

5-1974

Capital Expenditure Analysis and the CPA's Responsibility

Moustafa H. Abdelsamad

John B. Sperry

Follow this and additional works at: <https://egrove.olemiss.edu/mgmtadviser>



Part of the [Accounting Commons](#), [Business Administration, Management, and Operations Commons](#), and the [Management Sciences and Quantitative Methods Commons](#)

Recommended Citation

Abdelsamad, Moustafa H. and Sperry, John B. (1974) "Capital Expenditure Analysis and the CPA's Responsibility," *Management Adviser*. Vol. 11: No. 3, Article 6.

Available at: <https://egrove.olemiss.edu/mgmtadviser/vol11/iss3/6>

This Article is brought to you for free and open access by the Archival Digital Accounting Collection at eGrove. It has been accepted for inclusion in Management Adviser by an authorized editor of eGrove. For more information, please contact egrove@olemiss.edu.

Capital expenditure analysis is one area where the CPA without too much experience in management advisory services can advise his client with some confidence. But there are ground rules and he must know them —

CAPITAL EXPENDITURE ANALYSIS AND THE CPA'S RESPONSIBILITY

*by Moustafa H. Abdelsamad
and John B. Sperry*

Virginia Commonwealth University

CAPITAL expenditure analysis is a popular topic. It has attracted significant attention because capital expenditures represent large sums of money, affect the future, and are usually irreversible. In effect, these expenditures represent decisions of significant importance to any firm.

Despite the abundance of information on the theoretical aspects of the topic, less attention has been devoted to an empirical examination of business practice. Little attention, too, has been devoted to the role of the CPA in capital expenditure analysis. The purpose of this article is to review current theory and practice and the role of the CPA in capital expenditure analysis (CEA).

What is a CEA?

CEA is an activity concerned with the analysis of capital expenditures to determine their economic worth and the advisability of undertaking such expenditures. The

product of this effort is information: information which leads to acceptance or rejection of a proposal or indicates a need for additional data.

Capital expenditures usually refer to items which will be capitalized; i.e., fixed or non-current assets. Commonly, a capital expenditure is defined as a material cash outlay or debt incurrence, the benefits of which will be received in future years. It therefore includes major advertising campaigns, significant R&D programs, and planned long-term employee training and development programs. In this article the classical definition of fixed assets will be used.

Why is CEA a problem? Because the analytical process involves an estimate or forecast of future benefits. The decision process involves uncertainty. Also, the traditional matching problem is still here. The initial cost of the acquired fixed assets must be allocated to those future periods in which benefits

are to be received. The accrual concept requires that cost expirations be matched against earned revenues. And, finally, the literature is full of controversy and unresolved conflict regarding cost of capital, risk analysis, objectives of the firm, assumption of reinvestment of proceeds, capital rationing, mutually exclusive projects, and dealing with inflation.

How is the analysis done?

A variety of methods and techniques of CEA are available. They range from the simple to the sophisticated. Simple methods include payback and accounting rate of return. Advanced methods include discounted cash flow rate of return and net present value. Sophisticated approaches use additional techniques to supplement the advanced methods. These techniques include: (a) sensitivity and risk analysis, (b) simulation, (c) linear programming, and (d) PERT/CPM. Sophistications are now

more feasible and economical because of the availability of electronic computers.¹

To provide the reader with a base of reference, an introduction to the four most popular methods is presented.

1. *Payback* — Payback measures the length of time, in years, required to recover the original investment from the receipt of benefits generated by the investment. Benefits are defined as the net cash inflows after taxes, but before depreciation or finance charges. For example:

Given: An investment of \$8,500 is expected to produce \$1,000 net cash inflows, after taxes but before depreciation and interest, for 15 years.

Payback: $\$8,500/\$1,000 = 8\frac{1}{2}$ years.

