Management Adviser

Volume 11 | Number 3 Article 9

5-1974

Management Adviser, Volume 11, Number 3, May-June 1974 (Whole Issue)

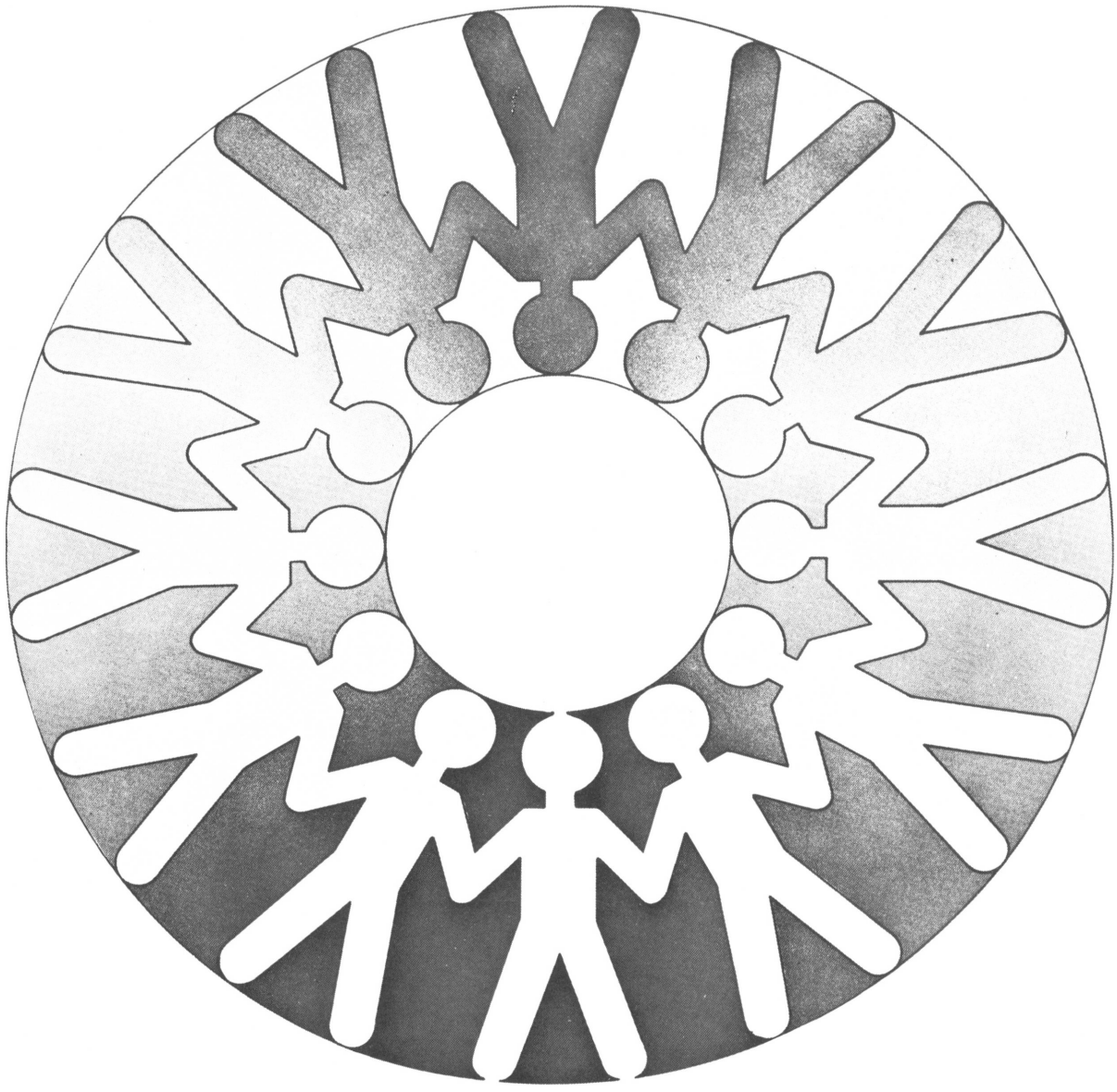
American Institute of Certified Public Accountants

management adviser
May-June, 1974

Analyzing a Client's Customer Profitability Picture

Merritt J. Davoust

A Publication of the American Institute of Certified Public Accountants



You can make a difference

Support your Mental Health Association

The Intellectual Giant.

The objective: to design the ultimate computer for accountants-one that can contain a complete accounting system in memory—with the option of magnetic tape cassettes or paper tape for client data to do more work than you ever thought possible.

The Litton ABS 1251 *is* the ultimate computer. Just ask the accountant who owns one. (We'll give you a list.)

The programs we've designed for the Litton 1251 can tackle the toughest reporting requirements you have, and provide the maximum service to your clients within a competitive fee structure. That's because we know your needs as well as your problems. We know because we have been the leading supplier to accountants for over 14 years. (Our salesmen have been trained in accounting.)

We can give you complex Financial Statements in just about any design. We can give you Statement of Changes in Financial Position. Scheduling. Allocations. Partner Profit Splits. (All automatic.) Branch and Multi-Corporation Accounting.

Automatic condensation of general ledger accounts for easier management reading.

Computer selection of accounts for detail auditing. And, of course, everyday routine work.

You can go from books of original entry to general ledger to financial statement work to work sheets, depreciation, amortization and so on—just by pressing a few buttons.

It has a memory so large (*two to seven times as large* as any office computer in its class) that you can have an entire accounting system in memory—and *still have room for data storage.*

All this in a system that fits in a corner of your office and can be operated by a competent clerk or secretary.

And, all this in a computer that costs less than machines with half the memory!

Challenge us. Ask us to perform for you. Compare us—in depth—with other computers.

You'll find the Litton 1251 a profit center for you. Instead of an extra cost. That's a promise.

Litton—remarkably uncomplicated.

AGY-48-MA-5/6

LITTON ABS
Litton Automated Business Systems

To Litton ABS: Please send information on the new 1251, the ultimate computer for accountants.

Name_____

Address_____

City_____ State_____ Zip_____

Mail to: Litton ABS, Accountants' Division,
34 Maple Avenue
Pinebrook, N.J. 07058 (201) 575-8100

A publication of the American Institute of Certified Public Accountants. Opinions expressed in MANAGEMENT ADVISER *are those of the editors or contributors, and may differ from policies of the AICPA and its committees.*

Management Adviser, May-June, 1974. Published bimonthly, Vol. 11, No. 3. Subscription rates: $12.50 a year, $2.25 a copy. Publication, editorial and business office: 666 Fifth Ave., New York, N.Y. 10019. Second-class postage paid at New York, N.Y.

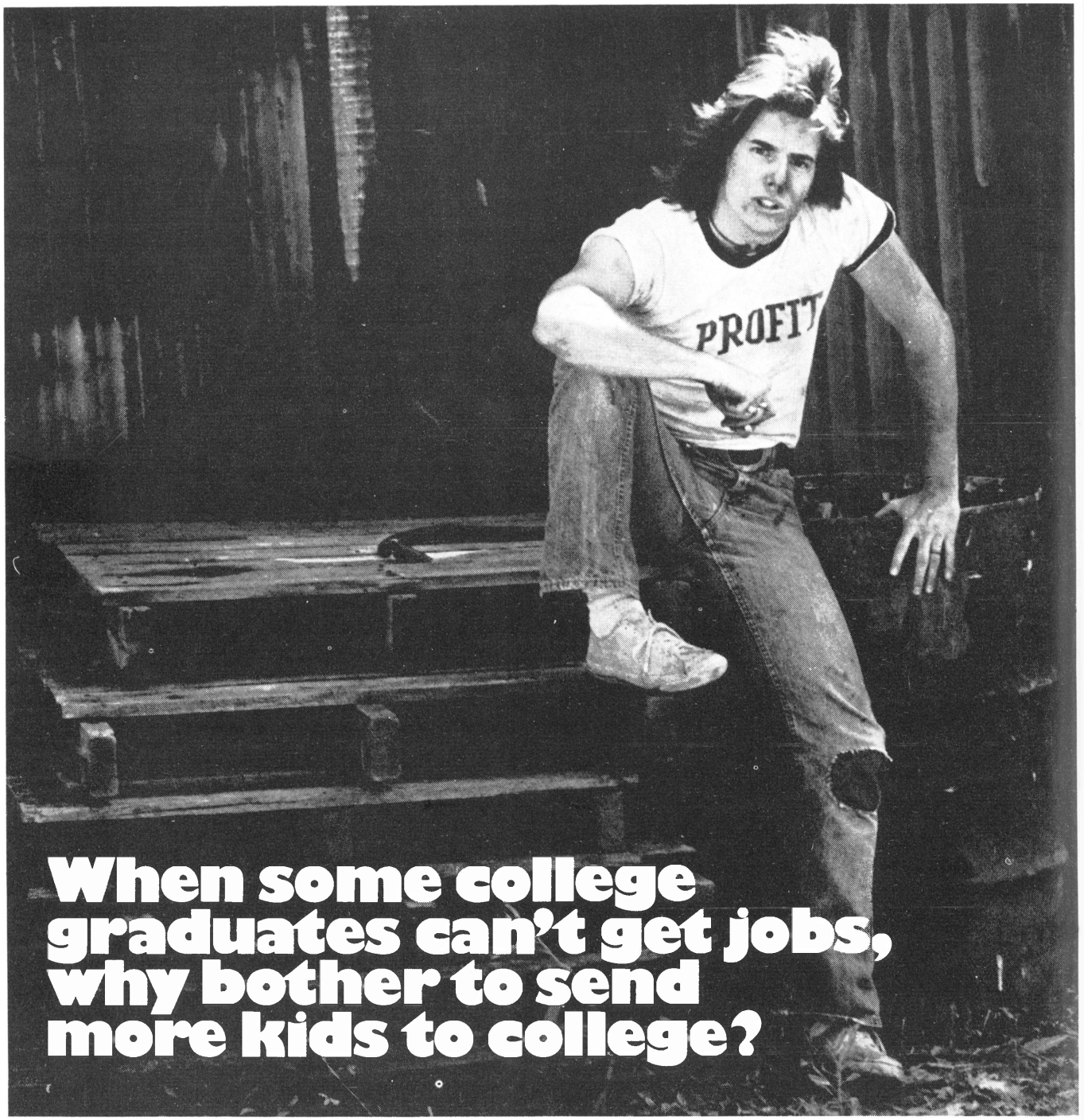
Change of address notices and orders for subscriptions are to be sent to 666 Fifth Ave., New York, N.Y. 10019. Subscribers ordering an address change must give four weeks' notice and both old and new address, including ZIP code number. Member Audit Bureau of Circulations. The contents of this magazine are indexed in *The Accountant's Index*, a publication of the American Institute of Certified Public Accountants.

May-June, 1974

management adviser

(formerly *Management Services*)

Cover design by Ann D. Kahaner



When some college graduates can't get jobs, why bother to send more kids to college?

It's something of a trend today to pooh-pooh the advantages of a college education.

But something of a dangerous trend.

If America is to maintain her place in the world, it will take trained and educated Americans who can compete with the best-educated products of Western Europe, Russia, China and Japan.

It takes college-trained minds to keep America competitive.

Yet, many of our colleges and universities are in the red. And many others have achieved only a fragile financial stability.

Your help is needed. To help finance stronger colleges, better colleges, and a system of higher education that can build a brighter future for all Americans, college-educated or not.

Give to the college of your choice. Now.

Council for Financial Aid to Education, Inc.
680 Fifth Avenue, New York, N.Y. 10019

Please send me your free booklet, "How Corporations Can Aid Colleges and Universities."

Name_____

Company_____

Address_____

City_____ State_____ Zip_____

CFAE

Ad Council

A Public Service of
This Magazine &
The Advertising Council

people, events, techniques

Companies Anticipating Shortages of Materials Have No Plans to Slash Sales Staffs, Survey Shows

Although companies are preparing marketing plans for an economy of scarcity, cutting back on their sales force is not expected, according to recently polled sales executives.

The Sales Executives Club of N.Y. and Porter Henry & Co., Inc., sales management consultants, received replies from 498 companies on what they are doing about the economic situation. The survey was conducted while the Arab oil embargo was still in effect.

Sixty-four per cent of the respondents said they were currently developing a specific marketing plan for an economy of scarcity. However, in two years 51 per cent of the respondents believe their sales force will be larger, 43 per cent believe it will be the same size, and only 6 per cent believe it will be smaller. Looking at these figures by industrial groups: 84 per cent of the insurance and financial services companies said they would expand their sales force; 69 per cent of the food companies said they would do the same; and 73 per cent of the drug, health, and beauty aids marketers plan to increase their sales staff.

Forty per cent of the companies reported that if the gasoline shortage affects their salesmen's ability to cover their territories, the more unproductive territories will be eliminated. The natural result of the gas shortage, according to 72 per cent of the sales executives, will be a greater emphasis on time allocation. Salesmen will have to pay closer attention to which customers are the most profitable and how much time they spend with them.

However, when the sales executives were asked, "Do you believe the energy shortage will become so severe that production will be curtailed and all products in short supply?"; forty-three per cent said

"yes," 46 per cent "no," and 11 per cent were undecided. The researchers believe that some of the executives were hesitant to classify shortages at "severe" and felt only some, not "all," of their products would be affected.

Only 20 per cent of the larger companies responding, those with sales forces of over 100 salesmen, saw severe shortages affecting them. Over 50 per cent of these larger firms did not anticipate severe shortages.

"The overwhelming majority—74 per cent—of the executives who took part in the survey believe that the salesman's job will be more difficult in the coming months," the study states. "And, along with this increased difficulty, the new role of the salesman—a role that will place him in a position of cutting an order as often as asking his customer to increase the order—will be more important to a company's overall success."

1973 Wage Gains Higher Than in '72, Lower Than in '71

In 1973 all industries less construction had an average wage gain of 24.8 cents an hour, reports The Bureau of National Affairs, Inc. The construction industry median hourly wage gain was 39.3 cents in 1973.

The publishing company reported its findings in "Facts for Bargaining," a part of its *Collective Bargaining Negotiations and Contracts.*

Although the median wage gains were higher than those in 1972, they remained lower than 1971's gains. In 1971 construction had an average wage gain of 68.1 cents per hour and all other industries 30.2 cents per hour. In 1972 construction had an average median gain of 38.3 cents per hour and all other industries 21.2 cents per hour.

Of the contracts negotiated in 1973 by the nonconstruction industries, 10 per cent were for one year, 36 per cent for two years, and 54 per cent for three years. In construction, 78 per cent of the contracts were for one-year terms, 18 per cent for two, and only 4 per cent for three years.

AT&T Announces New Resistance to Records Search

As of March 1, the American Telephone and Telegraph Company has put new procedures into effect to guard its customers' privacy.

Only under subpoena or administrative summons is AT&T submitting customer long-distance records to government or law enforcement agencies or legislative committees.

When such records are summoned or subpoenaed, the Bell companies are notifying the customers involved with an immediate phone call and a letter written within 24 hours of receipt of the records request. Only in circumstances where the requesting agency directs the company not to notify the client because it certifies that such notification would impede the investigation or interfere with the enforcement of law will this policy be waived.

Until now only if clients inquired whether their records had been subpoenaed or summoned had they been informed of the action.

"We would prefer not to reveal anything to anybody about the billing records of our customers, but obviously we must honor subpoenas served upon us," said Edward G. Greber, AT&T vice president.

"I want to emphasize that the records we're talking about contain only the information necessary for billing purposes. These records contain no information as to the contents of any telephone conversation," the AT&T executive said.

Giving Work Crews Greater Independence Increases Output

Allowing workers more self-management can lead to increased productivity. A group of assemblers working on a radar unit were able to cut their production time from 138 hours to 31 hours through self-initiated improvements, reports Towers, Perrin, Forster & Crosby, management consultants.

First, a line supervisor initiated a problem-solving session for his work crew. During this meeting assemblers identified production blocks and suggested ways to remove them. The assemblers set their own targets and strategies and solved their own daily problems, only calling in outside engineers and assemblers when necessary. Over a two-year period this approach enabled the assemblers to produce the units in 31 hours, which management felt was the point of optimum efficiency. Since the breakeven point was 100 hours, profit on the units allowed significant price reductions to be passed on to the customers, TPF/C states in its *Letter,* issue 113.

This is just the sort of job enrichment many union leaders oppose because of its potential for cutting down on the number of required workers (see M/A, May-June, '73, pp. 5-6).

Working a "whole job"

Another company is experimenting with giving each of its workers a "whole job." This means each job includes three elements: planning, doing the job, and evaluating the results, TPF/C states. In this company "every engineering job has been expanded from responsibility for a specialty to responsibility for an entire production unit."

In another case, although industrial engineers estimated 110 workers were needed for a new corporate facility, when the work force was organized into 12-member

teams that managed themselves, only 70 workers were required. TPF/C states that these teams: perform activities typically accomplished by maintenance, quality control, custodian, and personnel units; provide challenging assignments in addition to routine tasks; and afford job mobility and rewards for learning. The management of this facility reports improved yield, minimized waste, and fewer shutdowns.

"A number of other organizations are experimenting with techniques for putting the worker back into the center of the operation . . . Admittedly, it isn't an easy task. But it can be done. In fact, most behaviorists think it must be done," TPF/C says.

How about the unionists?

New Accountants Could Begin at $17,000 a Year by 1980: Half

By 1980 public accountants with less than one year of experience may well be receiving a median salary of $17,000 a year, estimates Robert Half, CPA. In 1950, when his personnel agency first surveyed the accounting positions in its files, median salary for the same position was $1,820 per year.

We challenged Mr. Half's low figure for 1950 and he responded that in 1940, when he first started working as an accountant, he was receiving $4 per week and he knew others who were paying for the experience.

In 1974, accountants with one year or less experience working in large-size firms are earning $11,500-$12,500, an increase of 8.6 per cent over 1973, reports Half's 1974 *Financial and Data Processing Prevailing Starting Salaries* survey. In medium-size firms the beginner is making $9,500-$11,000, an increase of 5.1 per cent from last year. If the accountant has a graduate degree he can expect 10 per cent more and if he has a CPA certificate another 10 per cent.

The survey is based on the position requests received by the Half organization in its 43 offices.

Systems analysts in medium-size installations experienced the greatest increase in salary range over the year, 14.9 per cent. In 1973 the salary range for that position was $10,500-$13,000. In 1974 it is $12,-000-$15,000. In large installations the systems analysts now earn $13,500-$15,000, and in small installations $11,500-$13,000. If the systems analyst has an undergraduate degree, 5 per cent is added on to the salary range and another 5 per cent is added on if the position involves substantial travel.

Senior consultants in 1973 averaged $16,000-$23,000 and in 1974 $17,000-$24,000. Managers in 1973 were earning $20,000-$40,000 and in 1974 are earning $22,000-$40,-000. Half reports that a graduate degree or a CPA certificate are worth an additional 10 per cent increase over those figures, both mean 12 per cent more and if substantial travel is called for an additional 5 per cent.

Although the firm says there are differences in salaries offered in various parts of the country, in most cases the difference is not greater than the variance in salaries between a large city and its surrounding suburbs.

Copies of the survey are available upon written request to Bernard Wilens, Vice President, Robert Half Personnel Agencies, Inc., 330 Madison Ave., New York, N.Y. 10017.

Arthur Young Reports Swing in Favor of 'Spendable Income'

Immediate spendable income is "back in style," reports Arthur Young & Company in *Compensating Executives: Meeting the Needs of Management Today*, a firm publication recently released.

MANAGEMENT ADVISER will cease publication after its next issue, July-August.

Part of the material covered in the magazine, which was established in March 1964 as MANAGEMENT SERVICES, will now appear in *The Journal of Accountancy*. In its August issue, *The Journal* will inaugurate an MAS department and will from time to time publish major articles on management advisory services.

The decision to suspend publication of MANAGEMENT ADVISER was made at the meeting of the AICPA Board of Directors in January in New York. The Board reasoned that one of the major purposes in creating the magazine was to establish CPAs in the minds of the public as qualified to handle top-level MAS assignments. Since the non-CPA readership of *The Journal* is now greater than that of MANAGEMENT ADVISER, it was thought that the objective could be achieved just as well by incorporating MAS material in *The Journal*. CPAs involved in management advisory services receive *The Journal* as members of the Institute; non-CPAs in accounting firms have access to *The Journal* through their firm's library or through independent subscription.

Subscribers to MANAGEMENT ADVISER whose subscriptions expire after publication of the July-August issue will be given the opportunity to fulfill the balance of their subscriptions with *The Journal of Accountancy* or they may elect to receive a refund. A mailing offering this option will go out in June.

Deferred compensation, stock options are less popular today . . .

Firm members obtained replies from 6,000 corporate executives in more than 1,000 corporations. Their study was conducted under the auspices of the Financial Executives Institute (see M/A, January-February, 1974, pp. 12-13, for a discussion of the FEI report). From these answers they concluded currently favored compensation practices include spendable income in the form of salaries and bonuses, executive incentive systems, fringe benefits, perquisites, and the "cafeteria" approach to compensation. Less popular practices include deferred compensation arrangements and stock options.

Majority want cash

"In a recent study," Arthur Young states, "over 75 per cent of the executives said they wanted a formal management incentive system. More than four out of five said they wanted their compensation in the form of cash; less than one-third said they wanted it in stock or some form of deferred income. Four out of five executives told us that stock options have lost their appeal as an incentive."

"Cafeteria compensation" allows the executive to have some choice in the form and timing of at least a portion of his total compensation. The CPA firm cautions that if this approach to compensation is used, a company should also provide top executives with continued financial planning attention.

The concept of "performance shares" is enjoying current popularity among stock accumulation approaches, the report explains. Performance shares are long-term rewards that are not paid unless the executive measures up.

"A company will set certain growth or profit standards either in earnings or sales for the division or for the company for anywhere from two to six years and allocate performance units to executives in much the same way that options are allocated. When the period of measurement expires, a percentage of those performance units is given to the executive, according to his company's or division's success in obtaining the previously established objectives. At that point, the performance units may be converted either into cash or stock at the current market price."

Stock options sometimes best

The mechanics of the performance share approach are very complex and difficult to explain to executives, especially if division as well as corporate targets are involved, Arthur Young notes. For young companies that cannot set realistic earnings targets yet, the firm suggests stock options are a better choice. However, for large corporations that have established valid parameters of growth "performance shares may be the wave of the future," the study states.

There is increasing pressure toward early retirement for executives, the firm reports. It is in part due to an attempt to satisfy the ambitions of the young executives and keep them from leaving, Arthur Young observes. However, it cautions, "It is estimated that the cost of providing a pension without reduction for years of service before age 65 rises at the rate of 6 percent a year." As mandatory minimum retirement age is reduced, a review of pension plans is required, the firm says.

Every Business With More Than 25 Employees Will be Affected by New Health Law, Warns Hay

Every business organization in the country with 25 or more full-time employees will be affected by Public Law 93-222, the "Health Maintenance Organization Act of 1973," reports Hay Associates in its newsletter, *Men & Management.*

The consulting firm points out Section 1310 of the law in particular. It states that the employer with, on the average, 25 employees or more "shall . . . include in any health plan offered to its employees . . . the option of membership in qualified health maintenance organizations . . . in the areas in which such employees reside."

If an employee chooses HMO coverage over that of the regular medical benefits plan offered by the company, then the employer must pay out the same amount for HMO coverage as it does for the regular company program, Hay explains.

"It appears at this early stage that, since there are relatively few HMOs in the true sense of the term to begin with, the number of those which will qualify under the Act in the near-term future will be quite limited," the firm observes.

