought about by rapid economic growth and an increasingly complex business environment. There is more than one way to handle mergers, more than one way to handle leases, more than one way to handle pension problems or an investment tax credit, all of which can lead to widely different financial statement figures.

Hence, when varying accounting methods were introduced, corresponding to an associated increase in the complexity of financial transactions and arrangements, this belief in the singularity of income was shaken. A popular reaction has been to level criticism against independent auditors for not insisting upon the exclusive employment of those procedures which would yield "accurate" results of operations and an income figure neither overstated nor understated. Again, the "belief" in the finiteness of income manifests itself. The problems caused by this implied belief in the singularity of income are compounded by the fact that almost all accounting principle alternatives appear to be valid extensions of particular income concepts. Diversity in accounting practice is a natural consequence of diversity in meanings associated with income.

## The Cognitive Significance of Income

It is the thesis of this paper that the unanswered questions dealing with the cognitive significance of income, a question to which our profession has yet to address itself, constitute the "root cause" of this crisis of confidence. The argument path for this contention depends upon three easily acceptable premises:

1. The attestatory function of public accountancy represents an attempt to render independent third party assurances that internal financial facts as presented by management are reliable.
2. By far, the major element of this disclosure system is income determination.
3. In all of this reporting matrix, accountants make a concerted effort to avoid subjective valuations and insist upon hard evidence for the facts so presented.

Independent auditors do not take it upon themselves to subjectively establish the valuation of assets. Historical cost is the traditional valuation basis precisely because it is a defensible magnitude. Once defined, this valuation scheme is capable of being efficiently communicated to the public in such a manner that all who read a financial statement come to an understanding of the fact that is attempted to be communicated. Property, plant, and equipment, at a valuation based upon an arm's-length transaction, communicates to a statement reader the *fact* of purchase and the *fact* of the cash equivalent given up to acquire such property assets. Receivables, valued at net realizable value, communicates a different but equally understandable fact — the fact of an expectation or the current economic value of receivables in the normal course of business. Intangibles are valued at the aggregate cash equivalent of those resources given up to acquire them. Liabilities are typically valued at the future cash equivalent of resources which will be required in liquidation. Here, too, a related real world fact is presented by management, audited by independent accountants, and effectively communicated to financial statement readers. In each *element* of both income determination as well as asset and liability presentation, the reported data on

financial statements has a related existential counterpart which, for want of a better term, can be classified as *a financial fact.*

On the income statement, the sales figure represents the aggregate cash equivalent of all incoming resources generated through normal business events and transactions. There are, of course, some unique situations which we all encounter in practice, but for the vast majority of situations, this characterization holds. Cost of Sales also represents a related real world fact which can be communicated to statement readers efficiently and with near full understanding. Most expenses relate to an expiration of an asset and are thus related to real world facts which can be symbolized in financial statements.

In all of this, it will be noted, we communicate a singular valuation fact for assets. Land is valued at historical cost. There is an equally relevant fact which we choose not to make a part of the formal communications process — its replacement cost or current value were it to be sold. The same can be said of other assets. We have insisted that value be a singular notion. The double-entry process tolerates only one value per asset when, in fact, value is not a singular concept. And, it is to be expected that income will be tolerated in the double-entry system under a singular scheme because its components (assets inflowing through sales and outflowing through expenses) are treated as singular. The clincher, however, is that, notwithstanding the factual nature of the inputs to the income determination process, the manipulation of such facts in the double-entry system does not produce a fact of income. The final figure on the income statement, and the one figure around which all of financial accounting revolves, is completely different in its relation to real world events from all other elements of financial reporting. This is hypothesized to be the central point of widespread misunderstanding and the situs of most of the unrest which permeates our profession. The proposition can be stated quite simply, but it requires precision to understand its consequences: *Income, when viewed as a success indicator, is not an intelligible fact which relates to a real world phenomenon as every other element of financial reporting does.*

Even if all the inputs to the income determination process were devoid of the uncertainties which are experienced in day-to-day events, even if all auditing and financial accounting were devoid of the estimates and inexactness which they are known to contain, the income figure which results from these processes would still not represent a symbolization of a real world fact. And the direct cause of our most troublesome problems stems from the belief of most nonaccountants (as well as some accountants) that income, like other elements of external reporting, is susceptible to verification as a fact.

In the past twenty years, we have witnessed a series of official pronouncements from the American Institute of CPAs, as well as from other sources, all of which have dealt with what ought to constitute the accounting treatment rules for the valuation of assets and for the capture of income. We have been through the old Accounting Procedures Committee, the early years of the Accounting Principles Board, the Accounting Principles Board with expanded authority, and recently we moved again; this time to a Financial Accounting Standards Board. We have been through the various committees of the American Accounting Association, the various once-and-for-all "postulates" studies aimed at a comprehensive statement of a unified theory for income measurement. In short, we have searched for over a quarter century for *the* conceptual directive with which to measure enterprise income. In all of this searching we have presumed that a reference *to the past* will yield for us a measurement of how well we have done *in the past*. But how well an enterprise has done in a particular past period cannot be measured without reference to the *future* consequences of actions taken and actions not taken in that past. The success of a business in a given year cannot be measured as a fact without reference to the future monetary consequences of all decisions taken in that year. Hence, income is unmeasurable as a fact in a world characterized by a lack of future knowledge. And it is this quest for the fact of income which may be the ultimate folly of our profession in our time.

How successful an enterprise has been in a given year is a matter of opinion when the consequences of actions taken in that year are yet to run their course, and this is true regardless of the exactness and objectivity of the parameters of the measurement process. *An* income figure for a particular year is measurable, just as *an* opinion can be drawn with respect to the success of operations. *The* income figure is not measurable.

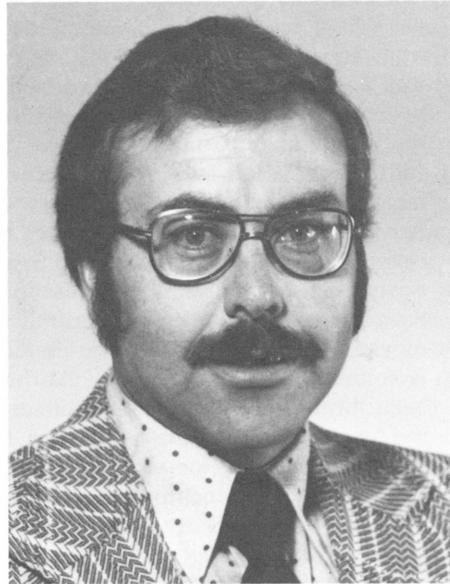
Can it be that we are attempting to measure an utterly subjective magnitude in an utterly objective way? Can it be that, notwithstanding all the insistence upon independence and objectivity which characterizes our function, we are still basically involved with the measurement of a magnitude which can only be interpreted as an *opinion*, regardless of the nonpersonal nature of the inputs? Can it be that the criticisms which we make, as well as those which we receive, are really levelled against only the symptoms which this basic and unresolved question induces in practice?

One might even be led to wonder why accountants associate themselves with an opinion measurement such as income. Why not concentrate upon a more comprehensive fact audit including those relevant financial facts which are not currently audited because they do not happen to "fit in" in the double-entry income determination matrix? Why not just audit the financial facts of historical experience and thereafter let financial analysts make whatever permutation or combination of the raw data they desire for the various interpretations which constitute their social role? After all, if a statement reader cannot utilize audited raw financial facts in an intelligent manner, there is little prospect that the currently computed income figure can be intelligently used. A complete abandonment of income determination and a significant expansion of the internal fact disclosure system constitutes a viable alternative which should be carefully considered by the profession. A concentration upon the audit of historical financial facts not limited to those which fit into the traditional double-entry process would clearly be more in keeping with the CPA's evolving societal role. We have released ourselves from the burden of valuations which are not objectively verifiable from historical factual transactions; why not release ourselves from the ultimate subjectivity — income?

But if the complete abandonment of income determination appears unfeasible for the present, and it clearly does, then there appears to be only one path to a lessening of the unrest. If income determination there has to be, then a massive educational campaign is needed to alter the public's typical bent when it comes to interpreting the significance and meaning of income. The financial community must be brought to an understanding of the subjective character of any income measure regardless of the objectivity of its computational inputs. Our insistence upon objective evidence for the valuations which determine net income is in no way a guarantee that the resulting income figure possesses a similar objectivity characteristic. The pervasive belief that there exists a single income amount measurable in finite form so long as "correct" accounting procedures are used will have to be replaced. There is no alternative. There is simply no

*(Continued on page 13)*

# Accounting and Matrix Theory



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**The author explains the application of matrix theory to some common accounting problems.**

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Research in accounting has revealed the benefits of utilizing interdisciplinary techniques in the formulation of specific theory.[1] Of increasing importance are the fields of mathematics, statistics, and computer science.[2] Although its use can in many cases produce "better results," the sophisticated level of mathematical analysis made available by these disciplines is, for the most part, ignored, discouraged, or not accepted.[3] Ironically, many of the reasons for this response seem to be the same as the advantages of using higher level mathematics. Mathematical notation facilitates formulation and recognition of relationships of variables; however, symbolisms and notations themselves are not easily understood or accepted. Through the use of mathematical notations, relationships can be established and evaluated, and a concentrated effort can be made on the problem itself rather than on the verbal terminology.[4]

This discussion will examine one area of accounting research involving mathematical analysis: matrix theory. Matrix theory can be applied directly to accounting and provides a method for analyzing particular accounting areas. In the simpler forms of matrix algebra, accounting theory finds both a theoretical approach and practical methodology. A more complex form of matrix theory is found in the concept of linear programming which requires the establishment of relationships of accounting data and results in a solution of values for an optimal relationship.

## Matrix Models

Many authors have recognized the relationship between accounting data and matrix forms. Devine has pointed out that accountants have historically dealt with vectors in primitive forms of measurement in reporting financial information. His major criticism was that the information was not formulated to the extent necessary for utilizing effectively mathematical techniques.[5] Concentrating upon various data processing applications, Corcoran has done extensive analysis in matrix theory and accounting. Corcoran has concluded that there is a similar logic involved in the methods which can be described as an input-transformation-output procedure.[6]

## Depreciation Models

Because of its common usage and diverse methods of valuation, depreciation is the first application to be examined. Following Corcoran's input-transformation-output method, depreciation can be viewed as the assets' bases (input) to be allocated, transformed by a rate over a period of time into a segmented schedule (output) showing the itemized annual expense. In matrix notation, this can be shown without elements as:

$$\underset{(N \times 1)}{\overset{A}{\begin{bmatrix} \; \end{bmatrix}}} \bullet \underset{(1 \times M)}{\overset{x}{\begin{bmatrix} \; \end{bmatrix}}} = \underset{(N \times M)}{\overset{B}{\begin{bmatrix} \; \end{bmatrix}}}$$

The elements of A can be shown at any basis and can be as numerous as needed with the only limitation being that all elements must be depreciated by the same method and for the same time length. The rate vector, x, will have the same dimensions as the time length. The values of the elements of x are determined as fractions or percentages of annual allocations for whichever method is used. The product matrix B will have as elements each asset's yearly depreciation; i.e., $b_{ij}$ refers to asset $a_i$ and its depreciation in year $x_j$. Furthermore, $\sum_{j=1}^{N} b_{i1}$ will show the total depreciation for year 1 and $\sum_{j=1}^{M} b_{ij}$ will give the total depreciation allocation for the first asset shown in A.

As an example, assume 4 assets whose bases are $1,500, $3,000, $4,500, and $6,000 and all of which are to be depreciated over 5 years under a sum-of-the-years'-digits method.

$$\underset{(4 \times 1)}{\overset{A}{\begin{bmatrix} 1{,}500 \\ 3{,}000 \\ 4{,}500 \\ 6{,}000 \end{bmatrix}}} \bullet \underset{(1 \times 5)}{\overset{x}{\begin{bmatrix} 5/15, 4/15, 3/15, 2/15, 1/15 \end{bmatrix}}} =$$

$$B = \begin{bmatrix} 500 & 400 & 300 & 200 & 100 \\ 1{,}000 & 800 & 600 & 400 & 200 \\ 1{,}500 & 1{,}200 & 900 & 600 & 300 \\ 2{,}000 & 1{,}600 & 1{,}200 & 800 & 400 \end{bmatrix}$$

(4 x 5)

Further adjustments to the rate vector can be made to incorporate other information such as partial year allocation. For the previous example, if all the assets were purchased on May 1, the following rate vector would provide the proper annual depreciation.

$$x = \begin{bmatrix} 2/9, 13/45, 2/9, 7/45, 4/45, 1/45 \end{bmatrix}$$

(1 x 6)

Of all the depreciation methods available, double-declining balance would present the most problems for the matrix application. Using the declining-balance would require modification of the A matrix and a series of operations for each year or adjusting the x vector to reflect the different rates. A final depreciation schedule could be represented as a matrix whose elements are the separately computed matrices. For the above example, the procedure for adjusted matrix A is shown below:

$$\begin{aligned} .4\,A &= B \\ .4\,(A - (B)) &= C \\ .4\,(A - (B + C)) &= D \\ .4\,(A - (B + C + D)) &= E \\ .4\,(A - (B + C + D + E)) &= F \end{aligned}$$

The final depreciation schedule would be represented as a matrix composed of the vectors B, C, D, E, and F. The adjusted x vector which would accomplish the same results is shown below:

$$x = \begin{bmatrix} .4, .24, .144, .0864, .05184 \end{bmatrix}$$

The general form of the depreciation procedure can be changed to reflect only one year allocations by using the current year bases in the A matrix and corresponding percentages in the x vector.

## Liquidation Models

A more complex matrix application can be made for indicating asset and creditor groups in preparation of a schedule of liquidation. Two matrices must be defined: one for realizable assets grouped by degree of pledged-security and one for the creditor groups and their respective claims upon each asset category. The input is the financial data of the asset categories; the transformation is the fractional creditors' claim on the asset categories; and the output is the monetary interest of each claimant in each asset category.

To use this procedure, the A matrix must contain realizable values and the owners' equity must be computed before values can be assigned to the B matrix. The A matrix is necessarily diagonalized for multiplication to occur. The B matrix will have a certain structure in that various creditor groups will have claims on related asset categories and none on other categories. For example, priority creditors will affect free assets and partially-secured creditors will not affect fully-pledged assets. The general form of the matrices is given below.[7]

Although the information listed in the C matrix is not itemized with respect to individual asset accounts, this is a minor point in view of the fact that money from the sale of the assets is distributed during liquidation, not the assets themselves. The schedule of the C matrix refers to this distribution of money by groups of liquidated assets which is the actual situation. The C matrix gives additional information that is not as obvious in the traditional Statement of Affairs.[8] The total interest of each creditor group can be found by summing the columns; i.e., $\sum b_{ij}$. Likewise, each asset row indicates the amounts due each creditor group upon liquidation of the asset group.

## Balance Sheet Models

Richards has written about a more general input-output matrix model. His model differs from those of Corcoran in that the inputs are the inflows and the outflows of the firm in the form of debits and credits. His model is divided into five basic areas of the balance sheet: all assets excluding long-term assets, long-term assets, equities, balance or catch-all accounts, and operations. The purpose of the model is to demonstrate the interrelationships of the accounts and to quantify that relationship.[9] The general formulas for the procedure are:

$$x - A\bullet = y \qquad \text{and } x = (I - A)^{-1} \bullet y$$

In the formulas, x is the vector of "account debits," A is the matrix formed by the five accounts indicating the inflow-outflow, and y is an unspecified vector of accounts in order of origination. The values of the y vector are the details of transactions. With this information, the effect on the related area and the size of that effect can be derived.

Due to the complexity of the form, Richards' input-output model will not be illustrated. It should be noted, however, that this model had a high correlation with the actual results of operations for Swift & Company during a six year period.[10]

(Continued on page 28)

**A**

| Fully Secured | Partially Secured | Free Assets |
|---|---|---|
| $a_{11}$ | 0 | 0 |
| 0 | $a_{22}$ | 0 |
| 0 | 0 | $a_{33}$ |

(3 x 3)

**B**

| Priority | Fully Secured | Partially Secured | Unsecured | Owners Equity |
|---|---|---|---|---|
| 0 | $b_{21}$ | 0 | 0 | 0 |
| 0 | 0 | $b_{23}$ | 0 | 0 |
| b | 0 | $b_{33}$ | $b_{34}$ | $b_{35}$ |

(3 x 5)

**C**

| | Liabilities Having Priority | Fully Secured Liabilities | Partially Secured Liabilities | Unsecured Liabilities | Owners Equity |
|---|---|---|---|---|---|
| Assets: | | | | | |
| Pledged in Full Security | | | | | |
| Pledged in Partial Security | | | | | |
| Free | | | | | |

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# Education

## Topical References to CPA Examination Questions in Theory and Practice

Candidates preparing for the CPA examination normally review past exams to get a feel for the testing material and to determine subject coverage and types of questions asked. Often, a candidate needs to concentrate on only a few selected topics to correct deficiencies in such areas. Or, a candidate may desire extensive references for systematic study.

CPA examination questions are useful to educators for classroom discussion and for quizzes in upper level accounting courses. They also provide material for use by those conducting examination reviews.

The following tabulation furnishes a reference for questions asked in Theory and Practice, Parts I and II, for the years 1971 through 1975. Five columns appear: (1) Brief description of the question. (2) Suggested time or whether the question is of a multiple choice (MC) nature. (3) Specific part of the examination. For example, "P-I" represents Practice, Part I. "T" represents Theory. (4) Date of the examination. (5) Question number. For multiple choice questions, "8 of 1," for example, represents multiple choice question number eight within the first major question.