The payback method is often criticized because it does not measure profitability. It ignores the proceeds after recovery of the investment. It does not consider the time value of money since it does not differentiate between dollars received at different points in time. The payback, however, does show how long it takes to recover the investment. It is simple. It is useful when the firm is encountering cash constraints, or when speed of investment recovery is important (e.g., in foreign investments), or when rapid obsolescence is anticipated.

2. *Accounting Rate of Return (ARR)* — The ARR measures the rate of return by the formula: average annual benefits divided by average investment. Annual benefits refer to accounting income; that is, after depreciation and taxes. For example:

Given: A machine costs \$8,500 with an estimated residual value of \$1,500 at the end of 10 years.

1—For more detailed information see Abdelsamad, M. H., *A Guide to Capital Expenditure Analysis*, New York, American Management Association, 1973, chaps. 3-8.

Expected average annual income is \$1,000.

$$\text{ARR: } \$1,000 \div \frac{1}{2} (8,500 + 1,500) \\ = \$1,000 \div \$5,000 = 20\%$$

The ARR is subject to criticism because it uses accounting income; it ignores cash flows and their timing, which are the essence of CEA. However, it does have some advantages: familiarity, interrelationship with internal records, and simplicity.

3. *Discounted Cash Flow of Return (DCFR)* — The DCFR measures the rate of return that makes the present value of expected cash inflows exactly equal to the present value of expected cash outflows. For example:

Given: An investment of \$5,019 is expected to generate cash inflows (after taxes and before depreciation) of \$1,000 at the end of each year for 10 years.

DCFR: The present value of \$1 received at the end of each year for 10 years at "15 per cent" is 5.019. The "15 per cent" is found through trial and error.

Proof: $\$1,000 \times 5.019 = \$5,019$.

Other things being equal, an investment with a rate of return above an internally established minimum is accepted.

The DCFR is superior to payback and ARR because: (a) it considers the time value of money, (b) it measures profitability, (c) it employs cash flows, and (d) it allows the ranking of proposals according to their rates of return.

Criticism of DCFR arises from the tedium of the trial and error process of obtaining the equalizing rate. Some believe it is not suited for evaluating mutually exclusive projects when limited funds are available. Others believe the DCFR unrealistically assumes a reinvestment of proceeds at the project rate.

4. *Net Present Value (NPV)* — The NPV method measures the excess of the present value of expected net cash inflows over the present value of expected net cash

outflows using a specified discount rate. For example:

Given: A \$10,000 investment is expected to generate \$2,000 annual net cash inflows for 10 years (no salvage). The specified discount rate is 14 per cent. NPV: The present value of \$1 received each year for 10 years at 14 per cent is 5.216.

The present value of expected cash inflows is $\$2,000 \times 5.216 = \$10,432$.

NPV = $\$10,432 - \$10,000 = \$432$.

One difficulty with NPV is the determination of an appropriate discount rate. This rate can be based upon the firm's cost of capital, which is hard to measure. Cost of capital is not subject to consensus of definition or pro forma computation. Another difficulty rests with businessmen's familiarity with a return that is specified in percentage form rather than in dollars.

Once the discount rate is determined, NPV is easier to compute than DCFR. It is superior to both payback and ARR because cash flows are used and the time value of money is considered. Whether or not NPV is superior to DCFR is debatable, although some au-



MOUSTAF A. ABDELSAMAD is associate professor of financial management at Virginia Commonwealth University. He received his master's and doctorate of business administration from George Washington University, Washington,

D.C. Dr. Abdelsamad is the author of *A Guide to Capital Expenditure Analysis*, published by the American Management Association in 1973, and several articles about financial management. JOHN B. SPERRY, CPA,



is associate professor of accounting at Virginia Commonwealth University. He received his M.B.A. from the Wharton School, University of Pennsylvania, and his Ph.D. from American University. He is co-editor of

The Virginia Accountant and a member of the Virginia Society of CPAs' committees on continuing education and public relations. His articles have appeared in *The Journal of Accountancy*, *The New Age*, *Business Executive*, and other periodicals.

thors express a distinct preference for NPV.²

A recent study of current practices of large industrial corporations, based on questionnaire data, personal interviews, examination of written policies, and personal correspondence, furnished the following conclusions:³

1. Payback is the most widely employed method of CEA. The methods used for evaluating projects may be ranked as shown in Exhibit 1, below.