Although the Department of Health, Education and Welfare is helping to underwrite the new law, heavy deficits are expected in the first operating periods partly due to discovery of pre-existing employee health problems and partly due to enrollment fees not catching up to cover fixed costs for the initial period. The cost and fee structures will be complex to establish, administer, and control. Also physicians are not too enthusiastic about the law, in part because to qualify for association with HMO the work in these clinics must be their "principal professional activity," Hay points out.

For the Management Consultant—

AICPA MAS Committee Issues Exposure Drafts of Standards For Practice and for Preparation of Financial Forecasts

The AICPA MAS Executive Committee at its March 28-29 meeting discussed two exposure drafts that are available to interested parties who wish to comment on them. One was a draft of "Management Advisory Services Practice Standards," prepared by the MAS Technical Standards Subcommittee and the other was "Standards for Systems for the Preparation of Financial Forecasts," prepared by the Forecasting Task Force of the MAS Executive Committee.

Practice standards

Recognizing that MAS practice draws on those trained in skills other than accounting, the proposed MAS practice standards are to apply to Institute members as well as non-members engaged in the structured practice of management advisory services in CPA firms.

State CPA societies and other interested parties have been sent copies of the proposed practice standards for their comments.

The following is a summary of the management advisory services practice standards being considered:

1. *Personal characteristics* — In performing management advisory services, a practitioner must act with integrity and objectivity and be independent in mental attitude.

2. *Competence*—The engagement is to be performed by a person or persons having competence in the analytical approach and process, and in the technical subject matter under consideration.

3. *Due care*—Due professional care is to be exercised in the performance of a management advisory services engagement.

4. *Client benefit*—A practitioner is to perform only those management advisory services engagements which, in his judgment, can reasonably be expected to result in a benefit to the client.

5. *Understanding with client*—Before an engagement is undertaken there is to be an understanding with the client on all significant matters relating to the engagement.

6. *Planning, supervision, and control*—Engagements are to be adequately planned, supervised, and controlled.

7. *Sufficient relevant data*—Sufficient relevant data is to be obtained, documented, and evaluated in developing conclusions and recommendations.

8. *Communication of results*—The results of the engagement are to be communicated to the client.

Preparation of forecasts

The proposed standards for the preparation of financial forecasts have been developed not only for the guidance of the preparers of financial forecasts and the developers of forecasting systems, but also for the management of companies that issue forecasts, and the financial public in general.

On February 2, 1973, the Securities and Exchange Commission said that it will permit companies to include financial forecasts in prospectuses and reports under certain conditions. These forecasts must meet certain standards, that have yet to be set.

"In spite of the widespread preparation of financial forecasts for internal use, no authoritative statement of guidelines or standards exist for either the preparation or publication of financial forecasts," the exposure draft states. "Such standards are desirable and necessary if published forecasts are to be useful to the public. Although the Securities and Exchange Commission has stated its intent to issue forecasting standards, it is desirable and consistent with Commission policy that these standards be developed in the private sector and be based on experience with financial forecasting."

In summary, the proposed standards are:

1. *Most probable single result*—A financial forecasting system should provide a means for management to determine what it considers to be the single most probable forecasted result.

2. *Accounting principles used*—The accounting principles used in the preparation of a financial forecast should be those which are expected to be used when the events and transactions envisioned in the forecast will be recorded in financial statements.

3. *Appropriate care and qualified personnel*—Financial forecasts should be prepared with appropriate care by qualified personnel.

4. *Best information available*—A financial forecasting system should provide for seeking out the best information available at the time.

5. *Reflection of plans*—The information used in preparing a financial forecast should reflect the plans of the enterprise.

6. *Reasonable assumptions suitably supported*—The assumptions utilized in preparing a financial forecast should be reasonable and appropriate and be suitably supported.

7. *Relative effect of variations*—The financial forecasting system should provide the means to determine the relative effect of variations in the major underlying assumptions.

8. *Adequate documentation* — A financial forecasting system should provide adequate documentation of both the forecast and the forecasting process.

9. *Regular comparison with at-*

tained results—A financial forecasting system should include the regular comparison of the forecast with attained results.

10. *Adequate review and approval*—The preparation of a financial forecast should include adequate review and approval by management at the appropriate levels.

The standards do not address the questions of what information a published forecast should include nor the independent attestation of forecast data. These matters are still under consideration by the AICPA.

John R. Mitchell, director of the AICPA's management advisory services division, explained neither set of proposed standards has yet been officially adopted by the MAS Executive Committee. If the Committee adopts the standards, it would constitute adoption by the AICPA as a whole.

Mr. Mitchell invites those interested in commenting on the standards to write to him to obtain complete copies of the exposure drafts. Comments on the Practice Standards should reach Mr. Mitchell by June 30. Comments on the Forecast Standards are to be directed by June 17 to Monroe S. Kuttner, manager – MAS, at the AICPA. Write to AICPA, 666 Fifth Avenue, New York, N.Y. 10019.

Touch-Tone Phones For Computer Input? Canada Has Them

Maybe there isn't a computer in every home just yet, but Simpsons-Sears in Toronto, Canada, is turning the residential Touch-Tone telephone into a shopper's terminal for its computerized ordering system.

Residents of the metropolitan Toronto free calling area who own a 12-button Touch-Tone phone can order items from the Simpsons-Sears catalogues by calling its automated order service. First the Touch-Tone owner must enter his name and address in the computer's memory by mailing in a form. After that initial identification, he can make his order in approximately half the time it would take him to call a human order taker.

An additional benefit of Touch-Tone ordering is that the computer can immediately check to see if the desired item, as numbered in the catalogue, is in stock and, if not, will tell the customer so. While the customer is still on the line, each item ordered is compared to the computer record to reduce errors and call-backs.

The system has been designed so that if a customer is having difficulty placing an automated order, a human operator can call the customer and overcome the problem. In its initial three-month trial period, one out of five customers required assistance.

Maurice Anderson, general manager, methods planning and development at Simpsons-Sears, stated, "We are not contemplating in any way that this technique will become more than an alternate method of ordering. We will continue to need our highly-trained and well-regarded telephone sales clerks to handle the majority of orders that come from customers."

After a total trial period of more than seven months, the Touch-Tone automated order service operates Monday through Friday from 9 a.m. to 9 p.m. in the Toronto area.

Arthur D. Little Foresees Much Larger EDP Systems by '80s

Modular component computers of very low cost, compared to current models, will be the next generation of computer systems, predicts Arthur D. Little, Inc., on the basis of a study done in support of an Air Force Systems Command Mission Analysis of automatic data processing requirements at base level (SADPR-85).

ADL conducted its research among all the major U.S. computer manufacturers as well as the university research labs.

Frederic G. Withington, who led the EDP portion of ADL's study, said, "Auxiliary storage subsystems will be available that make it economically possible to provide on-line access to groups of very large files. Substantial improvements in magnetic technology will make this possible by 1977; slow evolution toward magnetic-bubble and/or charge-coupled device technology will also cause improvements to continue through 1985 and beyond.

"Highly flexible, fully automatic data management software will be integrated with these subsystems."

ADL predicts that, by 1985, available data processing equipment will make installations 10 to 100 times larger than today's systems possible.

AICPA Conference on MAS Scheduled for Chicago in October

MAS specialists may want to make plans to be in Chicago October 2-3 to attend a conference sponsored by the AICPA especially for them.

This national conference will be largely of a technical nature, designed to interest those primarily engaged in management advisory services in CPA firms.

Included will be eight hours of workshops covering such topics as: career opportunities for non-CPAs in a CPA firm; the economics of an MAS consulting practice; diagnosing and managing multi-disciplinary engagements; and consulting opportunities for the CPA firm.

Speakers will include officials of the AICPA and the Federal Government as well as leading MAS practitioners.

More information about the fall conference is available from the MAS division of the AICPA, 666 Fifth Ave., New York, N.Y. 10019.

Nearly Two-Million Computer Terminals Predicted for 1977

By the end of 1977 there will be 1.8 million terminals installed in the United States, a study published by Creative Strategies, Incorporated, Palo Alto, Calif., states. In 1972 475,000 terminals had been installed.

Intelligent terminals (terminals capable of doing certain on-site operations) will experience a 21 per cent compound annual growth rate, reaching a $258 million market by 1977. "CSI sees continued rapid growth of new intelligent terminals which is directly related to the availability of low-cost semiconductor (MOS/LSI) [metal-oxide semi-conductor integrated circuits using large-scale integration] processor devices," the firm states. CSI sees intelligent terminals as the fastest growing segment in the general purpose terminal market.

General purpose terminals, dominated by cathode ray tubes (CRTs), are expected to grow from a 1972 revenue base of $430 million (on an if-sold basis) to $930 million by the end of 1977. Dedicated application terminals are expected to grow from $93 million in 1972 to $564 million by 1977.

Total conversion by 1977

CSI also projects that retailers will achieve total conversion to electronic point of sale equipment by 1977. The retail industry is expected to spend $2.7 billion for the needed equipment.

"Although costs may be as much as 20 to 100 per cent more than for electromechanical registers, the real payoff is expected to occur as a result of increased management control over inventories," CSI states.

By 1977 more than 346,000 system-oriented units will be installed in non-food retail stores, 125,500 of those in general merchandising, the company forecasts. By the end of the decade more than 100,000 systems-oriented units will be shipped for the supermarket segment of retailing. Credit card authorization systems are also experiencing increased demand. Sales volume is likely to total about $184-million by 1977, CSI states.

The firm's findings are part of its Industry Analysis Service. More information about the service or individual studies is available from Creative Strategies, Inc., The Executive Building, 1032 Elwell Court, Palo Alto, Calif.

New Plan to Counter Machine Obsolescence Offered by Redactron

Buy back arrangements that will protect its customers from suffering financial loss if their word processing equipment becomes obsolete is being offered by Redactron Corporation, Hauppauge, N.Y.

Under one plan, Redactron will credit to the purchaser of any new Redactron equipment the amount of the purchase price of the older equipment less the equivalent monthly rentals for the period in which the equipment was used.

Deposit plan

The second plan requires the buyer to pay a $500 deposit at the time of the purchase which entitles him to an 18-month grace period when he is able to return the word processing equipment as if he had rented it. If the buyer drops the buy-back option during the first 18 months, the $500 is refunded; if the equipment is returned after the first 18 months, the $500 will not be refunded. The second plan is to protect customers who wish to preserve the right to change to a different manufacturer if their needs change.

The two plans are designed so that the purchaser will not have to pay more than he would have to rent the word processing equipmen, Redactron states.

Honeywell Executive Decries Notion of Computer Enslavement

By the end of the century the myth that man will be enslaved by computers will be dispelled, a Honeywell executive told the Town Hall of California, March 12.

William T. Bayer, Jr., vice president of technical resources planning for Honeywell's worldwide computer operations, explained: "More and more people are entering the work force who know how to use computers. The U.S. will not be filled with computer experts, but the U.S. will be filled with people who understand how to use computer power."

He observed that computer companies are shifting their emphasis from manufacturing to sales, service, and software.

Some technological advances that may be achieved by the end of the century are: "wired cities," where every home is connected to a central computer; mail and newspapers "delivered" to the home on a television screen; and business terminals in the home that eliminate the need for office buildings, Mr. Bayer stated.

"Technology makes these things possible now or within the next quarter-century. But does society really want them, or need them? That's the real question involving computers in the year 2000," the Honeywell vice president said.

Thomas S. Dudick's article, "Cost Accounting Must Adapt to Nuclear Energy Needs," which appeared in the last issue of Management Adviser, *was a condensation of part of a special study conducted for the Valve Manufacturers Association, 6845 Elm St., McLean, VA 22101. The complete work covering cost accounting detail has been printed in its entirety in the VMA's publication* Valviews.

For the Executive in Finance—

Accounting Systems Should Reflect Inflationary Trends, Freeman Says; Material Shortages Predicted

Accounting systems that reflect inflationary trends ought to be implemented, advises Orville Freeman. Replacement costs and inventory should be used as determinants for calculating depreciation, the former Secretary of Agriculture and now president of Business International, advises.

Mr. Freeman was interviewed by *Boardroom Reports*, a management publication.

He predicts tougher times for the United States-based multinationals in their dealings with developing nations. The fear of international domination is real and must be reckoned with and, accordingly, he described some ways in which this is being done.

In the Far East, an idea that is gaining favor is an agreement whereby the investor pays the host nation part of the production, thus eliminating the host nation's feeling that it is being "taken over."

Arabs offer barter plan

According to Mr. Freeman the Arab nations have offered to swap cheap oil for production facilities built on their soil.

Multinationals should be prepared to pay higher taxes around the world. Economic blackmail could spread from oil to certain metals such as molybdenum, tin, titanium, and bauxite and to some foods including coffee and sugar, Mr. Freeman warns.

The former Secretary of Agriculture forecasts a real food shortage starting in the next few years because of the world's continuing population growth. Dwindling supplies could only be countered by a major scientific breakthrough to sharply increase food production or a worldwide depression that would direct more feed grain to cereal and bread rather than into meat output, he stated.

There is also the possibility of a drought in the United States which could create worldwide famine and a major economic dislocation. Mr. Freeman commented, "Droughts occur in cycles and the meteorologists say one is due statistically."

Boardroom Reports is a 20-page semi-monthly publication. The subscription price is $35.00 per year. Further information about the publication is available from Martin Edelstron, *Boardroom Reports*, 11 West 42nd Street, New York, N.Y. 10036.

Manufacturers Comply With Fair Packaging Laws, Says Dent

Manufacturers are complying with provisions of the Fair Packaging and Labeling Act, reports Secretary of Commerce Frederick B. Dent.

"I think there has been significant progress made in this area, even though compliance is on a voluntary basis," Secretary Dent said. He pointed out "the reduction of different package sizes and more uniform labeling will afford consumers better shopping comparisons and will eliminate unnecessary confusion in the marketplace."

Prior to the passage of the Fair Packaging and Labeling Act in 1966, there were 57 different toothpaste package sizes, based on ounces. Presently there are five standardized toothpaste sizes, a 91 per cent reduction, Mr. Dent noted. Similarly adhesive bandage containers have been reduced from 37 to 10 different packages, a 73 per cent reduction, he stated.

The Commerce Department's National Bureau of Standards checked one-third of the product categories, to be observed, and found "a high degree of compliance with voluntary standards." Each year another third will be checked for weight and measure standardization.

Since 1966 package quantity standards have been established for 44 product categories; 37 were established informally by manufacturers and seven were established as "Voluntary Product Standards," the Department of Commerce states.

Copies of the Department of Commerce report may be obtained by contacting the Office of Weights and Measures, National Bureau of Standards, Washington, D.C. 20234.

Stanford Research Will Help Individual Firms With Research Review

If the most recent innovation in your company is using zip codes, Stanford Research Institute may have a plan to activate your on-the-job retirees.

SRI, Menlo Park, Calif., has established a program that sends its research professionals to search for innovations. Accordingly, it is called "Innovation Search."

Its scientists first undergo an intensive indoctrination of a company's products, services, and technologies in the area to be investigated. They then meet with client company's representatives in a week-long search for innovations.

SRI's consultants include "1,400 research professionals, who represent more than 100 disciplines," the organization states.

The program attempts to discover ideas for new products or services; new uses or modifications of existing products or services; outlets for patents and technological processes that are not utilized; and outlets for unique capabilities that a company might possess.

Sessions among SRI professionals and client company representatives can take place either in the client company's facilities or at SRI headquarters in Menlo Park.

New Products and Services—

Commercial Printer Solves Shifting Payroll Problem By Imaginative Use of New York Service Bureau

Commercial printing, with its roster of specialized workers, pressmen, plate makers, sheet straighteners, cameramen, dot etchers, porters, presents a payroll problem of some size. Unfortunately, the average print shop, in spite of the number of skills required, doesn't always need the same number of personnel as it has jobs to be done.

This complicates the payroll problem. As does the fact that each trade is highly unionized. A man can work on one press today at one rate and another press tomorrow at a different rate and then when the pressure is off return to his normal press. So he earns at one hourly wage rate at one job, at a higher rate the next, and he returns to his basic wage the third. Throw in differing rates of pay for overtime work and the situation can become a bookkeeping nightmare.

This is basically the situation faced by Davis-Delaney-Arrow, a custom print shop in Manhattan specializing in producing annual reports, catalogs, direct mail material, and brochures.

"We have enough people to make payroll handling a complicated, costly procedure," said William Sproat, D-D-A controller, in an interview, "but not enough to justify installing our own electronic data processing set-up."

To achieve the benefit of electronics without the expense, Davis-Delaney-Arrow arranged for Magnagistics, a specialized personnel-oriented payroll processing firm to take on the job.

Together, the Magnagistics people and the D-D-A people designed a special time sheet for the print shop. Each worker's name and identification number is pre-printed on the time sheet. The bookkeeper at the printing plant merely enters manually after each worker's name the hours worked, the shift, and the key for the kind of work done. Magnagistics picks up these sheets on Mondays and, using interpretations for the shift (overtime, straight time) and for the type of work being done, processes them through a computer and returns a complete payroll to Davis-Delaney-Arrow each Tuesday afternoon. Payroll checks (for night shift workers only) are also prepared by the service. Day shift workers are paid in cash delivered under armed guard.

The payroll program also calculates deductions for the employee's union, which are deducted and sent to his local for use as a vacation fund for the employee. The system also includes preparation of the standard tax forms.

The company is satisfied with the arrangement which simplifies its bookkeeping problem to the utmost degree. "We are pleased because of the on-time delivery of checks without bother on our part," comments Mr. Sproat. "The ability to handle the complex rating and overtime schedule, to deduct the vacation items, and to get special reports just as a by-product of weekly input by our bookkeeper also figures in the efficiency rating we give the system."

Pitney Bowes Issues New Booklet to Help Mailing Efficiency

Our office postal scale is no longer obsolete: we just read the airmail rates to find out what the correct first class rates now are. Although the latest postal rate increase has not caused Pitney Bowes to reissue old machines, it has prompted the company to offer a free booklet "30 Ways to Make Your Mailing Operation More Efficient."

"Airmail—Never on Friday," advises Pitney. Since business letters won't be opened until Monday, the company says save the postage and stick with first class except for long distances.

Another suggestion is to save metered envelopes or tapes that were printed but for some reason were not used, for instance issuance in the wrong denomination. The local post office will give you a 90 per cent rebate for them, Pitney says.

When sending a first class letter along with a package, to avoid paying first class rates for the entire package mark it "First Class Mail Enclosed" and add the letter's postage to the parcel's postage; or tape the letter to the top of the package with the appropriate postage affixed.

The booklet is available at any Pitney Bowes sales and service office or by writing to the company at 159 Crosby Street, Stamford, CT 06904.

Machine Translator Introduced

A device that allows an operator to translate English terms into their numeric code equivalents for computer input has been introduced by the Standard Register Company, Dayton, Ohio.

The Procedure Selector is essentially a specially designed microfiche viewer, Standard Register explains. It displays a page of 120 item, service, or procedure descriptions at one time on a TV-like screen. Forty-five pages are available, which allows the operator to make selections from up to 5,400 items.

Correction—Donald Dewayne Martin, author of "A Graphic Solution to Discounted Cash Flow Problems," M/A, March-April, 1974, is assistant professor and chairman of the accounting department at Rockhurst College, Kansas City, Mo.

THE WORST HANDICAP OF ALL?

Being deprived of the right to education

There are seven million handicapped children in America. They need special education to develop their full potential as people. And they have a *right* to that education.
Yet less than half the children who need special education are getting it.

For information about special education for handicapped children—or for help—write:

CLOSER LOOK, BOX 1492, WASHINGTON, D.C. 20013

U.S. Department of Health, Education & Welfare, U.S. Office of Education, Bureau of Education for the Handicapped

"We lose money on every sale; we make it up on the volume" is a weary joke, but it's still true of too many companies' operating philosophy today, says the author, in recommending thoroughgoing—

CUSTOMER PROFITABILITY ANALYSIS

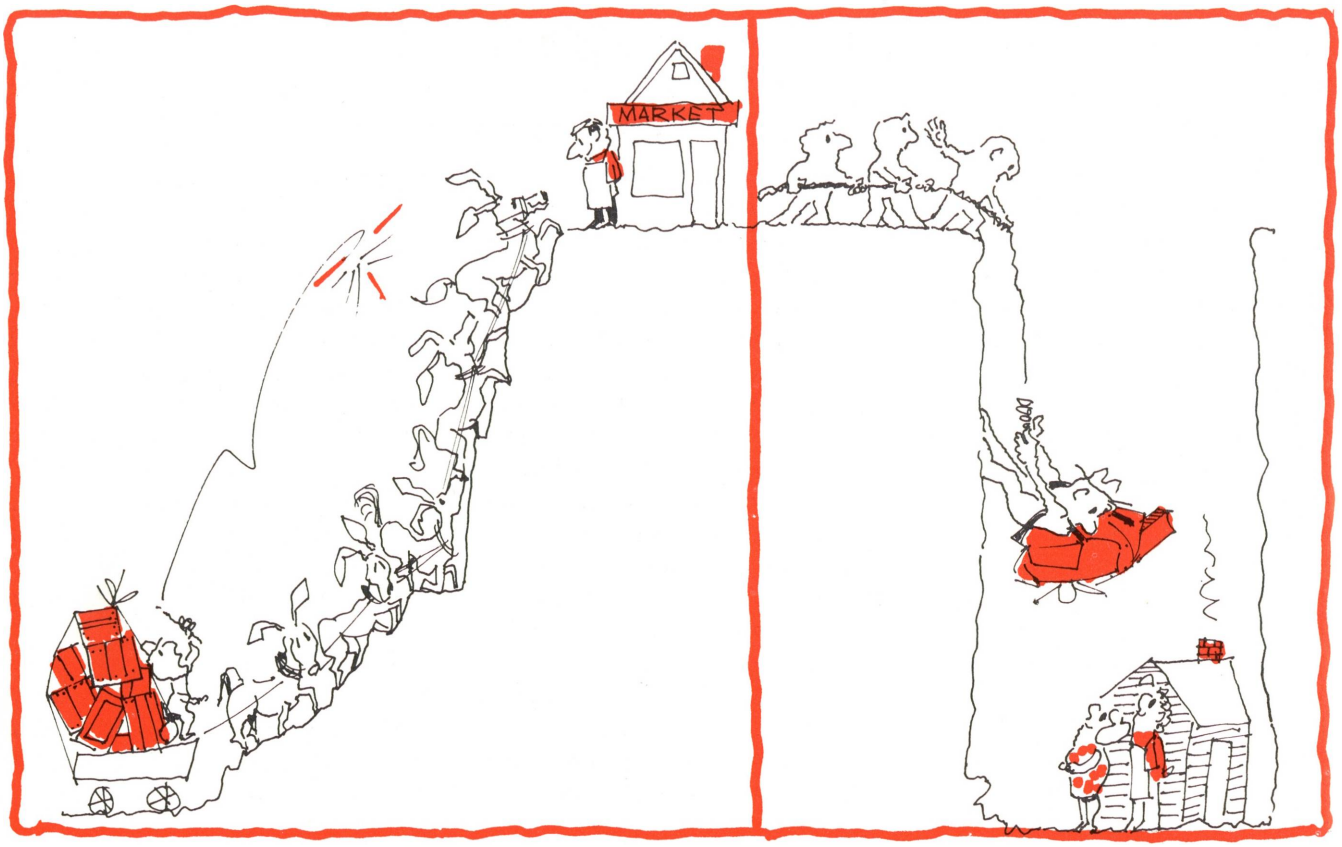
by Merritt J. Davoust
A. T. Kearney, Inc.

TODAY'S struggle with shortages, rising costs, and frozen prices may be obscuring a more fundamental problem that has been growing in importance in recent years. For some time we have been hearing about companies whose sales have continued to increase but whose profits have declined. It was becoming more and more apparent, even before the current crisis, that many companies are wrestling with the problem of long-established plants or products that are not achieving targeted profit goals. And, in many cases, management is finding that the time-honored solution of increasing volume is not producing the desired results.