Readers who have passed the exam are encouraged to forward their copies of the tabulation to current students, CPA candidates, and educators. Also, the editor of this column welcomes comments on its usefulness. If sufficient demand exists, annual updates can be published, and/or a similar tabulation can be prepared for the CMA examination.

| ACCOUNTING CHANGES--OPINION #20 | | | | |
|---|---|---|---|---|
| Revision of change in estimated life | MC | P-I | 5/75 | 3 of 1 |
| Change in depreciation method | MC | P-I | 5/75 | 15 of 1 |
| Change in depreciation method | MC | T | 5/75 | 17 of 1 |
| Revision of estimated life -- Building | MC | T | 11/74 | 19 of 1 |
| Change in depreciation method | MC | T | 5/74 | 25 of 2 |
| Revision in overhead rate | MC | T | 5/74 | 30 of 2 |
| Change in estimate | MC | T | 5/73 | 6 of 1 |
| Correction of an error | MC | T | 5/73 | 10 of 1 |
| Condensed statements of Income and Retained Earnings after adjustments for accounting changes | 50-60 | P-II | 11/75 | 5 |
| Statement presentation after adjustment for accounting changes | 40-50 | P-I | 5/74 | 4 |
| Definition, discussion, and justification for accounting changes; LIFO | 25-30 | T | 5/72 | 7 |
| ALLOCATION OF INCOME TAXES | | | | |
| Deferred income taxes | MC | P-I | 11/75 | 7 of 1 |
| Deferred income taxes | MC | P-I | 11/75 | 8 of 1 |
| Interperiod allocation justified | MC | T | 5/75 | 9 of 1 |
| Computation with warrant | MC | P-II | 11/74 | 6 of 1 |
| Computation with installment sales | MC | P-II | 5/74 | 7 of 1 |
| Change in tax rates | MC | P-II | 5/74 | 8 of 1 |
| Appropriate use | MC | T | 5/74 | 22 of 2 |
| Rate basis | MC | T | 5/74 | 23 of 2 |
| Loss carryforward | MC | T | 5/74 | 24 of 2 |
| Appropriate use | MC | T | 11/72 | 10 of 1 |
| Loss Carryforward | MC | T | 11/71 | 36 of 2 |
| Appropriate use | MC | T | 5/71 | 17 of 1 |
| Schedules of pretax accounting income, taxable income, and deferred tax | 50-60 | P-II | 11/73 | 4 |
| Deferred, liability, and net-of-tax methods; identification of items causing tax allocation | 25-30 | T | 5/73 | 3 |
| Calculation of deferred tax and timing differences; statement presentation | 40-50 | P-I | 5/72 | 2 |
| Reasons for interperiod and intraperiod tax allocation; concept of financial revenue and constructive receipt | 25-30 | T | 5/71 | 7 |
| ANALYSIS OF FINANCIAL STATEMENTS | | | | |
| Working capital provided by operations | MC | P-I | 11/75 | 10 of 1 |
| Effect of current maturities or working capital | MC | P-I | 11/75 | 11 of 1 |
| Effect of funds defined as (1) cash vs. (2) working capital | MC | P-I | 11/75 | 14 of 1 |
| Merchandise inventory turnover | MC | P-II | 11/75 | 9 of 1 |
| Number times bond interest earned | MC | P-II | 11/75 | 10 of 1 |
| Current ratio and working capital | MC | P-I | 5/75 | 16 of 1 |
| Effect of stock dividend | MC | T | 11/74 | 4 of 1 |
| Current ratio | MC | T | 11/74 | 5 of 1 |
| Book value and earnings per share | MC | T | 11/74 | 6 of 1 |
| Trading on the equity | MC | T | 11/74 | 7 of 1 |
| Effect of no dividends from Sub | MC | T | 11/74 | 8 of 1 |
| Inventory turnover | MC | T | 11/74 | 9 of 1 |
| Operating cycle | MC | T | 11/74 | 12 of 1 |
| Risk analysis | MC | T | 5/74 | 9 of 1 |
| Statement presentation of receivables | MC | T | 5/74 | 10 of 1 |
| Operating cycle | MC | T | 5/74 | 14 of 1 |
| Test of solvency | MC | T | 5/73 | 2 of 1 |
| Trading on the equity | MC | T | 5/73 | 3 of 1 |
| Current asset classification | MC | T | 5/73 | 14 of 1 |
| Current liability classification | MC | T | 5/73 | 17 of 1 |
| Classification basis | MC | T | 11/72 | 2 of 1 |
| Working capital | MC | T | 5/72 | 2 of 1 |
| Times bond interest earned | MC | T | 5/72 | 4 of 1 |
| Acid test ratio | MC | T | 5/72 | 10 of 1 |
| Ratio of cash to noncash expenses | MC | T | 5/72 | 11 of 1 |
| Net realizable value of A/Rec | MC | P-II | 5/72 | 13 of 1 |
| Days' sales outstanding | MC | T | 11/71 | 1 of 1 |
| Current bond interest earned | MC | T | 11/71 | 9 of 1 |
| Current liability classification | MC | T | 5/71 | 10 of 1 |
| Solvency ratios and other ratio analysis data | 25-30 | T | 11/73 | 7 |
| Multiple choice questions relating to ratio analysis (Numbers 1-8) | Short | P-II | 5/72 | 1 |
| BONDS PAYABLE | | | | |
| Bond discount | MC | P-I | 11/75 | 9 of 1 |
| Computation of amount to sell | MC | P-I | 11/75 | 13 of 1 |
| Presentation in statement of financial position | MC | T | 11/75 | 21 of 2 |
| Exercise of warrants | MC | P-I | 5/75 | 8 of 1 |
| Loss on retirement | MC | P-I | 5/75 | 17 of 1 |
| Unamortized discount | MC | T | 5/75 | 2 of 1 |
| Issue cost | MC | T | 5/75 | 3 of 1 |
| Computation of interest--Bonds | MC | P-II | 11/74 | 3 of 1 |
| Discount on bonds converted | MC | P-II | 11/74 | 4 of 1 |
| Effective interest rate--Bonds | MC | P-II | 11/74 | 5 of 1 |
| Premium on temporary investment | MC | T | 11/74 | 3 of 1 |
| Loss on retirement | MC | P-II | 5/74 | 2 of 1 |
| Cost to refund bonds | MC | T | 5/74 | 37 of 2 |
| Retirement--Exchange of securities | MC | T | 5/74 | 38 of 2 |
| Meaning of debt premium | MC | T | 11/73 | 3 of 1 |
| Reporting discount on Balance Sheet | MC | T | 11/73 | 7 of 1 |
| Debentures with detachable warrants | MC | P-I | 11/73 | 8 of 1 |
| Warrants issued with debt | MC | P-I | 5/73 | 14 of 1 |
| Exercise of warrants | MC | P-I | 5/73 | 15 of 1 |
| Serial bonds and working capital | MC | P-II | 11/72 | 14 of 1 |
| Serial bonds with premium | MC | P-II | 5/72 | 15 of 1 |
| Gain on retirement of bonds | MC | P-II | 5/72 | 16 of 1 |
| Gain on conversion | MC | P-I | 11/71 | 7 of 1 |
| Serial bonds and working capital | MC | P-I | 11/71 | 11 of 1 |
| Computation of interest--Bonds | MC | P-I | 11/71 | 12 of 1 |
| Effective and nominal interest rates | MC | T | 5/71 | 11 of 1 |
| Capital budgeting decision - redeem old and issue new bonds - net cash investment, net cash benefit, payback, present value | 40-50 | P-II | 11/75 | 3 |
| Statement presentation of debt and premium; computation of carrying value; valuation after issue | 25-30 | T | 5/71 | 3 |
| BONDS AND PROFIT SHARING | | | | |
| Computation--Bonus | MC | P-II | 11/74 | 7 of 1 |
| Contribution to profit sharing fund | MC | P-I | 11/73 | 14 of 1 |
| Computation--Bonus | MC | P-I | 11/71 | 5 of 1 |
| BUSINESS COMBINATIONS AND CONSOLIDATED STATEMENTS | | | | |
| Pooling of Interest - combined retained earnings balance | MC | P-I | 11/75 | 3 of 1 |
| Pooling of Interest - combined net income | MC | P-I | 11/75 | 4 of 1 |
| Purchase - excess of fair value of assets over cost | MC | P-I | 11/75 | 6 of 1 |
| Reporting of 30% investment | MC | P-II | 11/75 | 6 of 1 |
| Minority interest share of net income | MC | P-II | 11/75 | 7 of 1 |
| Statement presentation of unconsolidated Sub | MC | T | 11/75 | 13 of 1 |
| Effect of Sub's earnings and dividends on parent's unconsolidated statements | MC | T | 11/75 | 14 of 1 |
| Fair market value in excess of cost | MC | P-II | 5/75 | 2 of 1 |
| Difference in accounting income and tax income | MC | P-II | 5/75 | 3 of 1 |
| Basis of noncash stock acquisition | MC | T | 5/75 | 20 of 1 |
| Interpretation of statements | MC | P-II | 11/74 | 10 of 1 |
| Interpretation of statements | MC | P-II | 11/74 | 11 of 1 |
| Equity method for unconsolidated Sub | MC | T | 11/74 | 32 of 2 |
| Minority interest | MC | T | 11/74 | 37 of 2 |
| Presentation of minority interest | MC | T | 5/74 | 11 of 1 |
| Tax allocation on investment income | MC | T | 5/74 | 32 of 2 |
| Undistributed earnings of subsidiary | MC | T | 5/74 | 34 of 2 |

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Equity method--Dividends | MC | T | 5/74 | 39 of 2 |
| Equity method with amortization | MC | P-II | 5/74 | 11 of 1 |
| Market value in excess of book value | MC | T | 11/73 | 12 of 1 |

BUSINESS COMBINATIONS AND CONSOLIDATED STATEMENTS (CONTINUED)

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Equity method--Income recognition | MC | T | 11/73 | 13 of 1 |
| Undistributed earnings--Subsidiary | MC | T | 11/73 | 14 of 1 |
| Equity method--Dividends received | MC | T | 11/73 | 15 of 1 |
| Undistributed earnings | MC | T | 11/73 | 16 of 1 |
| Undistributed earnings--Subsidiary | MC | T | 11/73 | 17 of 1 |
| Losses of a subsidiary | MC | T | 11/73 | 18 of 1 |
| Tax on undistributed earnings | MC | T | 11/73 | 19 of 1 |
| Tax on undistributed earnings | MC | T | 11/73 | 20 of 1 |
| Pooling--Paid in capital | MC | P-I | 11/73 | 1 of 1 |
| Goodwill | MC | P-I | 11/73 | 2 of 1 |
| Excess assigned to fixed assets | MC | P-I | 11/73 | 3 of 1 |
| Revised basis of building--Purchase | MC | P-I | 11/73 | 7 of 1 |
| Equity--Dividend received | MC | T | 5/73 | 4 of 1 |
| Use of equity method | MC | T | 5/73 | 8 of 1 |
| Criteria for consolidation | MC | T | 5/73 | 13 of 1 |
| Finder's fee arranging combination | MC | P-I | 5/73 | 2 of 1 |
| Pooling and stock previously held | MC | P-I | 5/73 | 6 of 1 |
| Profit on sale of fixed assets | MC | P-I | 5/73 | 11 of 1 |
| Income under cost method | MC | P-II | 5/72 | 17 of 2 |
| Income under equity method | MC | P-II | 5/72 | 18 of 2 |
| Reporting 40% investment | MC | P-II | 5/72 | 19 of 2 |
| Cost and equity methods | MC | P-II | 5/72 | 20 of 2 |
| Reporting 30% investment | MC | P-II | 5/72 | 21 of 1 |
| Consolidated assets | MC | P-II | 5/72 | 27 of 2 |
| Pooling criteria | MC | P-II | 5/72 | 28 of 2 |
| Excess assigned to fix assets | MC | P-II | 5/72 | 29 of 2 |
| Expenses affecting a combination | MC | T | 5/72 | 13 of 1 |
| Comparative statement--Pooling | MC | T | 5/72 | 14 of 1 |
| Negative goodwill | MC | T | 5/72 | 15 of 1 |
| Goodwill | MC | T | 5/72 | 16 of 1 |
| Minority interest | MC | T | 11/71 | 14 of 1 |
| Intercompany eliminations | MC | T | 11/71 | 15 of 1 |
| Foreign subsidiary | MC | T | 11/71 | 16 of 1 |
| Foreign subsidiary | MC | T | 11/71 | 17 of 1 |
| Treasury stock effecting combination | MC | T | 11/71 | 27 of 2 |
| Polling of interest at midyear | MC | T | 11/71 | 28 of 2 |
| Property leased by subsidiary | MC | T | 11/71 | 34 of 2 |
| Goodwill from consolidation | MC | T | 5/71 | 4 of 1 |
| Reconstruction--Stockholders' equity | MC | P-I | 5/71 | 6 of 1 |
| Reconstruction--Capital stock | MC | P-I | 5/71 | 7 of 1 |
| Current stockholders' equity | MC | P-I | 5/71 | [illegible] of 1 |
| Current retained earnings | MC | P-I | 5/71 | 9 of 1 |
| Working capital of subsidiary | MC | P-I | 5/71 | 10 of 1 |
| Consolidated trial balance | 60-70 | P-II | 5/75 | 5 |
| Principles of purchase and pooling methods | 25-30 | T | 5/75 | 4 |
| Consolidated balance sheets for purchase and pooling of interest | 40-50 | P-II | 11/74 | 5 |
| Consolidated balance sheet and income statement with intercompany profit in land, fixed assets, inventory and sales | 40-50 | P-II | 11/73 | 3 |
| Purchase vs pooling; meeting pooling criteria | 25-30 | T | 5/73 | 4 |
| Consolidated balance sheet and income statement with assignment of excess of cost over book value to assets; profit in sales, bonds, and inventory | 50-60 | P-I | 5/73 | 3 |
| Applications of APB Opinion No. 18 | 40-50 | P-I | 11/72 | 2 |
| Comparative consolidated statements of income and stockholders' equity with emphasis on changes within stockholders' equity | 40-50 | P-II | 11/72 | 4 |
| Criteria for consolidated statements; eliminating entries for goodwill, equipment, merchandise, and note | 25-30 | T | 11/72 | 7 |
| Consolidated balance sheet with intercompany profit in inventory, bonds, and fixed assets; purchase in steps; purchase between statement dates | 50-60 | P-I | 5/72 | 4 |

CASH

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Payroll account | MC | P-II | 11/74 | 1 of 1 |
| Composition of cash | MC | T | 11/74 | 2 of 1 |
| Difference between cash and accrual | MC | T | 11/74 | 15 of 1 |
| Bank reconciliation | MC | P-II | 11/72 | 1 of 1 |

CONCEPTS

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Interim financial information | MC | T | 11/75 | 26 of 2 |
| Interim financial reporting | MC | T | 11/75 | 27 of 2 |
| Accounting for infrequent but not unusual event | MC | T | 11/75 | 28 of 2 |
| Disposal of a segment of a business | MC | T | 11/75 | 29 of 2 |
| Accounting for corporations vs. partnerships | MC | T | 5/75 | 10 of 1 |
| Unit of measurement | MC | T | 5/75 | 14 of 1 |
| Revenue recognition | MC | T | 5/75 | 15 of 1 |
| Opinions of the APB | MC | T | 11/73 | 1 of 1 |
| Going concern | MC | P-I | 5/73 | 10 of 1 |
| Valuation basis | MC | T | 5/73 | 1 of 1 |
| Gross margin variation analysis | MC | T | 11/72 | 4 of 1 |
| Revenue recognition | MC | T | 11/72 | 11 of 1 |
| Income measurement | MC | T | 5/72 | 12 of 1 |
| Consistency | MC | T | 11/71 | 6 of 1 |
| Accounting entity | MC | T | 11/71 | 18 of 1 |
| Revenue when production completed | MC | P-I | 5/71 | 15 of 1 |
| Sales basis | MC | P-I | 5/71 | 16 of 1 |
| Cash collection basis | MC | P-I | 5/71 | 17 of 1 |
| Leaving wealth unchanged | MC | P-I | 5/71 | 18 of 1 |
| Recognition of revenue and expense for a given time period | 25-30 | T | 11/75 | 3 |
| Interim reporting | 25-30 | T | 5/75 | 3 |
| Adjusting financial data for general price level changes | 25-30 | T | 5/75 | 7 |
| Recognition of revenue; income determination | 25-30 | T | 11/74 | 4 |
| Accounting entity concept | 25-30 | T | 5/72 | 5 |
| Cash basis concepts of revenue and income; cash basis gross margin | 25-30 | T | 5/72 | 3 |
| Purpose of financial accounting and reporting; general and qualitative objectives | 25-30 | T | 11/71 | 6 |
| Statements out of context involving circular reasoning, fallacies, half truths, erroneous comments, conclusions, or inconsistencies | 25-30 | T | 5/71 | 4 |

CORRECTIONS OF ACCOUNTS AND FINANCIAL STATEMENTS

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Effect of physical inventory error | MC | T | 11/75 | 11 of 1 |
| Effect of overstatement of earnings | MC | T | 11/75 | 12 of 1 |
| Effect of error on net income | MC | P-II | 5/75 | 7 of 1 |
| Effect of error on working capital | MC | P-II | 5/75 | 8 of 1 |
| Effect of error on retained earnings | MC | P-II | 5/75 | 9 of 1 |
| Error in payables and supplies | MC | T | 11/74 | 17 of 1 |
| Reconstruction of accounts receivable | MC | P-II | 5/74 | 10 of 1 |
| Effect of errors on net income | MC | P-I | 11/73 | 12 of 1 |
| Reconstruction of sales | MC | P-I | 5/73 | 5 of 1 |
| Effect of errors on net income | MC | P-II | 11/72 | 3 of 1 |
| Effect of errors on working capital | MC | P-II | 11/72 | 4 of 1 |
| Effect of errors on total assets | MC | P-II | 11/72 | 5 of 1 |
| Preparation of worksheet to show adjustments | 50-60 | P-I | 11/75 | 3 |
| Preparation of Balance Sheet accounts from various statements and information | 50-60 | P-I | 5/75 | 4 |
| Errors in life insurance, consignments, inventory, maintenance contracts, interest receivable, fixed assets, and loss on purchase commitments | 50-60 | P-II | 5/74 | 4 |
| Errors in prepaid rent, insurance, and taxes, and in leaseholds, sale and lease-back, bad debts, sales commission, franchise, and inventory | 30-40 | P-II | 5/73 | 3 |

CORRECTIONS OF ACCOUNTS AND FINANCIAL STATEMENTS (CONTINUED)

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Errors in sales tax, fixed assets, inventory, salaries and dividends payable, accounts receivable, advertising, common stock, bad debts, discount on bonds, pension, and property tax expense | 40-50 | P-I | 11/71 | 4 |
| Preparation of accural basis statements from cash basis records | 50-60 | P-I | 5/71 | 3 |
| Incorrect records requiring adjustments and statement disclosures | 40-50 | P-II | 5/71 | 4 |

COST AND MANAGERIAL

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Multiple choice relating to managerial and quantitative methods | 50-60 | P-I | 11/75 | 2 |
| Computation - inventoriable unit cost operating profit, variances | 40-50 | P-I | 11/75 | 5 |
| Various cost concepts including semi-variable cost, standard cost, forecasting, etc. (Nos. 15-20) | Short | T | 11/75 | 1 |
| Process vs. job order; equivalent production; normal vs. abnormal spoilage; FIFO process costing vs. weighted average | 25-30 | T | 11/75 | 6 |
| Multiple choice relating to managerial and quantitative methods | 40-50 | P-I | 5/75 | 2 |
| Effect of alternate product mix on total income | 30-40 | P-II | 5/75 | 3 |
| Multiple choice relating to managerial | 25-30 | T | 5/75 | 2 |
| Effect of errors on cost of goods sold and other accounts | 25-30 | T | 5/75 | 5 |
| Cost of goods manufactured; equivalent pounds of production; joint costs | 50-60 | P-I | 11/74 | 4 |
| Fixed and variable costs | 25-30 | T | 11/74 | 5 |
| Standard costs; disposition of variances; factory overhead applications | 25-30 | T | 11/74 | 6 |
| Multiple choice relating to managerial and quantitative | 50-60 | P-I | 5/74 | 1 |
| Cost of sales; variances | 50-60 | P-I | 5/74 | 3 |
| Definition of terms; breakeven | 25-30 | T | 5/74 | 7 |
| Multiple choice relating to cost accounting | 40-50 | P-I | 11/73 | 2 |
| Breakeven and contribution to profit | 40-50 | P-I | 11/73 | 4 |
| Product mix and computation of unit cost | 40-50 | P-I | 11/73 | 5 |
| Make or buy decisions | 30-40 | P-II | 11/73 | 5 |
| Multiple choice relating to managerial | 50-60 | P-I | 5/73 | 6 |
| Inventories; spoilage | 60-70 | P-II | 5/73 | 5 |
| Multiple choice relating to managerial | 25-30 | T | 5/73 | 2 |
| Unaudited quarterly statements; variations of actual from expected activity | 25-30 | T | 5/73 | 7 |
| Cost of production | 40-50 | P-I | 11/72 | 4 |
| Multiple choice relating to managerial | 50-60 | P-II | 11/72 | 2 |
| Multiple choice relating to managerial | 25-30 | T | 11/72 | 2 |
| Budgets | 40-50 | P-I | 5/72 | 3 |
| Optimal product mix | 40-50 | P-I | 5/72 | 5 |
| Equivalent units | 40-50 | P-II | 5/72 | 5 |
| Cost of production; equivalent units | 40-50 | P-I | 11/71 | 3 |
| Estimated annual revenue and expense, present value of cash flows | 40-50 | P-II | 11/71 | 4 |
| Use of variable budget | 25-30 | T | 11/71 | 7 |
| Projected data -- Hospital | 50-60 | P-I | 5/71 | 6 |
| Multiple choice relating to managerial | 40-50 | P-II | 5/71 | 2 |