2. There is a definite trend toward greater use of discounted cash flow methods. Both DCFR and NPV methods are used more today than in the past five or ten years.

3. A majority of firms use a combination of methods rather than one single method. In fact, it is becoming increasingly apparent that a combination of methods is preferable. The most common combinations are (a) DCFR and payback, and (b) ARR and payback.

4. A definite preference exists for the use of rates of return methods (ARR and DCFR) rather than payback or NPV, which do not result in a percentage figure.

5. The four major problems in the evaluation of capital expenditures are: (a) forecasting, (b) disclosure of alternatives, (c) inability of the accounting department to confirm or disprove the accuracy of forecast cash flows, and (d) qualitative information not subject to quantitative analysis.

6. Some managers do not feel "at home" with the uses and limitations of discounted cash flow methods. This suggests an educational void concerning the DCFR and NPV methods, especially when used in conjunction with other techniques mentioned earlier.

Currently, the CPA is regarded as a financial adviser as well as an auditor. The so-called management

2—Bierman, Harold, Jr., and Seymour Smidt, *The Capital Budgeting Decision*, 3d ed., New York, Macmillan Company, 1971, p. v.

3—Abdelsamad, *op cit.*, pp. 156-163.



Not being a technician, the CPA cannot know when a particular machine should be replaced. However, he can call his client's attention to old, worn equipment.

advisory service (MAS) has become an indispensable part of the CPA's job.

Large organizations can afford to hire in-house specialists and supplement them with outside consultants. These large enterprises usually engage large CPA firms. The latter have the resources to separate their auditing service from their MAS to ensure maintaining the CPA's independence, which is of paramount importance to accountants and their clients. On the other hand, the small organization usually employs a local CPA firm. Therein lies a problem since the small CPA firm usually does not have the resources to maintain two separate staffs—one for auditing and another for MAS. If the small CPA provides his client with MAS, he will be assum-

ing a dual role that may raise serious questions concerning his appearance of independence. This article is concerned mainly with the small CPA who wears the two hats of auditor and financial adviser, especially with respect to CEA problems.

The small CPA can, if he so desires, contribute significantly to the success of his client by helping him with CEA. He should recognize, however, that in helping his client with CEA he is assuming a role that is different than his typical, conventional role of attestation. The CPA, by virtue of his training and familiarity with his client's operations, is highly qualified to help him with CEA. If he fails to assume this responsibility, various groups (such as management consultants, bankers, and

EXHIBIT I

Major Projects			All Other Projects		
Rank	Method	%*	Rank	Method	%*
1	Payback	80%	1	Payback	80%
2	DCFR	69	2	ARR	56
3	ARR	57	3	DCFR	54
4	NPV	25	4	NPV	20

*Percentages refer to number of respondents using the method as a percentage of the total responses to that part of the question.

lawyers) may try aggressively to usurp such a role. If this occurs, his position as financial adviser will not be fully realized. Also, his failure to help with CEA will be at the expense of his client, who will then have to incur a large expenditure to get the same advice that could have been provided less expensively by the CPA.

Getting involved

A question to be raised at this point is: If the CPA is to help his client with CEA, how does he become involved in such activity in the first place? Involvement is a function of the existent CPA-client relationship. This relationship, in many cases, has been acquired over a long period of time. If the CPA has done his job properly, the relationship is one of confidence, based upon mutual respect and trust. The client respects and trusts the CPA's judgment and actively solicits his advice on important problems having financial implications. One of the problems of greatest importance falling in this category is that of CEA.