Why? Surely the basic "principle" of increasing sales to improve profits is still sound! Strangely enough, many companies are discovering that more volume is not the answer to missing profits. Even more strangely—there often appears to be a correlation between present unsatisfactory results and past successes in "maintaining share of market." Rank heresy? Not really—just the cold hard economic facts.

And "facts" are often at the root of the problem—accounting facts. As companies and volumes grew, the more it became necessary for the accountants to find suitable methods of "averaging" those costs not directly identifiable in the product. As business organizations became more complex, greater emphasis was placed on timely information, properly subdivided according to organizational needs, being made available on a tight time schedule.

These pressures shaped the basic objective of today's typical accounting system—the matching of costs and revenues within a particular time frame. In recent years, the accountants have regularly developed additional analytical tools to assist in the ever-increasing complexities



The premise that all customers are "average customers" just doesn't stand up. Many produce gross margins that don't pay for the cost of the sales call, the processing of the order, and product delivery.

of dynamic decision making. Responsibility accounting, breakeven analyses, direct costing, and variance analysis are but a few. In general, these tools were developed to fit specific organizational requirements and have continued to accept the premise that all customers are "average" customers.

But, instead of helping management pinpoint profit opportunities, these accounting approaches can often camouflage the real problems.

This is so because the improvements in the accounting system have tended to be product-line or manufacturing-plan oriented rather than customer-type oriented. In addition, the drive to increase volume at all costs has often meant tapping marginal customers or sales territories. Sales volume has gone up but total profit has gone down as a result, since each additional sale means increased direct production costs. If the profit from the sale—taking into account all the time spent in making it and the time spent in making deliveries—is lower than it is for better customers, the net result is going to be lower overall profitability for the product even though total sales volume figures show an increase.

In recent years, increasing emphasis has been placed on the concept of integrated physical distribution. This has helped to identify the fact that many cost accounting systems have taken only a cursory peek beyond the factory door and have, traditionally, lumped together a significant portion of total costs as part of "indirect overhead." It has also helped to make management more aware of the cost impact of different customer characteristics.

In the first place, nearly all the costs beyond the factory are not fixed nor are they indirect. They are the direct result of the mix of customers and their order profiles and the marketing, distribution, and service policies of the company. The key point is that they are usually direct, variable costs when measured against the source of revenues—namely, the customer.

More and more companies are discovering the value of a profitability accounting system that matches costs and revenues by *source*—rather than by time period.

Are we talking about significant costs? Recent studies show that the percentage of the sales dollar that is most heavily influenced by customer characteristics exceeds 20 per cent in many manufacturing industries and ranges even higher in

MERRITT J. DAVOUST is a principal in the Chicago office of A. T. Kearney, Inc., management consultants. He received his bachelor of science degree from the Illinois Institute of Technology and later earned his master of business administration degree from the University of Chicago.

most service industries. At these orders of magnitude, it is clear that management needs better information about the differences in "customer costs" and a system that permits determination of profitability by types of customers' characteristics.

This knowledge can serve management needs in several ways:

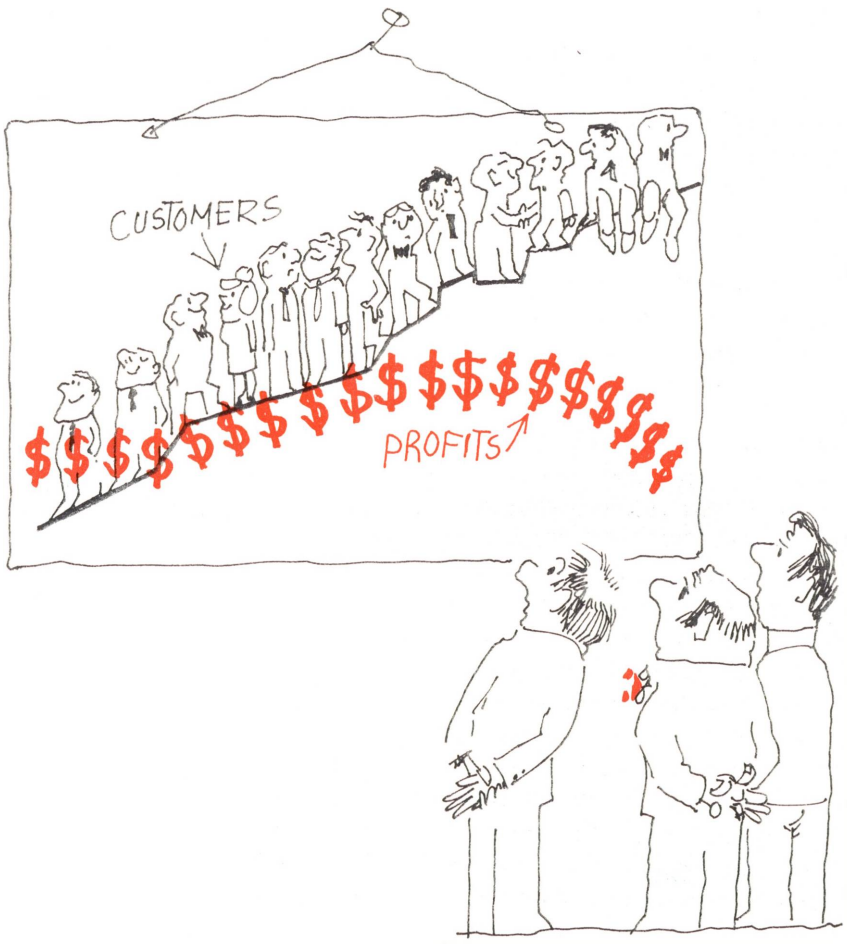
1. Establishment of organizational goals based on the identification of the inherently most profitable business mix.
2. Formulation of specific, customer-oriented marketing strategies to achieve this mix.
3. Development of optimum integrated distribution systems taking full advantage of trade-off opportunities.
4. More accurate financial planning.

Profit improvement opportunities available through the reshaping of the inherent profitability of the business mix are generally many times greater than those available from improved efficiency alone. In most systems of profit accountability, some organizational units (usually plants or product managers or sales groups) are measured as profit centers. The accounting system essentially flows revenues and costs *back* to the organizational unit and attempts to properly match them within a specified accounting period. However, meaningful decisions are difficult to make in dealing with an unprofitable profit center since it is actually an agglomeration of all the individual profits or losses derived from each and every customer transaction in which its products were involved. Thus, to effect a significant improvement in the inherent profitability of an operating unit, it is necessary to identify those individual pieces of business that are not profitable. Steps can then be taken to attempt to raise these to acceptable levels. If, after consideration of such key factors as product mix, sales coverage, pricing, order profiles, and distribution costs, it is determined that some customers cannot be converted into sources of profit, you can begin systematically to de-emphasize the specific source of loss. At the same time, a properly constructed system will permit the development and application of revised marketing and distribution strategies more specifically tailored to the inherently more profitable segments of the market.

In effect, this is saying: reverse the flow of cost information. Instead of gathering costs, develop a systematic method of flowing costs *forward* to the revenue source so that a clearer picture can be achieved as to the real sources of profit. A customer profitability analysis program rests squarely on the availability of key cost information developed in readily usable form. This generally requires a basic cost building block approach in which the first step is the:

1. Segregation of each cost pool.
2. Identification of the factors that cause those costs.
3. Development of cost per unit factors.
4. Determination of the appropriate ranges of applicability.

It is this step which most often takes the most time, the most ingenuity, and the greatest reshaping



As the number of customers goes up, the profits can easily decline.

of the company's traditional accounting records, because customer-related costs do not fit into established organizational responsibility patterns. For many years, the sheer size of this task may have scared off many companies who continue to wonder why they are regularly in the bottom half of their industry in terms of profit per dollar of sales.

The rewards, however, can be worthwhile. Recently, a major distributor of paper and related products completed a detailed analysis of costs and profitability in a sales region. The area selected was one that had experienced increased sales volume but decreased profits. The results were eye-opening. Salesmen were making hundreds of face-to-face calls on customers where the gross margins did not pay for the cost of the call, the processing of the order, and the delivery of the product. The company had overachieved a goal of having the best sales coverage in the industry. Armed with new customer profitability information, this company was able to improve profit by 25 per cent by systematically adjusting sales coverage and revising its operating methods. Steps are now under way to apply customer profitability analysis to the entire company with a practical expectation of several million dollars of additional profit. While it is true that a great deal of detailed information must be handled, the availability of computer-based order entry and invoicing systems makes feasible the development and utilization of this important approach to profit management.

An approach that worked

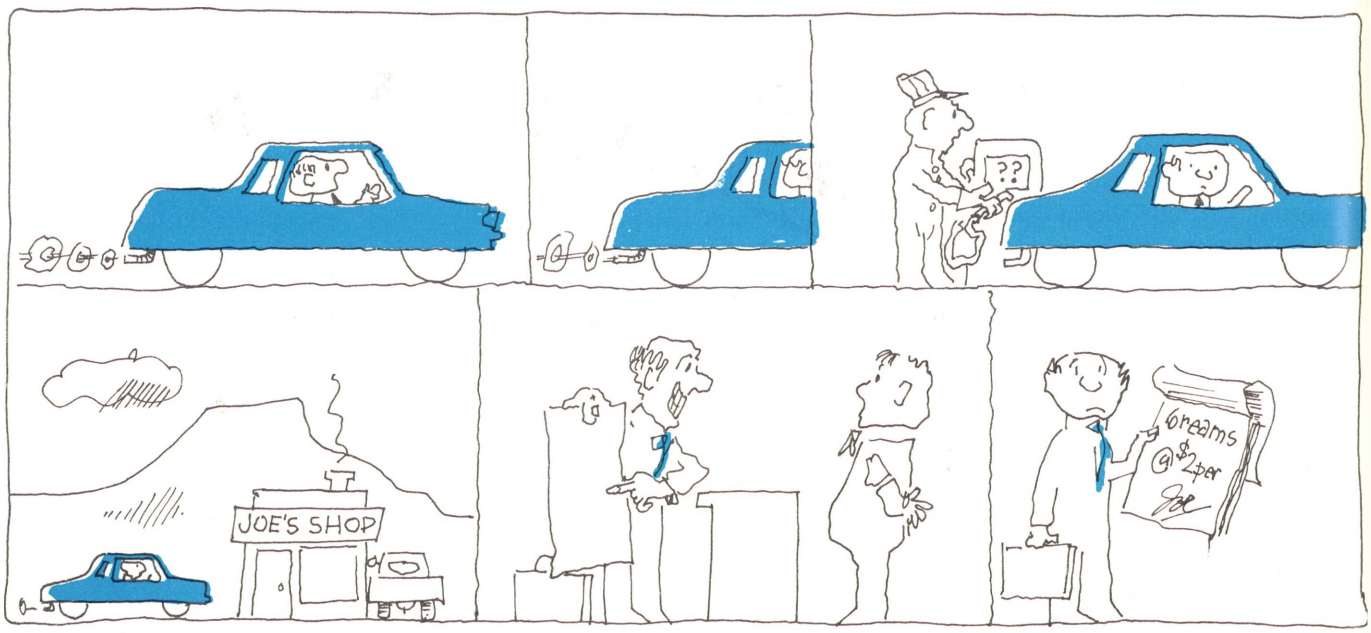
Here is a practical approach for the use of customer profitability analysis as a tool to "reshape" the business mix into the inherently most profitable configuration. You might call it a "vertical boring."

The purpose is to take an appropriate slice through the entire business operation in order to establish the methods by which all product, selling, distribution, and other customer-related costs can be flowed back to the revenue source. In order to determine the effect on net system profitability, a number of factors will have to be considered. These will probably include (but not be limited to) the following:

- Order size profiles
- Customer size and individualities
- Special customer needs
- Special packaging or handling
- Product line differences
- Inventory turnovers
- Levels of customer services.

It should not be inferred that each and every customer must be individually analyzed. Generally, the needs for detail will be spelled out by your own characteristics. For example, if your product is in the grocery field, proper classification might require individual accounting for large chains, while all small independents might properly be lumped as a suitable segment. Different requirements for services might be a more meaningful grouping. Geographic differences may, in some cases, be of greater influence than the type of customer. Since you want to tailor *your* market strategies, you will have to tailor the inputs based on your own business. And a little A-B-C philosophy is always applicable here (i.e., spend more time looking at the significant dollars).

In the case of a $50 million company in the food business, an anal-



Salesmen were making hundreds of face-to-face calls where the potential margin couldn't possibly cover all the costs involved.

If your product is in the grocery field, proper classification might require individual accounting for large chains, while all independent stores might be lumped as a separate segment.

ysis showed that one major product which appeared to be only marginally profitable in total was actually capable of meeting profit objectives in certain markets under controlled conditions. Here was a classic case: a basically profitable "core" of business had been eroded by vigorous selling programs undertaken to achieve "growth." When the details were known, it was easy to tailor a marketing strategy that fit the cost and profit characteristics of this product and return it to acceptable status. By shrinking the volume back to its profitable base, net profit was actually increased by nearly $500,000.

When you are ready to begin your analysis, here are the key steps to take:

1. Select a test market that you feel is representative of a significant portion of your business.

2. Select an appropriate sample period.

3. Decide how you want to classify customers (i.e., how many individual customers should be analyzed and how others should be lumped together). If you have computer-based invoicing, it is usually not too difficult to analyze *each* customer in the test markets.

4. Measure the actual gross revenues derived from each transaction and develop appropriate profiles of the sample data.

5. Identify all costs (product standard costs, order processing, scheduling, warehousing, transportation, selling, technical service, and any other as appropriate) connected with the sample period sales volume.

6. Conduct a sensitivity analysis to determine the most critical cost elements, and, consequently, those which must be developed with the greatest accuracy.

7. Develop cost building blocks for each unit of customer-related activity. Synthesize costs (using industrial engineering data and techniques) where necessary to complete the development of total system costs from producing units to customers.

8. Evaluate the impact on the profitability of individual customers or logical business segments in each test market of changes in:

(a) Distribution methods
(b) Order size mix
(c) Service levels
(d) Selling methods
(e) Combinations.

9. Identify the general strategies (i.e., selective service levels, incentive pricing, distribution channels, etc.) that would motivate customers to accept changes in ordering policies or procedures or in distribution methods.

10. Prepare a detailed plan of approach to market testing and evaluation of the different strategies.

11. Implement the most promising changes and evaluate the results.

12. Develop a plan for expansion of the most successful strategies to other markets.

Will your company benefit?

Do you need customer profitability analysis? Ask yourself these questions:

- Is each organization profit center at or above the profit average for comparable business operations?
- Have past drives to improve (or maintain) share of market been successful although return on the increased volume was not quite what was expected?
- Is the business presently serving a substantial variety of customers and markets, using multiple distribution channels and employing "blanket" marketing strategies for all segments of the business?
- Have large customers been harder and harder to come by while "small" orders are making up a greater percentage of the business?

Chances are, if you have any of these problems, you are already struggling with the question of what to do about it. The solution is simple and direct—although not effortless. The time has come to analyze the ultimate profit center—the customer.

Shortages of any vital raw material—oil, bauxite, coal—can have catastrophic effects on manufacturer, supplier, and customer. Here two specialists present a method of evaluating such impact they advised their clients to adapt during the recent energy crisis—

ANTICIPATING THE EFFECT OF SHORTAGES

by R. Bruce MacGregor
and William J. Leininger
Ernst & Ernst

AMERICANS today are bathing in a wave of euphoria. The Arabs have lifted the oil embargo, God's in his heaven, and all's right with the world. Gasoline's available again, cars are on the road, the winter's past, and no one froze.

It's a happy state, but it may well be a short-lived one. The Arab nations, discovering just how potent their oil weapon could be, have lifted the oil embargo for two months. Then it is subject to review. And possibly restoration. The price of Middle Eastern oil has already skyrocketed. The age of low-cost energy has gone. Energy may be abundant but it won't be cheap in the foreseeable future. It may very well be neither cheap nor abundant.

The oil embargo imposed by the Arabs caused great short-term difficulties, of course. Most of these have now been eased. But the overall dimensions of the energy crisis have not. We are still short of energy, not as short as we were in the middle of winter, but still short of our requirements. So a sudden abundance of energy would be a danger sign for the economy, a sure signal that we were heading into a severe recession. To that degree a slight shortage of necessary energy is a hopeful sign for the economy as a whole. But it's also a danger sign to the individual business.

This has meaning to every businessman, of course, but its significance extends well beyond the energy requirements of his own business. We have already seen this in the very short-term truckers' strike that occurred at the beginning of February, when the combination of high diesel fuel costs and an arbitrary speed limit goaded many truckers to stop work. Meat packing plants do not depend heavily on energy, yet the effects of the truck strike forced them to close throughout the Midwest.

A business's suppliers' and customers' problems can have a very direct effect on its business.

What every business needs is an approach, a method of isolating the

good and bad news the high cost of energy (and the possible reimposition of the Arabs' oil embargo) is apt to bring it, and a plan to cope with the possible consequences. This must be based on an understanding of possible changes in its supply and demand relationships caused by the oil shortage, whether that shortage is absolute, as it was during the worst days of the crisis, or relative, as it is now in terms of foreign oil cost.

For example, toy manufacturers do not use a disproportionate amount of energy in their own manufacturing processes. But they depend heavily on plastics for use in their products. Their suppliers are going to be heavily handicapped since plastics are made from petrochemicals. The same thing is true of every other manufacturer who uses plastics. And of every clothing manufacturer who employs synthetic fabrics in his products.

These are contingencies that can be met. There are wood and metal to replace plastics. There are wool and cotton and rayon to replace synthetic fabrics based on petroleum derivatives. But they can be met only if the ultimate producer can anticipate exactly how the petroleum shortage is apt to affect him and his product, and if he has time to investigate alternative sources of supply.

Customers are apt to be as seriously affected as suppliers. If the manufacturer builds small cars, he can reasonably expect orders to go up, even though gasoline supplies have become much more abundant since the most acute days of the energy crisis. The higher prices at the fuel pumps will ensure small car demand. If he is engaged in public transportation, he can reasonably expect to see his business increase for the same reason and because of the tentative nature of the latest Arabian move. His suppliers, bus manufacturers, builders of railway cars and equipment, can anticipate their volume will go up as well.

What are some of the organizations that can anticipate increased demand for their services, and thus can reasonably be expected to need a greater flow of supplies?

Ski and vacation resorts close to a major city (within easy driving distance and comparative safety from gas shortages) should prosper. The memory of endless gas queues is still fresh, and there is always that continuing rise in fuel prices.

Products where demand drops

Products where demand could be expected to drop would be: luxury items, such as pleasure boats, vacation homes in the country, snowmobiles, very large cars. All of these could be supported in our present fuel situation, but they are each expensive in themselves. How many people would want to invest in them while the Arabs are "playing yo-yo" with their embargo weapon is problematical. The next review of the Arabian stance on oil exports is due in June.

There is another problem: that of the manufacturer buying products that are in themselves marginal to the suppliers. Such suppliers may be more than willing to sacrifice such products if fuel becomes either too scarce or too expensive.

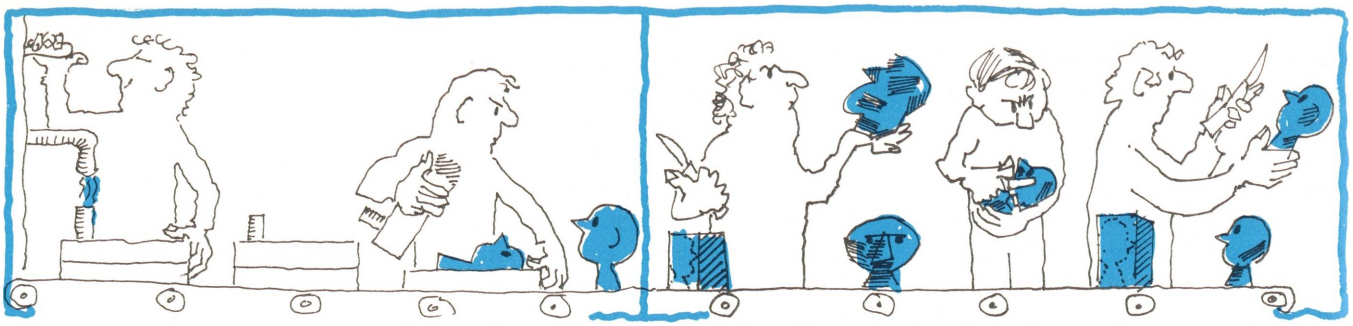
So there are three main aspects of the fuel shortage that must be taken into account when a business tries to plan for its future in these uncertain times: the effect it will see directly in its own operations, the effect on its suppliers, and the effect on its customers.

Plan suggested

We suggest to our clients that they set up an energy-cost impact review in the form of a matrix to provide the necessary evaluation structure. This would be somewhat as shown in Exhibit 1, page 23. Use of the matrix defines the nine studies that can be integrated into a company-wide energy review.

What are the elements of these studies that are common to businesses and to all clients?

There is another problem: that of the manufacturer buying products that are themselves marginal to the suppliers. Such suppliers may be more than willing to sacrifice such products if fuel becomes either too scarce or too expensive.



Toy manufacturers do not depend heavily on energy. But they do use a great quantity of plastics in their products. They can at least use wood and metal to replace the plastics made from oil.

There are four basic tasks involved:

- Identifying the historical facts (or the current ones) that are needed,
- Determining where the information may be obtained,
- Designing a structure for classifying information,
- Collecting the facts.

The data audit is specifically designed to answer questions about an unknown and unknowable future. It is designed to display the facts on activities and items that, properly analyzed, may reveal the characteristics of the impacts. It is an aid to finding the best possible solution to all problems that might arise, rather than an attempt to predict what those problems might be. It is, in effect, a plan for all contingencies that might occur in the future.

Supplier audit—The aim of the first task is to identify the basic data needed to support a supply requirements analysis which will highlight those supplies that are vital to maintaining the business, and those that are subject to restriction or curtailment. For a manufacturing company, for example, the data needed might include volume and type of steel, fasteners, motors, paint and finishes, plastics, computer services, delivery services, etc. Inspection of invoices paid will provide a ready source of all outside suppliers and supplies, while inspection of the bill of materials, plant production schedule, and company information system will provide an insight into the critical nature of the supplies. Vulnerability of supplies when not known, may be assessed by using outside information sources.

Vulnerability to shortages

The emphasis in the second task is on finding information about the vulnerability of suppliers to shortage curtailment of production. Examples of sources of information are:

- Economic and production data from trade journals, Government publications, newspapers, etc.
- Personal communication with suppliers of key items
- Use of economic input/output models (from which some sample data are presented later)
- Supplier trade association information
- Perusal of the Federal regulations governing the availability and cost of petroleum products to supplier industries.

Task Three, establishing a set of classes within which to collect data, is essential for sorting out what information about supplies is useful for assessing how vulnerable the company may be to loss or shortage of supply (due to supplier rationing, or supplier loss of petroleum products). While specific classes will vary considerably among companies, certain dimensions would seem to be universally important:

- Input material (raw, semi-finished, and finished in the case of, for example, wholesale/retail) classed by number of processing steps (e.g., mined and delivered; mined, purified, shaped, and delivered; etc.).
- Supplier characteristics such as distance from company, U. S. or foreign (and specific country for foreign), approximate number of other suppliers of the same product/service, degree to which prevailing regulations assure petroleum products to the suppliers.

Assembling the data

The last task, actually assembling the data, requires a decision on what specific information to collect, e.g., volumes, cost, uses, consumption/use patterns (seasonality), etc. It is important for the manager to continually characterize supplies in terms pertinent to energy impacts. This focus will facilitate elimination from consideration of those supplies which have an assured availability, are not critical, or are generally unaffected by energy shortages or sharply increased costs.