FASB STANDARDS

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Research and Development | MC | T | 11/75 | 30 of 2 |

FIXED ASSETS -- VALUATION, DEPRECIATION AND DEPLETION

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Recognition of gain on an exchange | MC | T | 11/75 | 23 of 2 |
| Financial basis for exchange | MC | T | 11/75 | 22 of 2 |
| Computation of depletion | MC | P-II | 11/75 | 15 of 1 |
| Valuation of F.A. | MC | P-II | 11/75 | 5 of 1 |
| Computation of depletion | MC | P-I | 5/75 | 1 of 1 |
| Computation of depreciation | MC | P-I | 5/75 | 2 of 1 |
| Financial basis for trade-in | MC | P-I | 5/75 | 12 of 1 |
| Financial basis for exchange | MC | P-II | 5/75 | 1 of 1 |
| Basis for statement presentation | MC | P-II | 5/75 | 10 of 1 |
| Straight-line depreciation | MC | T | 5/75 | 11 of 1 |
| Definition of depreciation | MC | T | 11/74 | 10 of 1 |
| Basis for statement presentation | MC | T | 11/74 | 21 of 2 |
| Costs included in land account | MC | T | 11/74 | 30 of 2 |
| Increasing charge depreciation | MC | T | 5/74 | 3 of 1 |
| Cost of razing | MC | T | 5/73 | 7 of 1 |
| Computation of depletion | MC | P-II | 11/73 | 9 of 1 |
| Computation of depletion | MC | P-II | 11/72 | 10 of 1 |
| Computation of depletion | MC | P-II | 11/72 | 11 of 1 |
| Treatment of improvement to assets | MC | T | 11/72 | 7 of 1 |
| Units-of-production method | MC | T | 5/72 | 3 of 1 |
| Notes to financial statements | MC | T | 5/72 | 8 of 1 |
| Installment purchase | MC | P-II | 5/72 | 12 of 1 |
| Gain on sale | MC | P-I | 11/71 | 2 of 1 |
| Financial method for trade-ins | MC | P-I | 11/71 | 3 of 1 |
| Tax method for trade-ins | MC | P-I | 11/71 | 4 of 1 |
| Appraisal increments | MC | T | 11/71 | 5 of 1 |
| Inclusion in fixed assets | MC | T | 11/71 | 10 of 1 |
| Group depreciation | MC | T | 11/71 | 19 of 1 |
| Sales tax on machinery | MC | T | 5/71 | 14 of 1 |
| Computation of asset cost and depreciation | Short | P-I | 11/74 | 5b |
| Pollution control equipment | Short | T | 11/73 | 4a |
| Self-constructed asset; depreciation | 25-30 | T | 11/73 | 6 |
| Conventional accounting concept of depreciation; depreciation of computer system | 25-30 | T | 5/72 | 4 |

FUND ACCOUNTING - MUNICIPAL AND OTHER

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Calculation of property tax and journal entries | 40-50 | P-II | 11/75 | 4a & b |
| Various multiple choice relating to state and local government (Nos. 31-40) | Short | T | 11/75 | 2 |
| Major differences in purpose of accounting and reporting for a large city vs. industry | 25-30 | T | 5/75 | 6 |
| Multiple choice relating to municipal and nonprofit hospital | 40-50 | P-I | 11/74 | 2 |
| Journal entries for all funds and groups of accounts -- Municipal | 40-50 | P-II | 5/74 | 5 |
| Multiple choice relating to fund and managerial | 25-30 | T | 11/73 | 2 |
| Fund budgets | 40-50 | P-II | 5/73 | 2 |
| Worksheet for adjustments and distributions to funds; financial statements for General Fund | 40-50 | P-II | 11/72 | 5 |
| Multiple choice relating to funds | 40-50 | P-I | 5/72 | 6 |
| Journal entries for funds | 50-60 | P-I | 11/71 | 6 |
| Multiple choice relating to fund and managerial | 25-30 | T | 5/71 | 2 |

INSTALLMENT SALES

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Deferred income taxes related to | MC | P-II | 5/75 | 4 of 1 |
| Deferred gross profit | MC | P-II | 11/74 | 13 of 1 |
| Gain or loss on repossession | MC | P-II | 11/74 | 14 of 1 |
| Appropriate use | MC | T | 11/72 | 12 of 1 |
| Appropriate use | MC | T | 11/71 | 35 of 2 |
| Appropriate use | MC | T | 5/71 | 18 of 1 |
| Revenues and expenses under installment method | Short | P-II | 11/73 | 2b |

INSURANCE

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Coinsurance | MC | T | 11/72 | 16 of 1 |
| Coinsurance | MC | P-I | 11/71 | 13 of 1 |
| Coinsurance | Short | P-I | 11/74 | 5a |

INTANGIBLES--VALUATION AND AMORTIZATION

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Amortization of patent | MC | P-II | 11/75 | 13 of 1 |
| Trademark | MC | T | 11/74 | 20 of 2 |
| Patents | MC | T | 11/72 | 8 of 1 |
| Goodwill written off | MC | T | 5/71 | 15 of 1 |
| Research and development costs | 25-30 | T | 5/74 | 4 |
| Franchise fees and rental of equipment | 25-30 | T | 11/71 | 4 |
| Problems in accounting for intangibles; possible accounting solutions | 25-30 | T | 5/71 | 5 |

INTERNATIONAL OPERATIONS

| Topic | Type | Part | Exam | Question |
|---|---|---|---|---|
| Statement presentation of loss from currency devaluation | MC | T | 5/75 | 18 of 1 |
| Conversion--Purchases | MC | T | 11/74 | 33 of 2 |
| Conversion to U.S. dollars--Goodwill | MC | T | 11/74 | 38 of 2 |
| Conversion using average rate | MC | T | 11/72 | 17 of 1 |

| | | | | |
|---|---|---|---|---|
| Criteria for using consolidated financial statements; exchange ratio; standards of disclosure required by FASB #1 | 25-30 | T | 11/75 | 4 |

### INVENTORIES

| | | | | |
|---|---|---|---|---|
| Computation - ending inventory | MC | P-II | 11/75 | 16 of 1 |
| Cost to retail ratio | MC | P-II | 11/75 | 17 of 1 |
| Computation-cost of goods sold - periodic | MC | T | 11/75 | 1 of 1 |
| Lower of cost or market | MC | P-I | 5/75 | 7 of 1 |
| Error in inventory | MC | T | 11/74 | 11 of 1 |
| FIFO vs LIFO concepts | MC | T | 11/74 | 22 of 2 |
| Retail inventory method | MC | T | 11/74 | 28 of 2 |
| Valuation basis | MC | T | 11/74 | 34 of 2 |
| Measurement bases | MC | T | 11/74 | 36 of 2 |
| Lower of cost or market | MC | T | 5/74 | 6 of 1 |
| Inventory and cost of goods sold | MC | P-II | 5/74 | 6 of 1 |
| Retail inventory method | MC | P-II | 5/74 | 14 of 1 |
| Estimate based on markup on cost | MC | P-I | 11/73 | 10 of 1 |
| Loss on purchase commitment | MC | P-I | 11/73 | 11 of 1 |
| Estimate based on markup on cost | MC | P-I | 5/73 | 4 of 1 |
| Perpetual vs. periodic | MC | T | 11/72 | 6 of 1 |
| Effect of FIFO on income | MC | P-II | 5/72 | 9 of 1 |
| Estimate based on markup on cost | MC | P-II | 5/72 | 14 of 1 |
| Use of price index numbers | MC | T | 5/72 | 7 of 1 |
| Lower of cost or market | MC | T | 11/71 | 2 of 1 |
| Discounts Lost | MC | T | 11/71 | 3 of 1 |
| Departure from cost basis | MC | T | 11/71 | 4 of 1 |
| Unacceptable methods | MC | T | 5/71 | 9 of 1 |
| Error in inventory | MC | T | 5/71 | 12 of 1 |
| LIFO, FIFO, and weighted average | Short | P-II | 11/74 | 3a |
| Retail inventory method | Short | P-II | 11/74 | 3b |
| Periodic LIFO; dollar value LIFO; advantages and disadvantages | 25-30 | T | 5/74 | 5 |
| Content and pricing of manufacturing inventories; errors in recording | 50-60 | P-I | 11/72 | 3 |

### INVESTMENTS

| | | | | |
|---|---|---|---|---|
| Classification | MC | T | 5/74 | 7 of 1 |
| Determining total cost | MC | P-I | 11/71 | 14 of 1 |
| Identifying securities; making adjusting entries | 50-60 | P-I | 5/75 | 3 |
| Classification; tax allocation for undistributed earnings of Sub | 25-30 | T | 11/74 | 3 |
| Equity method of accounting for investments--*Opinion No. 18* | 40-50 | P-I | 11/72 | 2 |
| Reporting at cost vs. current market value | 15-20 | T | 11/72 | 6 |
| Transactions involving Investments and Investment Revenue | 40-50 | P-II | 11/71 | 5 |

### LEASES

| | | | | |
|---|---|---|---|---|
| Lease equivalent to a sale | MC | P-I | 11/75 | 15 of 1 |
| Operating lease | MC | P-I | 11/75 | 16 of 1 |
| Tax difference between sale and operating lease | MC | P-I | 11/75 | 17 of 1 |
| Computations | MC | P-II | 5/75 | 5 of 1 |
| Computation of interest expense | MC | P-II | 5/75 | 6 of 1 |
| Statement presentation | MC | T | 5/75 | 7 of 1 |
| Amortization on installment purchases | MC | T | 5/75 | 8 of 1 |
| Statement presentation | MC | T | 5/75 | 12 of 1 |
| Gross profit on installment sale | MC | P-II | 5/74 | 1 of 1 |
| Interest and depreciation | MC | P-II | 5/74 | 15 of 1 |
| Assignment to third parties | MC | T | 5/74 | 26 of 2 |
| Sale by manufacturer or dealer | MC | T | 5/74 | 33 of 2 |
| Statement presentation | MC | P-I | 11/73 | 6 of 1 |
| Sale and leaseback | MC | P-I | 5/73 | 12 of 1 |
| Sale and leaseback | MC | T | 5/72 | 18 of 1 |
| Taxes, insurance, and maintenance | MC | T | 11/71 | 23 of 2 |
| Sale and leaseback | MC | T | 11/71 | 24 of 2 |
| Financing method | MC | T | 11/71 | 25 of 2 |
| Financing vs operating methods | MC | T | 11/71 | 26 of 2 |
| Property under construction | MC | T | 5/71 | 1 of 1 |
| Sale and leaseback | MC | T | 5/71 | 6 of 1 |
| Criteria for operating leases and sales leases; entries for a lease-purchase | 25-30 | T | 11/75 | 5 |
| Revenues and expenses by type of computer program lease | 50-60 | P-II | 11/73 | 2 |
| Financing vs. operating leases; disclosures in statements; sale of leases | 25-30 | T | 5/73 | 5 |
| Present value; deficiency in income taxes; interest and amortization | 40-50 | P-II | 5/72 | 4 |

### LIABILITIES

| | | | | |
|---|---|---|---|---|
| Warranty expense and liability | MC | P-I | 5/75 | 4 of 1 |
| Statement presentation of estimated liability | MC | T | 5/75 | 16 of 1 |
| Classification of contingencies | MC | T | 5/74 | 1 of 1 |
| Liability for unredeemed coupons | MC | P-I | 5/73 | 1 of 1 |
| Liability for unredeemed coupons | MC | P-II | 11/72 | 15 of 1 |
| Warranty repair and replacement cost | MC | T | 5/72 | 9 of 1 |
| Identification--Contingencies | MC | T | 11/71 | 11 of 1 |
| Property taxes | MC | T | 11/71 | 12 of 1 |

### LONG TERM CONTRACTS

| | | | | |
|---|---|---|---|---|
| Percentage of completion | MC | P-I | 5/75 | 13 of 1 |
| Percentage of completion | MC | P-I | 5/75 | 14 of 1 |
| Earned but unbilled revenue | MC | T | 11/74 | 18 of 1 |
| Computation | MC | P-II | 11/72 | 12 of 1 |
| Computation | MC | P-II | 11/72 | 13 of 1 |
| Income statements for completed contract; cash budgets | 50-60 | P-I | 11/74 | 3 |
| Revenue and income under both methods; reconstructing balances | 50-60 | P-II | 5/73 | 4 |

### OWNERS' EQUITY--PERSONAL FINANCIAL STATEMENTS

| | | | | |
|---|---|---|---|---|
| Value of land | MC | P-II | 11/72 | 2 of 1 |
| Statement of assets and liabilities using current values | 40-50 | P-I | 11/73 | 6 |
| Statement of assets and liabilities and statement of changes in assets | 40-50 | P-II | 5/71 | 5 |

### OWNERS EQUITY--CORPORATIONS

| | | | | |
|---|---|---|---|---|
| Stock dividend | MC | P-I | 11/75 | 1 of 1 |
| Stock rights | MC | P-I | 11/75 | 2 of 1 |
| Effect of stock Dividend | MC | P-I | 11/75 | 5 of 1 |
| Stock option - total compensation | MC | P-II | 11/75 | 8 of 1 |

### OWNERS EQUITY--CORPORATIONS (CONTINUED)

| | | | | |
|---|---|---|---|---|
| Treasury stock | MC | T | 11/75 | 8 of 1 |
| Debt securities with warrants | MC | T | 11/75 | 9 of 1 |
| Compensatory stock option plan | MC | T | 11/75 | 10 of 1 |
| Measurement date for compensatory stock option plan | MC | T | 11/75 | 24 of 2 |
| Expensing compensation in a compensatory stock option plan | MC | T | 11/75 | 25 of 2 |
| Stock options - compensation and deferral | MC | P-II | 5/75 | 11 of 1 |
| Stock dividend | MC | P-II | 5/75 | 15 of 1 |
| Reissue of treasury stock | MC | T | 5/75 | 19 of 1 |
| Redemption of preferred stock | MC | T | 5/75 | 1 of 1 |
| Exchange of bonds for stock | MC | T | 11/74 | 16 of 1 |
| Stock warrants | MC | P-II | 11/74 | 15 of 1 |
| Reissue of treasury stock | MC | P-II | 11/74 | 16 of 1 |
| Stock dividend | MC | P-II | 5/74 | 12 of 1 |
| Stock option and compensation | MC | P-II | 5/74 | 16 of 1 |
| Use of term "reserve" | MC | T | 5/74 | 2 of 1 |
| Dating of retained earnings | MC | T | 5/74 | 5 of 1 |
| Contingency reserve | MC | T | 5/74 | 12 of 1 |
| Measurement date for option | MC | T | 5/74 | 35 of 2 |
| Stock option for future services | MC | T | 5/74 | 36 of 2 |
| Stock dividend | MC | T | 5/73 | 5 of 1 |
| Book value per share | MC | T | 5/73 | 12 of 1 |
| Settlement of legal suit | MC | P-I | 5/73 | 13 of 1 |
| Classification--Warrants outstanding | MC | T | 11/72 | 3 of 1 |
| Damages from litigation | MC | T | 11/72 | 14 of 1 |
| Prior period losses | MC | T | 11/72 | 15 of 1 |
| Sale of stock rights | MC | P-II | 5/72 | 10 of 1 |
| Dating of retained earnings | MC | T | 5/72 | 5 of 1 |
| Stock dividend | MC | P-I | 11/71 | 8 of 1 |
| Stock dividend | MC | P-I | 11/71 | 10 of 1 |
| Retirement of treasury stock | MC | P-I | 11/71 | 15 of 1 |
| Cash dividend | MC | T | 11/71 | 13 of 1 |
| Stock dividend | MC | T | 11/71 | 29 of 2 |
| Deferred compensation contracts | MC | T | 11/71 | 37 of 2 |
| Proceeds--Debt and warrants | MC | T | 11/71 | 38 of 2 |
| Prior period costs | MC | T | 5/71 | 2 of 1 |
| Liquidation preference on preferred | MC | T | 5/71 | 5 of 1 |
| Quasi-reorganization | MC | T | 5/71 | 8 of 1 |
| Prior period adjustment presentation | MC | T | 5/71 | 20 of 1 |
| Preparation of stockholders' equity section; computation of EPS | 25-30 | T | 11/74 | 7 |
| Worksheet to properly classify stockholders' equity items | 50-60 | P-I | 5/74 | 2 |
| Issue of convertible debt vs debt with separate warrants; journal entry for issuance of notes and warrants | 25-30 | T | 5/74 | 3 |
| Stock options as compensation; statement presentation | 25-30 | T | 5/72 | 6 |
| "Secret reserves" and "watered stock" | 25-30 | T | 11/71 | 3 |

### OWNER'S EQUITY - PARTNERSHIP

| | | | | |
|---|---|---|---|---|
| Retirement of partner | MC | P-II | 11/75 | 1 of 1 |
| Admission of new partner | MC | P-II | 11/75 | 2 of 1 |
| Admission of new partner | MC | P-II | 11/75 | 3 of 1 |
| Liquidation of partnership | MC | P-II | 11/75 | 4 of 1 |
| Computation of net income | MC | P-I | 5/75 | 9 of 1 |
| Admission of new partner | MC | P-I | 5/75 | 10 of 1 |
| Computation of bonus | MC | P-I | 5/75 | 11 of 1 |
| Profit and loss agreement | MC | T | 5/75 | 4 of 1 |
| Admission of new partner | MC | T | 5/75 | 5 of 1 |
| Insolvent partnership | MC | T | 5/75 | 6 of 1 |
| Cash distribution at dissolution | MC | P-II | 11/74 | 8 of 1 |
| Admission of new partner | MC | P-II | 11/74 | 9 of 1 |
| Partnership for federal income tax | MC | P-I | 11/74 | 15 of 1 |
| Contribution of property | MC | P-I | 11/74 | 16 of 1 |
| Capital at formation | MC | P-I | 5/73 | 7 of 1 |
| Capital at formation | MC | P-I | 5/73 | 8 of 1 |
| Goodwill vs bonus | MC | T | 5/73 | 18 of 1 |
| Goodwill at withdrawal of partner | MC | P-I | 11/71 | 9 of 1 |

### OWNER'S EQUITY - PARTNERSHIP (CONTINUED)

| | | | | |
|---|---|---|---|---|
| Adjustment of net income and capital accounts; capital contributions at formation; goodwill at formation; salary, bonus, and interest allowances; sale of interest; admission of new partner | 40-50 | P-I | 11/72 | 5 |
| Computing current value of partnership assets--A/Rec, inventory, and fixed assets; pooling of interest | 50-60 | P-II | 11/71 | 3 |