The CPA is in an enviable position since he is usually more accessible and visible to his client than are other sources of counsel. Thus, the most desirable situation is one in which a client recognizes his need for help (with CEA) and asks the CPA for assistance. The client is more likely to follow advice that he has sought. However, the CPA, even when he has not been asked for advice, has the obligation to bring to the attention of his client the better methods of CEA that could be used to help him reach sound decisions before funds are committed. In his capacity as auditor, through his contacts with the client's employees and because of his familiarity with the client's operations, he has ample opportunity to discover potential CEA problems.

In a large firm it is possible to identify four CEA activities: project generation, evaluation, selec-

tion, and follow-up. To the small CPA and his relatively small client, project generation is most likely to be regarded as project identification or the recognition of opportunities for investment. For example, a small businessman usually does not think of replacing a piece of equipment until it is completely worn out or until a shrewd salesman has been successful in convincing him of the need to do so. A CPA is not expected to be a technician; he is not expected to know when a machine should be replaced. However, he can direct the attention of his client to the need for replacing old equipment by periodically (e.g., annually or semiannually) asking his client, "Is this the proper time to think of replacing the machine?" and if not, "Why not?"

Project evaluation aspires to collect information regarding the economic consequences of an investment decision. In the world of the CPA (as applied, for instance, to the proposed purchase of a machine) this means asking relevant questions regarding the performance of the present machine, possible alternatives, expected benefits from the best alternative, incremental benefits, timing and duration of these benefits, and the reliability of figures. Selection (actual decision) is based upon both quantitative and qualitative information. In a large enterprise many projects compete for funds, and selection of the proper mix of proposals can be a real problem. In contrast, in the small firm, the decision maker is usually faced with less intricate problems, and frequently the decision is yes or no; accept or reject. Here, the CPA helps by asking the right questions, realizing that quantifiable economic consequences of an investment decision should be supplemented by an evaluation of the qualitative aspects. The CPA also helps in interpreting the quantitative data and in their presentation. The CPA should *never make the actual decision* since that would compromise his role as an adviser

and jeopardize his independence.

Finally, a follow-up is needed after the project is completed. Information should be collected on the actual performance of the project and compared with the estimates. The postaudit provides valuable information and a learning experience. It can help show the strengths and weaknesses in the assumptions, analyses, and evaluations that were made in past decisions. The CPA can help his client find ways of improving his methods of handling similar capital expenditure projects in the future.

Convincing the client

It is certainly a difficult job for the CPA to convince his client of the value of his contribution. But, unless the client recognizes the value of the CPA's contribution, he will not follow his recommendations. The CPA should be careful not to lead his client to expect too much too soon. The results of improvements in any system of CEA usually occur over a long period of time and are often hard to isolate. Here are some suggestions that may help in convincing the client of the value of the CPA's contribution:

1. The CPA has to be very tactful in offering advice to his client. Advice should be clearly communicated as such and not as an attempt to usurp the decision-making prerogatives of the client. The CPA should present the information and let the client reach his own conclusions.

2. Businessmen like to know what other successful managers are doing. By being aware of current practices, the CPA can (without imparting any confidential information) point out that these suggested methods and techniques are currently used by similar companies with much success. He can also show his client that he is not alone in facing these problems.

3. Whenever possible, the CPA should relate the effect of the capital investment decision to the bottom line of the income statement



The CPA, in an MAS role, should never make the actual decision since that could compromise his role as an observer and jeopardize his independence.

(profit-loss). This figure is closely watched by businessmen.⁴

4. Costs should not exceed benefits. The CPA can demonstrate that the extra costs in time and money would be far exceeded by the benefits to be derived from the additional information that would enable the decision maker consistently to make better decisions.

5. The CPA can demonstrate by a simple example that a small percentage of savings, because of improvements in the CEA system, would result in a large amount of savings. For instance, assume a firm has an annual capital expenditure of \$20,000. Savings of as little as 5 per cent a year due to improvements in the CEA system, if they last for 20 years, would result (at 6 per cent interest) in a present value (before tax) savings of \$11,470.⁵

6. Selling an appreciation of the CPA's contribution to his client depends upon the understanding of the client's goals and personality.