Operations audit—The purpose of this audit is to develop a meaningful representation of the sources and applications of energy in business operations. Identification of the information needed and its source (Tasks One and Two) are simple matters. Energy would include electricity, natural gas, propane, fuel oil, coal, and middle distillates. The details of the classification, Task Three, would be determined by the characteristics of the company. For some companies, for example, a breakdown of fuel oil by grades may be useful. The structure of sources and applications should be constructed so that a clear picture

of energy usage is developed in sufficient detail to allow analysis of the impacts of supply shortages of different severity. A general illustrative example, again using a manufacturing company, is shown in Exhibit 2, at the right.

Exhibit 2 suggests that the important dimensions are a broad classification of uses (e.g., non-process, process, and transportation), including locational units (e.g., offices, plants, and centers within these as appropriate), and elements descriptive of energy use (e.g., heat, light, machine tools, electric furnaces). The level of detail in the structure should be guided by:

- Quantity of energy consumption
- Importance to operations
- Likelihood of renewed energy shortage or escalating costs.

Having defined a structure, the last task has two steps. The first step is to describe energy consumption by source, such as quantity, time patterns (seasonality or other factors influencing use rates), special characteristics (e.g., contractual arrangements concerning peak loads and costs), and other important characteristics (e.g., storage capacity for fuel oil used as a back-up to the interruptible natural gas service).

EXHIBIT 1

Suppliers:	Data Audit	Impact Analysis	Plan Formulations
Company Operations:	Data Audit	Impact Analysis	Plan Formulations
Customers/Market:	Data Audit	Impact Analysis	Plan Formulations

EXHIBIT 2

Illustrative Operations Audit Energy Source and Application Matrix

	Cost of Fuel* Oil (#6)	Cost of Natural Gas	Cost of Elec-tricity	Cost of Gasoline*	Cost of Middle Distillates
Non-Process					
Administrative Office					
Heat					
Light					
Equipment (non-process)					
Plant A					
Heat					
Light					
Equipment (non-process)					
Process					
Plant A					
Shipping & Receiving					
Fork Lifts					
Other Equipment					
Machine Shop					
Machine Tools					
Heat Treating					
Electric Furnaces					
Gas Furnaces					
Plant B					
Shipping & Receiving					
Transportation					
Tractor-Trailer Fleet					
Small Vehicles Fleet					

* For these products, a separate array could be developed to show the alternative sources available to the company.

R. BRUCE MACGREGOR is a principal in the Washington, D.C., office of Ernst & Ernst. Prior to joining the CPA firm he was a vice president of Corporate Research, Inc., and a supervisor of advance product planning at the Ford Motor Company. Mr. MacGregor received his bachelor of science from the University of Michigan. He is a registered professional engineer.

WILLIAM J. LEININGER is the manager-in-charge of the management consulting services division of the Washington, D.C., office of Ernst & Ernst. Before joining the firm he was vice president of Operations Research, Inc. He also worked for Chrysler Corporation, developed economic projections for Humble Oil Company, and served as an expert consultant in natural gas area-rate proceedings before the F.P.C.

The next step is to allocate the energy consumption down through the applications structure. It may be advantageous to assign the energy to systems prior to a detailed allocation. For example, the company may have three separate heating systems using fuel oil. Allocating first to a heating system and then to facilities or zones within facilities may contribute to subsequent analysis.

An alternative second step may be useful to consider for some businesses—development of process flow of product components by production centers and allocation of each center's energy use to the components. Because this type of analysis could be very complex and time consuming, it would be appropriate to consider only if a business anticipates significant energy shortages or critically heightened costs (perhaps complicated by supply disruptions) to a degree that the company must select which products will be curtailed. Significant growth opportunities within constrained supplies may also justify this detailed data development.

Customer audit – As noted, the energy crisis will alter traditional supply/demand relationships. Thus, the first task here is to identify the possibilities for increased or decreased demand for a company's products or services. Among these are:

- A decrease in customer demand due to a shift in consumer

EXHIBIT 3

Classification of Customer Data

a. Manufacturing Company

Customers	Products			
	Drills	Saws	Planers	Sanders
Construction Company				
Hardware Stores				
Department Stores				
Direct Sales				

b. Distribution Company

Customers	Products		
	Warehousing	Over Road Transportation	Local Distribution
Manufacturing Company			
Wholesalers			
Retailers			

buying patterns (e.g., for tourism or travel-oriented products or services) or possibly an increase in demand (e.g., in-home recreation products).

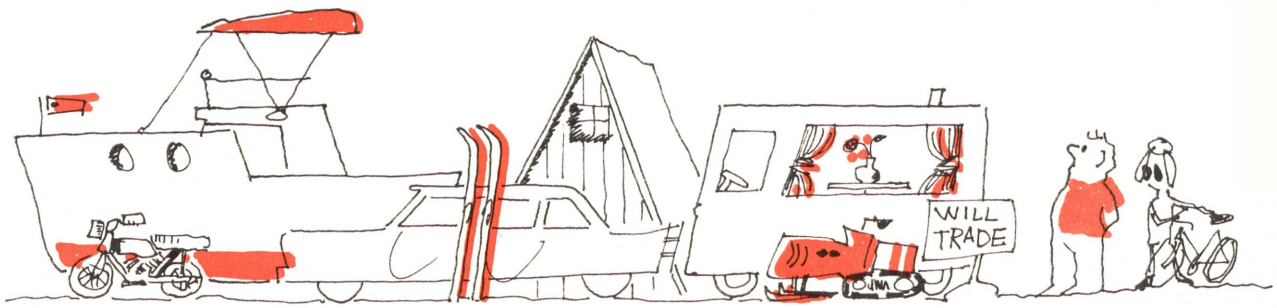
- A decrease in customer demand caused by supply shortages or cost increases the customer is experiencing from other sources.
- A decreased output of the company, making rationing among customers necessary.
- Substitution by customers of some other material or product not provided by the company due to, for example, energy-crisis-caused price changes, risk potential of future supply shortages or cost increases, need for customers to conserve processing energy, or other reasons. These same factors could increase demand if the company is the one to which customers are switching.

These examples suggest that a company is vulnerable to, or has opportunities arising from, a variety of possible changes in expected demand based on patterns. Thus, the task of designing a useful matrix for classifying customer data must carefully consider sectors of potential impact. This task is made more difficult by the fact that the demand changes may begin several processing steps beyond the company's product or services, such as by a customer's customers. The basics of the matrix would be a classification of customers in one dimension, and products or services sold to them in the other (see Exhibit 3, at the left). The characterization of customers might include name, their use of the company's product, and information about their customers, if appropriate. The customers might be classified together in logical groupings, e.g., export and domestic consumer product, capital equipment, intermediate producer, etc. The Standard Industrial Classification (SIC) codes might be useful for this purpose.

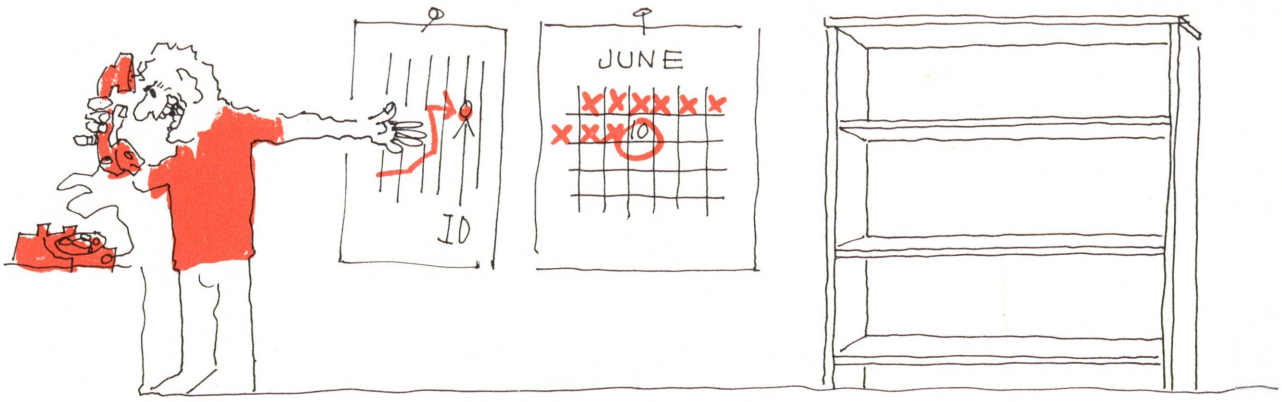
Collecting the information

The fourth task, collecting pertinent information for the customer data base, should then be completed, including quantity, price, seasonality, contractual commitments, and similar data that quantify and describe the business relationships. The assistance of outside sources such as wholesalers, manufacturers representatives and agents, and possibly an input/output analysis may be necessary to properly do this task.

Supplier analysis—The major steps of the supplier analysis are to identify energy- or energy-cost-related shortages; assess their severity; identify the possible range of price changes associated with short-



Products where demand could be expected to drop would be items such as pleasure boats, vacation homes in the country, very large cars. They could be supported in our current state of fuel availability but they're expensive in themselves and a renewed oil crisis would make them prohibitive.



The wise company will review its entire MIS in view of potential shortages. In a time of shortages, the time to re-stock inventory may be whenever the needed goods are available, not according to inventory level re-order points.

ages (e.g., while a product may be in short supply, a company can still get as much as is needed at, say, three times the former price); evaluate possible solutions; and quantify the implications of uncorrectable supply shortages that might occur. The analysis will employ the following approaches: judgmental estimates based on characteristics of supplies and suppliers, evaluations of alternative materials and source of supplies, a "simulation" of the production process, and a "model" of the interrelationships among the company and its suppliers. Clearly, the depth of analysis and degree of sophistication will vary depending on the company. In some instances, companies will already have a solid information base about supplies (e.g., an oil dealer whose main supplier is an oil wholesaler). In other instances, the knowledge will have to be refined (e.g., the manufacturer who requires aluminum motor housings, wire, insulation, etc.).

Next, the manager must examine the vulnerability of the company to severe levels of energy supply reduction caused by price increases or resumption of the embargo. The operations audit will have described historical and expected energy use disregarding the energy crisis. The conservation analysis will define attainable reductions without curtailing output and, hence, will indicate the extent of company flexibility. Foreseen use with conservation actions implemented establishes an upper limit of energy use for maintaining planned activities. The next task is to establish a lower boundary which is the irreducible minimum energy level needed to *stay* in business. For example, safety, health, and efficiency considerations may show that plants and offices need to be heated no lower than 60° during working hours and 46° during non-working hours; elements of a processing system often will require a significant minimum energy use. The basic minimum requirement will not likely be a single set of figures but rather alternatives based on alternative operations assumptions. For example, assumptions on working hours establish the time for which maintaining 60° is necessary.

Between the minimum-to-stay-in-business usage and usage with conservation actions implemented is a range of energy consumption which, if curtailed, would reduce production or services provided. One way to examine vulnerability in this area is to make reasonable assumptions about potential energy shortage or cost increases and then to identify the most favorable way to curtail activities; that is, to minimize the impact of the new energy levels required. The result of this analysis would establish alternative actions for energy shortages below the conservation level and above the fixed minimums.

Customer analysis—The customer analysis must use the audit data to address two basic situations:

- Allocating products/services among customers if the company is limited by supply shortages to output less than demand, if it is forced to ration its products in other words.
- Identifying how pre-existing customer demand may have changed and hence changed total demand for the company's products.

The company basically faces the same allocation options and decisions as a government in wartime: rely exclusively on price; provide reduced allocations with extra amounts available at penalty prices; or rely on strict rationing. The selection of the appropriate method will probably be influenced by such factors as the degree of competition for consumers; stability of business relationships; length and severity of shortage; type and volume of products; and manpower available to implement allocation. The pricing options do, of course, have important limitations, such as price controls, and antitrust regulations.

Identification of how pre-existing customer demand may change is the mirror image of identifying how supplier availability may change. The steps to be taken are exactly the same. Table 1 (on page 26) shows the resulting demand changes for several sample industries as estimated by an economic input/output model. Table 2 on page 26 shows the detail underlying the totals for the household furni-

ture industry. Note that the tables can also be read from the customer's viewpoint to reveal supplier changes. This information comes from the Interindustry Forecasting Model (INFORUM) at the University of Maryland, for which Ernst & Ernst is one of the sponsors.

Action and contingency plans

Very possibly in performing an impact analysis, a company will find other matters which must be reflected in its action/contingency plans. For example, the foreseen demand changes may be so significant that work-in-process, finished goods, and accounts receivable valuation would need review; and the value of certain capitalized R&D may decline. A company finding indicators of curtailment, even if in growth rather than absolute, may determine that cost reduction programs are needed to protect profit margins. A similar program might be triggered by supply price increases. Also impacted might be growth plans (e.g., those to increase capacity), cash flow, and new products or services in developmental stages. Certainly, the managers will be alert to the overall implications to their business while performing the basic impact analysis.

The last task, then, is the development of the specific steps to be taken now (the action plan) and the possible steps to be taken if specified events occur in the future (contingency plan). A normal procedure would be to establish an action plan for immediate implementation (e.g., to reduce cost, to preserve output levels, to achieve a more protected level of operations, etc.) and formulate a series of contingency plans with specific trigger mechanisms (e.g., two consecutive months where fuel deliveries are 10 per cent below requirements; input lead times for item A going over six weeks; allocations of supplies falling to 90 per cent of requirements, etc.).

A crucial element for the success of this whole exercise is to estab-

TABLE 1

Illustration of How Industry Demand Changed with Recent Energy Crisis

Industry	Growth Rate in Per Cent for the Period Shown		
	1973-74	1973-75	1975-78
Buses and Local Transit			
Pre-Crisis		1.84	1.38
Crisis	17.35	12.09	3.51
Coal Mining			
Pre-Crisis		.80	1.79
Crisis	13.94	9.62	3.19
Household Furniture			
Pre-Crisis		2.60	2.33
Crisis	—1.68	2.41	2.47
Wall and Building Paper			
Pre-Crisis		—1.76	1.93
Crisis	—7.40	—2.36	2.06
Paperboard Containers			
Pre-Crisis		3.40	3.08
Crisis	1.48	2.93	2.91
Retail Trade			
Pre-Crisis		3.73	3.31
Crisis	1.65	3.02	3.37
Banks			
Pre-Crisis		5.83	4.71
Crisis	4.97	5.69	4.80
Hotel and Lodging Places			
Pre-Crisis		5.12	4.15
Crisis	4.48	5.02	4.24

* "Energy Crisis" reflects the estimated reduction in oil available from the Middle East.

TABLE 2

Interindustry Flows for Household Furniture Pre-Crisis Forecast

Purchasers from Household Furniture Industry	Growth Rate in Per Cent for the Period Shown				
	1971-85	1973-75	1975-80	1980-85	1973-85
Household Furniture	3.0	2.6	2.4	1.5	2.1
Radio and TV Receiving	5.6	5.1	3.8	2.8	3.6
Trailer Coaches	2.5	2.2	2.6	3.3	2.8
Sum of Intermediate Flows	4.2	4.0	3.2	2.6	3.1
Wholesale & Retail Trade	3.6	3.5	3.0	1.9	2.6
Communication	4.8	—.8	3.4	2.2	2.2
Finance and Services	3.2	2.7	.8	—.1	.7
Electric Utilities	3.9	.2	3.3	2.2	2.3
Sum of Sales to Capital Equipment Buyers	3.8	2.0	2.3	1.3	1.8
Residential Construction	.9	—11.4	1.9	1.2	—.6
Additions and Alterations	1.3	1.4	1.2	1.0	1.2
Sum of Sales to Construction Activities	1.0	—8.4	1.7	1.1	—.2
Personal Consumption	3.2	3.9	2.8	2.2	2.7
Change in Inventories	—.1	—15.5	—5.2	—7.5	—7.9
Imports	7.3	—1.6	7.1	9.5	6.6
Sum of Sales to Final Demand	2.9	3.7	2.4	1.4	2.2
Total	3.0	2.6	2.4	1.5	2.1

lish a way to measure the effect of the contingency plan, and a way to follow events which are the basis of the contingency plans. While this appears to be a self-evident statement, too often plans have been implemented without appropriate monitoring and control so that, if not disastrous, the results were less than desired. The monitoring and control element is particularly important in the contingency plans area, where false signals might set a plan in motion when it was not needed, or a real signal might be missed and a needed response was not implemented.

Summary

This article has attempted to show some of the ways in which the energy-crisis/energy-cost shortage, with its resultant change in supply-demand relationships, could impact businesses of all types. The crucial task for a business is to effectively evaluate the effects on its operations and profits. Fortunately, there are techniques and tools available to systematically analyze the energy impacts. The matrix discussed herein provides an orderly approach for developing data audits, impact analyses, and alternative plans for dealing with suppliers, company operations, and customers/markets. These, in turn, produce a complete energy impact evaluation whereby a business can better cope with the likely changes.

Everything we are recommending about fuel shortages applies equally well to a number of other raw materials imported from abroad that may be in artificially induced short supply in the immediate future. The Arabs in their maneuvers with the oil weapon inspired many other producers of materials, that the industrialized nations don't have, to think long second thoughts about how they might use their resource as a bargaining medium. Bauxite producers have already tried it—although not too successfully. The next producers' cartel will learn from their mistake. We may well be in for a series of economic shortages throughout the foreseeable future.

And, depending on the raw material that's in short supply, the crisis to the manufacturing company may be even more unexpected than were the effects of the fuel crisis. Many multiplant companies have routine operations, such as setting inventory level stock points at a prefigured level, that are all controlled from plant headquarters. But in a time of shortage, the time to re-stock inventory may be whenever the needed goods are available. The wise company will review its entire MIS system in view of these changing factors.

All protective measures outlined in this article can be used to meet these situations exactly as they could for oil.

All of the suggestions made in this article may seem entirely too elaborate for a crisis that seems to be past. But its price consequences aren't. Nor its duration. The oil-producing states are due to re-evaluate on June 1 their action in lifting the embargo late in March. If they should reimpose the embargo, after a two-month period without it, the consequences could be even more severe than they were the first time. The company that has made future contingency plans based on this possibility cannot help being better equipped to deal with whatever happens than the firm that has happily assumed the worst was over in March.

Furthermore, the Government has belatedly been giving warnings that the lifting of the Arab embargo doesn't solve all the United States' energy problems by a long shot. It alleviates them, yes. But the country is falling behind consistently in matching energy supplies with energy consumption. Sooner or later we're going to be seriously short of energy again even if all the oil-producing states do their very best to increase pre-crisis allotments. And there again, the company that has a well thought-out plan as to what to do will have the advantage.

. . . too often plans have been implemented without appropriate monitoring and control so that, if not disastrous, the results were less than desired. The monitoring and control element is particularly important in the contingency area, where false signals may set a plan in motion when it's not needed . . .

Too many accounting systems are built on Theory X principles; they emphasize unfavorable variances rather than the favorable. The psychological result: budget exaggeration and employee dishonesty—

DO ACCOUNTING REPORTS REINFORCE FAILURE?

by Letricia Gayle Rayburn
Memphis State University

ACCOUNTANTS are beginning to question the traditional assumptions about employees' behavior in business organizations. These behavioral assumptions are reflected in the methods used for internal reporting; should they be changed? More and more accountants are beginning to give attention to the impact of the processes of measuring and reporting on people and organizations.

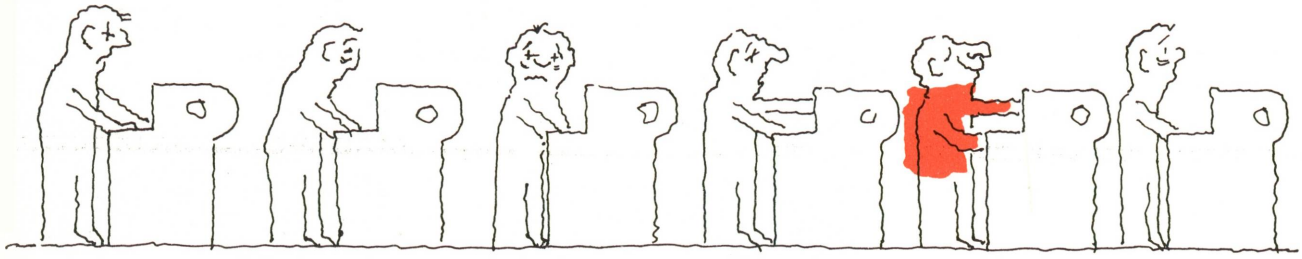
Traditional accounting model

The traditional accounting model reflects Theory X, which considers workers as being motivated solely by economic forces. Theory X also assumes that people are innately lazy and interested in doing as little work as possible. Since under this style of leadership workers are perceived to be ordinarily inefficient and wasteful, tight budgets and controls are considered necessary. There is a strong emphasis on the use of accounting as an instrument in the process of reducing and controlling costs. Under this model the source of management authority is the formal organization chart and the job title.

These underlying ideas about human nature were reflected in Frederick W. Taylor's scientific management movement, which considered the employee as an additional part of the machine. Taylor was interested in maximizing the productivity of the worker through increased efficiency and reduced costs. The scientific management movement flourished and rapidly became an important part of the business enterprise scene; many of Taylor's views are widely accepted today. Taylor and his successors studied factory costs in detail and stimulated the development of modern cost and management accounting. Administrative management theory with its emphasis on control and segmental responsibility and accountability also affected this development.[1]

This scientific method created many repetitive unmotivating jobs. As a result, in many large industrial plants today there is much inattention and conscious motivation to do a bad job. The workers are often bored and think of new destructive ways to break the monotony of the system. Persons with low intelligence and low creative ability usually find assembly line work acceptable; however, many people in these jobs are underemployed.

1—Caplan, Edwin H., "Behavioral Assumptions of Management Accounting," *The Accounting Review*, July, 1966, p. 501.



Of every six men in production, five report job tension.

Accountants have contributed to the assembly line problem by overemphasizing short-run unit costs. The cost of absenteeism and turnover is not determined but is allocated and hidden in general overhead. If the work environment causes the worker to turn to alcohol and drugs for his stimulation, the long-run cost to the organization and society is much higher.

If accountants agree that the major purpose of managerial accounting is to provide the various levels of administration with data that will facilitate decision making, they must also be certain that performance measurement is not distorted. Employees can develop many ingenious ways of falsifying accounting reports. It is often done in an organizational climate of fear and distrust in order to protect the employee. Employees can justify, to themselves at least, this falsification of accounting records if they believe the reporting system is unfair.

A variation of this is often seen in the recurring cycle of governmental and business budgets. The comparison of performance against the budget influences the next budget. In cases where the expenditure was less than the amount budgeted, there is a tendency to revise the subsequent budget downward. In other cases where the expenditure exceeds the budgeted amount, the manager is criticized and often penalized. It usually will take a manager only one cycle to recognize "the rules of this game." As a result, managers will engage in a spending spree the last few weeks of an appropriation year to avoid being cut down the next year. This cycle occurs because budgets overemphasize specialized departments and not the total organization.