### OWNER'S EQUITY - EARNINGS PER SHARE

| | | | | |
|---|---|---|---|---|
| Computation | MC | P-II | 11/74 | 2 of 1 |
| Convertible bonds | MC | P-II | 5/74 | 9 of 1 |
| Computation with options | MC | P-II | 5/74 | 13 of 1 |
| Primary EPS on consolidated basis | MC | P-I | 11/73 | 4 of 1 |
| Fully diluted on consolidated basis | MC | P-I | 11/73 | 5 of 1 |
| Computation--Fully dilutes | MC | P-I | 5/73 | 3 of 1 |
| Convertible debt | MC | T | 5/73 | 9 of 1 |
| Options--Primary | MC | P-II | 11/72 | 6 of 1 |
| Options--Fully diluted | MC | P-II | 11/72 | 7 of 1 |
| Equivalents--Preferred stock | MC | P-II | 11/72 | 8 of 1 |
| Effect of cumulative preferred | MC | T | 11/72 | 13 of 1 |
| Yield rate on bonds | MC | P-II | 5/72 | 30 of 2 |
| Effective exercise price of warrant | MC | P-II | 5/72 | 31 of 2 |
| Treasury stock method for warrants | MC | P-II | 5/72 | 32 of 2 |
| Equivalents--Preferred stock | MC | P-II | 5/72 | 33 of 2 |
| Average shares outstanding | MC | P-I | 11/71 | 6 of 1 |
| Convertible debentures | MC | T | 11/71 | 39 of 2 |
| Options and warrants | MC | T | 11/71 | 40 of 2 |
| Computation of net income and number of shares (primary and fully diluted) | 40-50 | P-II | 5/73 | 4 |
| Effect of dividends on preferred stock; treasury stock method; convertible debentures | 25-30 | T | 5/74 | 6 |
| Equivalency of debentures, preferred stock, options; weighted average number of shares; computation | 40-50 | P-I | 5/71 | 4 |

### PENSION COSTS

| | | | | |
|---|---|---|---|---|
| Past service benefit cost | MC | T | 11/75 | 2 of 1 |
| Statement presentation | MC | T | 11/75 | 3 of 1 |
| Minimum charge for pension plan expense | MC | T | 11/75 | 4 of 1 |
| Recognition of actuarial gain or loss | MC | T | 11/75 | 5 of 1 |
| Actuarial cost methods | MC | T | 11/75 | 6 of 1 |
| Pension plan disclosures | MC | T | 11/75 | 7 of 1 |
| Vested rights | MC | T | 5/74 | 21 of 2 |
| Statement presentation | MC | T | 5/73 | 11 of 1 |
| Past Service cost | MC | T | 11/72 | 9 of 1 |
| Actuarial gains and losses | MC | T | 11/71 | 30 of 2 |
| Accrued or prepaid cost | MC | T | 11/71 | 31 of 2 |
| Past and current service cost | MC | T | 5/71 | 3 of 1 |
| Actuarial gains and losses; computation of pension cost; statement presentation | 25-30 | T | 11/73 | 5 |

### POLICIES (ACCOUNTING)

| | | | | |
|---|---|---|---|---|
| Disclosure of policies | MC | T | 5/74 | 28 of 2 |
| Significant accounting policies | MC | T | 11/73 | 10 of 1 |
| Statement presentation | MC | T | 11/73 | 11 of 1 |

### PRESENT VALUE TECHNIQUES

| | | | | |
|---|---|---|---|---|
| Computation of bond selling price | MC | P-I | 11/75 | 12 of 1 |
| Discount on note receivable | MC | P-I | 5/75 | 5 of 1 |
| Use of present value tables | MC | T | 11/74 | 23 of 2 |
| Use of present value tables | MC | T | 11/74 | 24 of 2 |
| Use of present value tables | MC | T | 11/74 | 25 of 2 |
| Use of present value tables | MC | T | 11/74 | 26 of 2 |
| Effectiveness for capital budgeting | MC | T | 11/74 | 35 of 2 |
| Discount on note receivable | MC | P-II | 5/74 | 3 of 1 |
| Deferred income taxes | MC | P-II | 5/74 | 4 of 1 |
| Interest income | MC | P-II | 5/74 | 5 of 1 |
| Interest rate imputed | MC | T | 5/74 | 29 of 2 |
| Noninterest bearing note | MC | T | 5/74 | 31 of 2 |
| Proceeds of note discounted | MC | P-I | 11/73 | 13 of 1 |
| Proceeds of note discounted | MC | P-II | 5/72 | 11 of 1 |
| Use of compound interest formulas | MC | P-I | 5/71 | 11 of 1 |
| Use of compound interest formulas | MC | P-I | 5/71 | 12 of 1 |
| Use of compound interest formulas | MC | P-I | 5/71 | 13 of 1 |
| Use of compound interest formulas | MC | P-I | 5/71 | 14 of 1 |
| Use of time value of money in long range planning | 25-30 | T | 5/73 | 6 |

### PRICE LEVEL ADJUSTMENTS

| | | | | |
|---|---|---|---|---|
| Sales restated for price level changes | MC | P-II | 11/75 | 11 of 1 |
| Mortgage note payable restates | MC | P-II | 11/75 | 12 of 1 |
| Unacceptable practice | MC | T | 5/73 | 15 of 1 |
| Monetary items | MC | T | 11/72 | 18 of 1 |
| Support for statements | MC | T | 5/72 | 17 of 1 |
| Adjusting financial data for general price level changes | 25-30 | T | 5/75 | 7 |
| Support for price level statements; price level vs current value; monetary vs nonmonetary; subsequent statements | 25-30 | T | 11/73 | 3 |
| Various multiple choice questions relating to price level accounting | 40-50 | P-II | 11/71 | 2 |

### QUANTITATIVE TECHNIQUES

| | | | | |
|---|---|---|---|---|
| Definitions | MC | P-II | 11/74 | 17 of 2 |
| Definitions | MC | P-II | 11/74 | 18 of 2 |
| Definitions | MC | P-II | 11/74 | 19 of 2 |
| Average cost function | MC | P-II | 11/74 | 20 of 2 |
| Learning curve | MC | P-II | 11/74 | 26 of 2 |
| Learning curve | MC | P-II | 11/74 | 27 of 2 |
| Linear programming | MC | P-II | 11/74 | 32 of 2 |
| Linear programming | MC | P-II | 11/74 | 33 of 2 |
| Probability of sales | MC | P-I | 5/74 | 13 of 1 |
| Definitions | MC | P-I | 5/74 | 14 of 1 |
| Definitions | MC | P-I | 5/74 | 15 of 1 |
| Definitions | MC | P-I | 5/74 | 16 of 1 |
| Definitions | MC | P-I | 5/74 | 17 of 1 |
| Definitions | MC | P-I | 5/74 | 18 of 1 |
| Various multiple choice questions relating to use of probability diagram (Questions 28-31 of 2) | Short | P-II | 11/74 | 2 |

| | | | | |
|---|---|---|---|---|
| Various multiple choice questions relating to use of probability tables, exponential smoothing, and linear programming | 50-60 | P-I | 5/73 | 5 |
| Use of statistical sampling tables for sample size, upper precision limit, and sampling objectives | 40-50 | P-I | 11/72 | 6 |
| Various multiple choice questions applying quantitative techniques to managerial accounting | 25-30 | T | 5/72 | 2 |
| Various multiple choice questions relating to linear programming | 50-60 | P-I | 11/71 | 5 |
| Various multiple choice questions relating to PERT, EOQ, and linear programming | 50-60 | P-I | 5/71 | 5 |

| RECEIVABLES AND ALLOWANCE FOR DOUBTFUL ACCOUNTS | | | | |
|---|---|---|---|---|
| Computation of allowance | MC | P-II | 11/75 | 14 of 1 |
| Accounts receivable aging | MC | T | 5/75 | 13 of 1 |

| RECEIVABLES AND ALLOWANCE FOR DOUBTFUL ACCOUNTS (CONTINUED) | | | | |
|---|---|---|---|---|
| Effect on working capital | MC | P-II | 11/74 | 12 of 1 |
| Balance sheet disclosure | MC | T | 11/74 | 27 of 2 |
| Unearned discounts and interest; finance charges | MC | T | 11/74 | 31 of 2 |
| End of year adjustment | MC | P-I | 11/73 | 9 of 1 |
| Raising cash from A/Rec | MC | T | 11/72 | 1 of 1 |
| Equity in Assigned A/Rec | MC | T | 5/72 | 1 of 1 |
| Effect on working capital | MC | P-I | 11/71 | 1 of 1 |
| Measurement | MC | T | 5/71 | 16 of 1 |

| SOCIAL COSTS | | | | |
|---|---|---|---|---|
| Recognition and measurement | Short | T | 11/73 | 4b |

| STATEMENT OF CHANGES IN FINANCIAL POSITION | | | | |
|---|---|---|---|---|
| Trade-in of equipment | MC | T | 5/74 | 27 of 2 |
| Exchange of securities | MC | T | 5/74 | 40 of 2 |
| Appropriateness of presentation | MC | T | 5/73 | 16 of 1 |
| Stock dividends declared | MC | T | 11/71 | 21 of 2 |
| Statement objective | MC | T | 11/71 | 22 of 2 |
| All financial resources | MC | T | 5/71 | 7 of 1 |
| Discussion on APB #19; discussion of certain items as sources or uses of working capital | 25-30 | T | 11/75 | 7 |
| Preparation--Working capital basis | 40-50 | P-I | 5/74 | 5 |
| Preparation--Working capital basis | 40-50 | P-I | 5/73 | 2 |
| Statement of objectives and critique of sample statement | 25-30 | T | 11/72 | 5 |
| Various multiple choice questions | Short | P-II | 5/72 | 22ff |
| Preparation--Working capital basis | 50-60 | P-II | 5/71 | 3 |

| TAX | | | | |
|---|---|---|---|---|
| Worksheet - Federal Income Tax | 40-50 | P-I | 11/75 | 4 |
| Multiple choice relating to corporations and partnerships | 50-60 | P-II | 11/75 | 2 |
| Corporation--Taxable income | 40-50 | P-I | 5/75 | 5 |
| Multiple choice relating to individuals and partnerships | 50-60 | P-II | 5/75 | 2 |
| Multiple choice relating to corporations and partnerships | 40-50 | P-I | 11/74 | 1 |
| Individual | 50-60 | P-II | 11/74 | 4 |
| Corporate; gain or loss on property disposition | 40-50 | P-I | 5/74 | 3 |
| Multiple choice relating to individuals | 40-50 | P-II | 5/74 | 2 |
| Individual | 50-60 | P-I | 11/73 | 3 |
| Multiple choice relating to corporations and partnerships | 50-60 | P-II | 11/73 | 1 |
| Individuals and proprietorship | 40-50 | P-I | 5/73 | 4 |
| Individuals | 40-50 | P-II | 5/73 | 1 |
| Multiple choice relating to corporations and partnerships | 50-60 | P-I | 11/72 | 1 |
| Individual; capital gains and losses | 50-60 | P-II | 11/72 | 3 |
| Multiple choice relating to individuals | 50-60 | P-I | 5/72 | 1 |
| Individuals; tax planning; Sub Chapter S | 50-60 | P-II | 5/72 | 3 |
| Corporate | 50-60 | P-I | 11/71 | 2 |
| Multiple choice relating to individuals | 50-60 | P-II | 11/71 | 1 |
| Long-term capital gains | 25-30 | T | 11/71 | 5 |
| Corporate | 40-50 | P-I | 5/71 | 2 |
| Multiple choice relating to individuals | 50-60 | P-II | 5/71 | 1 |

## The Current Crisis

*(Continued from page 7)*

such thing as "true income," "real income," or "absolute income" in a world of uncertainty. And the insistence of the financial community that we measure it will not bring the impossible to pass.

Scholars in the field of economics had quite a few more years in which to come to an understanding and eventual rejection of micro income analysis than we have as yet had. If economists, who have never been required to audit a large company, abandon income as a tool which "breaks in our hands," perhaps accountants ought to heed this caveat. Not only is the typical accountant unaware of these conceptual limitations; in fact, the typical accountant has gone farther and proceeded with the measurement of income with almost total disregard as to how the resulting amounts ought to be interpreted. We have undertaken an awesome task and the prognosis does not improve when a seven-member board is vested with the power to prescribe the exact procedures to be used to measure a continuingly subjective phenomenon. It matters little how many there are who are doing the guessing. A narrowing in the diversity of accounting treatment rules is viewed by many as the solution to our present state of affairs. This will only postpone the inevitable. Sooner or later we will have to come to grips with an answer to the question of what we intend to convey with income. If the same difficulties which were encountered by economists are now being faced by accountants, although manifested in a different form, then the really basic question remains and A.P.B. Opinions and FASB Statements which narrow accounting diversity do not go very far in providing solutions to those more basic difficulties. Until we face the phenomenon of income squarely, our more serious difficulties will remain.

## Conclusion

The outlook for a rapid improvement in the philosophical underpinnings of our profession is not bright at all. Both solutions, the complete abandonment of income and, failing that, a massive educational program to convey the subjectivity character of any income measure, require widespread knowledge of the serious limitations inherent in the measurement of income, even on a purely conceptual level. There is, unfortunately, little prospect that accountants will conclude that income determination "breaks in our hands." It is clearly possible that, given as much time with income concepts as the economists had, we will, in turn, also abandon income measurement. But by then, will institutional rigidity and the precedent of a long line of buttressing opinions of an increasingly quasi-judicial body so embed income measurement that it will become impossible to emerge from the quagmire? It will be years before we will be able to discern the path the profession will take to solve this dilemma. The pivotal question remains unanswered. What do we intend to convey by income measurement?

## Notes

[1]John R. Hicks, *Value and Capital* (Oxford, 1946), p. 174. Hicks goes on to state that the concept of income is one which the theoretical economist employs ". . . at his peril." p. 180.

[2]Herbert T. McAnly, "The Case for LIFO: It Realistically States Income and is Applicable to Any Industry," *The Journal of Accountancy*, June, 1953, pp. 691-700.

[3]Arthur M. Louis, "A Fat Maverick Stirs Up the Accounting Profession," *Fortune*, December, 1970, pp. 96-99.

[4]Raymond J. Chambers, "A Matter of Principle," *The Accounting Review*, July, 1966, pp. 443-57.

[5]For an early expression of this concern see Edward E. Williams, "A Note on Accounting Practice, Investor Rationality, and Capital Resource Allocation," *Financial Analysts Journal*, July-August, 1969, pp. 37-40.

[6]*Forbes*, April 1, 1970, p. 40. (Emphasis added.)


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# Electronic Data Processing

## Controlling the Accuracy of Computerized Data

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Accounting is the process of identifying, evaluating, recording, and communicating financial information about an economic entity. Accounting controls may be characterized as a system of procedures designed to facilitate the proper discharge of accounting responsibilities for the protection of company assets and creation of a satisfactory audit trail. These control procedures should document all transactions and further insure that only correct and authorized data enter the accounting records. Care must be taken that any operations performed on the data are done accurately and in a time frame that will produce useful results. The fundamental importance of accurate data in any information system is succinctly described by the oft-repeated phrase GIGO — garbage in, garbage out.

In a data processing environment the tasks of verifying and controlling data generally involve the activities of capturing source data, accurately transcribing nonmachine-readable data, and guarding against any subsequent loss or distortion as the data is subjected to the many different manipulations, summaries, and transformations performed upon it during the course of normal processing operations. A variety of techniques, some manual and some computerized, are employed to insure the accuracy of the data used.

### Machine-Readable Data

Before a computer can successfully process data, these data must exist in a form intelligible to the equipment. Machine-readable data can take many physical forms. It can appear as holes in a punched card, as magnetic spots on a strip of tape, or as magnetic spots along a track in a disk file. These machine readable forms are usually different from those directly intelligible or convenient for human use. Thus the information about transactions must be converted into one of these storage forms before it can be processed by the equipment. This conversion or transcription process in which human-readable data is converted into machine-readable data is one of the key procedures in any data-processing environment.

The transcription process has a role of great importance in computerized record-keeping. First, it is the basic source of data for subsequent processing and, incidentally, the point at which many of the data controls are established. Therefore, much time and attention is devoted to developing techniques for verifying the accuracy of the machine-readable records produced. Second, the process is time-consuming and expensive. The key punch is still the predominant method of original data entry, representing 80 percent of the keyboards involved in computer data preparation.

Keypunching is a manual key-driven process similar to that used in typing that effectively copies desired data on punched cards. A trend that seems to be increasing is the replacement of keypunching with key-to-tape or key-to-disk operations. This is functionally similar to keypunching — that is, it is a manual data-recording process — but it produces magnetically recorded data that can be used by higher-speed input devices, constitutes a more compact form of storage than punched cards, and is frequently subject to fewer intermediate processing steps than punched card data.

Many of the key-to-disk systems are trending toward an on-line mode of operation in which the computer can perform certain editing functions as the data are stored on disk storage for subsequent processing. This is quite similar to the input process in real-time systems where an operator keys in a transaction at a terminal for immediate processing, although the typical key-to-disk operation is a data collection activity for subsequent batch-processing.

Much of the development work in the data-recording or data-entry area has been aimed at speeding the manual transcription process or eliminating it where possible. Thus preprinting magnetic characters on checks or developing optical scanning equipment that can read printed or even handwritten documents would eliminate the requirement of manual transcription which is time-consuming and a source of many errors.

The need to convert data into a machine-usable format introduces additional considerations into the control process. Procedures must be developed to insure that the conversion process takes place without error, so that the machine-readable records reflect accurate and com-

plete data. The fact that these records are usually not intelligible to a human being without interpretation from the data-processing equipment raises the possibility that errors in the data will go undetected until a fairly long period of time has elapsed or until the error is reflected in the final reports. A delay in detection of an error can be costly, particularly if these records are being used to control or otherwise affect the actual operation. In addition, correction becomes more difficult when undetected errors are allowed to mingle with large volumes of other transactions.

### Responsibility for Data Controls

The data-processing department does not create information, nor does it in fact act as the end user. It is only a processing facility that makes it possible for the various user departments to minimize the cost of recording information generated by those departments and to maximize the use or benefit derived from this information. Since the user departments generate the information, they are the departments that have responsibility for proper authorization of data and in many instances for verifying the accuracy of the source data.

The data-processing group has as its responsibility insuring that this source information is accurately converted into machine-readable or otherwise usable form. Certainly the data-processing department is not excused from the responsibility of insuring full capture of information wherever possible. But the ultimate responsibility for recognizing sources of information and for insuring that all data is properly generated and all transactions properly initiated falls with the user department.

### Controls for the Data-Recording Process

The data control techniques employed by computer installations can be divided into three basic groups: those techniques concerned with the accurate transcription of information into machine-readable records, those techniques concerned with testing the accuracy of the data itself, and those techniques concerned with preventing distortion of the data through subsequent processing procedures. The techniques employed to accomplish these three goals represent a mixture of manual and programmed activities.

Most machine-readable data is created by a manual process, usually a keying operation, in which the operator copies the information from some previously recorded document and produces as output of this operation a machine-readable version of the document. The key-driven device used for this "copying" or transcription process may be physically located in the data processing department or it may be located in the user department. These devices vary in nature from traditional keypunches, key-to-tape, and key-to-disk devices to various manually operated terminal devices such as teletype (and other typewriter-like units) and CRT units, which are usually located at the individual user sites. In the latter case, although data is captured at the source by the user, the requirements for accurate transcription and verification of the data remain.

Assuming that the original document is correctly or accurately recorded, the control techniques for the transcription process center around comparing the contents of the machine-readable record with the contents of the source record. The simplest way to accomplish this is to check the machine-readable record visually. This may be accomplished by looking at the records and comparing the list to original source documents. Visual checking is rarely a practical approach, however, for if it is done accurately it is a slow, time-consuming technique and is subject to the fallibility of the visual scanning.