4—For more details on the importance and advisability of combining cash flow information with accrual accounting, see William L. Ferrara, "A Better Perspective on Capital Expenditure Decisions," *Management Adviser*, September-October, 1971, pp. 48-54.

5—That is, $5\% \times \$20,000 \times \$11,470$ (present value of an annuity of \$1 per year for 20 years at 6%).

The client's appreciation will be in direct proportion to the extent of tailoring and particularization of the analysis and the presentation to the client's situation.

7. The client could be informed of some favorable side benefits that could occur from a more refined CEA system. For example, the financing of projects would be made easier since bankers and other sources of capital are more receptive to well-documented needs.

The most difficult part of the evaluation process concerns estimating costs and benefits. Detailed estimates of costs and benefits and their timing must be developed in order for useful CEA to be accomplished. To be helpful, the CPA should be well-versed in the theory and practice of CEA.

Advanced methods and techniques of CEA require the use of cash flows rather than accounting income. This usually represents, to the conventional accountant, a drastic departure from accounting income. Cash flow is a simple concept yet at times very hard to understand. It is simply the cash-in and the cash-out (inflow and outflow). An investment project is regarded as an outflow of cash (for example, the purchase price of a machine) made with the expecta-

tion of resulting inflows of cash at different points in time. Each project is treated as a unit, and estimates are made for the life of each unit. Depreciation has no place in cash flow except to the extent of its effect on taxes. The concept of cost-allocation is replaced by incremental and opportunity costs.

To estimate cash flows, a detailed method of listing all items of cash-in and cash-out may be used. However, it is customary to use the more familiar, and sometimes more readily available, accounting income and adjust it for non-cash charges to arrive at cash flows. For example, given an investment of a machine which is expected to increase accounting income before taxes and straight-line depreciation by \$10,000 per year; the tax rate is 50 per cent; there is no salvage; and the expected life of the machine is five years.

Then:

	Accounting	Cash Flows
Benefits before depreciation and taxes	\$10,000	\$10,000
Depreciation (used for tax purposes)	2,000	
	<u>\$ 8,000</u>	
Taxes—50%	4,000	4,000
	<u>\$ 4,000</u>	<u>\$ 6,000</u>

Cash flow is estimated at \$6,000 (cash-in of \$10,000 less taxes of \$4,000). The \$4,000 accounting income after depreciation and taxes could be used to estimate cash flows by adding the \$2,000 depreciation (a non-cash expense) to the \$4,000 to get \$6,000.⁶

The rules of the game

It may help here to point out that CEA is a different game than that of preparing financial statements. CEA has its own rules, which have been developed historically. The CPA has to be aware of these rules and must use his own judgment to decide in a particular situation when to follow or depart from any of them. Some of these rules are listed below and described briefly.⁷

1. *Capital expenditures include more than fixed assets.* The methods and techniques used for CEA do not apply to fixed assets only. They also apply whenever a material amount of cash is spent at one point in time and the cash benefits are expected to be received over a period of time exceeding one year.

2. *CEA includes administrative and economic aspects.* CEA cannot be successful without both the technical aspect of the analysis itself and the supporting administrative setup and related paper work.

3. *Classify capital expenditures whenever possible.* Capital expenditure projects should be grouped into similar classes to facilitate their evaluation.

4. *Consider future costs—not sunk costs.* In CEA, only future costs are relevant; past costs are sunk costs and should not influence future decisions.

5. *Consider only future bene-*

fits—not past benefits. In CEA, the future benefits to be expected from future use of the proposed capital expenditure should be considered. Past rates of usage and past benefits are irrelevant.

6. *Make computations on an after-tax basis.* Taxes affect cash flows; accordingly, all computations should be made after taxes.