Only one out of six men in the labor force of the United States reports being free of tension on the job. Some of this tension is mild enough to be taken in stride. But for other people the tensions are severe enough to impose great costs for both the person and the business organization in which he is employed. Role conflicts constitute a major source of such tensions.[2]

Incompatible expectations

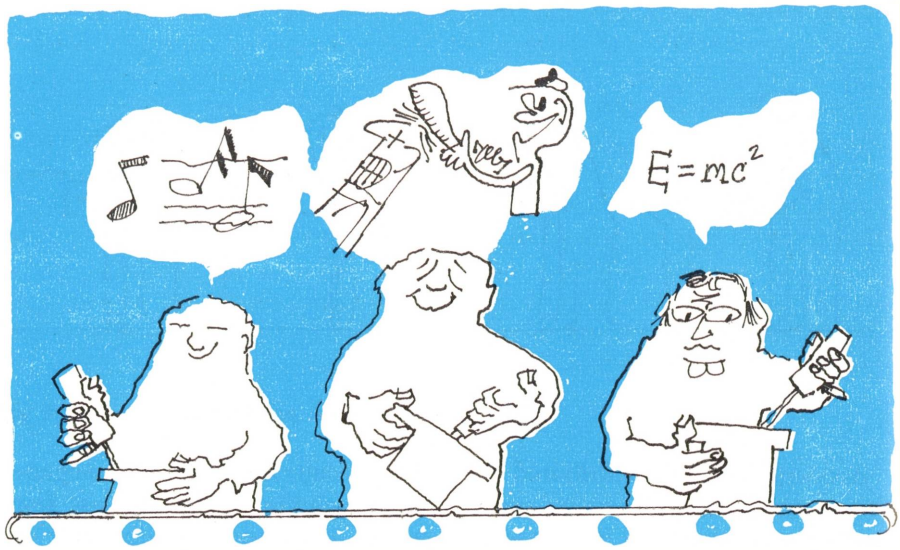
The accountant is very often caught between two different demands where two people or groups put conflicting pressures on him to make a decision in favor of the action that they each desire. This exposure to incompatible expectations is often experienced by the accountant in the budgeting process. Production personnel usually feel that the accountant should not make the budget contain such tight controls while top management usually feels that the budget contains too much buffer. Accountants recognize the conflicting position in which they are placed and often they become defensive about their work. They will use their technical accounting language to confuse the production personnel. The inability of the factory personnel to understand this language gives the accountant a false sense of security.

Problems in reporting

The reporting of unfavorable variances causes further breakdowns in the communication chain. The reasons for the unfavorable variances are often not published along with the results. For instance, suppose the foreman of Department A has used more material than the standard specifications allowed because the purchasing department has ordered a cheaper grade of material than the standard specified. The accountant will then show an unfavorable material quantity variance for Department A and the foreman is penalized.

The traditional practice in accounting is to practice management by exception; however, many times the exception is defined as showing only unfavorable variances rather than also showing exceptionally high favorable variances. The emphasis is on punishment rather than a combination of reward and punishment. The worker who is striving for high efficiency may become quite anxious because management by exception highlights only his mistakes. He may find himself preoccupied with the number of times he had unfavorable variances rather than his performance level over the long

2—Kahn, Robert L., Donald M. Wolfe, Robert P. Quinn, and J. Diedrick Snoek, *Organizational Stress: Studies in Role Conflict and Ambiguity*, New York, John Wiley & Sons, Inc., 1964, p. 55.



People of limited intelligence may find assembly line work satisfactory; however, many are really "underemployed."

The emphasis is on punishment rather than a combination of reward and punishment. The worker who is striving for high efficiency may become quite anxious because management by exception highlights only his mistakes. He may find himself preoccupied with the number of times he had unfavorable variances rather than his performance level over the long run . . .

run. Too little attention has been given to the effects of failure on people. An employee who is highly interested in his work may suffer unnecessarily when deficiencies in his cost center are highlighted, especially if these are deficiencies over which he had no control. In order to resolve this personal conflict, he may doubt the validity of the standard or budget management has set.[3]

Participative budgeting process

Since a crucial problem in budget administration is obtaining acceptance of the budgets from employees, more companies should experiment with a participative budgeting process. The budget's influence on motivation may be more effective if the budget is not imposed. Many organizations have found that the best way to gain acceptance is to have the supervisors all participate in the making of the budgets that affect them. There is evidence that participation in budget making in connection with the comparison and reviewing process may lead to increased goal acceptance by the participants. Participation in the budgetary control system strives to get the participants ego-involved, not just task-involved. In addition to the better operation of the company, a real value of participation at all management levels is the psychological values that accrue. A high degree of participation leads to better morale and greater initiative. Participation can reduce resistance as employees feel that the budget is their idea now and not just management's idea. Participation in the budgeting process often causes the employees to become personally committed to the control system.[4]

Often management wants its employees to believe that it solicits their suggestions when, in fact, it desires only false participation. Such attitudes soon filter down the line to the employees; this approach is no better than the imposed budget approach. Management may realize that this half-hearted acceptance is risky and in order to ensure its position it may request the signatures of the acceptors so that they cannot later deny they accepted it.

Letting employees participate in the budgeting process may not be

3—Bernberg, Jacob G., and Raghu Nath, "Implications of Behavioral Science for Managerial Accounting," *The Accounting Review*, July, 1967, p. 478.

4—Wallace, Michael E., "Behavioral Considerations in Budgeting," *Management Accounting*, August, 1966, p. 6.

the best solution for all organizations. Management must ask itself if the personality and history of the group is conducive to participation. Employees will likely influence the decisions so they become less threatening to them; extra slack may be built in the budget so it will be easier to meet. In order to contribute to the budget-making process employees must be informed of important influencing factors. Additionally, top management must decide if it is open to flexibility and is willing to accept the decisions jointly made by employees and managers.

LETRICIA GAYLE RAYBURN, CPA, is associate professor of accountancy at Memphis State University, Tenn. Previously she was an auditor-staff accountant with L. A. Champagne & Co., CPAs, and a systems analyst-programer with Mobil Oil & Refining Co. Dr. Rayburn received her B.S. from Murray State University, her M.S. from the University of Mississippi, and her Ph.D. from Louisiana State University. Dozens of her articles have appeared in accounting journals.

The true success of any budgetary system depends upon its acceptance by all company members who are affected by the budget. If the participation process is conducted properly, it should build acceptance of the budget by those persons responsible for meeting it. The accountant should not view his function as primarily one of criticizing the actions of others, instead he should demonstrate that he is willing to revise their budget whenever experience indicates that it is necessary.

Conclusion

Accounting reports should give greater emphasis to favorable performance. Not only should management be made aware of poor performance, but also it should have the information available for rewarding efficient production. More thought should be given to the effects of failure on the organization's participants so that accounting measurements do not pave the way for additional failure.

If management launches participative budgeting, it must be sincere. Employees must be informed of important influencing factors affecting the budget. Top management must decide it is really willing to accept the decisions jointly made by employees and managers.

Employees, living in a climate of fear and distrust, can find many ways of falsifying accounting reports.

Too many companies are satisfied with cost control, this author suggests, and neglect true cost reduction techniques. Yet this is the area where really significant savings can occur —

COST REDUCTION BEGINS... WHERE COST CONTROL ENDS

by Joel L. Roth

Industrial Distributors of America, Inc.

FOR MANY YEARS, industrial cost reduction efforts were limited to cyclical efforts by individual companies; generally in a crash, one-shot program that was later abandoned as the crisis passed or the need for publicity disappeared.

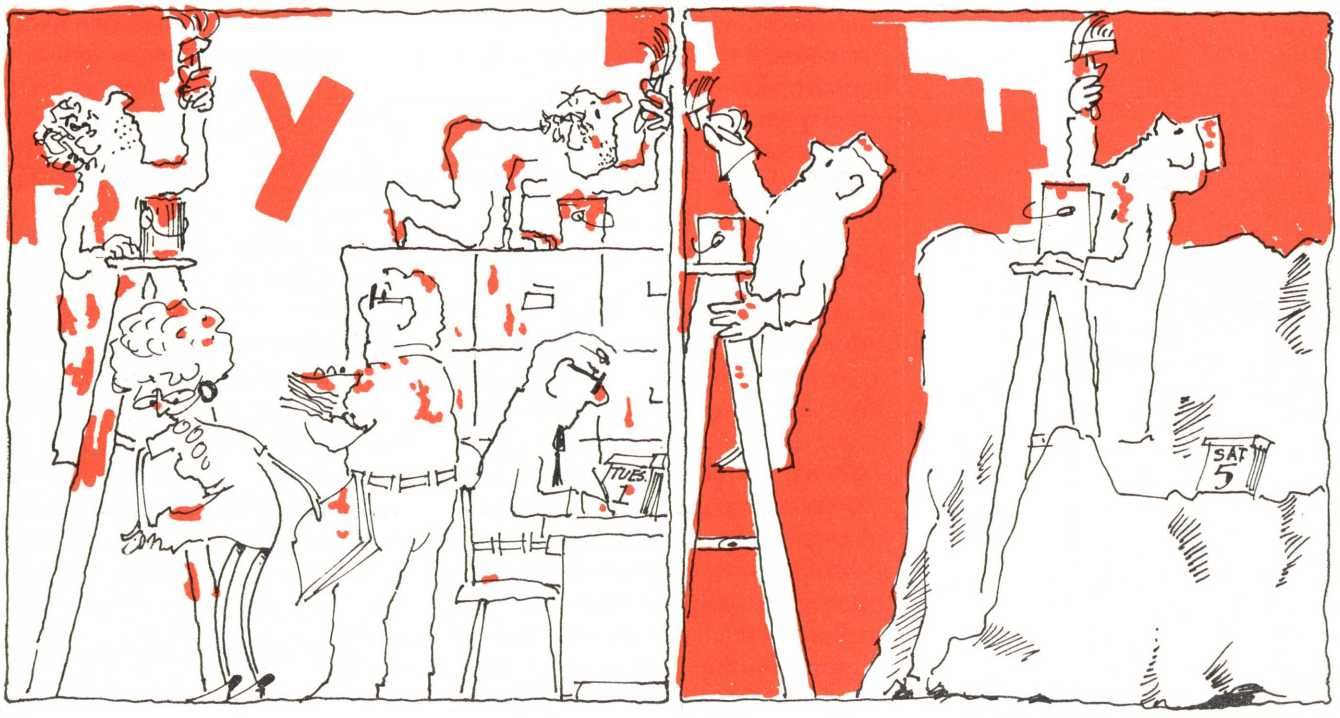
But in the last few years there has been a startling transition. Not only companies, but entire domestic industries have become noncompetitive from a cost point of view. Two obvious examples in recent years were consumer electronics and textiles. And, in fact, the problem of cost inefficiency or cost noncompetitiveness has gone beyond the cyclical or occasional stage. It's become a permanent and growing trend. In fact, we're approaching the point where entire nations have become noncompetitive cost-wise. Again, a rather obvious example of this is what has happened in Britain in perhaps the last 10 years or so.

And, in fact, this condition of cost noncompetitiveness has led to many recent economic problems and policies in the U.S., e.g. monetary revaluation, wage-price controls, volatile capital flows, and cost-push inflation. So we're talking about more than a one-industry type of problem or a one-company type of program.

Most sizable companies today probably devote considerable time and effort to cost accounting and cost control. But, unfortunately, in today's business climate, the ability to reduce costs and not just control them has become absolutely essential in order to prolong product life and to maintain existing markets as well as to achieve new ones. For example, without the element of cost reduction, there probably would be no color TV market as we know it today. And the initial success of the Ford automobile undoubtedly resulted from Henry Ford's ability to bring unit costs down to a level affordable by a large number of families. Similarly, convenience alone would not have caused housewives in recent years to switch from cloth napkins and cloth towels to disposable paper ones, unless the cost had been reduced to make paper an attractive alternative. (It is noteworthy that recently escalating costs of such products may eventually reverse the trend for the same reasons.)

In order to clearly distinguish between the two terms—cost control and cost reduction—I'd like to redefine them. In classic terms, "control," according to the standard textbook definition, is the measurement and correction of the performance of subordinates to assure the accomplishment of your organization's or department's directives and plans. This control implies the existence of goals and plans. In the case of "cost control," the plans are the operating budgets or cost standards. The measurement starts with the accumulation of cost data through timekeeping records, vouchers, and so on. The measurement also includes the comparison of operating costs against budget or, in other words, the generation of variance reports. That is the classic control definition that most of you are quite familiar with.

Ideally control is forward looking. And the best kind of managerial control anticipates deviations before they occur. If that is not possible, the next best method is to detect variations as they occur and



One obvious cost reduction: A maintenance department crew of nine painters was replaced by an outside contractor's team and two men. Overall costs were reduced sharply, and the new crew would work evenings and weekends, so disturbance was minimized.

take immediate corrective action.

Cost control is concerned with reducing costs to the level of established standards. Dynamic cost reduction is concerned with lowering established cost standards. It challenges all the standards and endeavors to reduce them continuously.

Secondly, the standards in the case of cost control are targets to shoot at. But in cost reduction the standards are suspect. Cost control emphasizes the past and present, but cost reduction emphasizes the present and the future. We usually limit cost control efforts to items which have standards or budgets. But in cost reduction we apply our efforts to every section of the business, whether or not standards exist.

In cost control we seek to attain the lowest possible cost under *existing conditions.* But in cost reduction we recognize no condition as permanent, since a change in conditions can result in a lower cost. (For instance, coal is once again becoming cost-competitive with oil and natural gas.)

In both cases, in cost control and in cost reduction, we have a state of mind. In this respect they're similar, although we're talking about a different attitude. And finally, cost control is never finished. It is a continuing function; however, cost reduction can be considered as complete for the time being in a particular area because it's essentially a project-type approach.

These, then, are some of the common distinctions between cost control and cost reductions.

Example of cost-reduction

A hypothetical company engineer uses only MTA (motion time analysis) to set a standard for an eyelet press operation of three hours per thousand pieces at a base wage at that time of $2.50 per hour. Under the cost control approach, as long as the direct labor costs for this particular operation, do not exceed $7.50 per thousand pieces, the operation is considered to be under satisfactory control. Once the engineer takes methods into consideration to have a cost reduction approach, on the other hand, he might suggest a change in the machine speed, manning, tooling, tolerances, or materials, to permit the standard to be reduced to 2½ hours per thousand pieces or $6.25 per thousand. We now have a lower standard and we are apt to stop there unless the time study expert is also trained in methods analysis. As long as only time study is used the cost accounting department, having adjusted the standard cost sheets, will remain quite satisfied as long as the direct labor costs of the operation do not exceed $6.25 per thousand pieces.

Within this traditional cost control framework we're content to aim at this existing standard based on the past and present production method, namely the eyelet press. But in applying the cost reduction approach, we find that by putting the part on an automatic screw machine, we can reduce our direct labor cost to $4.75 per thousand. Again, the cost accounting department changes its standard cost sheets. However, those cost reducers never quit, and they're

back for another look this year. Now they find that the ± .0005 in. tolerance on this part is over-designed. It's tighter than required for product reliability. So we change the specs to ± .005 in. and direct labor cost becomes $4.00 per thousand.

Never-ending search

Going further still, the cost reducers look for another lower cost solution. They find that the part can be made of plastic and injection molded in the company's plastics department. This will definitely lower material costs and may also lower labor costs. Let's suppose at this point that somebody fails to notify the cost accounting department—which happens. They are not aware of the change in method, and their standard cost remains at the old figure. Every week the plant variance report shows a favorable (or plus) variance against the recorded standard. And manufacturing supervision is happy. But the cost reduction team takes another look at the part, and finds it can be purchased from an outside supplier at a delivered price of $2.00 per thousand. Now, we could continue this example ad infinitum (and possibly design the part out of existence), but the point is already evident. From a cost control viewpoint, we would have been satisfied with a direct labor cost of $7.50 per thousand pieces. But the cost reduction approach did not accept that standard. And the cost was materially reduced.

It's ironic that management has devoted considerable attention and resources to the problem of cost control. Such common corporate activities as general accounting, budgeting, cost accounting, industrial engineering, and even data processing to some extent, have been devoted to cost control methods and techniques. But in many organizations, comparatively little effort has been expended on cost reduction, particularly on a continuing full-time basis. Yet as we have illustrated, even the best cost accounting and cost control system can do no more than maintain the status quo. In today's economy, the status quo is just not enough.

In other words, a company with good cost control is not necessarily cost efficient. Starting with that premise, how do you determine where to concentrate your cost reduction efforts? Let's assume you have a given level of financing requirement—$2 million. Let's suppose, however, that you can find a way to squeeze some excess cash out of your operations. Even though the interest rate at this given date is a constant amount in the marketplace, you can reduce your interest costs by reducing your financing requirement.

. . . a company with good cost control is not necessarily cost efficient. Starting with that premise, how do you determine where to concentrate your cost reduction efforts?

Identify essential areas

I have seen cost reduction successfully achieved in virtually every phase of business—from taxes to direct labor—from selling expenses to utility costs. However, the amount of cost reduction that can be achieved is related to the characteristics of the given cost, and to the amount of management effort devoted. Accordingly, a point of diminishing returns can be reached where the cost of additional effort outweighs the potential savings. It's obviously unwise to concentrate on a relatively minor cost element while excessive major costs go unchecked. Therefore, it becomes essential to identify those areas where cost reduction efforts should be concentrated.

Now I'm going to discuss briefly a dozen cost techniques that I

JOEL L. ROTH is president and chief executive officer of Industrial Distributors of America, Inc., Atlanta, Ga. Before joining the company, he was a vice president of Gulf & Western Industries and a manager with Ernst & Ernst. He received his bachelor of science in chemical engineering from Case Institute of Technology and his master of business administration from New York University. He is a member of several professional societies including the National Society of Professional Engineers and the Association for Corporate Growth.

found to be quite useful over the years. This is not to say that these are the only cost reduction techniques, or even necessarily the best ones.

Spotting cost reductions

Major versus minor costs—Any business organization, whether it be manufacturing, extractive, financial, or commercial has a distinctive cost structure or cost profile. Such a cost profile commonly expresses every cost element as a percentage of sales dollars or cost of sales. It's obvious that where we have labor and raw material costs aggregating two-thirds of the total factory cost, it's rather fruitless to concentrate efforts—let's say on insurance, which is 0.1 per cent of factory cost. The emphasis should logically be on manpower and raw materials. Many companies spend a lot of time and effort on minor items while excluding major cost areas.

Pareto's principle—The second thing I find useful to keep in mind is the vital few versus the trivial many, more formally known as Pareto's Principle of Maldistribution, but which we commonly call the 80:20 rule. The economist Pareto observed at one point that wealth is distributed through society in such a way that a small percentage of the population controls a very large proportion of wealth. This principle can also be applied to a business organization in many different ways. For example, a small percentage of products accounts for a large percentage of revenues. A small number of customers account for a large percentage of sales. The same concept can be extended into virtually every department or operation. For example, most substandard work can be attributed to a few operators, or a few machines. Most equipment maintenance can be attributed to a few machines. Most purchasing dollars can be attributed to a few materials, and so on.

Controllable versus non-controllable costs—At any given level of an organization the manager has control over certain costs, but no influence at all over other costs. Accordingly, he has to learn to distinguish the controllable costs and concentrate on reducing those, rather than wasting his efforts on cost factors that he cannot influence.

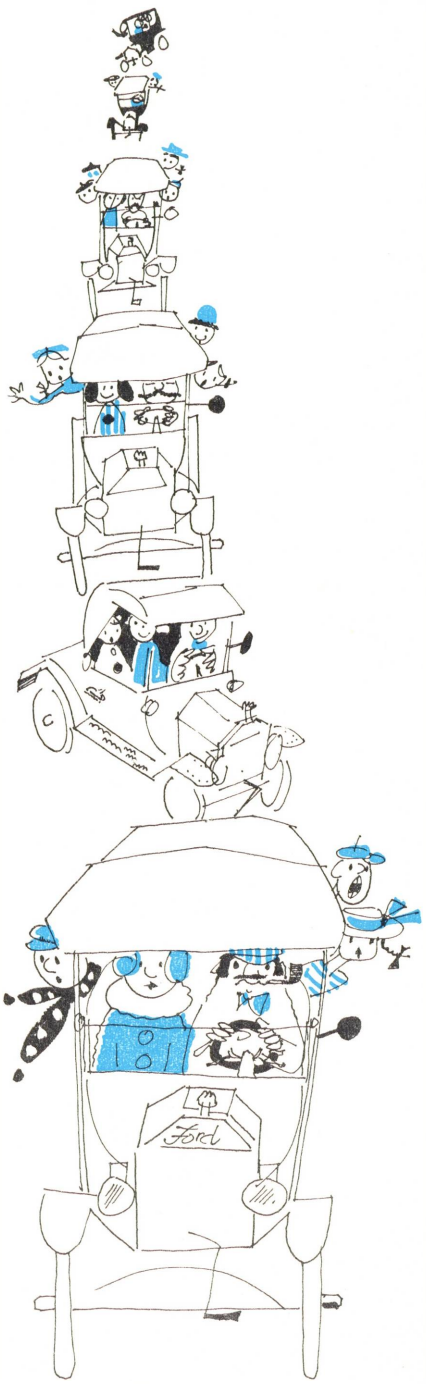
I'm not suggesting that some costs are non-controllable, and, therefore, must be tolerated at their existing level. *It is axiomatic that every single cost element is controllable at some level of the organization.* This is always true over a sufficient time span, but not always true for the near term.

If the cost is not controllable by a manager at one level, then it's controllable by someone up the line. For example, a foreman can control and reduce downtime in his department, but he has virtually no influence over personal property taxes. But the controller or the treasurer has substantial impact over personal property taxes, but probably very little impact, if any, on building occupancy expense. The president can make an impact on building occupancy expense by deciding to relocate the plant to a lower cost area, or through some other similar management decision.

Every cost is controllable at some level of the organization, and it becomes important to direct management's attention at that level to the costs that it can control.

Fixed versus variable costs—The fourth technique is recognition of cost behavior—fixed versus variable expenses. Managers generally think of variable expenses as controllable and fixed expenses as non-controllable, and, therefore, they think of variable expenses as susceptible to cost reduction and fixed expenses as relatively irreducible. Actually, expenses in the fixed categories which generally are regarded as not susceptible to cost reduction, can, in fact, be made to behave like variable expenses from the viewpoint of cost reduction.

Let's take three examples of expenses that you would normally



. . . the initial success of the Ford automobile undoubtedly resulted from Henry Ford's ability to bring unit costs down to a level affordable to a large number of families.

consider fixed, and see how they can be converted into controllable, reducible costs. Building depreciation is generally included in factory overhead, and regarded as fixed at a given location. However, this expense can be regarded as reducible with geography. The cost or occupancy cost for a given size building can vary by as much as 50 per cent between different locations.

Take a second illustration: maintenance labor. The maintenance department payroll for craftsmen such as millwrights, tinsmiths, riggers, plumbers, and electricians generally bears little relationship to production volume, yet these costs can be both controlled and reduced. For example, one of our plant managers complained bitterly about the high cost and low productivity of a nine-man painting group in his maintenance department. We found a reliable industrial contractor who was hired only when needed, reducing our painting crew to two men. Not only did we achieve substantial direct economies, but the painting contractor was willing to work on evenings and weekends, thereby removing any disruption from our production and office operations. Therefore, we took a fixed cost, the painting crew, and converted it to a variable expense.

A third example is general office clerical payroll. Office payroll varies even less in relation to production volume than does the maintenance payroll. Yet here again, a fixed cost can be changed to a reducible cost. For instance, in working with one of the insurance companies we instituted an "apron shift" that allowed local housewives to work at clerical jobs on an hourly basis. These women would arrive at 10 or 11 o'clock in the morning and go home at 3 or 4 o'clock in the afternoon, thereby allowing them to meet their children after school. Not only did the office payroll decline while volume was increasing, but this approach also alleviated problems of a tight labor supply for full-time workers. And, moreover, we found that these hourly workers, because they did work shorter hours, were substantially more productive during their shorter working day; again, a fixed expense was converted to a variable one.

Unit costs—The fifth technique involves unit costs, a phrase you've heard many times over the years. But it's one of the most useful indicators of cost reduction potential. Bear in mind, that the unit fixed cost of a product, that is the fixed portion of the unit cost, is variable inversely with volume. And the variable unit cost is fixed with volume.