Visual verification is useful in those instances where the data being recorded is to be used immediately, as is the case in real-time systems. When an operator is recording information on a terminal for immediate use in updating an installation's files, it is imperative that that information be checked for accuracy at the point of recording rather than through some subsequent more automated technique. In these circumstances the terminal should be equipped with a facility to provide automatic feedback for immediate visual checking. If the terminal has a cathode-ray tube device (CRT), the information being recorded by the operator is displayed on the tube. The operator can then visually check the information recorded before using it. A similar approach is the attachment of a hard copy facility to a terminal. This is even more desirable, since it provides an audit trail record as well as an opportunity for the operator visually to check the accuracy of the data as it is being recorded.

Visual checking of data usually should be limited to those instances where information must be used immediately. It is time-consuming because it delays the operator's ability to record subsequent information, and in a high-volume situation it is subject to the same fallibility that affects all human activities. A much more common technique for verification of the original keying procedure is one which involves a duplication of the original keying procedure in a process called key verifying. In key verifying the original recording operation in which the operator produces the machine-readable record is followed by a second operation in which the operator rekeys the data from the source document while the device (usually a key verifier) is concurrently reading the previously produced record. The device then compares the information keyed by the operator with the information recorded in the newly created machine-readable record. If they agree, the record is passed through as having been properly produced. If they do not agree, the operator is notified.

The failure of the machine-readable record to compare with the source document may indicate a keying error by the verifier, or it may indicate an error in the recording of the original machine record. Which it is is determined by repeating the keyed verification process. If on the repetition of the verification attempt the source document is found to agree with the machine-readable record, it may be assumed that the original verification was in error but that the machine-readable record is correct. If the disagreement persists during the second verification procedure, the assumption is that the machine-readable record produced is in error, and it is corrected. Key verification provides a fairly accurate way of checking the transcription process in high-volume applications, but it represents a fairly expensive technique. Since key verification represents a complete duplication of the effort and time involved in the original data recording, key verification of all data represents a cost to the installation that is equivalent to the actual data-recording cost. Because of this cost consideration key verification is frequently employed on only key fields within a record rather than on the entire record.

There are a number of different devices for manual key-driven recording of machine-readable data. The most common is the keypunch. This is a device in which the operator, through a keying operation, produces punched card records. These keypunches still represent about 80% of key-driven data-recording activity. Other key-driven data recording devices are those that produce standard magnetic tape or tape cassettes and those that produce various forms of disk storage. The functional advantage of the key-to-tape and key-to-disk devices lies

in the fact that they produce a form of machine-readable record that represents a higher speed facility than that represented by punched cards. Frequently when punched cards are the initial form of machine-readable records, a procedure will be executed to copy those cards to some form of magnetic storage. If the transcription process produces tape or disk directly, it eliminates the need for this separate operation.

The introduction of a buffer facility to any of these key-driven devices makes error correction procedures somewhat easier. When a key-driven device has a buffer facility, the keying operation causes storage of the data in the buffer. The actual machine record is not produced until the operator depresses a key causing transfer of the information in the buffer to the recording medium. The advantage of this approach is that the operator can then key the entire record before having it transcribed into machine format. Recognition of an error during the keying process provides the operator with the opportunity to rekey the stroke immediately before the machine-readable record has been produced. The process is somewhat analagous to that involved in typing. Frequently an operator recognizes that an error has been made in the process of keying a stroke and can correct it immediately. However, it should be recognized that key-driven data-recording operators, like typists, can make keying errors that they do not recognize and therefore that the introduction of a buffer facility to any of these key-driven recording devices does not eliminate the need for subsequent verification.

## The Use of Check Digits

Use of a check digit (or self-checking number) is another technique employed to verify the accuracy of certain fields. A self-checking number is one that has a precalculated digit, called the check digit, appended to the basic information for the purpose of catching transmission or recording errors. For example, a five-digit code with a self-check digit would appear as a six-digit or six-position field. When such a field is read, the self-check digit would be used to verify the correctness of the field by recalculating the check digit and comparing the calculated check digit with the digit recorded as part of the field. When key-driven recording devices are equipped with a check digit device, the recorder automatically calculates the check digit as the operator keys the field. If the operator keys the same check digit that the device automatically calculates, this is an indication that the field as recorded by the keying operation is correct.

The check digit does more than merely verify the transcription operation, for it checks on the validity of the source data itself. Thus if the source data is incorrectly generated, the check digit approach identifies the error, whereas key verification identifies only transcription errors, not errors in the original input data. Check digits can be used to validate fields such as part number, customer number, or employee number, where the content of the field is not subject to change by the processing involved and where the value in the field is predictable. A check digit cannot be used to validate a quantity field or an amount field where the value is not a preestablished identification code.

The check digit technique catches approximately 97% of the transposition and substitution errors that are the most common type of keypunching and clerical errors. The possibility does exist, however, that a transposition error will not be detected by this technique. Furthermore, a check digit will not identify those instances in which a valid but incorrect code is used. For example, a payroll record may contain a valid employee identification number as one of its fields, but this valid employee identification number may be identifying the wrong employee.

A self-checking number can be used in a number of ways. As discussed above, it can be part of the transcription-checking process when source data is converted to machine-readable form. Keypunches can be equipped with a hardware feature to handle check digits. The technique can also be easily implemented through programmed control in the computer. Any time a data field that is appropriate as a self-checking number is inputted, the computer program can calculate and check for the check digit. This can be done whenever a data record is accessed by the computer and is especially useful when original source data is being entered directly — that is, in real-time operations where an operator is keying in source data through a remote terminal. A self-checking number is also useful when data is being entered through optical scanning techniques that read original documents. As mentioned earlier, self-checking numbers verify more than the accuracy of the transcription process — they also provide a technique for validating the contents of the fields themselves. This is especially valuable in real-time applications where the data can be used to effect master files as soon as it is recorded.

## Batch Controls

Much processing is done in batch mode. Where instantaneous reaction to a transaction is not required, it is usually more efficient to collect a group of transactions (and make any necessary corrections) before using the data for processing. When transactions can be held for batching, control totals for a group of transactions can be calculated from the original source data. When the machine-readable records for this group of transactions are created and subsequently read by data processing equipment, control totals from the machine-readable records can be calculated. If these control totals balance to the control totals accompanying the original source data, the assumption can be made that the transcription process has recorded the data accurately. These control totals can be taken on a number of different fields. Control totals can be calculated in quantitative fields or on identification fields. Frequently, when the control total is calculated on a nonquantitative field (for example, part number), the total is called a hash total rather than a control total. This type of total is taken solely for checking purposes, since the value calculated has no quantitative significance.

A batch may be made up of a group of records having a common identity such as a department, or it may be made up of a specified number of records. The initial balancing operation is designed to determine whether the group of machine-readable records has been properly recorded in the fields checked under the control total; after that takes place several batches may be combined into one larger batch. It is usually desirable to keep the initial batches fairly small so that, should an error be detected by an out-of balance condition, it would be simpler to locate the individual record in error. The larger the batch, the longer the search process to locate such an error record. Once, however, the initial batches are balanced, indicating the machine-readable records have been properly transcribed, accumulation of the small batches into larger, more efficient groupings is desirable. Usually a number of totals are calculated for each batch. If, for example, there are two or three quantity fields as well as an identification field, it would not be unusual to calculate a control total for each of the quantity fields as well as for the identification field.

The balancing operations can be completely automated and executed by com-

puter program. This can be accomplished by having a control card punched that contains the batch totals for each batch and then read along with the machine-readable records produced by the transcribing procedure. The computer program can calculate the batch controls for each group of records and compare them against the control card or control record read in with the original balancing totals.

The use of control totals and record counts is primarily useful in a batch-processing environment, and in fact these control totals are frequently referred to as batch totals. The principles of control totals or batch totals can also be applied in a real-time environment, although the use of these control totals will differ in a real-time environment from that in a batch-processing environment. The purpose of various processing controls and data controls is, first, to prevent erroneous data from producing incorrect results and to prevent loss and distortion of data through processing errors, and, second, to facilitate correction of errors when errors are discovered. Because the batch totals can be calculated and used before the data is actually used to update master records, the batch controls in a batch-processing environment allow accomplishment of both goals. However, this is not possible in a real-time environment because, by definition, in a real-time environment transactions are processed immediately as they occur. It is possible, however, to make good use of control totals in a real-time environment to accomplish the second objective of error control — this is, to facilitate correction of errors when they occur and, furthermore, to facilitate recognition of these errors.

### Other Techniques

An installation will usually implement some combination of the verification and balancing techniques to verify the accuracy of its data-recording procedures. For example, it may key-verify or use a check digit on the identification or control fields of each record, and it may use control totals for the quantity fields. It is possible that descriptive information recorded within each record will not be verified at all. One-hundred-percent accuracy is better guaranteed by complete use of all techniques on all fields within every record, but it must be remembered that each of these verification techniques represents a cost to the installation that must be balanced against the importance of accuracy for each individual field. Further, it has to be recognized that these techniques are oriented toward verifying the transcription or recording procedures of the installation. In general, they do not guarantee the accuracy of the data but rather guarantee that the source information provided to the data-processing department has been faithfully transcribed.

Because the transcription process itself can introduce errors into the data, and because it represents an additional cost to the installation, much attention is given to techniques in which the source document itself can be made machine-readable. One such approach is to use turn-around documents in which some of the identifying information is recorded on the document in machine-readable form. An example of this technique would be the use of customer bills in the form of punched cards where customer identification information is prepunched in the card. This reduces the amount of information that has to be manually recorded and thus verified. Another example of this approach is the use of prerecorded magnetic ink characters on the bottom of checks and deposit slips. The only information that must then be manually recorded on the document is the amount of the check, done by a keying operation on an encoding machine.

Another approach is to use a printed document itself as an input form. This can be accomplished by the use of optical character readers that read documents printed with certain special typefonts. These typefonts can be installed on printers and typewriters so that the hard copy they produce can also be used subsequently as input data. The accuracy of this printed information is essential, and since there is no separate verification of a keying process, applications that use this type of data make greater use of other checking procedures such as check digits, batch controls, and other program tests to detect reading error.

One technique for minimizing the cost of transcribing source data to machine-readable form is the production of machine records as a by-product of other operations. Cash registers can produce paper tape or magnetic cartridges or can even transmit to a central recording facility (which might be a computer) as the cashier rings up sales. Some retail stores are experimenting with magnetic encoding on price tags that can be read by a sensing device at the check-out counter as part of a point-of-sale (POS) data entry system.

### Checking on the Data Itself

Although the primary responsibility for insuring the integrity of data rests with user/initiator departments, there are some techniques that the data-processing department itself can employ to check on the accuracy of data. The responsibilities of the data-processing group should extend wherever possible beyond mere verification of the transcription and processing procedures and attempt to establish the accuracy of the data itself before or as it is recorded in machine-readable form and used for processing.


**FIGURE FLATTERY**

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As discussed previously, the employment of a check digit or self-checking number is an example of a technique that concerns itself with the accuracy of the data itself. A check digit can be used to insure that certain fields within machine records contain valid information. These check digits can be employed during the recording process or during subsequent processing techniques to insure that records being used to update master files are valid.

Frequently the logical consistency of individual fields within a record can be checked by a processing program designed to edit the data. This editing program can be combined with a balancing operation or in batch-mode processing it may be executed independently as a separate program. In those instances where the computer itself captures the original data, the computer can be programmed to perform the editing function as it is recording the transaction rather than waiting to collect a batch of transactions to be edited. Further, some of the editing functions may be incorporated in subsequent processing programs. It is frequently possible to predict for various applications the validity of certain classes of data. For example, if customer numbers in the accounts-receivable file do not contain alphabetic data, when transactions affecting that customer file are being edited it is plausible to test the customer identification field in these new transactions for any alphabetic characters. The existence of an alphabetic character signals something wrong with that record. It is possible that a transaction from a different kind of activity has become mixed in with the file, or it is also possible that the customer number for this particular record was incorrectly recorded and somehow escaped the verification procedures associated with the transcription process.

The field containing an action code has certain predefined acceptable actions for a given application. Thus that field can be edited to make sure that it contains only codes that are acceptable or recognizable by subsequent processing programs. Other fields that contain blanks, negative amounts, alphabetic data, or information that exceeds certain values can also be recognized as being inconsistent with data acceptable for a particular application. Frequently it is not possible to predict what a particular value should be in a field, but it is possible to predict what the maximum and minimum values should be in that field. For example, when editing the data records that reflect hours worked in a payroll application, it is quite possible to recognize potential errors in the hours-worked field if the number of hours recorded exceeds a logical maximum for a week or if an employee receiving sick pay receives credit for hours worked during the same time period.

When using a given transaction to effect an updating operation against the master file, it is possible to use certain information recorded in the master file to verify the transaction further before using it for updating purposes. For example, the employee master records that contain year-to-date earnings may also contain a skills inventory indicating those jobs for which an employee is qualified. Thus, before using the transaction record indicating the number of hours the employee has worked, it is possible to verify the job code in the transaction record against the skills inventory recorded for that employee. A transaction record directing payment for a job code or compensation rate for which the employee is unqualified can thus be identified and printed out on an exception report for special review by the payroll department.

Sometimes none of the verification procedures in effect will detect an error in a transaction record. It is quite possible to record a valid customer number that happens to be the number for another customer and is incorrect for this particular transaction. But some other tests of logical consistency can be used — for example, if a transaction indicates receipt of cash from a customer whose balance due is zero, this can be an indication that the transaction somehow recorded the wrong customer number or that, in fact, there could be an error by the customer and an overpayment. In any event, such a condition can be printed out on an exception report and brought to the attention of the accounts-payable department. It is much more desirable to verify that a customer has overpaid than to neglect to record a receipt from one customer by giving credit to another.

The longer an error is allowed to exist, the more difficult it is to correct it or the more pervasive is its effect. Data that is incorrectly transcribed or that is in error at the time it enters the data processing department and is allowed to affect records through several subsequent operations will create incorrect results for each of those operations. As a consequence of this, many validation and checking techniques are concentrated at the beginning of a processing application. Much of the checking takes place immediately after the transcription or recording operation. Usually data is edited before being used to update master files.

The attempt to preserve data integrity involves execution of a combination of techniques, not all of which can be carried out at the same time. Where possible, correction should be made immediately, and the corrected data reentered into the system during the same processing cycle.

*(Continued on page 28)*

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# Financial Statements

## Another Look at the Statement of Changes in Financial Position

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*Professor Posey is a member of various professional organizations, including AWSCPA, and has previously been published in THE WOMAN CPA.*

### History of the Statement

Although the funds statement was developed in the early 1900's, its inclusion in the external reporting package was not mandatory until the 1970's. Accounting Principles Board Opinion No. 3[1] recommended that a statement of source and application of funds be presented as supplementary information in financial statements. Even then, one of the members assented with the qualification that he felt the statement should be required. Two other members qualified their assent because they felt the statement might be misleading to some unwary investors. In October, 1970, SEC Accounting Series Release 117[2] required the inclusion of a statement of source and application of funds in certain registration statements and reporting forms. The release did not specify a particular definition of funds nor did it specify the format. The disclosure of material changes in the components of net funds or working capital was a requirement.

Accounting Principles Board Opinion No. 19[3] (APB No. 19) required that a funds statement be presented for each period for which an income statement is presented by profit-oriented business entities, whenever an income statement and a balance sheet are presented together for all periods ending after September 30, 1971. The Board specified that the statement should be prepared using a total resources concept, meaning that it should include all important aspects of the financing and investing activities of the reporting entity during the period covered. Such activities as an exchange of debt or equity securities for property and plant or long-term debt should be included as both sources and applications of funds, even though working capital or cash, common definitions of "funds," were not affected. To reflect this broad concept of funds, the Board recommended that the title be changed to "Statement of Changes in Financial Position."

### Inclusion of the Statement in the Annual Report

Although APB No. 19 was the first time the Statement of Changes in Financial Position (referred to subsequently as the "Statement") had been an external reporting requirement (may be omitted on financial reports restricted for internal use only), many reporting entities had been including the Statement in their annual report. According to 1971 *Accounting Trends and Techniques,*[4] 573 of the sample of 600 companies included a funds statement in their 1970 annual report with a variety of titles. Slightly over half (53%) used the title "Source and Application of Funds," and an additional 154 used the word "Funds." The remaining 116 (20%) used a title containing the phrase "Working Capital." The auditor's report covered all but fourteen of the funds statements. Implementation of APB No. 19 should have been no real problem for most reporting entities and APB No. 19 was generally considered a non-controversial promulgation.

The Statement, although not replacing either, should provide a useful link between the income statement and balance sheet. The Board stated the objectives of the statement as "(1) to summarize the financing and investing activities of the entity, including the extent to which the enterprise has generated funds from operations during the period, and (2) to complete the disclosure of changes in financial position during the period."[5] To achieve these objectives, the presentation should be clear and understandable to the statement user. Descriptive titles which clearly portray the activity involved and also have reasonable comparability to the statements of other reporting entities seem essential to provide useful statements for many users.

## The Sample

To determine the degree of adherence to the requirements of APB No. 19 in the Statement of Changes in Financial Position contained in the annual reports of publicly held corporations, the writer examined the 1974 annual reports of the 100 largest industrial companies as reported by *Fortune*, May, 1975. Ninety-nine of the reports were available, although the reports for six of the reporting entities were for the reporting year ended during 1973. All of the annual reports contained the Statement, most often presented as the last of the three major statements. One of the ninety-nine reporting companies did not follow the recommended statement title; instead, it used "Summary of Operations." The statement did not comply very closely with other recommendations of the Board.

## Compliance with the Requirements of APB No. 19

APB No. 19 provides for flexibility in form, content, and terminology in the statement to meet differing circumstances. For instance, paragraph 11 provides that the Statement may be in balanced form or in a form expressing the changes in working capital, cash and temporary investments combined, or of cash. The balanced form could show increases in working capital, cash and temporary investments, or cash as an application of resources or decreases as a source of resources. Ninety-three statements showed changes in working capital, four presented changes in cash and marketable securities (title used on the Statement), and two apparently used cash. Two of the statements were presented in an unusual form; they were not divided into the customary sources and applications format. Instead, deductions indicated by parenthesis were shown in the same column as additions, and a total was presented. One reporting entity included just "cash" with no explanation as an addition in the column. This decrease in cash was not labeled at all and seemed confusing even to this reader. To be sure, one can refer to the comparative balance sheet to ascertain that the latest year had a decline in cash from the preceding year, but this and the other less than ideal presentations would probably leave some users confused.

Of even greater concern is the apparent lack of compliance with the recommendation that the wording of the Statement make it clear to the user that the items such as depreciation, deferred taxes, depletion, and earnings of investments carried at equity which are added back (or deducted) from income before extraordinary items, if any, are not sources or uses of working capital or cash. The Opinion presents as an example of an appropriate caption "Add — Expenses not requiring outlay of working capital in the current period." An alternative procedure "is to begin with total revenue that provided working capital or cash during the period and deduct operating costs and expenses that required the outlay of working capital during the period." Although this approach has been recommended by writers,[6] none of the statements surveyed used this approach.

Forty-five of the Statements surveyed used wording that presented either Net Income or Income Before Extraordinary Items, sale of discontinued operations, or accounting changes and the deductions not requiring an outlay of working capital or revenues not providing working capital as equivalent items. Exhibit I shows a very common format for the working capital provided by the operations section of the Statement.