7. *Consider the time value of money.* Discounting of cash flows should be used to differentiate between a dollar received today and a dollar to be received at any later time.

8. *Quantify whenever possible, but do not overdo it.* CEA should measure the quantifiable economic consequences of a proposed capital expenditure whenever possible.

9. *Avoid excessive "necessity" expenditures.* It is customary for poorly managed companies to wait until a decision cannot be delayed and then to consider a capital expenditure proposal a "necessity," without careful consideration.

10. *Do not subscribe to the profit illusion.* Profitability is not the full proof of effective capital expenditure management.

11. *Benefits from the analysis should exceed its cost.* The costs of CEA should never be allowed to exceed the benefits to be derived from the additional information resulting from the analysis.

12. *Do not shy away from profit maximization.* Profit is a fundamental prerequisite to the survival and growth of any business enterprise.

13. *Consider alternatives whenever possible.* Alternate courses of action should be considered whenever a capital expenditure proposal is being evaluated.

14. *Use the project concept whenever possible.* A proposal to replace 10 similar machines should be treated as one project and not as 10 separate projects.

15. *Use a multi-talent approach whenever possible.* The various aspects of a large capital expenditure proposal should be studied by experts in each aspect whenever necessary and economically justifiable.

16. *CEA is both an art and a science.* In addition to the well-established body of knowledge of CEA, there are many aspects of CEA that are considered more an art than a science.

17. *There is no substitute for good judgment.* In CEA, the decision maker must, in the final analysis, use his own judgment to weigh both the quantitative and the qualitative information collected.

18. *Do not overlook the human side of the enterprise.* CEA, like any other program, cannot succeed without the full support of the people in the organization.

In estimating cash flows the following sources may be of help:

1. Historical data of similar projects undertaken in the past can be especially useful with regard to cost information.

2. Salesmen and manufacturers' representatives are usually willing to provide data they have collected to support their "sales pitch." This type of information should obviously be used with care.

3. Employees who are familiar with the operations can often provide dependable estimates.

4. Outside consultants may be asked for advice on major capital expenditure proposals.

Presenting his findings

All efforts of the CPA will be in vain unless he presents the results of his analysis properly. First, the CPA should do his homework to familiarize himself with the concepts and techniques of CEA and the specifics of his client's situation.

Second, he should make his presentation at a level and in language that the client can readily understand. He should avoid highly technical financial terms that are not familiar to his client. The presentation should be simple, brief, and concise.

Third, he should select the proper time and place for presentation, so that the client will not

6—For details regarding a sophisticated yet operational CEA procedure, see Schwab, Bernhard, and Helmut Schwab, "A Method of Investment Evaluation for Smaller Companies," *Management Services*, July-August, 1969, pp. 43-53.

7—Abdelsamad, *op. cit.*, chap. 2.

be frequently interrupted. A face-to-face contact should be part of the presentation. This would allow informal but meaningful dialogue, to ensure that the client understands all the ramifications and to give him ample opportunity to ask questions.

Fourth, the CPA should address himself to the facts and be frank. He should stick to his role of adviser and resist the temptation to make a decision. The CPA's role is that of teacher and adviser—not decision maker.