The fixed costs, since they are fixed, will vary per unit, depending on the level of volume. The variable costs are constant per unit, by definition. What does that mean? Certainly it means that a very sound cost reduction result is obtained when we can achieve greater volume from an existing production unit, whether it be man, machine, or building, or convert unused productive resources to usable ones. Remember, as production goes up, the fixed unit cost will decline and the variable unit cost will remain the same. Consequently, the total unit cost will also decline.

Let me illustrate it with an example we encountered a few years ago in a gray iron foundry, which had a bottleneck in the molding operations due to a lack of both manpower and space. It's very difficult to get mold-making labor, or any labor, to work in a foundry today. Through an industrial engineering study of the flow and layout of the foundry, we were able to recover about 15 per cent of the foundry area by storing flasks, molding boards, and other materials outside the building, and by changing pattern storage practices. Through an analysis of product and customer mix, we found that small, intricate castings with a lot of core work took almost exactly twice as much labor as large, simple castings with very little core work. Therefore, by reducing the amount of core work—the number of small, intricate castings—we found that we could convert a great deal of core-making labor and space to mold making. In doing so we freed substantial manpower for mold making, and accomplished two things simultaneously. First, we increased productivity, and, thereby, lowered our fixed unit costs of building and equipment, because we had more revenue going through the building by a factor of almost 2:1. And, secondly, we shifted our product mix toward higher margin business.

Static standards—The sixth technique involves static standards in budgets. A study of existing budgeted standard costs would generally reveal that there are some figures that haven't changed for years, or have changed very little. This often suggests that a particular cost or operation has not been closely scrutinized for some time and, perhaps, should be reevaluated. In one plant not long ago, we found that a material standard on a rather volatile-priced material, had not been changed for five years. Obviously, someone wasn't looking at the standards for that operation.

Budget variance — The seventh point concerns excessive or continuing variances. Variances from standard, as shown in periodic variance reports or operating statements, can be significant indicators of cost reduction potential. For example, a continuing negative labor variance,

. . . we introduced an "apron shift" that worked from 10 or 11 o'clock until mid-afternoon.

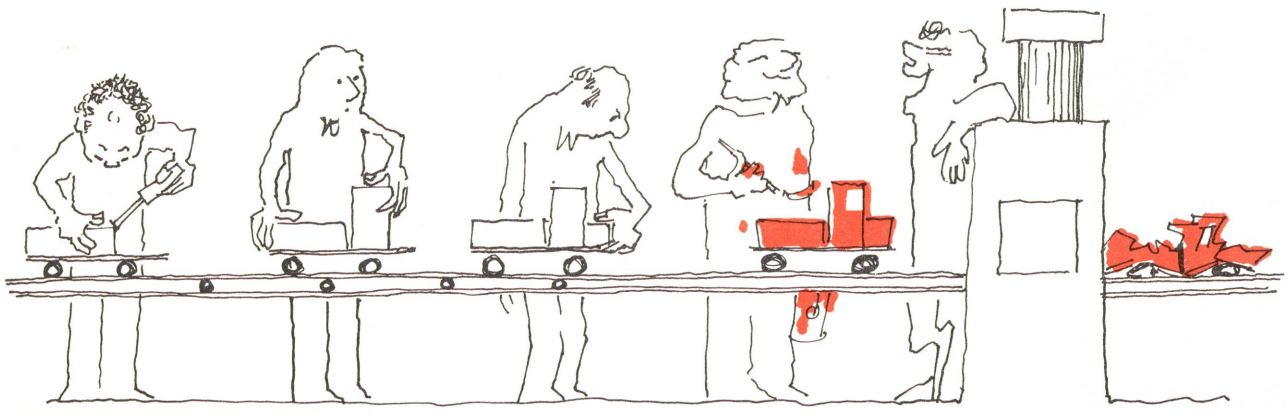
if analyzed properly, can be traced, perhaps, to excessive overtime. This, in turn, may lead to the installation of new equipment, addition of more manpower, or a change in production scheduling techniques. It should be noted that a positive variance, or a gain variance, is just as important to analyze as a negative variance. If an operating manager has found a methods improvement, for example, and lowered his cost, that change may be applicable elsewhere in the company.

Profitability analysis—Eighth is what I call a "profitability measure" of each business segment. It's continually amazing to me how few business managers demand or receive a regular income statement or return on investment evaluation of the various key components of their business. For example, how many sales vice presidents are there who get a gross income statement by branch, by distributors, by salesman, by product line, by territory, or by customer. My experience is that few get this, or request it. How many plant managers have a balance sheet, or a return-on-investment measure of the major product lines going through their plant where they produce a number of different product lines in the same plant? Again, an amazingly large number do not get or request this kind of information.

Illustrative of this is a forgings manufacturer who produced both standard or stock pipe fittings and non-stock or special pipe fittings. Both product lines were produced in the same plant on essentially the same equipment. We conducted a return-on-investment analysis of the two lines and found that the stock items accounted for over two-thirds of the net investment in that plant, including working capital, partly due to heavy, slow-moving inventories, but less than one-third of the pre-tax income. Conversely, the special items provided more than twice the profit on less than one-half the investment.

In another company that comes to mind, there were five unrelated product lines aggregating $10,000,000 in annual sales. Although the company did not maintain internal product income statements, an estimate of product line performance was made. We found that one of the five lines had lost an estimated $3,500,000 over the preceding eight years. It also represented a disproportionately high amount of total investment. It seems to me that if you want to reduce costs, it's pretty important to know that. And, again, it's amazing how many managers don't have access to such information about their operations.

Make-versus-buy—Although this technique has been very well publicized, many companies just do not avail themselves of it. Too often management attempts to produce everything possible "in-house" in the belief that such a practice will increase burden absorption, when, in fact, it may be more economical to reduce the burden than to absorb it. I've always felt that putting maximum volume through a plant, for example, to maximize burden absorption is a very defensive approach to business. It's really going about the problem backwards. Why not reduce the burden, instead of trying to absorb it. I can think of a manufacturer, for example, of electro-mechanical products who maintained a sizable production machine shop and other fabricating operations, even though his shop operated on an average of about 15 per cent of capacity. He also maintained a sizable parts inventory since the cost of a setup, in some cases, justified three years of production. We found that by having the engineers



Most substandard work can be attributed to a few operators or a few machines.

do minor redesign of many of their components to standard industry practices, many of these parts could be purchased directly from suppliers and distributors at lower cost. As a result, the machine shop and the fabricating departments were virtually dismantled, and the parts inventories were cut sharply. Not only were costs lowered, but management is now concentrating on what its business really is—electrical products design, assembly, and marketing—and not trying to run a metal fabricating operation.

Standardization—As in make-versus-buy decisions, the technique of standardization is well-known but not so often practiced. Any company that has numerous lengthy bills of material, for example, is probably a candidate for standardization analysis. One example, perhaps the most dramatic one I can think of on this score, is a machine tool manufacturer whose models were designed from the ground up. This created tremendous burdens in design engineering, in delivery times, in manufacturing setups, in inventory levels, in parts replacement, and so on down the line. But a switch to modular or building-block design concepts, using standardized components and sub-assemblies, obtained dramatic reductions in costs and improvements in service, which was equally important in this case.

In a different framework, a large commercial and consumer finance company negotiated separate automobile purchase loans every time a customer walked into an office. They developed unique contract terms and conditions on each occasion, eventually leading to 84,000 different automobile financing contracts. An analysis of these contracts suggested that every one of them could be handled within one of 12 standard contract conditions or terms. The result is a fantastic potential reduction in paperwork processing, in clerical labor, and in data processing costs.

Intra-company pricing—The eleventh technique relates to transfer, or intra-company, pricing, otherwise known as "spare the sacred cow." Numerous companies, in an attempt to use the profit center concept, mislead or distort their internal operating results. Transfer pricing is often based on arbitrary or artificial management policies, resulting in depressed results for efficient profit centers and inflated results for inefficient operations. I can think of a metals mining company, for instance, where all of the mines were treated as a profit center, and all the concentrates fom these mines were consumed within the company by its own mills and smelters. Mine revenues were computed on the basis of prevailing, comparable market prices. So long as the mines, in aggregate, showed a profit, management was well satisfied. But investigation showed that four of the mines in this company were extremely costly and inefficient, since the ores could be purchased on the open market far more cheaply than they could be produced in these particular mines.

The management of a fabricated metal products company adopted a practice of selling from its plants to its warehouses at standard cost plus 20 per cent. Thus the loss variances were transferred to the warehouse, and market discounts were taken at the warehouse, effectively insulating the high-cost plants from the blame for their own poor management.

Competitive analysis – The last point I'd like to make in this particular area of cost reduction techniques is about competitive analysis. A great deal of insight can be gained from public and quasi-public information about your industry or competitive companies within your industry. For example, many industry groups prepare operating ratio statistics and other data, as do the IRS, Robert Morris, and a number of other agencies.

To illustrate, a natural resources firm was spending about $3,500,000 a year on research and development with less than spectacular results. An analysis of their competitors' financial statements revealed that the company had a much higher ratio of R&D expense to profits than did other more successful companies in the industry. This led to a critical review of the R&D function. As a result, the budget was cut to $1,500,000 a year—less than 50 per cent. And the efforts of the R&D laboratory were redirected. Perceptible progress in penetrating new markets was evident within a year.

A cosmetics company was losing money steadily. Analysis of the registration statements, prospectuses, 10-Ks, and other data available on some of the more successful companies in the industry quickly revealed that the company's cost of sales were in line with more successful competitors, as were their direct sales and administrative expenses. However, other selling expenses such as promotion, demonstrators' salaries, and other selling costs were double what other companies were experiencing. This led to a pruning of the customer mix, a revision of promotional allowances, and an alteration of trade channels.

Possible techniques unlimited

I don't suggest that these 12 techniques for identifying cost reduction potentials are the only techniques we could discuss. You could perhaps list another 50 to 100 techniques. These are 12 of the common and successful techniques that I have seen applied. However, I believe that the number of techniques available for effective cost reduction is really limited only by your own imagination.

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 programing, 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 = 8½ 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. Expected average annual income is $1,000.
> ARR: $1,000 ÷ ½ (8,500 + 1,500) = $1,000 ÷ $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 × 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 x 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-

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

MOUSTAFA H. 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.

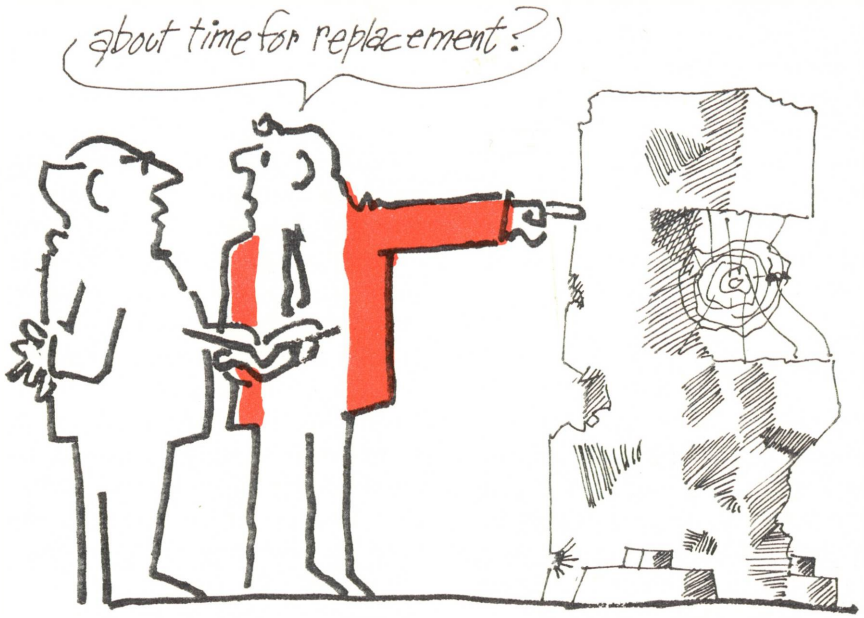
3. A majority of firms use a combination of methods rather than one single method. In fact, it is becoming increasingly apparent that a combination of methods is preferable. The most common combinations are (a) DCFR and payback, and (b) ARR and payback.

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



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 assuming 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.

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.

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, selection, 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. 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 expectation 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	
	$ 8,000	
Taxes—50%	4,000	4,000
	$ 4,000	$ 6,000

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% × $20,000 × $11,470 (present value of an annuity of $1 per year for 20 years at 6%).

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 benefits—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 à 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 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]

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

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.

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.

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.

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.

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

The recent SEC announcement that corporate estimates of future earnings could be publicly announced strongly implies that the next step could be that they are required to be. This will lead to a much more rigidly determined earnings forecast —

PROBABILISTIC PROFIT PLANNING: A FEASIBLE APPROACH

by Richard J. Tersine
and Cyrus A. Altimus, Jr.
Old Dominion University

Corporations have always been interested in profit planning. The usual approach has been through deterministic budgets by both formal and informal processes. Profit-planning information is vital for internal decision making. Decisions concerning the selection, procurement, and utilization of resources are highly dependent on the accuracy of profit projections. Profit planning in the form of released estimates of future performance to financial institutions has an important impact on the stock market vis-a-vis security prices.

A future requirement?

Historically, corporations have revealed future economic performance informally with less than full public disclosure. This situation has dismayed many regulatory agencies. The Securities and Exchange Commission now permits and may someday require corporations to publish forecasts of their earnings.[1] Proponents argue that simple fairness, not to mention legal requirements, dictates that forecasts be made public. Opponents argue that forecasts could result in a flood of lawsuits against management for any lossses.

As long as profit planning was only for internal management use, there was no necessity for formal control procedures. A requirement for public disclosure mandates the need for common formal procedures. .Although full disclosure of profit forecasts is not required at this time, it may not be very far off on the time horizon. This article will develop a probabilistic profit model that the authors believe could meet this impending future need.

The typical profit budget for a single-product company is shown in Exhibit 1, page 47. This direct-costing format permits the use of breakeven and cost-volume-profit analysis. Fixed costs have been segmented into managed and committed costs. Managed fixed costs are costs that can be modified in the short run, while committed fixed costs are both useful and appropriate in the preparation of probabilistic budgets.

The segmentation of fixed costs into managed and committed costs allows a more detailed examination of the figures used to develop the profit budget. However, the budget in Exhibit 1 and others like it allow for no indication of potential variability of the various estimates. The specific items in the budget are subjective estimates of the most likely values to occur. The neglect of variability is the most outstanding weakness in the typical deterministic profit budget. The uncertainties and dynamic fea-

1—Securities Act Release 5362 and Exchange Act Release 9984, February 2, 1973, "Statement by the Commission on Disclosure of Projections of Future Economic Performance."

tures surrounding an organization create a difficult atmosphere for the single most likely estimates used for profit planning. Precise definitions of such potentially volatile variables as revenue, selling price, sales mix, labor cost, and material cost are difficult—if even possible. When single estimates, rather than a range of possible outcomes, are used, the significance of dispersion is ignored.

Budgets can be considered plans for the future which incorporate forecasted performance levels. Since the future is uncertain, nobody can forecast the future perfectly. A useful approach is to treat uncertainty in terms of risk. Risk requires the gathering of additional information, insights, judgments, experience, hunches, and intuition to be able to make some kind of probability estimate about the relative likelihoods of performance levels. Futuristic probability estimates frequently require both objective and subjective probabilities. Probabilities are objective if nearly everybody would arrive at the same values. Probabilities are subjective if they are determined by judgment, intuition, and experience.

With subjective probabilities, not all decision makers from different backgrounds would establish the same probability distribution for events. While this fact can be discouraging, there are benefits from such a process of subjective assimilation. It permits an analysis of one-of-a-kind problems that managers previously had to handle without assistance. It encourages meaningful communication among members of the organization by providing a common language in which to discuss problems. Explicit consideration of performance risk sharpens thinking because it makes disagreements between managers explicit and puts the importance of various factors into perspective. The preparation of the model could be the greatest benefit from risk analysis.

While a stochastic approach to profit planning may be advantageous, the difficult task is to model realistic performance in a probabilistic framework. The accounting profession has not specified how stochastic profit budgets should be constructed. As early as 1966, the American Accounting Association encouraged the adoption of probabilistic financial statements, but did not offer any guidelines.[2] Numerous authors have addressed the problems of risk and uncertainty.

EXHIBIT I

Profit Budget for the Year Ending 197X

Sales	100,000 units @ $5		$500,000
Variable Costs			
Manufacturing	$2 per unit	$200,000	
Marketing	$1 per unit	100,000	300,000
Marginal Contribution			$200,000
Managed Fixed Costs			
Manufacturing		$ 10,000	
Marketing		5,000	
Administration		20,000	35,000
Short-Run Margin			$165,000
Committed Fixed Costs			
Manufacturing		$ 80,000	
Marketing		15,000	
Administration		20,000	115,000
Net Income Before Taxes			$ 50,000
Taxes—50%			25,000
Net Income After Taxes			$ 25,000

Variety of approaches

Jaedicke and Robichek[3] used the normal probability distribution to consider risk in cost-volume-profit analysis. Magee[4] developed decision trees to determine expected net present value of alternative investments. Hertz[5] applied computer simulation with specified distributions to obtain the expected return on investment. Hillier[6] incorporated risk into capital investment decisions by assuming a normal distribution. Byrne et al.[7] recommended decision trees and network concepts in financial statements. Tersine and Rudko[8] advocated bivariate risk treatment in capital investments with uncertain lifetimes. Coughlan[9], Hespos and Strassman[10], and Springer et al.[11], provided procedures for developing stochastic financial statements. Greer[12] developed procedures for

2—American Accounting Association, *A Statement of Basic Accounting Theory*, 1966, pp. 38, 59, and 65.

3—Jaedicke, R. K., and A. A. Robichek, "Cost-Volume-Profit Analysis Under Conditions of Uncertainty," *The Accounting Review*, October, 1964, pp. 914-26.

4—Magee, John F., "How to Use Decision Trees in Capital Investments," *Harvard Business Review*, September-October, 1964, pp. 79-96.

5—Hertz, David B., "Risk Analysis in Capital Investment," *Harvard Business Review*, January-February, 1964, pp. 95-106, and "Investment Policies that Pay Off," *Harvard Business Review*, January-February, 1968, pp. 96-108.

6—Hillier, Frederick S., "The Derivation of Probabilistic Information for the Evaluation of Risky Investments," *Management Science*, Volume 9, 1963, pp. 443-57.

7—Byrne, R., et al., "Some New Approaches to Risk," *The Accounting Review*, January, 1968, p. 33.

8—Tersine, Richard J., and William Rudko, "A Bivariate Stochastic Approach to Capital Investment Decisions," *The Engineering Economist*, May, 1972, pp. 157-76.

9—Coughlan, John W., "Profit and Probability," *Advanced Management Journal*, April, 1968.

10—Hespos, R. F., and P. A. Strassman, "Stochastic Decision Trees for Analysis of Investment Decisions," *Management Science*, August, 1965, pp. 244-59.

11—Springer, Clifford H., et al., *Probabilistic Models*, Irwin, 1968, chapts. 4 & 5.

12—Greer, Willis R., "Capital Budgeting Analysis with the Timing of Events Uncertain," *Accounting Review*, January, 1970, pp. 103-114.

EXHIBIT 2

	Pessimistic	Most Likely	Optimistic
Sales ($5 per unit)	$400,000	$500,000	$585,000
Variable Cost			
Manufacturing	150,000	200,000	240,000
Marketing ($1 per unit)	80,000	100,000	125,000
Marginal Contribution	$170,000	$200,000	$220,000
Managed Fixed Cost			
Manufacturing	$ 5,000	$ 10,000	$ 15,000
Marketing	4,000	5,000	8,000
Administration	15,000	20,000	22,000
Short-Run Margin	$146,000	$165,000	$175,000
Committed Fixed Costs			
Manufacturing	$ 80,000	$ 80,000	$ 80,000
Marketing	15,000	15,000	15,000
Administration	20,000	20,000	20,000
Net Income Before Taxes	$ 31,000	$ 50,000	$ 60,000
Taxes—50%	15,500	25,000	30,000
Net Income After Taxes	$ 15,500	$ 25,000	$ 30,000

handling investments with uncertain lifetimes. Furst and Markland[13] applied probabilistic techniques to franchising opportunities. Many authors have described detailed approaches to probabilistic financial analysis.

Methodology

The beta distribution is a general distribution which can acquire a wide variety of shapes between any two finite values an analyst cares to choose. The beta distribution can be made symmetrical, skewed, peaked, or flat which adds the variety that describes many environmental phenomena. This flexibility of form renders the beta a useful distribution when no theoretical justification for another distribution can be found. The beta distribution currently in use in PERT fits the requirements for probabilistic profit planning. Because of its current use in planning, management should be familiar with its uses and the requirements of the needed information.

The beta asks for three estimates, i.e., a pessimistic, most likely, and an optimistic, revealing the discrete nature of the inputs. The criteria for selecting the inputs are well outlined in most texts concerning PERT. They include the statement that the pessimistic and optimistic estimate have at most a one per cent chance of being outside their stipulations barring any extreme "act of God."[14]

Three-level budget

A three-level profit budget is shown in Exhibit 2, above. The three levels are the pessimistic, most likely, and optimistic estimate respectively. As can be seen, the three-level estimates (Exhibit 2) are more informative than the most likely values (Exhibit 1). Exhibit 2 estimates show that profit after taxes can be as low as $15,500 or as high as $30,000. The use of the most likely estimate of $25,000 can, therefore, be misleading.

A range of possible profit is more meaningful than a point estimate, but it is still not adequate. A decision maker needs to know the probabilities associated with different profit levels. The beta distribution is a very efficient distribution that permits a user to obtain a tremendous amount of information from only three inputs. Ferrara and Hayya[15] advocated the beta distribution for profit planning, but they did not develop the technique to its fullest potential. They simply reverted to the assumptions of normality.

Fortunately, it is not necessary to work directly with the formulation of the beta distribution. Standard charts have been developed which allow a quick and easy solution. The first step is to standardize the mode or the value of the variable at which the frequency is at a maximum. The most likely estimate for the beta distribution is defined as the mode. The mode is standardized by the following formula:

$$r = \frac{m-p}{o-p} = \text{standardized mode}$$

where m is the mode or most likely estimate, p is the pessimistic estimate, and o is the optimistic estimate.

13—Furst, Richard, and E. Markland, "Franchising Opportunities: A Probabilistic Approach," *Financial Executive*, February, 1970, pp. 20-25.

14—Hough, Louis, *Modern Research for Administrative Decisions*, Prentice Hall Inc., 1970, p. 361.

15—Ferrara, William L., and Jack C. Hayya, "Toward Probabilistic Profit Budgets," *Management Accounting*, October, 1970, pp. 23-28.

RICHARD J. TERSINE is associate professor of business management at Old Dominion University, Norfolk, Va. He has held positions in management and engineering with several aerospace firms, including the Boeing Company, Pan American World Airways, Inc., and the Martin Company. Dr. Tersine received his D.B.A. from Florida State University, Tallahassee. He is the author of many technical articles and has coauthored **Models and Problems in Operations Management**, Grid Inc., Columbus, Ohio, 1974, with Dr. Altimus.

CYRUS A. ALTIMUS, Jr., is associate professor of business management at Old Dominion University. He was an instructor of management at the Pennsylvania State University, where he received his Ph.D. in business administration. Among his consulting engagements, Dr. Altimus has served as an education adviser to the Xerox Corporation and has researched shoplifting in the Tidewater, Va., area for the Tidewater Retail Merchants Association.

The next step is to substitute any given profit level t for which you want to determine the probability of earning less than this amount into the formula:

$$X_t = \frac{t-p}{o-p} = \text{standardized profit level for t}$$

The standardizing formulas are necessary so that Chart 1, below, can be used in establishing profit level probabilities.