Others in the sample clarified the adjustments somewhat by using the format shown in Exhibit II. If the reader carefully reads down to the fourth item, the phrase "other items not requiring the use of working capital" may give the lay reader a clue that some are not really a source of working capital. Since the statement includes net income or income before extraordinary items in the same category, the presentation hardly seems as clear as the Board apparently intended. Fifty-four of the reporting entities used the wording in APB No. 19 or very similar wording. Some of the adaptions seemed to clarify the wording for the particular data included. Rather than a caption for a group of different items, three of the statements in this latter group added to net income a single item called "depreciation and other items not requiring current outflow of working capital" and in the other case "items not affecting working capital — principally depreciation and deferred taxes." At least one statement included

**Exhibit I[1]**

| | Millions of Dollars | |
|---|---|---|
| | Year Ended Dec. 31. 1974 | Year Ended Dec. 31, 1973 |
| Operations | | |
| Net Income | 530 | 291 |
| Depreciation and Depletion | 248 | 245 |
| Deferred Income Taxes— Noncurrent | 51 | 20 |
| Minority Stockholders' Share of Income | 31 | 25 |
| Unremitted Earnings of Companies Carried at Equity | (24) | (7) |
| Working Capital Provided from Operations[2] | 836 | 574 |

[1]Wording taken from an actual statement.
[2]In several cases the total was presented without a caption

**Exhibit II**

| | Millions of Dollars | |
|---|---|---|
| | Year Ended Dec. 31, 1974 | Year Ended Dec. 31, 1973 |
| Operations | | |
| Net Income | 240 | 210 |
| Depreciation | 150 | 145 |
| Deferred Income Taxes | 40 | 35 |
| Other Items not requiring the use of working capital | 15 | 10 |
| Working Capital Provided from Operations | 445 | 400 |

the adjustments needed for extraordinary items along with the other adjustments to income before extraordinary items to arrive at working capital provided by operations. One statement presented deferred income taxes below working capital provided by operations as a negative source of funds. In some cases the words "funds from operations" were used instead of "working capital," and in five cases the words "charges not requiring cash in current period" or similar terminology were used on a statement with a working capital format.

The statements using the cash or cash and marketable securities formats often presented the same working capital provided from operations format as that presented in statements using the working capital format throughout. In these cases the changes in the appropriate current items as required in APB No. 19 were shown elsewhere in the statements. In all statements but three the changes in working capital were presented either in the body of the main statement or in a schedule immediately following and attached to the sources and applications of funds. The remaining schedules of changes in working capital were presented in adequate detail as footnotes. This alternative treatment, in at least one case, was required to fit the statement on one page by the amount of detail in both the statement and the schedule of changes in working capital, but in the others it was just a matter of arrangement. The requirement for the presentation of the changes in working capital, which could be obtained with a little effort from the comparative balance sheets, was followed as closely as the requirement for the Statement itself.

Various words for the two sections of the Statement were used in the ninety-nine annual reports surveyed. Some used resources provided and resources applied; some used funds or working capital instead of resources. All of the terms except those using working capital, which does not imply the broad approach required, seem to be reasonably informative.

A few discrepancies in account titles of the same item presented in two statements within the same annual report were noted. Perhaps a statement reader would understand one but not the other in some cases, but one wonders if he/she could have trouble recognizing the item as the same one on the different statements. For instance, one reporting entity used the words "timing differences" under provision for income taxes on the income statement and "deferred taxes" on the statement of changes in financial position. In another instance, depreciation and depletion were used on the Statement and capital extinguishments was used on a ten-year summary of the changes in financial statement which was presented with the statistical data in the back of the annual report.

## The First Objective of Financial Statements

The first objective of the Trueblood Commission for "financial statements is to serve primarily those users who have limited authority, ability, or resources to obtain information and who rely on financial statements as their principal source of information about an enterprise's economic activities."[7] If statements are to be presented to meet this objective, they surely must be understandable to the user. Users vary from the unsophisticated occasional investor to the managers of the reporting entity. The unsophisticated investor would probably rely on the annual reports for a larger amount of information than any of the other statement users. All firms must make the information contained in the SEC required 10K available on request, and a few, including two in this sample, present some or all of the additional data included in the 10K within the annual report. It has been reported that very few have requested this additional information. Since the annual report is the primary source of information for many users, including the unsophisticated, all statements should be presented with as much clarity and comparability as possible.

## Conclusions

Nearly half (45%) of the Statements presented by the reporting entities surveyed seem to represent substandard reporting because of lack of compliance with paragraph 10 of APB No. 19. The wording recommended by the Board seems clearer and therefore more likely to achieve the first objective of the Trueblood Commission than that used by these reporting entities.

Although all of the firms presented the Statement, there seems to be considerable room for improvement in format, content, and terminology, even after recognizing that the Board expressly recognized the need for flexibility to achieve a presentation that is most informative for the particular circumstances. By observation of the content of the Statement, it appeared that all firms had adhered to the broad concept of total resources, although in a few statements the captions did not disclose this fact. Perhaps another look at APB No. 19 to achieve more than just substantial compliance would help achieve the first objective of the Trueblood Commission.

## Notes

[1]American Institute of Certified Public Accountants, Accounting Principles Board, "The Statements of Source and Application of Funds," *Accounting Principles Board Opinion No. 3*, New York, 1963.

[2]*Accounting Series Release 117*, Securities and Exchange Commission, Washington, D. C., October 14, 1970.

[3]American Institute of Certified Public Accountants, Accounting Principles Board, "Reporting Changes in Financial Position," *Accounting Principles Board Opinion No. 19*, New York, 1971.

[4]American Institute of Certified Public Accountants, *Accounting Trends and Techniques*, Twenty-fifth Edition, New York, 1971, p. 255.

[5]American Institute of Certified Public Accountants, Accounting Principles Board, "Reporting Changes in Financial Position," *Accounting Principles Board Opinion No. 19*, New York, 1971.

[6]For example: J. M. Giese and T. P. Klammer, "Achieving the Objectives of APB Opinion No. 19," *Journal of Accountancy*, March, 1974, 54-61.

[7]American Institute of Certified Public Accountants, *Objectives of Financial Statements*, Report of the Study Group on the Objectives of Financial Statements, New York, 1973, p. 17.


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# Legal Developments

## Auditors' Liability to Investors for Clients' Inadequate Disclosure or The Auditor as Police Dog

Dr. Patrica C. Elliott, CPA
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*GUEST WRITER: This column was written by Margaret R. Liles, a staff auditor with the Seattle office of Price Waterhouse & Co. Ms. Liles recently received her M.B.A. from the University of Washington.*

*The article is in two parts and will be concluded in the July 1976 issue.*

### Introduction

In 1896 Lord Justice Lopes characterized the responsibilities of an auditor for the detection of fraud by restating criteria which for years have been accepted as the proper test of auditors' liability:

> "[An auditor] is a watch dog, but not a bloodhound. He is justified in believing tried servants of the company in whom confidence is placed by the company. He is entitled to assume that they are honest, and to rely upon their representations, provided he takes reasonable care. If there is anything calculated to excite suspicion he should probe it to the bottom; but in the absence of anything of that kind he is only bound to be reasonably cautious and careful.
>
> . . . ."Auditors must not be made liable for not tracking out ingenious and carefully laid schemes of fraud when there is nothing to arouse their suspicion, and when those frauds are perpetrated by tried servants of the company and are undetected for years by the directors. So to hold would make the position of an auditor intolerable."[1]

In view of the explosive growth of securities law fraud litigation in recent years and recent court cases imposing professional liability under the securities laws, it is respectfully submitted that Lord Justice Lopes' view is obsolete and that the role of the auditor, at least in the eyes of the Securities and Exchange Commission (SEC), is not even that of bloodhound — much less watchdog — in fact, it now seems to have become that of police dog.

The auditor's duties as police dog and the emerging grounds for liability as imposed by recent cases are in this article analyzed in terms of three functions: 1) the duty to investigate (the "Sniff" Function), 2) the duty to disclose (the "Bark" Function), and 3) the duty to alert authorities (the "Bite" Function). Some consequences for accountants of the new standards of liability and the auditor's new role as police dog are also explored.

### Background

#### Legal Basis for Liability

Any liability of an account for improper disclosure by a client must be in the nature of a derived liability — that is, the client must first do something illegal and the accountant must be deemed liable as a participant or aider and abettor in some fashion. In order to understand accountants' liability, it is thus essential first to explore the basis on which the client becomes liable.

The statutory and regulatory provisions most frequently relied upon in private litigation by investors charging securities fraud in financings are Section 10(b) of the Securities Exchange Act of 1934 (the Exchange Act) and Rule 10b-5 thereunder. Rule 10b-5 makes it unlawful for any person (using the jurisdictional instrumentalities of the mails or interstate commerce) in connection with the purchase or sale of a security: "1) to employ any device, scheme or artifice to defraud, 2) to make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading or, 3) to engage in any act, practice or course of business which operates or would operate as a fraud or deceit upon any person . . ."

In connection with a fully-registered offering of securities, civil liability for damages to any purchaser of the securities for material misstatements or omissions contained in the financial statements in a registration statement is expressly imposed upon auditors, as well as upon the issuing corporation, its officers, directors, certain experts and underwriters, by Section 11 of the Securities Act of 1933.

Language substantially similar to that contained in Rule 10b-5 is used in other sections of the federal securities laws to give investors a cause of action against sellers of securities for material misstatements or omissions in prospectuses and other communications,[2] proxy solicitations by registered companies,[3] tender offers,[4] and documents filed with the SEC under the Exchange Act.[5] Moreover, in most state securities laws ("Blue Sky" Laws) there is an express civil liability section akin to Section 12 of the Securities Act and a general antifraud provision very similar to Rule 10b-5.

Rule 10b-5 contains broad provisions which are not limited to a financing in which a corporation receives proceeds from the sale of securities. General finan-

cial information which could foreseeably cause investors to purchase or sell a company's securities, such as that issued in press releases and periodic reports to shareholders, may lead to liability of a company under Rule 10b-5 if such information contains material misstatements or omissions.[6] Notably absent in the language of Rule 10b-5 is any delineation of duties owed, or by whom and to whom such duties may be owed. It has been left to the courts to interpret the Rule and fashion a standard of conduct for liability and successful defense thereof in 10b-5 cases.

The party initially and principally responsible for fraudulent conduct in securities fraud cases in which an independent accountant is involved is usually the accountant's client company and its management. Securities fraud has come to mean imperfect disclosure as to all material facts in official company statements — a very different concept from the willful or criminal fraud of the common law variety traditionally referred to in the literature of the accounting profession. Financial information is initially the undertaking of the client. The independent accountant's undertaking in these matters is traditionally limited to the expression of an opinion on the fairness of the financial statements furnished by the client for review.

If accountants are liable, they usually would be so on a derived or secondary basis for having participated in or aided and abetted the illegal conduct of a client. By means of their opinion issued on the misleading financial statements or their association with unaudited statements or other data, the auditors may be charged with participating in or aiding and abetting the misstatement or omission of material information. Recent securities fraud litigation typically includes charges that accountants, as a result of their work pursuant to the audit engagement, either knew or should have known of their client's disclosure deficiencies and thus may be liable to investors on an aider and abettor theory.

## Current SEC Crusade for Higher Professional Standards (i.e. Greater Liability)

In recent years the SEC has undertaken a drive to hold accountants to higher professional standards. This drive has been conducted through SEC lawsuits against members of the accounting profession, public expression of views by SEC Commissioners and its Chief Accountant, and SEC *amicus curiae* briefs in civil lawsuits.

Commissioner Sommer quite correctly points out that accountants are in a unique strategic position, by virtue of their power and traditional independence, to influence corporate behavior, to detect securities frauds in the incipiency, and to nip a fraud before it blossoms.[7] Moreover, the popular (albeit perhaps misguided) view is that the presence of a reputable accountant in a business transaction constitutes an assurance, if not legitimacy, of at least accurate presentation. In Commissioner Sommer's view, the public's expectations in this regard should be met to the extent practicable.[8]

SEC Chief Accountant Burton echoes Commissioner Sommer on the policies behind recent enforcement activities by the Commission involving professionals:

> ". . . The SEC enforcement program is designed to maintain the integrity of the market place and deter fraud . . .: these professionals are an essential element in providing access to the market place, since the sale of securities cannot take place without their involvement. Professional responsibility at these points of access can prevent many questionable activities before they occur . . ."[9]

The key issue in the crusade for increased accountants' responsibility for proper disclosure by their clients in business transactions has been aptly stated by former Chairman Garrett:

> "The problem . . . is the involvement of accountants and lawyers in the failure of issuers to comply with the requirements of our laws for full and fair disclosure of material information."[10]

In Garrett's view, a really successful fraud cannot be accomplished in our complex financial world without the help of accountants and lawyers. He views the accountants' proper role as that of police officers — to insist in their corporate and financial practice upon compliance with the law in accordance with professional standards. Garrett praises the efforts of the accounting profession to enunciate professional standards and guidelines, but he adds the following caveat:

> ". . .The final goal of full and fair disclosure must in the end govern over the mechanical adherence to any conceivable checklist. . . . Accountants and lawyers are in the front line of law enforcement, helping to achieve the goals of . . . full and fair disclosure to investors . . ."[11]

This then is the sum and substance of the SEC's crusade: the SEC has deputized each and every accountant and attorney to be an enforcement agent of the Commission in the detection and prevention of securities fraud. Moreover, the SEC would involve public accountants in areas in which accountants have traditionally refused to accept responsibility, such as interim reports and press releases. Nonetheless, speeches by SEC Commissioners also state that it is not expected that "auditors . . . become insurers against all forms of management fraud, however carefully concealed,"[11] but only in "appropriate cases."[12] If auditors have been sufficiently careful and are merely victims of the client's duplicity, they should not be liable. The unanswered question, of course, is: how careful is sufficiently careful?

## Flexible Duty Standard

The SEC's theory is that the extent of an accountant's duty to investigate and disclose material facts will be determined in the light of the surrounding circumstances of the particular case, with emphasis upon a CPA's duty to the investing public. Commissioner Sommer indicates that with respect to Rule 10b-5 violations the old mechanistic application of traditional common law concepts (such as *scienter*, reliance, etc.) is eroding, and that trying to measure conduct by such ambiguous concepts is "a bit of a waste of time." Instead, Commissioner Sommer, quoting extensively from the recent Ninth Circuit opinion in *White v. Abrams*,[13] advocates a flexible duty standard, whereby

> ". . . one must look to the nature of the duty properly imposed upon the auditor, the extent to which his [sic] work is expectably relied upon, the indications of departure from accepted norms of the profession, the suggestions of submission to pressures from clients, the extent of his [sic] awareness of the picture the financial statements present to one relying upon them, and the seriousness of the consequences if care is not exercised."[14]

Hence, most suits against accountants under Rule 10b-5 would not be dismissed for lack of *scienter* (knowledge and intent to deceive) and would proceed to trial. An accountant's duties would thus presumably be subjectively determined by each jury on a case-by-case basis. The courts, in applying the flexible duty standard advocated by Commissioner Sommer, would assess the duties and degree of care

applied by accountants in each specific factual context. An accountant could be held liable to investors for a client's inadequate disclosure even though she or he was unaware of the error. As Commissioner Sommer notes, application of the flexible duty standard by the courts would undoubtedly result in an upgrading of performance by CPAs,[15] and the fear of liability is an effective, albeit costly, stimulus to increased diligence and better disclosure.

Many legal commentators expect the flexible duty standard for professional liability espoused by the court in *White v. Abrams* will be adopted by other circuit courts in cases brought under Rule 10b-5 in the future. For public accountants the prospect of such increased exposure to liability for breach of duty, coupled with the magnitude of damages generally involved in securities law cases, is unsettling, to say the least, particularly if such duties are to be defined in an unpredictable fashion.

## The Sniff Function — Auditors' Liability for Inadequate Investigation

One application of the flexible duty standard for accountant defendants is illustrated by *Hochfelder v. Ernst & Ernst,*[16] a case on appeal from the Seventh Circuit to the Supreme Court.

The underlying fraud in this case was committed by Leston B. Nay, president and 92% owner of First Securities Company of Chicago, a small brokerage firm. Nay had created certain spurious escrow accounts in which some of his brokerage customers (plaintiffs) had invested, and he had secretly used the funds for his own purposes. The injured investors claimed that Ernst & Ernst, auditors of First Securities Company, were negligent in performing their audit, that is, in failing to discover (i.e. sniff out) and follow up by additional testing the existence of Nay's "mail rule," whereby only Nay was to open mail addressed to him, even when he was absent from the office, and Ernst & Ernst was thereby guilty of facilitating or aiding and abetting Nay's concealed fraud.

The *Hochfelder* court focused on the auditor's duties to investors in analyzing the necessary elements for aiding and abetting a violation of Rule 10b-5. After rejecting the contention that proof of the auditors' knowledge of their client's fraudulent scheme is necessary to maintain a claim against them, the court found it necessary to show only that, if the defendant had a duty of inquiry,

> "The party charged with aiding and abetting had knowledge of or, *but for a breach of the duty of inquiry, should have had knowledge of the fraud,* and that possessing such knowledge the party failed to act due to an improper motive or breach of a duty of disclosure."[17] [Emphasis supplied.]

This case is somewhat unusual in that the auditors' client who committed the fraud was a brokerage firm, required by statute[18] to file audited annual financial statements with the SEC. Hence, because of their audit engagement, the auditors, Ernst & Ernst, had a statutory duty of inquiry which inured to investors. Because there was no proof of reliance on the auditors' report by the injured investors, the court found no common law duty of inquiry. The expansion of auditors' responsibilities to investors under the securities laws beyond the duties imposed by common law standards is thus well illustrated by this case.

The *Hochfelder* case stands for the proposition that whenever an audit is done pursuant to some statutory requirement for filing financial statements with the SEC, (such as a prospectus, a 10-K report, and perhaps an annual report to shareholders) the auditor who breaches a duty of inquiry due to failure to sniff out fraud may be liable to investors under Rule 10b-5. This would result although investors have not seen the auditor's report, although the auditor is unaware of the client's fraud, and although there is no privity of contract between auditor and investor. In circumstances not involving SEC filings, if investors actually rely on the auditor's report, presumably the requisite duty of inquiry would also be found to flow to investors.

It thus is not difficult for a court to find that auditors have a duty to sniff long and hard at the financial condition of their client. Whether or not liability will be imposed will then be determined by a finding of negligence in the audit resulting in breach of that duty, which also is an issue of fact to be determined at trial. The *Hochfelder* court appears to lend some comfort to accountants in that the court says that if auditors follow generally accepted auditing standards (GAAS) in conducting their audit review, they will be protected from liability to investors for failing to detect fraud.

Unfortunately, GAAS do not often spell out precise procedures an auditor should follow, and auditing procedures are often a matter of judgment. From the benefit of hindsight it is almost always possible to perceive additional steps an auditor could, and thus presumably should, have taken to lead to the uncovering of a client's fraudulent conduct. Since the adequacy of an auditor's auditing procedures is to be an issue of fact to be determined at trial, and since even accountants will have differing opinions as to what should have been done in close cases, it should not be difficult for plaintiffs in many such cases to provide expert witnesses who will assert that the defendant auditors should have taken additional steps. It follows that the wide latitude in determining whether or not there has been compliance with GAAS means that attempted reliance upon GAAS offers little assurance of protection from liability to investors in the cases which by virtue of hindsight are "close cases."

In the second and concluding part of this article, we will explore the "Bark" and "Bite" functions and whether or not old dogs can be taught new tricks.