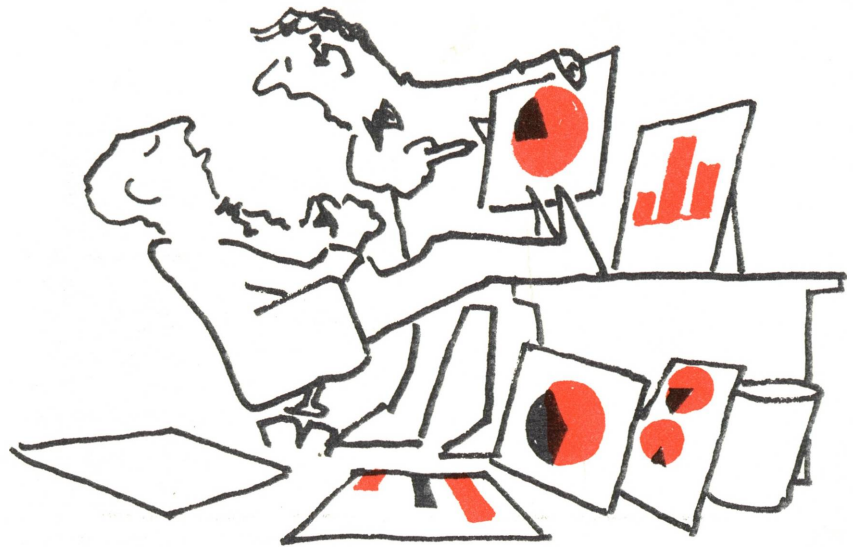
A supplemental means of communicating CEA data is the submission of a management letter. The management letter is a separate report, usually submitted to the client immediately following completion and delivery of the audit report. The letter usually includes recommendations for improvements in the accounting system or controls, and can pertain to any related topic upon which the CPA feels qualified to comment. The management letter serves to reinforce the CEA analysis previously communicated face to face. It can be used as a means of developing additional CEA engagements. It can also serve as the bridge between the function of attestation and the provision of specialized management services.

There is an increasing trend for CPAs to provide management advisory services (MAS) involving subject areas supplemental to attestation.⁸ Controversy exists concerning the expansion of MAS because of its potential adverse effect on independence. Recent surveys, however, indicate that independence may be an outgrowth of the observer's perception of (a) compatibility of the service provided with the image of the independent auditor and (b) auditor competence.⁹

Image correlates with need; if a

8—*Statement on Auditing Procedure No. 54*, AICPA, November, 1972, p. 232.

9—Hartley, Ronald V., and Timothy L. Ross, "MAS and Audit Independence: An Image Problem," *The Journal of Accountancy*, November, 1972, p. 50.



Salesmen are usually more than willing to provide data to support their sales pitch. This type of information should obviously be used with care.

need exists and the CPA has the requisite competence, such need should be served. If the CPA can assist in the internal decision-making process, failure to do so is tantamount to negligence. The argument over independence should not dilute the CPA's ability to be of assistance to his client. We must recognize that in the ultimate sense true professional independence is a state of mind.¹⁰

Position of small firm

APB opinions do not differentiate between large CPA firms and small CPA firms. De facto particularization, however, does exist. When the independent auditor is required to audit his client's accounting records his independence need not be questioned.¹¹ The justification for this position is economic necessity. The public accounting profession cannot ignore the needs and limited financial resources of the multiplicity of small businesses.

10—Statement by Newman T. Halvorson, formerly national partner in charge of technical auditing and accounting for Ernst & Ernst, at the firm's 1970 Symposium for Educators.

11—Carey, John L., and William O. Doherty, *Ethical Standards of the Accounting Profession*, New York, AICPA, 1966, p. 39.

About 95 per cent of all businesses are "small." They produce 37 per cent of the GNP. Increasingly, they are facing pressures which jeopardize their survival.¹² To the small businessman, his problems are as complex as those facing the multinational executive. He does not, however, have access to similar financial resources or technical counsel. Societal objectives dictate provision of full financial services from the accessible expert: the CPA! The controversy concerning independence is not relevant to small businesses. Society's greatest concern is to maximize the probability of success of the small entrepreneur. This can only be done through the provision of the requisite managerial expertise.

The accounting profession can maximize its contribution to the nation's economic welfare by ensuring that modern techniques of CEA are made available to and used by all businessmen, particularly small businessmen. These decisions are of such magnitude that they could very well mean the difference between survival and failure. Thus, the CPA can and should help his client with capital expenditure analysis.

12—Grafer, H. Richard, "The Small Business Financing Gap," *The Arthur Anderson Chronicle*, December, 1972, p. 18.