By using Chart 1, the probability of earning less than a given amount can be determined.[16] Chart 1 is used in the following manner. Calculate the standardized mode (r) for the investment and the desired value(s) of X_t. Enter Chart 1 at r on the vertical axis and consult the scale at the top of the Chart to locate the curve that represents X_t. From the intersection of r and X_t, drop to the bottom scale of the chart to obtain the percentage value. The percentage value indicates the probability that the investment will earn less than the given amount X_t.

Example 1: From the information in Exhibit 2, what is the probability of earning less than $25,000?

$$r = \frac{m-p}{o-p} = \frac{25,000-15,500}{30,000-15,500} = .65$$

$$x_t = \frac{t-p}{o-p} = \frac{20,000-15,500}{30,000-15,500} = .31$$

Note that r is greater than .5, so we enter Chart 1 with the complements of r and X_t (.35 and .69). The resultant probability read from the bottom of Chart 1 is approximately .95. Since we used the complements, the probability that profit will be less than $20,000 is .05. The probability that profit will exceed $20,000 is .95.

By defining the confidence level as the probability that profit will exceed a given size, we can obtain the probabilistic information shown in Exhibit 3, page 50, about the data in Exhibit 2.

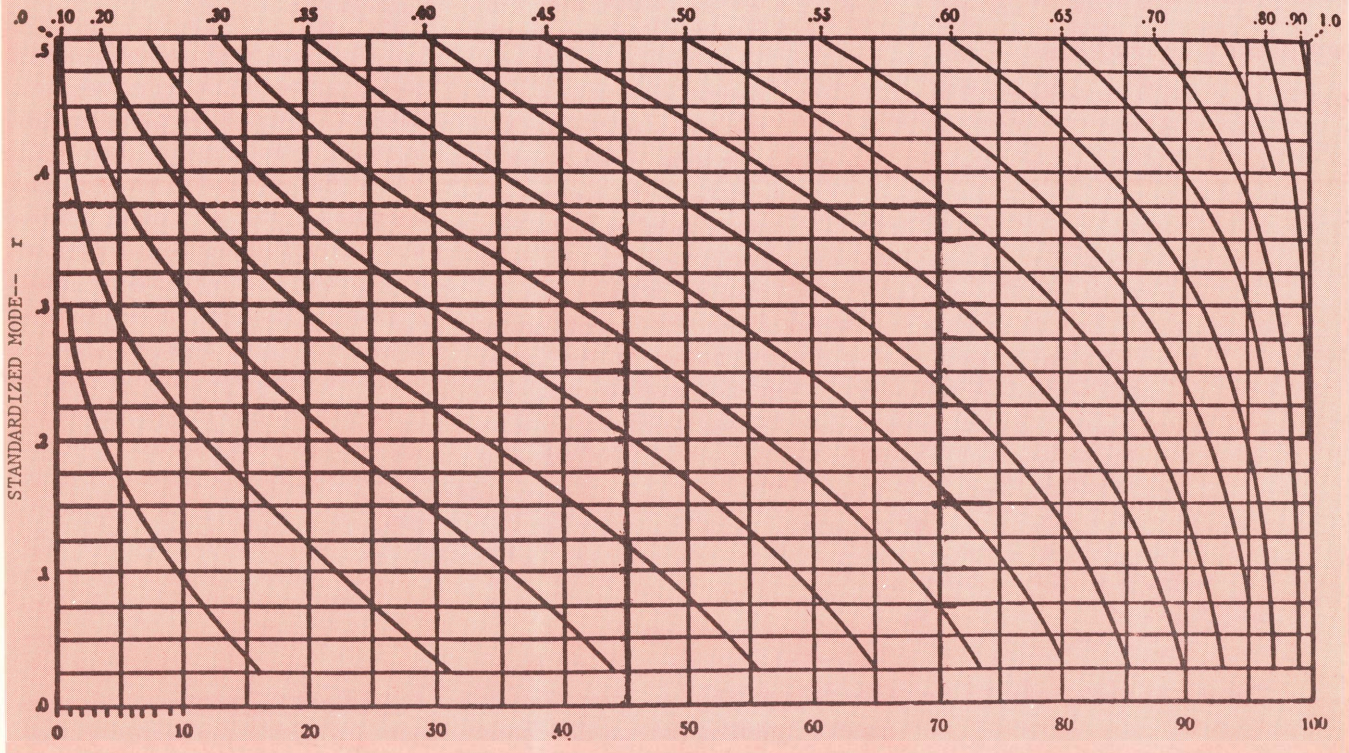
The profit level (t) for a given confidence level in Exhibit 3 is determined in the following manner. The first step is to determine X_t from Chart 1. The X_t value is obtained by finding the intersection of the standardized mode (r) and the given confidence level on the lower horizontal axis and proceeding up the curve lines to the approximate X_t value on the top horizontal scale. The profit level (t)

16—Chart 1 was taken from Willis R. Greer, Jr., "Capital Budgeting Analysis with the Timing of Events Uncertain," *Accounting Review*, January, 1970, p. 112. The chart is developed for values of the standardized mode r up to .5. For values of r in excess of .5 ($r > .5$), it is necessary to work with the complements of both r and X_t. The probability read from the chart represents the probability that the investment will earn more than t.

CHART 1

BETA CURVE AREA CHART

X_t



PERCENTAGE OF THE TOTAL AREA WHICH LIES BETWEEN THE EXTREME LOW END OF THE BETA DISTRIBUTION AND SELECTED VALUES OF *X*

Probability profit planning requires an estimate based largely on guesswork. But the beta distribution, familiar from PERT, does provide a flexible tool that can incorporate any degree of complexity or realism desired . . .

EXHIBIT 3

Confidence Level	x_T	Formula*		Profit(T)
95%	.31	.31(30,000 − 15,500) + 15,500	=	$20,000
75%	.49	.49(30,000 − 15,500) + 15,500	=	22,600
50%	.62	.62(30,000 − 15,500) + 15,500	=	24,490
25%	.73	.73(30,000 − 15,500) + 15,500	=	26,085
15%	.79	.79(30,000 − 15,500) + 15,500	=	26,955

*Profit = t = x_t(o − p) + p

is then obtained from the following formula:

$$t = X_t\ (o\text{-}p)\ + p$$

Steps in the procedure

The following is a recap of the steps in the procedure:

Step 1. Determine the optimistic (o), most likely (m), and pessimistic (p) budgets.

Step 2. Standardize the mode (r)

use formula $r = \dfrac{m - p}{o - p}$

(Note: if r greater than .50 use reciprocal)

Step 3. Determine x_t value(s) corresponding to the confidence levels required.

Enter Chart at r level on the vertical line. Follow this line over to the confidence level required and then follow the curve up to the top axis to read the x_t value. (Note: if reciprocals were used to find r, the reciprocal of x_t must also be used.)

Step 4. Find the profit corresponding to the confidence level by using formula: profit = t = x (o - p) + p

There are many situations where a business might require a minimum level of profit. This could occur when a firm has had a history of dividend payments that management feels constrained to maintain but existing or proposed financing requires that no dividends be disbursed unless a minimum profit level is attained. By using the outlined procedure a manager can find the probability of generating some desired level of profit.

Example 2: From the information in Exhibit 2, what is the probability of earning at least $23,000 profit?

$$\text{Profit} = t = x_t\ (o - p) + p$$
$$23{,}000 = x_t\ (30{,}000 - 15{,}500) + 15{,}500$$
$$x_t = .52$$

The probability can now be read from Chart 1 by entering at the .48 level on the top scale and following the curve down to the intersection with the standardized mode (.35). The probability is then read from the bottom of the chart. In this case, there is a .71 probability that the firm will earn at least $23,000.

Conclusion

Probability profit planning necessitates a stochastic interpretation. The beta distribution permits management to incorporate their abilities in the estimation process. The changing states of nature (economy, competition, legal environment) can be reflected in management estimates and revealed through the beta approximation. It could be integrated into corporate profit planning with little difficulty.

The basic characteristics of the beta model can be extended to include any degree of complexity and realism desired. The beta distribution does not provide a panacea for probabilistic profit forecasting, but it does provide a flexible tool. The data inputs are very simple and the tri-level budget inputs are within the realm of existing practice. It could provide the consistency and flexibility needed for external reporting on future economic performance.

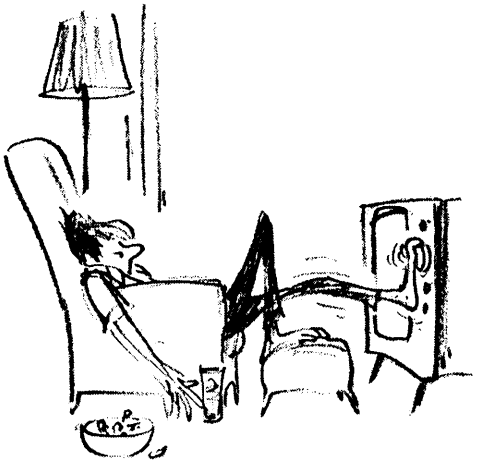
Are you setting a good example for your kids...

by avoiding cigarettes?

by keeping weight normal?

by serving tasty, low-fat foods?

by seeing your doctor regularly?



by <u>not</u> being a TV athlete . . .

but by exercising moderately instead?

Help your children form good living habits now
to reduce their risk of heart attack later.

Help your Heart... Help your Heart Fund

what people are writing about

BOOKS

Conglomerates Unlimited: The Failure of Regulation by JOHN F. WINSLOW, Indiana University Press, Bloomington, 1973, 296 pages, $10.

Conglomerates are endangering the future of our competitive market structure, this author says, and he asks why. He quotes extensively from public disclosures of national investigations to allow the corporate leaders' own words to hang them.

This book makes for very exciting reading, enjoyable if the reader can divorce himself from the public that is being abused. Mr. Winslow was formerly counsel to the Antitrust Subcommittee of the House Committee on the Judiciary. Despite all the extraordinary testimonies the subcommittee produced in its two-year investigation, 1969-1970, no legislation has resulted from its investigations.

Mr. Winslow looks at the methods and motives for building conglomerate corporations; the function of the central, acquiring management; and the role of Government agencies.

Four acquisitions are described to illustrate how conglomerates are formed.

"The first method is for the conglomerate to convince some bankers that its acquisition program for corporate concentration can benefit them. . . . The conglomerate should not feel that it must choose a bank that conspicuously needs more business. Rather it should choose from the biggest. It should choose a bank run by David Rockefeller," Mr. Winslow recounts.

He describes how Gulf & Western's mergers were made possible by Chase Manhattan in return for moving acquired companies' banking to Chase and informing the bank which companies G&W would attempt to take over.

At the Hearings on Conglomer-

ate Corporations, Gulf & Western's vice president, and former Chase Manhattan loan officer, Roy Abbott was asked by the House Antitrust Subcommittee counsel if it was his duty to keep Chase informed of proposed mergers and acquisitions prior to the announcement of such actions in the newspaper.

Mr. Abbott replied, "Occasionally, yes. It would have been much the same as if I had gone to a neighbor and said, 'Look, I am going to extend my house and [it's] going to cost about $5,000, can you lend me $6,000 to be on the safe side,' and 3 or 4 days later he would look out the window and see a new car . . . my neighbor would be very upset. Very much in the same light we keep our banks informed of what we are doing as it will relate to our financial condition; obviously, we have loans, we have lending arrangements, and they are conditioned on what we have said we are going to be doing.

"If our plans change, obviously these are important facts which the bank has to know."

Profitability of acquisitions

Gulf & Western's executives have said the purpose of the conglomerate is to improve the management of the acquired companies. The House Antitrust Subcommittee secured profitability figures through 1969 for 11 of the 13 major G&W acquisitions. Eight of the 11 earned less in proportion to their assets under G&W control than under independent management, Mr. Winslow reports.

Another method for conglomerate growth is for the acquiring company to pay the owners of the target company in cash and then to transfer the debt from the cash outlay to the same company upon taking control, the author explains. He uses the case of Ling-Temco-Vought, Inc., and Wilson & Co. to illustrate this method. Before the merger Wilson's net worth was $125 million. LTV transferred to it $50 million of the acquisition debt and diminished the company's net worth by 40 per cent.

"LTV management announced to all shareholders that it had 'strengthened' Wilson & Co. by 'financially innovative actions.' If to reduce shareholders' earnings by transferring to them equity and debt obligations amounting to more than a third of a company's net assets without adding one cent to those assets is to strengthen a company, then that statement is plausible," Mr. Winslow observes.

Conglomerates can grow in a third way. They can secure, perhaps with debt securities, a company with excess liquid reserves and use those reserves.

"Great American Insurance Co. had never paid a dividend of more than $2.50 per share. On January 14, 1969, during the first year of control by National General (owner of 98 per cent of Great American stock), the insurer paid a dividend to National General of $55 per share. In all, $173 million. The majority shareholder thus shaved the reserves down to the very limit required by law as minimum protection for policyholders," the author states.

The fourth method of conglomerate growth that Mr. Winslow describes is "to accept a call from the Pentagon some day, informing one that the army, by granting contract price increases, has in effect delivered an acquisition to the conglomerate." This is how Memcor, Inc., became part of LTV, he states.

Mr. Winslow questions the purpose of the conglomerate headquarters. From figures made available at the Hearings on Conglomerate Corporations, added management efficiency does not seem to be proved by the declining post-merger performance of the acquired companies.

"If there is a lesson to be derived from the examination of the three acquirers [Litton, LTV, and ITT] it is strengthened by the fact the one conglomerate which did not acquire for the purpose of securing anticompetitive advantage has fared least well. LTV has undergone reorganization and partial liquidation."

Mr. Winslow maintains that rather than transferring general management ability to its subsidiaries, Litton transfers a technique for securing Government awards. The conglomerate was able to obtain Navy contracts for the construction of nine amphibious helicopter-carrying assault ships and thirty DD-963 Spruance-class destroyers for a shipyard it didn't have in operation yet.

Agencies' control unexercised

Neither the ICC, SEC, IRS, nor the Justice Department are using their regulatory powers to their full extent to protect the public against industrial consolidation, the author states. He gives examples of the various agencies' lack of control.

One of the examples he cites is the IRS grant of tax exemption under Section 368 to ITT's acquisition of Hartford Fire Insurance Co. This exemption is granted to legitimate corporate "reorganizations," Mr. Winslow writes. A reorganization being an exchange of voting stock between the owners of two combining corporations, not the cash purchase of the target company's stock by the acquisitor.

"The transaction which the IRS identified as a sale was ITT's temporary transfer of the Hartford stock to an Italian bank, Mediobanca of Milan. In fact, however, the shares passed from ITT to Mediobanca—and after the ruling was secured, back again from Mediobanca to ITT—without even the alleged purchaser's payment of a purchase price," he states.

On March 6, 1974, the IRS revoked its 1969 tax ruling on the ITT-Hartford merger. So it seems the IRS has come to view the situation in the same way Mr. Winslow does.

A powerful picture of the few controlling the many has been drawn by Mr. Winslow. Perhaps his picture is not always an objective one. Not everyone will agree with it. He draws on some of the color-

ful commentary of the business press and quotes it as if it were more than opinion. But the hearings testimonies he presents were originally uttered as fact and it is hard to believe responsible executives actually admitted what they did.

This book is a real cops and robbers thriller with a twist: The robbers usually win.

You Can Profit from a Monetary Crisis by HARRY BROWNE, Macmillan Publishing Co., Inc., New York, 1974, 386 pages, $8.95.

This might be the premier how-to-do-it book of the year. How to do it in this case encompasses how to get out of rapidly depreciating American paper currency and move your assets out of this country into a solid Swiss bank.

Not only depreciating American paper currency, but valueless real estate, insurance policies, stock market investments, etc., are bad risks. Mr. Browne is convinced a severe recession in this country is inevitable, that everything the Government does to avoid it makes it all the more inevitable, and that Government intervention in any part of market operations is always lethal. Swiss banks, being almost entirely free of Government interference, not being required to report anything to the Government, and holding their currency in Swiss francs (which have substantially higher gold backing than dollars) thus get his highest approval.

To say Mr. Browne is an ultra-conservative in money matters is putting it mildly. But at least he is consistent in his theories. Government intervention means tariffs, import quotas, and depletion allowances, as far as he is concerned, as well as free medical care. All are bad.

Mr. Browne's main thesis is that gold and silver are the only true monies; paper currency is worthless except as a receipt for gold or silver. Since the gold backing for the dollar has almost completely vanished, the dollar is the most worthless kind of paper money and could plunge precipitously overnight in terms of other currencies. The solution: convert every available dollar into a hard currency (one freely convertible into gold) just as soon as you can before the Government forbids exporting dollars.

This thesis, which may be dubious economically but which certainly has some vestiges of truth, is reinforced by the matter-of-fact details Mr. Browne loads into his book: why a Swiss bank is best for your money, even if you want to have your account in some gold-backed currency other than Swiss, like Dutch guilders or Austrian schillings (both excellent investments according to Browne); how you can open a Swiss bank account without leaving this country; the names and addresses of Swiss banks; buying gold bullion through the bank; buying gold bullion on margin through the bank. The dangers of holding currencies with even higher gold backing than the Swiss franc or the Dutch guilder, like the Lebanese pound or the South African rand, are also discussed.

A chilling logic

Granted Mr. Browne's economic theories, which are explained at length in the first portion of the book, "You Can Profit from a Monetary Inflation," takes on a chilling logic. Listing 17 points on a nation's progress through inflation to total monetary disaster, the author lists as Point 5:

"Eventually, inflation will be noticeable on a monthly basis, instead of just annually. A consumer may notice that an item he buys regularly has gone up in price several times during a few months. If that happens with a number of things he buys, inflation has reached an advanced stage."

Do the symptoms sound familiar? They should. The author estimates the United States had reached this stage by fall of 1973. From that point on, according to him, unless the most Spartan Government action is taken, runaway inflation is usually inevitable.

The solution: Swiss banks

The solution: Swiss bank accounts. They're legal; they don't have to be reported to the U.S. Government unless any single deposit exceeds $5,000.

And here Mr. Browne gets into the most fascinating part of his book. A bank money order for $5,000 does not have to be reported, he points out ingenuously; so several $5,000 money orders on successive days can build up quite a respectable balance in Swiss francs, or Dutch guilders, or Austrian schillings. All you have to do is tell the Swiss bank what strong currency you want your weak dollars converted to.

The profit doesn't come mainly through interest paid to you; it comes from the steady appreciation of the foreign currency against the dollar. This morning, for example, Swiss francs were worth 33¢ in American currency. A year ago they were worth a fraction over 30¢ apiece. A ten per cent increase in one year's time in a bank acount is not bad, and, according to Mr. Browne, we have not yet reached the state of runaway inflation. When we do, the sky's the limit as far as he's concerned. A value of $1.00 or $2.00 by the end of the year for the Swiss franc doesn't seem at all improbable to him.

From this point on Mr. Browne's advice becomes more and more pragmatic. His counseling about making separate $5,000 deposits on successive days, rather than transferring $15,000 all at once is quite straightforward, his advice about reporting foreign interest or appreciation to the U.S. Government is ambiguous: "It's up to each investor." His advice about buying gold bullion, strictly forbidden to U.S. citizens, is direct: "Buy it through a Swiss bank if you don't

mind a little short-term risk." It can't do anything but increase in value over the long term; it's perfectly safe; and there's no way the United States government can learn about it unless your holdings are so enormous it would pay U.S. authorities to bribe a Swiss bank employee to reveal them. "Bribe" because it's against Swiss law for any bank employee to reveal anything about a customer's holdings or identity unless a (Swiss) criminal charge is involved.

Mr. Browne's theories go off into the really wild, blue yonder as his book continues. He gives advice on how to buy gold in Canada and transfer it to the chosen Swiss bank by courier if the Government *in extremis* absolutely bans Swiss bank accounts for American citizens, and the best way to stock a retreat if the American inflation reaches the dimensions of the post-World War I German experience (have lots of canned goods, liquor, and cigarettes). The canned goods are for nourishment; the liquor and cigarettes for bartering purposes.

The trend continues

Mr. Browne's picture of a doomsday world sounds impossible for a nation that only a few years ago had the "world's strongest currency." A lot of water has gone under the bridge since that time, however, and, according to Mr. Browne, nothing has occurred to change the downward trend of the dollar.

One amusing note in a grim and frightening book, someone (undoubtedly Macmillan's legal counsel) has stipulated that the book carry a warning, in an obscure spot on the page usually reserved for the copyright notice and Library of Congress listing:

"In dealing with any transaction whose legality may be questionable, the reader should obtain the advice of a lawyer."

Mr. Browne, fortunately, lives in Vancouver where the wrath of U.S. authorities is meaningless.

Managing the Socially Responsible Corporation by MELVIN ANSHEN (Editor), Macmillan Publishing Co., Inc., 1974. 256 pages, $10.95.

Columbia University's Garrett Lectures on Managing the Socially Responsible Corporation, delivered in the fall and winter of 1972-3, are the substance of this book. Professor Anshen has edited the presentations and includes his commentary at the end of each.

"American society is in a stage in its development when it needs, expects, and is beginning to demand a range of business behavior radically different from the previously accepted and approved pattern of business performance," Professor Anshen writes. The speakers in this lecture series agree with him and suggest that businessmen work with the change rather than against it.

Economist William J. Baumol said he does not believe voluntary social action is the answer. Rather, legislation should be passed so that firms are not acting socially responsible out of benevolence but out of a need to effectively meet competition.

"The two most important characteristics of such changes in the rules, as far as we are concerned, are that there is nothing voluntary about following them, and that it applies equally to all competitors. In this way, it frees management from pressures to undertake a role in the policy-making process which it has no reason to want and which society has every reason to fear. Moreover, it protects the firm from attacks by those who stand ready to undercut it at the first opportunity, an opportunity which would be opened were the firm to bow to social pressures for the voluntary pursuit of its social responsibilities," the economist said.

He suggested that businessmen cooperate in the design and implementation of effective legislative measures as the appropriate medium of social responsibility.

Clark C. Abt, president of Abt Associates, Inc., said, "Until government defines corporate social responsibility through legislation and enforcement, the definition must remain a matter for industry and individual company self-definition."

Despite what he admits to be "the still primitive state of this art of social auditing." Abt Associates, Inc., has undertaken this form of reporting. "It presents in a financial statement format, in dollar equivalents, the social assets and liabilities on the balance sheet, and the social benefits and costs and net social income on the income statement, accruing to employees, clients, local community, and general public. Many of the numbers, although all carefully computed on the basis of actual records and data, represent management judgments about the relationship between one set of data and another. In the absence of 'generally accepted' social auditing principles, there is no other alternative for an organization innovating its own system than to use its own best judgments concerning the meaning of its numerical data."

Dr. Abt blames the slow start in developing uniform social audit standards on both the GAO and the AICPA.

"The lethargy of the Congress's General Accounting Office in moving toward social audits of federal social action programs and policy research has not helped. The even slower response of the AICPA to the problem—despite numerous excellent articles on social audits and their components in the accounting journals—has also failed to give socially concerned CPA's much encouragement towards developing more uniform social auditing standards," Dr. Abt said.

[The AICPA does have a social measurement subcommittee that is working on the problem.]

Other speakers addressed the topics of the socially responsible corporation and labor relations, the public relations function, the political process, and management organization.

The Limits of Corporate Responsibility by NEIL W. CHAMBERLAIN, Basic Books, New York, 1973, 209 pages, $10.00.

To the proponents of more social responsibility on the part of business, Dr. Chamberlain issues a tentative "no." Social responsibility is not the concern of private concerns, he contends, and, even if it were, their entire history and the social context in which they exist, would make it almost impossible for them to take meaningful action.

Dr. Chamberlain's book, divided into ten chapters, looks at the concept of businesses' obligation to work for social goals and finds it wrong or impossible to achieve on almost all scores. As much a social history as a business book, it presents an interesting, if not altogether persuasive, case for his thesis.