## Notes

[1]*In re Kingston Cotton Mill Co. (No. 2),* [1896] 2 Ch. 279 (Lord Justice Lopes). Note that the accounting profession's standard, as outlined in SAS No. 1 §110.05, is similar, in that GAAS impose on the auditor a duty to be on the lookout for fraud and to test the client's internal control system, but that responsibility for failure to detect fraud (which responsibility differs as to clients and others) arises only where there is clearly a failure to comply with GAAS.

[2]§12(a) of the Securities Act.

[3]§14(a) of the Exchange Act and its enabling Rule 14a9.

[4]§14(e) of the Exchange Act.

[5]§18(a) of the Exchange Act.

[6]See, e.g. *SEC v. Texas Gulf Sulphur Co.,* 401 F.2d 833 (2d Cir. 1968) (press release); *Heit v. Weitzen* 402 F.2d 909 (2d Cir. 1968), *cert. denied,* 395 U.S. 903 (1969) (press releases and annual report to stockholders).

[7]Sommer, *Professional Responsibility: How Did We Get Here?* 30 BUS. LAW. 95-6 (1975). Speech of SEC Commissioner Sommer, *The Four Musts of Financial Reporting,* [1973-74 Transfer Binder] CCH Fed. Sec. L. Rep. ^ 79,620 (Jan. 8, 1974) at 83,662.

[8]Burton, *SEC Enforcement and Professional Accountants: Philosophy, Objectives and Approach,* 28 VAND. L. REV. 19-20 (1975). See also, Speech of SEC Commissioner Sommer, *The Four Musts of Financial Reporting,* [1973-74 Transfer Binder] CCH Fed. Sec. L. Rep. ^ 79,620 (Jan. 8, 1974).

[9]Garrett, *Problems of Professional Responsibility,* 1 ABA LITIGATION 33 (Winter, 1975).

[10]*Id.*

[11]Garrett, *Improving Financial Disclosure to Investors,* 136 J. OF ACCOUNTANCY 14 (1973) at 16.

[12]*Id.* at 14.

[13]495 F.2d 724 (9th Cir. 1974).

[14]Sommer, *Accountants: A Flexible Standard,* 1 ABA LITIGATION 35 (1975), at 39.

[15]*Id.* at 39.

[16]503 F.2d 1100 (7th Cir. 1974).

[17]*Id.* at 1104.

[18]§17(a) of the Exchange Act and Rule 17a-5 thereunder requires broker-dealers to file audited financial statements, prepared in accordance with GAAS, with the SEC.

# Reviews

## Writings in Accounting

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**"CRITERIA FOR DETERMINING MATERIALITY," Discussion Memorandum issued by the Financial Accounting Standards Board, March 21, 1975.**

In the later part of May 1976 the Financial Accounting Standards Board is planning initial public hearings in connection with issuing a Statement dealing with the "Criteria for Determining Materiality". During the public hearing consideration will be given to the Discussion Memorandum issued on the subject in March of 1975.

The Discussion Memorandum indicates that while the exact "materiality" decision-making process varies, financial statement preparers and auditors have traditionally considered the following types of factors in reaching materiality decisions:

1. The economic, business and political environments of the business.
2. The nature and ability of a business management, the nature of operations and the manner of financing those operations.
3. The acceptability of accounting principles being used and management's rationale for using those principles.
4. The potential effects of an uncertainty.
5. The nature and circumstances of a matter and the effect the disclosure or nondisclosure would have on users.
6. The magnitude of and financial effect (current and potential) upon the trend of earnings and liquidity position of the business.
7. The determination of materiality on an individual item or on a cumulative basis.

After considering and discussing the concerns of investors and lenders and viewing financial statements in relation to the above factors, the Discussion Memorandum indicated that financial statements need to provide sufficient information so that: 1) risk and return can be evaluated and 2) business level and trend of operations can be assessed. In making such decisions comparative financial statement analysis is very significant.

Of specific interest in the Discussion Memorandum are illustrations of four levels of criteria for determining materiality, one or a combination of which could be adopted in a Statement by the Financial Accounting Standards Board. The levels vary depending upon the degree of specificity of the factors to be considered and mode of expressing the criteria illustrated as quantitative, nonquantitative or partly quantitative and partly nonquantitative.

The illustrations which were included as examples in an appendix to the Discussion Memorandum, are summarized as follows:

1. General overall criterion, quantitative — This criterion develops an overall rule specifying a quantitative amount that can be generally applied. For example, a matter could be deemed material if the ratio of its current or potential effect to a pertinent current financial statement amount equals or exceeds 5%.

2. General criteria — These criteria illustrate materiality decisions which are made without quantitative tests and also show how general criteria might be framed in quantitative terms stated in ranges.

   a. Nonquantitative criteria — An item would be deemed to be material if its disclosure or lack of disclosure would reasonably be expected to influence the judgment and actions of a well-informed investor or creditor. Under this criteria, matters could be disclosed even though the impact on the financial statements would be slight.

   b. Partly quantitative and partly nonquantitative criteria — Under these criteria, the materiality of a matter could be determined if an amount or its current or potential effect exceeds or equals 10% of a pertinent financial statement amount. If the amount or current or potential effect is less than 5% on a pertinent financial statement amount the matter could be presumed to be immaterial. However, if an amount or current or potential effect is between 5% and 10% the materiality of the matter depends on the surrounding factors and circumstances.

3. Criteria based on factors underlying or bearing on materiality — These criteria encompass traditional materiality factors, previously discussed, and include such items as environmental factors, enterprise related factors, accounting policies, uncertainty, circumstances surrounding a matter and its characteristics, magnitude and financial effect, and cumulative financial effect. All of these factors are generally evaluated together and the importance placed upon any one is generally dependent upon individual circumstances.

4. Quantitative criteria for special matters — This illustration of criteria demonstrates the incorporation of quantitative tests for specific items or situations. The Discussion Memorandum included three examples. In each of the examples, which included accounting changes and extraordinary, unusual and infrequently occurring events and transactions, quantitative tests were applied on the specific matters and compared to appropriate financial statement amounts.

The final decision of the Financial Ac-

counting Standards Board on defining materiality criteria is right now a matter of conjecture. However, emphasis on materiality criteria by the Financial Accounting Standards Board, if combined with the continued consideration of theoretical accounting questions and problems which would aid in the comparability of financial information between similar businesses, should improve the quality of financial information for users of financial statements.

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### AUDIT AND CONTROL OF COMPUTER SYSTEMS, Elise G. Jancura; Petrocelli/Charter, New York, N.Y., 1974; 355 pages, $13.95 (cloth-cover).

*Audit and Control of Computer Systems,* written by Dr. Elise G. Jancura, CPA, is written to provide auditors, both internal and external, with a reference for use in their audit of computerized information systems. The coverage includes both inhouse and contracted systems. This book is concerned with data security and control in computer processes, with changes necessitated in internal control because of computer processes, and with evaluation of the results of computerized activities. The author's intent is to discuss computer techniques and equipment from the control and audit perspective, assuming the reader has had exposure to computers, programming, and computerized information systems as well as to traditional audit concepts. In addition, the author expresses as a goal the use of this material by EDP management or by a computer audit specialist as a reference for usefulness of concepts and techniques previously learned in audit and control of computer systems.

Chapter one contains an overview of auditing and its role in the business environment; chapter two contains a review of electronic data processing. A detailed discussion of various types of control peculiar to an EDP system is given in chapters three and four. Chapter five contains a detailed discussion, with examples of documentation of an EDP system.

The remainder of the book is written to the auditor and contains details concerning review of internal control, peculiarities of an EDP environment, and the use of the computer as an audit tool with some detail on audit software packages. Further, a discussion is given concerning the audit of real time and other advanced systems as well as the audit of firms which use contracted computer services.

In the reviewer's opinion this book is an excellent reference on the audit of computer systems. The organization of the material seems to jump from audit to computers and back to audit and a better organization might have been to consider topics from the auditor's view only and discuss details of EDP as they are needed by the auditors in the auditing process. However, this is not a major criticism because the topics are well marked and logical to a degree as presented. The book achieves its stated objectives.

There are few, if any, books in the market today which fulfill the objective of this one; and references on this topic are needed by anyone involved in the audit of EDP systems.

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### EFFICIENT CAPITAL MARKETS AND ACCOUNTING (A CRITICAL ANALYSIS), Thomas R. Dyckman, David H. Downes, and Robert P. Magee; Prentice-Hall, Inc., Englewood Cliffs, N.J., 1975, 97 pages, $8.95 (cloth), $5.95 (paper).

Do financial statements have an impact on market prices of corporate securities? Are capital markets responsive to financial data supplied by the accounting profession? Are capital markets efficient mechanisms capable of digesting available information and producing prices on capital funds which at any time reflect current demand and supply conditions? If the market is efficient, what implications does this have for accounting? These are some of the questions answered in *Efficient Capital Markets and Accounting,* one of the books in Prentice-Hall's "Contemporary Topics in Accounting Series."

In recent years numerous articles have been written on the "efficient market hypothesis." Professional journals such as *Journal of Finance* and *Accounting Review* have shown an abundance of them. Yet, reading only one or two of the articles often leaves the reader with little knowledge of what is actually being discussed since most of the articles are highly quantitative and are usually directed towards examining only one aspect or implication of the hypothesis. Finally a group of authors have sifted through all of the sophisticated literature on the subject and have simplified, condensed, and summarized the current body of knowledge in a book written in language that does not require a Ph.D. in statistics and mathematics to understand.

The gist of the efficient market hypothesis (EMH) is that prices are determined by supply and demand forces under conditions approaching pure competition. Any new information is instantaneously reflected in prices. There are three degrees, or forms, of the hypothesis. In the case of security prices, the weak form states that current prices fully reflect information implied by the historical sequence of prices; the semi-strong form asserts that prices fully reflect all publicly available information; while the strong form asserts that prices reflect all information. Most attempts to prove the hypothesis have been directed towards proving the semi-strong form.

The majority of tests of market efficiency have used NYSE securities prices. It can be proved that EMH will hold under conditions of zero transactions costs, free access to all available information for all market participants, and agreement among all market participants on the implications of that information for both the current set of security prices and the likelihood of certain future security prices. However, since these conditions are not strictly adhered to in the securities market, the market may not be efficient. Many tests have been directed towards establishing violations of these conditions as being insufficient to cause the hypothesis in its semi-strong form to be rejected. Most proponents of the EMH concede that securities markets are not "efficient" in the strictest sense, but are sufficiently "efficient" to make the EMH a workable description.

The book is well organized. In Chapter 1 the EMH is clearly defined and its various forms explained. The theory of capital asset pricing is also explained since some familiarity is required to understand tests of the hypothesis. Chapters 2, 3, and 4 are directed towards summarizing the research and findings that have been accumulated on the subject. Chapter 2 consists of a review and evaluation of research supporting EMH. In Chapter 3 studies which offer evidence contrary to the hypothesis are reviewed and critiqued. In Chapter 4 the limitations imposed by assumptions underlying the models used to test the hypothesis are examined. Evidence is presented explaining why results of current research may not be conclusive. In Chapter 5 the implications of the EMH for the accounting profession are examined. There have been some misunderstandings over these implications. The most frequently raised questions are answered in this chapter.

Contrary to common practice, useful appendices are included. They are actu-

ally handy references. In Appendix A the basic statistical techniques used in discussing testing of the hypothesis are explained. In Appendix B a concise explanation of the most extensively used models is presented.

The book is recommended to anyone interested in the area. For those unfamiliar with the literature, it is easy to understand. For those acquainted with the literature it is a handy reference publication for the library.

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**"The Role of the Accountant in Investment Analysis," Richard P. Brief and Joel Owen, FINANCIAL ANALYSTS JOURNAL, Vol. 31, No. 1, January-February, 1975.**

To study the role of the accountant in investment analysis is impossible without developing an explicit model. The first model developed was a pure one-period model in which the firm's life coincided with the investment horizon. The only information investors need in this one-period model was that which would enable them to make rational portfolio decisions. The second model, a multi-period model, relates the prices paid by investors at any point in time to the firm's lifetime future cash flows.

The role of the accountant in a one-period model is to determine the firm's future cash flows, which investors require to establish equilibrium prices of securities and to allocate shares among themselves. The accountant would assist promoters in writing the prospectus by making statements about the future cash flows. Interim reporting serves no purpose in a one-period model. The role of the accountant as it relates to "winding up" is not relevant to investment decisions.

In the multi-period investment model, the issue of the existence of a secondary securities market arises. The interim price or value of any firm at an instant in time will depend on dividend policy, initial wealth of investors, investor preference, etc. In this model, the accountant would provide investors with interim reports that furnish information about the future cash flows of existing firms.

Estimation theory inverts the traditional perspective in accounting by focusing on the problem of using interim reports to estimate cash flows over the remaining life of the firm, not by focusing of problems determining the true earnings of an interim reporting period. By dividing the life of the firm into subperiods, an accountant could better provide information about the firm.

The author states that the advantage of estimation theory is that it does not depart significantly from conventional, orthodox positions in accounting. It also provides a conceptual framework for reinterpreting traditional accounting which links the role of the accountant to the needs of the investor.

In conclusion and in agreement with Professors Brief and Owen, it is felt that the objectives of financial statements should be to provide the investor with information about the firm's future cash flows.

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**MANAGEMENT CONTROL IN NONPROFIT ORGANIZATIONS, Robert N. Anthony and Regina E. Herzlinger; Richard D. Irwin, Inc., Homewood, Illinois, 1975; 355 pages, $13.95 (cloth).**

The authors of this book divide all organizations into two groups: (1) those whose objective is to earn profits and whose success is measured primarily by the amount of profits earned; and (2) those whose objective is to render a service and whose success is measured primarily by the amount and quality of the services they render. *Management Control in Nonprofit Organizations* is concerned with the latter group.

The statement is made that, to the best of the authors' knowledge, this is the first book of its type. The book is not concerned solely with accounting in nonprofit organizations or with organization theory and organization behavior of nonprofit organizations. Instead, the authors have chosen to concentrate only on the controlling function of management in nonprofit organizations. The planning function of management is touched on in chapters on programming (in the sense of establishing projects) and budgeting.

There are chapters that might be of specific interest to the accountant involved in nonprofit organizations. Such chapters deal with the control structure of the organization in detail. The idea of interrelated sets of accounts, one constructed in terms of programs, and the other constructed in terms of responsibility centers is discussed thoroughly. The need for consistency between the two sets of accounts is emphasized.

One chapter of the book deals extensively with the problem of pricing the services of a nonprofit unit. The authors hold that services should be sold, rather than given away, and that prices should be equal to full cost. The motivating influence of price, to both the client and the manager are discussed.

Other sections deal with the main steps of the management control process: programming; budgeting; operating and accounting; and analysis and acting on performance. As a means of summary the


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authors have listed practices that seem to them to account for the excellent management control they have found to exist in some nonprofit organizations.

This book could be very helpful for anyone involved in the operation of a nonprofit organization. Accountants are often asked to serve as board members for such organizations.

An active and concerned board of directors is a good point of beginning to improve the management control system within a nonprofit organization. An organization with a good control system can be assured that its goals are being reached in an efficient manner and that its service is of use to those it intends to serve.

*Management Control in Nonprofit Organizations* should be required reading for all members of government, particularly those involved with such mammoths as the Department of Health, Education, and Welfare, and the Department of Defense.

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**"THE MARKETING OF ACCOUNTING SERVICES," D. Larry Crumbley, Ray Barnhardt, and Robert J. Boewadt, THE CPA JOURNAL, Vol. XLV, No. 5, May 1975.**

The main thrust expressed by the authors is that CPA's must become "client oriented." The first step is a determination of client's needs by a program of marketing research.

While informal client research may yield information as to a client's needs and wants, market research should provide data involving what client's want, what they do not like, and why they have changed accountants. Long-term client relations will benefit from an analysis of data of this nature.

In some cases clients may not realize a firm can perform the service it wants. Exchanging views with lawyers, bankers, and other accountants provides useful information as to what these services might be and whether or not they should be added.

Once an accountant has located in a community, a marketing orientation toward clientele should be adopted. The accountant should attempt to create a favorable image among both present and possible future clients. This may be accomplished by accepting speaking engagements before both accounting and non-accounting groups; writing accounting articles aimed at the public-at-large or specific business groups; and engaging in activities of civic, religious, or political organizations.

To enhance the marketing of accounting services, the accounting profession should continue to prepare films and pamphlets to inform the public about the services performed by CPA's.

It is the opinion of this reviewer that a marketing orientation toward clientele by the individual accountant backed by group public information and publicity programs by the accounting profession will result in not only a cultivation of new clients, but more longstanding relationships with present clients.

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**Accounting and Matrix**
*(Continued from page 9)*

## Conclusions

The applications presented here are by no means singular. There is virtually no limit to the number of possibilities for application, except, of course, if one limits the number of processes in accounting practice. Multi-reciprocal consolidations, secondary overhead allocations, period budgeting, responsibility accounting, and variance analysis for costs are other suggested areas for matrix uses.

The advantages of the matrix models are basically two: (1) their compact and simple format, and (2) the ease of application. As long as there can be identified input and formulated transformations, any output report can be constructed through the use of matrices.

## Notes

[1]John W. Buckley, Paul Kircher, and Russel L. Mathews, "Methodology in Accounting Theory," *Accounting Review* XLIII (April, 1968), 281.

[2]A. Wayne Corcoran, "Applied Mathematics and Accounting," *Management Accounting* LI (August, 1969), 29.

[3]*Ibid.*

[4]*Ibid.*, pp. 29-30.

[5]Carl T. Devine, "Some Conceptual Problems in Accounting Measurement," *Research in Accounting Measurement: American Accounting Association Collected Papers*, Edited by Robert K. Jaedicke, Yuji Ijiri, and Oswald Nielson (Menasha, Wisconsin: American Accounting Association, 1966), p. 20.

[6]A. Wayne Corcoran, *Mathematical Applications in Accounting* (New York: Harcourt, Brace & World, Inc., 1968), p. 133.

[7]*Ibid.*, p. 162.

[8]*Ibid.*, pp. 160-165.

[9]Allen B. Richards, "Input-Output Accounting for Business," *Accounting Review* XXXV (July, 1960), 429-437.

[10]*Ibid.*, p. 435.

**EDP**
*(Continued from page 18)*

Frequently, however, the correction process involves a certain amount of manual checking, discussion with the operational department involved, or reconstruction of the data. In these instances processing the correct items is usually allowed to continue without waiting for correction of the error item. When the error is corrected, the corrected transaction can be introduced into a subsequent or the next processing cycle.

Failure to exercise control over the correction procedure can be a serious weakness in a program for data control. There should be formal, carefully prescribed procedures to insure that once errors in data are discovered corrections are effected and the corrected data is properly reintroduced into the processing activities. One of the observations the auditor should make when reviewing a client's system of controls is the attention paid to the error correction program and to the assignment of responsibility for its implementation.

Procedures aimed at determining the accuracy of data are equally applicable to batch systems and real-time systems. In both cases data relationships such as the internal consistency of fields within a transaction record, the consistency of the transaction record to the master record against which it is applied, and the existence or absence of required fields for particular types of transactions can be used to check validity, whether one is handling one transaction in a real-time environment or a batch of transactions in a batch-processing environment. The primary distinction between correction in the two environments occurs in the time frame during which errors are recognized and acted upon.

In determining how extensive the checking facilities should be in a given installation, its management should make a conscious effort to measure the expense to the installation of instituting certain controls as well as the expense to the installation if the errors that these controls are designed to prevent should occur. The optimum situation from an installation management point of view would be to provide controls to the point where the cost of the controls would equal the cost of failure that could have been prevented by those controls. This optimum control level may be further affected by legal requirements, but it does not excuse the installation management from recognizing the relative advantages of alternative operations.

# Personal Management

## Communication

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In the management context the very concept of communication has undergone a radical transformation, according to Raymond Miles.[1] Communication is a broad term embodying many connotations. Porterfield[2] says that under traditional management communication was regarded exclusively as a control mechanism. Messages were unilateral, generally downward, comprised of orders, directives, and commands, and preoccupied with limiting the discretion of lower echelons.

The advent of human relations management altered this view of communications. The change was not so much in design as in implementation and execution. Managers were encouraged to "sell" their orders and directives and diplomacy was to be used in implementing corrective actions.

In Herbert A. Simon's words, "it is obvious that without communication there can be no organization."[3] It is logical to assume then that communication is the undergirding of all managerial functions. We know that it has become an integral part of corporate policy and strategy. Eastern Airlines, for instance, recently announced a new position of Senior Vice President-Corporate Communications, The Chase Manhattan Bank has near the top of its organization hierarchy a position called Officer of Corporate Communications, and other organizations with executive positions responsible for overall communication include the General Electric Company, Chrysler Corporation, NASA, and B.F. Goodrich.

Should we, as professionals, concern ourselves with communication? What communicative skills, of the broad number embodied in the word communication, do we need? It is important that we are capable of effective communication if we are to obtain needed data and information and in turn communicate the synthesis of this data to others. Regardless of the field in which we are employed and/or the level at which we are currently functioning, it is important that we understand something about effective communication.

First, let us consider upward communication from subordinates. Upward communication is essential to managers who have to obtain timely and accurate data and information. "Research suggests that the greater the subordinate's ambition, the greater the likelihood he [sic] will restrict, distort, or hide negative news."[4] Subordinates must be convinced that their superiors welcome both good and bad reports and that no recrimination or reprisal will result. To properly assimilate all data into the necessary end product as well as to enable managers to make improvements where needed, it is essential that they have accurate reports that contain both negative and positive information. Upward communication is essential if managers are not to become informationally destitute.

Some of the more commonly mentioned obstacles to upward communication are:[5]

1. The managers' failure to discern the importance of perceptual differences between themselves and their subordinates. (E.g. it is typical for the manager to possess a "group view" and the subordinate to possess an "individual view.")

2. The managers' failure to discern that the subordinate is keenly aware of status and authority and perceives the managers as power brokers.

3. The tendency of managers to "share" everything with their subordinates may be interpreted by the subordinate as paternalistic, dictatorial or boastful behavior.

The solution or correction to the above obstacles may be within the manager's power. The stimulation of upward communication may be enhanced by managers studying past encounters to determine whether their responses and reactions contributed to communication failures. They then must take steps to improve their communicative skills. Partly this involves being able to respond to negative news more intelligently so as not to block communication of this type of data.

Secondly, let us consider downward communication. The manager who wants to communicate must be aware of the power of non-verbal communication, must be able to take into account the unique qualities of each situation, must be sensitive to the gap created by superior-subordinate relationships, and must ever guard against making decisions based on mere assumptions.

Effective communication is a must in any business endeavor or activity. How effectively do you communicate?

### Notes

[1]Raymond E. Miles, *Theories of Management: Implications For Organizational Behavior and Development*, McGraw-Hill Series in Management, New York, 1975, pp. 96-113.

[2]C.D. Porterfield, "Innovations in Communication in Business," Presented before Annual Conference, Southwestern Business Administration Association, March 5, 1975.

[3]Herbert A. Simon, *Administrative Behavior*, 2nd ed., The Macmillan Co., New York, 1957.

[4]C.D. Porterfield, "Obstacles to Upward Communication," *Communique*, Creative Communications Group, (April, 1975) Vol. 2, No. 2, p. 1.

[5]*Ibid.*

# Small Business

## Counseling Help for the Small Business — The Small Business Institute

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Marysville, Ohio

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Occasionally, every accountant is likely to be faced with clients or acquaintances who badly need basic counseling for their small businesses but who cannot afford the fee that a management consultant or public accounting firm would charge for their services. If the business is located in the vicinity of a university, and if the school is participating in a new program called the Small Business Institute (SBI), these services may be available free of charge.

SBI is a program of the Small Business Administration (SBA). Although the Institute has been in existence only for a short time, it has proved quite successful. Under the SBI program, a team of senior-level or graduate students in business administration is assigned to work with a small business. The team works under the supervision of one or more faculty counselors. A confidential and professional relationship is maintained between the SBI team and the client business. As far as the small business is concerned, the only requirement is that it is willing to accept the assistance of the SBI team. The expenses of the students are reimbursed by the SBA, but no fees are paid. Most businesses who receive SBI services either have a direct loan from the SBA or bank loans guaranteed by the SBA. However, if the school can work the business client into its case load, services of SBI can be obtained without loan contacts with the SBA. The business should contact the local SBA for further information and assignment of a team.

The rest of this article describes some experiences of student teams working with small business clients through the SBI at Mississippi State University seen from the viewpoint of the author who serves as a faculty counselor for the SBI. In some ways, these experiences may be somewhat less than typical since Mississippi State University is located in a rural area where businesses in the program are widely dispersed and tend to be small even by SBA standards. Nevertheless, these illustrations should provide some concrete examples of how the student teams may be of assistance.

Some of the areas in which student teams have assisted their small business clients include inventory planning, store layout, basic recordkeeping, advertising, compliance with state and local regulations and internal control.

### Inventory Planning

This seems to be a very common problem and many small businesses participating in the SBI needed help in this area. In one instance, the owner of a cycle and lawnmower shop had new and used models displayed in the shop together. Some used models would be disassembled, and parts were taken from both new and used models to make repairs. No control was maintained over the parts and they were not checked out when they were used to repair a cycle or a mower. The team recommended that the parts area be screened off and that admittance be restricted. Further they recommended that disassembled mowers and cycles be placed in a central location and that repair order forms be used with each job on which parts used would be listed. To an accountant these recommendations are basic and absolutely necessary, but many owners of small businesses who place first importance on the skill required to accomplish the repair work, may never waste a thought on the necessity of keeping track of repair parts used.

Another team counseled with a ladies' clothing store that kept no inventory records. The team recommended keeping inventory records by department and that each item be identified with a coded tag. Then the team suggested that either the store personnel keep inventory records based on these tags, or that the business engage an outside computer service for inventory control, and they also recommended a specific firm.

### Store Layout

This, too, seems to be a very pervasive problem among small businesses. Frequently teams return from their initial contact with the client with the reaction that the appearance of the business is cluttered or crowded or that the merchandise is hard to find.

One team of students encountered a men's clothing store with several basic layout problems. The team suggested display of all shirts in one area and locating all trousers in another. Another recommendation was to rearrange the racks to facilitate traffic flow and to limit the number of garments to the capacity of the racks. Finally, the team recommended a sale to clear out old and shopworn merchandise.

Another team counseled with the owner of a hardware store who had the merchandise stacked in the aisles and who was convinced that the customers actually enjoyed digging through piles of merchandise to find what they were looking for. The team suggested placing some of the merchandise in the storeroom and that other merchandise be rearranged and displayed in a logical and orderly manner. Apparently, the students were convincing and the store owner began a basic clean-up and rearrangement of the stock.

### Basic Recordkeeping

Along with display of wares, recordkeeping is probably the most prevalent prob-

lem which SBI teams at Mississippi State have encountered. In almost all cases, the teams have recommended improvements in the existing records. Oftentimes students express their frustrations at not being able to analyze other problems because of the lack of sufficient records.

In some instances, the assistance of the SBI team is limited to just one thing — like when a team helped the owner of a grocery store prepare a balance sheet. Then the need proves to be ongoing, and in this case another team later assisted in setting up a cash journal. In a small electronics firm a team helped the owner set up a cash journal and suggested that the owner hire a student to keep it current and up-to-date. Still another team set up cost records for a building contractor for budgeting and recording costs for each home built.

Whether the owner of a small business borrows from the SBA or from a lending institution, balance sheets and profit and loss statements are a must. Therefore, basic recordkeeping has to take top priority in the services rendered by SBI teams.

### Advertising

This, too, has been identified as a problem area in many of the businesses that student teams have counseled. Some businesses did not even have adequate signs to identify the business or its location. One team complained that their client's grocery store could not be seen soon enough to do any good — 150 feet when approaching from one direction, 500 feet when traveling in the opposite direction. A billboard-type sign near the road, signs in the window and limited newspaper advertising were among the recommendations of the team.

For another client, a small department store, the team actually checked the rates in the local newspapers and recommended a specific area paper with a wide circulation. The students also reviewed and revised the contents and layout of the newspaper advertisements and encouraged the client to use plastic bags with the stores's name.

### Compliance With State and Local Regulations

Communications is a troublesome area and when it comes to business regulations and local authorities, many owners of small businesses have their share of problems. One team found a barber shop owner waiting impatiently for the city engineers to fill a hole and mark off the lot so that the construction of the new barber shop could begin. The old shop had been displaced by Urban Renewal and the shop was temporarily located in a mobile home. The barber was somewhat distressed that the city officials were taking so long to ready the lot. A trip to city hall by the students revealed that the city engineers were awaiting notification by the owner that the SBA loan needed for construction had been approved. When they were informed that the money had been made available three months ago, the city engineers' team was on the scene the next day to prepare the lot. A classic case of lack of communication, and the initiative of the SBI team put an end to a lot of frustration.

In another case, the owner of a filling station had been in business for about three months but had never filed any sales tax returns or paid over any of the sales tax collected. The SBI team contacted a member of the state sales tax division who supplied the owner with the necessary forms and assisted with setting up proper sales tax records.

### Internal Control

Several business owners have complained to student teams of incidences of shoplifting. Generally, students have been unable to determine the extent of the problem — primarily because of poor inventory and sales records. Some teams have come away with the impression that the owner was using shoplifting as an excuse for a poor profit performance. One team noted that their client, the owner of a grocery store, had gained 30 pounds since taking over the business two years earlier. However, internal control has been poor in many instances, and several teams have recommended improvements in this very important area.

In one case, the owner of a service station had employed a recently released convict. The employee worked alone for many hours every day. To compound the problem, the cash register was not equipped with a tape to provide a record of cash received and inventory records were not maintained. The SBI team encouraged the owner to use a cash register with a tape and to seek more qualified help, since the ex-convict proved unreliable in other ways as well. The owner implemented both of these suggestions.

One grocery store owner complained that shoplifting was going on in the store although nobody was ever caught in the act. The owner frequently had to work in the meat department in the back of the store which made surveillance of the shop difficult. The students suggested basic changes in the store layout and helped obtain and install a one-way glass door to the meat department.

### Benefits of the SBI Program

The categories of small business problems outlined above certainly do not constitute an exhaustive list. Student teams have dealt with a full range of business problems. From the students' standpoint, the SBI program has been very beneficial. It has provided a bridge between the students' academic preparation and their eventual life in the business world. With a few exceptions the teams have brought great enthusiasm to their task. It is one of the few academic projects that the students seem to truly enjoy. Students who return after graduation frequently talk about their cases and ask about their clients.

From the standpoint of the client businesses the program has also been successful. At times, the success was brought about by the expertise that the students bring to the problem. At other times, the key to success had simply been the objective, enthusiastic attitude the students provide. Most owners have been very cooperative with the student groups, and many have implemented the recommendations made by the students.

On the whole, the SBI program is proving beneficial to both client businesses and student counselors.

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# Editor's Notes

## Accounting, Politics, and Women

Even though by now we are well into this year, it is not too late for you to make a Bicentennial Year's Resolution. And what you should resolve to do is to become actively involved in politics this year in order to help preserve the republic which was founded 200 years ago.

Depending on your personal preference and time commitments your political involvement can run the gamut from voting every chance you have all the way to running for political office. In order to help you decide how you will celebrate this Bicentennial, we'll discuss some of the opportunities you have for getting politically involved.

### Use Your Vote

Several political observers predict that as few as half of the eligible voters will exercise their franchise this year. That means that your vote will have an impact each time you use it. Therefore vote every chance you have: in precinct caucuses, in the primaries, and — of course — in the election. But you should do more than just vote; you should use your vote to make candidates commit themselves publicly to specific courses of action which you support.

If, for instance, you live in one of the states which has not yet ratified the Equal Rights Amendment, then you should force the candidates for the state legislature to commit themselves, either for or against the ERA. If they promise to support it, drop them a note (a postcard is sufficient) telling them that you will watch them. And then watch them after they are elected to make sure they keep their promise. If they are against it, drop them a note telling them that you will not vote for them unless they change their position on the ERA. If opponents to the ERA get enough letters and postcards from eligible voters urging them to change their position, they may just do it.

As a woman you can raise the issues of equal rights for women, sex discrimination, and affirmative action in any election — local, state, or federal — by speaking up in political meetings or writing notes to the candidates. You can legitimately ask candidates running for positions in the executive branch, like mayors, governors, and the presidency, how they will correct the underutilization of women in certain branches of government and in the higher appointive offices and what they will do to enforce the laws against sex discrimination and speed up pending cases. And you can ask candidates for positions in the legislative branch whether they will appropriate enough funds to enforce existing laws and what, if anything, they will do to strengthen laws against sex discrimination.

You should also use your expertise as an accountant to scrutinize the rhetoric of political candidates. Who else but an accountant has the expertise to pin a candidate down on tax reform? And who else but an accountant has even a chance of making sense out of a budget?

As a further step you can combine the fact that you are a woman with your expertise as an accountant by raising issues only a woman would raise and by discussing them expertly as only an accountant could discuss them. Two obvious examples of such issues are sex discrimination in the tax laws and in the appropriations for athletic programs in school budgets.

Always remember that the pen is mightier than the sword and that a note to a politician, either before or after the election, can do wonders.

### Become A Campaign Treasurer

If you want to get involved in politics beyond using your vote, think about joining the campaign staff of a candidate. And with your professional training you should really aim at the job of the campaign treasurer. That position has become much more important with the passage of election reform laws at the federal level and in many states.

In order to find out what the job of a campaign treasurer involves, we have studied the *Campaign Treasurer's Handbook*, published and sold by the AICPA. The *Handbook* confirmed our belief that accountants make ideal campaign treasurers because they have the following necessary and desirable attributes for the job:

*Technical Expertise.* As a minimum the campaign treasurer must have a knowledge of basic bookkeeping and budgeting.

The bookkeeping system depends on the size of the campaign. For a small, local campaign the bookkeeping can consist of only a checkbook and a periodic trial balance. For a larger campaign with more contributions coming in and more payments for a larger variety of reasons going out, it is probably advisable to keep a cash receipts and a cash disbursements journal. It may even be a good idea to keep a small general journal to record liabilities or to use a simple voucher system to keep track of them. At what point it becomes too cumbersome to draw up a trial balance directly from the different journals and it becomes necessary to set up a general ledger is a decision the campaign treasurer must make. But even with a large campaign the bookkeeping system is still essentially a cash system with the necessary safeguards built in so that liabilities are not overlooked.

A budget of expected contributions is absolutely essential. This may consist of a simple worksheet with one column for each month and a total column at the end, as the *Handbook* suggests. If, however, each month's column is followed by a year-to-date column, it becomes much easier to compare the budget to actual results, both by month and cumulatively.

If this were all the technical expertise required of a campaign treasurer, anybody with a couple of courses in introductory accounting could fill the job. But an accountant can do more.

For one thing an accountant can set up a good system of internal control to make sure that only authorized persons make deposits and disbursements; that all contributions are legal, are properly deposited and reported; and that no unauthorized or illegal disbursements are made.

For another thing an accountant can perform various analyses. For instance, appeals for funds and their related expenses can be coded in such a way that contributions received can be matched against specific mail or media fund solicitation campaigns. Once that is done, the accountant can determine which solicitation method is the most cost-effective and save the candidate money in this and future campaigns.

*Knowledge of Applicable Election Laws.* From all you read about the Federal Election Campaign Act of 1971 and the laws passed by states, you must conclude that these are often very complicated laws. But here, again, the accountant has an advantage. Anybody who can make sense out of the Internal Revenue Code can also cope with these election laws, and anybody who can prepare a 1040 or an 1120 can also prepare and file the required pre-election and post-election reports for political candidates. What you have to do is to get ahold of the state or federal laws applicable to your candidate and then study them as if they were the Code or an IRS Regulation.

*Standard of Ethics.* In this post-Watergate era every candidate will want a campaign treasurer with a sense of integrity and a high standard of ethics. (But if you should find a candidate who does not, you know enough to stay out of that campaign.) As professional accountants we have both a written Code of Professional Ethics and some unwritten rules about things which are done and things which are not done. Therefore, when we offer our services to a candidate, we are, in effect, telling her or him that the financial side of the campaign will be handled in a proper, honest, ethical, legal — in one word in a *professional* manner.

*Conservatism in Money Matters.* When you read the stories about — usually unsuccessful — candidates left with huge debts after an election or hear about the difficulties candidates have raising campaign funds, you must come to the conclusion that very few candidates for political office ever have enough money to run a campaign as they think it should be run. Therefore it is essential that somebody in the campaign point out every so often how much money is in the till, how much money is committed and how much is still free to be spent on various projects.

Most importantly, somebody must prepare realistic projections of how close or how far the campaign is from insolvency. As accountants we have been conditioned in our training and in our work to be conservative in forecasting future results, to abhor deficits, and to dread insolvency; therefore, we may play an important role in predicting and/or preventing financial disaster.

These are all reasons why accountants should serve as campaign treasurers. But there are additional reasons why we women accountants should do it.

By working as campaign treasurer for a candidate we can convince the candidate, others on the campaign staff, and the general public that we deserve equal rights while gaining visibility and recognition for ourselves personally and for all women accountants. In addition, by working for a female candidate (who is probably not overwhelmed by offers from male accountants) we can help to make sure that she has as good a campaign staff as her — probably male — opponent and do our part to correct the underrepresentation of women in political offices.

If we have convinced you that you should become a campaign treasurer, study the AICPA's *Handbook* and the applicable election laws, and then go and find a candidate. And may the best person win!

## Offer Your Expertise to Elected Officials

During election years and at any other time you can perform a real service if you offer your expertise as a professional accountant to elected officials on a volunteer basis. Even though many of them have paid staffs, they are quite often seriously understaffed, especially if they serve at the local or state level.

If you think, for instance, about the hundreds of laws which are debated in a state legislature every year, you will realize that it is hardly possible for any state legislator to be knowledgeable about all of them, no matter how large her or his staff. For that reason many of them rely on committee reports and the advice of their party's leadership. We are sure that a lot of them would welcome the services of a trained expert who can study a proposed law, analyze it, and then summarize it for the legislator before the matter comes up for debate. And who can do that better with a bill authorizing or appropriating funds than a trained accountant?

## Run For Office

The ultimate of political involvement is, of course, being a candidate. So if you really want to become politically involved, you should run for office. As women and as accountants we are aware of the fact that men and lawyers are over-represented among elected officials. Besides, a woman's place is in the house, the house of representatives that is, and the senate, the mayor's office in city hall, the governor's suite in the state capitol, and sooner or later in the Oval Office in the White House. Nobody is going to put women into the places where political decisions are made; women have to run for office to get there. Therefore, if you have the desire to run for office, we wish you luck. And may you win by a landslide.

## Conclusion

As you can see, your political involvement can take many forms. So make a Bicentennial Year's Resolution to take an active part in politics this year. That way you will do your share to make sure our form of government will have a Tricentennial. And who knows, being politically active this year may just help you to survive this Bicentennial Election Year.

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