He presents the typical corporation in ten different environments and details the arguments against social responsibility in each. Beginning with corporations and consumers, he points out that consumer pressures in our society are consumption-oriented, that improvements in the social milieu can only be achieved if the consumer—the present consumer—insists on them, and is willing to forego other satisfactions in order to get them.

Whether he is willing to forego each satisfaction is an open question in Dr. Chamberlain's mind. He points out that Government regulations designed to persuade consumers to rebel against corporate evils could very well have done nothing but confuse the public. In response to an order of the Federal Trade Commission that advertisers back up their claims, the author quotes *Business Week*, June 10, 1972, on what happened:

". . . The Commission's idea is that by putting the documentation before a skeptical public, the press and consumerists will point accusing fingers at perpetrators of fraudulent claims.

"In practice, however, the idea has not worked out very well. Automobile manufacturers, for example, flooded the overworked FTC staff with a mass of technical material that has taken many months to evaluate. It concluded that 13 of 73 claims were not supported by empirical data, 21 had incomplete data, and 32 could not be evaluated at all because the terminology was too technical."

This could very well have been only the end result of a rapacious industry deliberately using confusing terms to delude a gullible audience, so the book uses another example. What is a manufacturer's liability for a product that could be hazardous only if his instructions regarding its use are ignored?

Court decisions regarding this question have gone both for and against the manufacturer, but it is a no-man's land at the moment.

Unwholesome demands

Finally, even if all product guarantees were made ironclad, if every item made were absolutely safe under any conditions, what of the ultimate consumer and his tastes, which he will satisfy with his dollars? Every possible study could show that the internal combustion engine has been a curse in this country: what difference will that make to a customer with money who wants an automobile? As long as he wants it—and in sufficient numbers—he represents a market. And it is the business of business to satisfy the needs or desires of markets at a profit.

Similarly with environmental improvements, Dr. Chamberlain quotes a 1971 report of the Council of Economic Advisers:

"Rising affluence is at least as important as a growing population in creating additional demands on the supply of natural resources." It further documents this conclusion by showing that per capita consumption expenditure in constant (1958) prices rose from $1,145 in 1929 to more than double that, $2,323 in 1970.

Yet how many consumers are willing to give up more and more automobiles, more and more color television sets, more and more Disneylands in terms of what the cost will be respectively in terms of the atmosphere, energy consumption, the ecology. Not enough, suggests Dr. Chamberlain. As long as environmental protection doesn't interfere with anyone's comfort, it's fine. But once it threatens unnecessary automobile travel, higher taxes (paradoxically), recreation, or more and more plastic playgrounds, it requires a long second look.

From this point the author goes into a long discussion of the influence business has had on the process of education in this country and traces the introduction of the business ethic into the very foundations of education through the free public education system developed during the latter half of the 19th century. Business was supreme and business could do no wrong. So as business gradually evolved into the corporate form, as it gradually spread beyond its original markets, became more systematized and more mechanized, there were no warning voices to cry "Halt." Yet as business became more and more systematized, work became less and less interesting. At the same time the products of the system became more and more desirable.

Work as a tradeoff

Now we have reached a state, the author says, where work is not an end in itself but merely a tradeoff. So many dull hours on the job produce the money to buy so many products the consumer wants or believes he wants. So many hours of drudgery balance so many hours of freedom.

But nothing is going to persuade the consumer to abandon the rewards for which he spends so many dull hours on the job.

The net result of all this, the author implies, is a kind of stasis, a situation where each side is immobilized. Industry cannot move except in the most limited way; the

consumer can't move because anywhere he goes he will be depriving himself of one of the elements of the only meaningful part of his life.

Does the author see any solution to the dilemma? Possibly through joint action of corporations and the Federal Government. Anything else, he feels, would be completely ineffective. Only the national Government is large enough to cope with the needs and drives of the larger corporations. The Federal officials through regulations and flat and meaningful suggestions may still be able to control the situation.

One thing emerges clearly from Dr. Chamberlain's book: He doesn't think individual corporations can do it on their own anymore.

The People Factor: Managing the Human Climate by PHILIP LESLY, Dow Jones & Irwin, Inc., 1974, 268 pages, $9.95.

There is a segment of the business community that does not believe all aspects of social problems are quantifiable. Mr. Lesly is a member of this group.

"Today's highly trained managers are schooled in the mastery of tangibles. The computer is their prophet, and its testament is quantification. If it can't be counted it can't be measured, and if it can't be measured it doesn't count," Mr. Lesly observes.

"The intangible human attitudes that underlie the malaise of our times make our 'scientific' managers uncomfortable because they defy quantification. Yet their prophet says quantify, so the hatreds, jealousies, ambition, cruelties, greed, and other evils that are moving forces of today's world must be attacked as if they were numerical factors," he writes.

Later on in his book aimed at managers, Mr. Lesly explains, "Public relations people of experience and ability are sensitive to these intangible attitudes, know how to sense and test them, and are trained in judgment and techniques for dealing with them. They have a role to play in the total management function."

Guess what field Mr. Lesly is in?

Although he may well be right in what he says, do not look to this book to give you the inside track on testing "intangibles." Put your trust in experienced public relations practitioners is this book's advice.

No corporate communications program can be really effective without the participation of top management, he writes. "However, participation should not be defined as operation. The nuances and skills in this field are even more difficult for most managers to master themselves than the technical areas—which, after all, are tangible and thus in keeping with their training."

If you don't get insulted along the way, Mr. Lesly's book does have some interesting ideas in it.

Two opposed forces

One observation that he makes is that two electronic forces which characterize our age are moving in opposite directions.

"Our system is based on rules, like computers. Television is based on emotion. Society is based on history and tradition. TV is based on immediacy and novelty," he writes. "There are scarcely any elements in America that have been progressing as rapidly as these two electronic forces. The impact of both these revolutions is massive. They appear to be on a collision course."

Although he credits Marshall McLuhan with having sensed that television was drastically changing our society, Mr. Lesly feels Mr. McLuhan was wrong in believing the electronic media will replace the written word.

He also cites the professor as one of the underlying factors for the present breakdown in communication:

"Stress on audio-visual media makes it easy to feel educated and informed on a diet of superficial material. McLuhan fostered this by declaring the printed word dead, long before audio-visual media can provide the depth and variety needed."

Nor is Mr. Lesly in agreement with Harvard Business School's teaching methods (although he tactfully does not name the school). He writes, "The most prestigious of the graduate schools of business has based its operations on the 'case method.' This presumes that through intensive study of what has occurred in some organizations at some time in the past, and by exploring and discussing the ramifications of that case, a person will become trained in how to cope with similar problems in his future responsibilities."

The author maintains, "This pursuit of the outmoded practice of extrapolating future plans out of past patterns combined with the training that many managers receive leads to a widespread urge to comb the past in making plans. This is part of the urge to pin down all possible factors into tangibles and to make accurate tangible predictions."

Mr. Lesly's position is, "The past is a prologue—a source of clues to what lies ahead—rather than a script for future performance.

"All the grist that goes into decisions involving the human climate must be weighed and positioned by the sensitivity, the experience, and the judgment of skilled professionals. There is no effective substitute yet—including the attitudes and actions of the past—for the honed intelligence of the exceptional human mind."

Partial benefits

If you are in a position to hire a public relations firm, this book may help you in deciding what to look for. If you are not, this book at least serves to counterbalance the articles that maintain various mathematical management techniques can solve people problems.

Working by STUDS TERKEL, Pantheon Books, 1974, 589 pages, $10.

Over three years, Mr. Terkel interviewed dozens of people in different jobs to find out not only what they do but what they imagine and think they might be. It's a collection of insights culled from strangers in the crowd.

"In the thirties (as rememberers of 'Hard Times' remembered), not very many questioned their lot. Those rebels who found flaws in our society were few in number. This time around, 'the system stinks' was a phrase almost as recurrent as 'more or less'," Mr. Terkel observes.

People complained to Mr. Terkel about their non-recognition, the nature of their job, and being spied on by supervisors.

The author said he intentionally left clergymen, doctors, politicians, and journalists out of his book because "I felt that their articulateness and expertise offered them other forums." However, he has left out technical workers as well (scientists, engineers, computer specialists) who might have had some different ideas about what has been called an age of technology.

He did take time to speak to a young auditor in a large CPA firm. His statements are not likely to lure anyone into the profession. The CPA says he is viewed with fear and suspicion when he goes into a company to perform an audit. He also comments on the pressure to get things done and his firm's policy of either promoting people or letting them go, up or out.

"When people ask what I do, I tell them I'm an accountant. It sounds better than auditor, doesn't it? (Laughs.) But it's not a very exciting business. What can you say about figures? (Laughs.) You tell people you're an accountant—(his voice deliberately assumes a dull monotone) 'Oh, that's nice.' They don't know quite what to say. (Laughs.) What can you say? I could say, 'Wow! I saw this company yesterday and their balance sheet, wow!' (Laughs.) Maybe I look at it wrong. (Slowly, emphasizing each word) *There just isn't much to talk about.*"

The most interesting interviews are, perhaps, those with people you do not usually have the occasion to have frank discussions with. For instance, the low-level Government employee who clearly outlines her reasons for botching up a job; or the bank teller who explains that money is just "little pieces of paper" to her unless it is her own.

A conversation with a fireman closes the book. He had the same feelings the teller did but did something about them. "I worked in a bank. You know, it's just paper. It's not real. Nine to five and it's - - - -. You're lookin' at numbers. But I can look back and say 'I helped put out a fire. I helped save somebody.' It shows something I did on this earth."

Mr. Terkel believes there is an unquiet desperation in our work force and that people are aware of a sense of personal worth, or lack of it. His interviews tell it all.

Beginning Computer Glossary for Businessmen, by LARRY C. SCHMALZ, THOMAS A. BAILEY, and CHARLES J. SIPPI, Funk & Wagnalls Library of Computer Science, Funk & Wagnalls, New York, 1973, 246 pages, $6.95, and **Computer Glossary for Accountants and Bankers** by MARSHALL N. MCFIE and CHARLES J. SIPPI, Funk & Wagnalls Library of Computer Science, Funk & Wagnalls, New York, 1973, 247 pages, $6.95.

Here is an ingenious idea for a book series—excerpting a dictionary for special interest groups. The publisher already has issued glossaries for students and teachers, for engineers and scientists, for medical and health scientists, and for production automation specialists. One can foresee them for personnel men, office managers, marketing specialists, etc. The only question is whether owning the excerpts has any real advantage over owning the entire dictionary.

These two glossaries evidently represent an attempt to reduce the bulk of a standard dictionary of computer terms—in this case the Howard W. Sams & Co. Inc. *Computer Dictionary and Handbook*—by selecting from it only those terms deemed to be of particular importance to a special group.

The glossary for the businessman contains 161 pages of definitions ranging from "abort" to "zoned format"; the one for accountants and bankers (one wonders why accountants are combined with bankers rather than with businessmen) contains 195 pages of definitions ranging from "ABA" to "zone punch." About a quarter of the entries are duplications, although it would appear that many more of the terms considered worth defining for the businessman might be equally useful to the banker—or at least to the accountant.

Each book also contains extensive appendixes. In Appendix A the businessman is offered what the authors themselves describe as a "thought-provoking analysis concerning the impact of computers on business leaders." Appendix A for the bankers deals, not surprisingly, with the impact of computers on accounting and banking. (Rather sloppily done, it contains a paragraph on the computerization of the customer services operations of "the First City National of New York City.") The other three appendixes, "Basic Principles of Computer Systems," "Summary of Modern Computer Languages," and "Flowcharting—Abbreviations, Symbols, and Procedures," appear in both books.

The definitions, derived as they are from a reputable source, appear to be sound. The appendixes, while not inspired, are adequate.

The real question is why? Only the rare accountant, banker, or businessman who plans to carry his computer dictionary around in his briefcase (these glossaries, al-

though reduced in bulk, are not pocket-size) would gain any substantial advantage by purchasing one of these volumes rather than the complete original.

Briefly listed

Understanding Computer Contracts by PHILIP J. SCALETTA, JR., and JOSEPH L. WALSH, Data Processing Management Association, 505 Busse Highway, Park Ridge, Ill. 60068, 52 pages, $9.50, DPMA members $6.50.

The stated goal of this analysis of standard commercial computer purchase and lease contracts is to develop a general model which will include all relevant provisions to be considered during negotiations for the EDP equipment. The booklet describes the standard contract's language characteristics, including syntax, semantics, and pragmatics. It compares the provisions of Government computer purchase contracts to standard commercial contracts. A selected bibliography is given.
This highly technical booklet is the first part of the DPMA's *Management Reference Series.*

MAGAZINES

Computer Systems Analysis and Design: A Perspective by P. A. RICHARDS, *The Australian Accountant,* August, 1973.

The purpose of the article is to describe, in brief outline form, the procedures of a systems analyst in a typical systems development study.

The scope of work performed by a systems analyst is limited, in most cases, by a company's traditional attitudes and monetary constraints. Whatever the boundaries of the job, the best results are obtained when a team of specialists from various fields are employed, bringing in outside experiences and expertise.

Mr. Richards divides the computer systems development study into six interrelated stages: Select, Record, Examine, Develop, Install, Maintain.

In the Select stage, computer studies are begun either because there is a particular problem which has developed in the business or through a review of the already existing system to adjust it to organizational changes. Priorities must be established in a rational manner; consideration has to be given to financial and personnel matters. Both long- and short-term return should be provided by selected projects. Projects should also provide for an effective and efficient personnel mix.

The feasibility report

A feasibility study is carried out in this stage to test project appropriateness in technical, financial, and organizational matters. Needed equipment must be available. The project must be financially worthwhile and financing ability must be shown. Disruption of the organization caused by the tentative system must be justified in terms of time and rate of changes. The results of the feasibility study are a formal statement of objectives, systems boundaries, authority, restrictions, and a detailed personnel and financial plan for the project; the conclusion of this primary stage is a decision to accept the feasibility report and proceed with the project.

The Record stage involves the establishment of procedural and informational requirements of the new system. The organization's personnel can provide information in these areas, but the systems analyst must be prepared to test the logical validity of this information. Flowcharting is a widely used method to record information on procedures and data requirements. Information must be recorded in order that it can be analyzed and communicated. The Record stage, then, maps out the environment in which the new system will operate in order to find constraints or motivations to productive action.

The process of analyzing the facts discovered in the recording stage and the possible solutions is the basis of the Examine stage. The output of the stage is a conceptual outline of a solution which meets the requirements of the Investigation stage and is compatible with overall company objectives and data needs of users. This output is in the form of a "problem specification." Alternative systems designs are compared to this problem specification to test the validity of their logic and their tentative acceptability.

When the "best" design has been determined through analyzing the pros and cons of all possible solutions, the Development stage comes into play. The design has been selected with full consideration of the technical constraints involved, as Mr. Richards feels these are of paramount importance after the initial stages. A second determining factor is whether to take a top-down or bottom-up approach. Will information needs and procedures be dictated by corporate policies or will personal functions and decision making receive major priority?

From the Development stage will come a detailed system design including all technical specifications, physical layout, program formats, and file designs; management would receive this detailed report for review.

In the Implementation stage the system is finally put into actual operation. Most activities in this stage are concerned with meeting deadlines which are established for changeover. Many changes will be made during this stage, especially in relation to user output requirements. A major area of consideration at this point is in the human relations and behavioral aspects of installing the system. A great deal of care must be taken to allow people to adjust to the new system so they will be willing to work with it.

The Installation stage is more

than likely going on concurrently with implementation. Essentially, installation involves actual movement of equipment to the site and the preparation of the site itself. Testing is also involved in this stage.

The final stage

The final stage, Maintain, is a continuous one. Maintenance activity involves close scrutiny of operations for any problems which could develop; these problems could range from the technical to training to behavioral.

Management determines system success by many different factors. Because a computer is involved, management may feel that mistakes or lateness are impossible or intolerable. Systems designers must know the demands to be made of the system and must be able to correct difficulties and ease minds at the same time.

CECILY BAXTER
Louisiana State University at Baton Rouge

Governmental Accounting: A Total Systems Approach by E. REECE HARRILL and THOMAS E. RICHARDS, *Management Controls*, February, 1973.

The title of this article is misleading. Specifically, this article considers how a total systems approach can be applied to both governments and other types of organizations. For any organization, a computerized accounting system should be capable of providing management with the information necessary to make timely, rational, and informed decisions. But when diverse operations are performed by an organization, no single conventional set of data can effectively serve all levels of management. A successful system should be sufficiently flexible to be able to respond to the varied information requests of the different managers—a total systems approach.

How can such an accounting system be designed? The authors suggest that the critical feature of such a system is the account coding system. They suggest that the accounting system should be constructed in three steps: (1) establish a set of general ledger accounts; (2) classify these accounts by related events and actions; and (3) identify interrelationships among accounting data.

General ledger accounts

The general ledger accounts should be structured so that each account provides aggregated information. The accounts should be stated in broad terms and only a minimum number should be maintained. Each account should be classified into several subgeneral ledger accounts in order to provide "overall data commonality at higher management levels" while also reflecting the individuality or characteristics of management in each of operating units.

Classification

A further classification of ledger accounts by events and actions is needed to improve data flexibility. At this level of classification, each ledger account has additional code numbers to show where a particular accounting event was initiated, with which functional unit of an organization it is associated, and with which specific action it is involved. Specifically, classification criteria may be placed in a hierarchy, as follows: (1) accounting unit responsible for initiating an original action; (2) additional accounting subunits whose accounts are affected by (1) above; (3) time period reference; (4) specific functional unit of an organization; (5) specific activity; and (6) subactivity.

In short, all accounting events should be recognized at the lowest level of account coding hierarchy, then entered into the higher-level classification scheme, and finally aggregated in the general ledger accounts.

Once all events are processed on the basis of this classification code, interrelationships among accounting data may be readily identified. Thus, flexibility of accounting data for a variety of purposes is enhanced. Both the facility of identification and the degree of flexibility depends upon how far the classification scheme goes. The authors approximate the size of a code from 20 to 25 digit numbers.

Similarity and applicability

The nature of accounting systems does not essentially differ among organizations. Rather, a considerable degree of similarity exists because accounting is a measurement science concerned with economic activities of an entity of any type, governmental or nongovernmental. Like a government, an industrial organization has many operational units. A government engages in economic activities such as receiving and spending money, buying, selling, and producing; so does an industrial organization. As a result, governmental accounting is similar to industrial accounting in many respects, and the total systems approach can be applied to both with few modifications.

Once such an integrated accounting system is introduced and operated successfully, a single data base can generate different sets of information for different purposes and different management levels. As the authors note, information can be obtained by the selection of any combination of classification elements. By relating selected combinations, accurate and timely data are available so that various reports can be prepared in a variety of formats. Of course, all costs and benefits should be accounted for before such a computerized integrated system is introduced by a specific institution.

BYUNG T. RO
Michigan State University

Opportunities for Accountants in the Socio-Economic Area by SYBIL C. MOBLEY, *The CPA Journal,* December, 1973.

The author calls for an extension of accounting measurement techniques to account for a community equity in business enterprises and to devise a system of measurement commensurate with this task.

Dr. Mobley proposes the idea of a community equity to reflect the interest a community has in a firm. This equity arises from the common resources both share. In recognition of this equity, she proposes the accounting formula might be changed to read Assets = Creditor's Equity + Owner's Equity + Community Equity. The community's equity arises from the relationship between the owners and creditors of the firm and the community. Whereas the owners and creditors expect a dollar return, the community expects either (1) resource maintenance, (2) resource growth, or (3) resource distribution or reallocation. The community vests certain rights to a firm in issuing licenses and franchises and in return for these rights the firm acquires a performance responsibility.

Dr. Mobley calls for the discarding of accounting for only the "big splash" of the firm to the exclusion of the "waves and ripples" it sends out. The "waves and ripples" become large in certain circumstances and not only in the form of economic benefits, but also in the form of social and/or economic sacrifices. Today's society will no longer tolerate the ignoring of these sacrifices in reported accounting data.

The author stresses that not all risks of economic enterprises are borne by those who risk capital. In addition to the capital investors, the public risks the use of its natural resources to meet human needs, and the workers risk their energy conversion for the organization. Professor Mobley thus concludes that a highly developed economy must report not only the profits earned by the firm, but also the accommodation of human needs—both economic and social.

The measurement system needed for socio-economic data could be met by what the author calls "tendency." Tendency describes direction and magnitude and the author does not claim that it could be any more precise. She defends tendency by stating that the current measurement systems of dollars do not, in reality, provide us with more than a direction or magnitude of a firm. They do not tell us to invest an exact sum in cash.

The author concludes that we live in different times and in a rapidly advancing society. If accounting is to remain relevant to the needs of today, it must measure what needs to be measured, not what we have traditionally measured in the past.

H. RONALD PITT
Oklahoma State University

Caveat Executor: A Warning on Misuse of Linear Regression by LEE H. SMITH, RALPH W. ESTES, and THOMAS C. COMMITTE, *Managerial Planning,* January-February, 1974.

How valid are least squares analyses of historical data for estimation purposes? This article discusses some of the pitfalls that await users of simple linear regression models who do not critically examine the applicability of the model to their specific problems.

Since corporate decision making is necessarily concerned with predicting future events, the conscientious planner attempts to reduce the uncertainty of his task by utilizing various information analysis techniques. By so doing the planner hopes to describe his uncertain world in terms of manageable risk. One of the most commonly used methods of employing historical data to predict future events is simple linear regression analysis.

The user of this method postulates a linear relationship between two or more variables and finds the best estimate of that linear function using a technique known as the method of least squares. Professors Smith, Estes, and Committe maintain that, attracted by its computer-made simplicity, users of least squares may be implicitly accepting as true basic assumptions about their underlying data which may, in fact, not be true.

The linear regression model is represented by:

$$Yi = \sum_{j=1}^{P} Bj\ Yij + \varepsilon i \quad (i = 1, \ldots, n)$$

Among the major assumptions the least regression model and the least squares analysis require are that the distributions of the disturbance or error terms, the ε's, be independent, have means equal to zero, and have a constant variance. The authors investigate the implications of these assumptions and the potential impact of violations. That the disturbance terms are independent indicates that no single error distribution is correlated with any of the model variables or with any of the other error distributions. In other words, the level of the error at any point does not depend on the magnitudes of the Y's or the X's, nor is it influenced by the levels of any of the other errors.

If the error mean is truly zero then the error distribution is centered along the hypothesized linear regression. If not, there exists evidence of non-linearity. If a condition of equal variance, homoscedasticity does not exist, the problem of heteroscedasticity must be resolved. Possibly, a solution lies in discovering a functional relationship between error variances and model variables and in transforming the data to an equivalent equal variance condition. Both linearity and homoscedasticity can be tested using appropriate statistical techniques. The authors discuss a case of non-equal variance where the error variances are linearly related to the Y-variable and illustrate the impact of such a condition with an example of breakeven analysis. In their example. the breakeven point is significantly higher under conditions of error variance, which increases in proportion to sales level, than if error variance is assumed to be constant.

The *caveat* is that the user of a linear regression model must be sure that the data he uses conforms to the underlying assumptions of the model. If the data does not conform, the model may yield meaningless and misleading results, and the decision maker should consider revising the linear model or turning to alternative estimation techniques.

FRANK H. SELTO
University of Washington

An Operational Cost of Capital for Capital Budgeting Decisions by RONALD M. COPELAND, *Managerial Planning*, January-February, 1972.

Formulation of an operational cost of capital measure useful for solving capital budgeting problems will provide an objective criterion by which management can determine whether it should implement a proposed capital expenditure.

Two problems related to capital budgeting decisions are measuring and ranking proposed projects according to desirability, and matching sources of funds with the proposed projects. In order to choose between alternative projects, these problems must be solved simultaneously. An operational cost of capital measure must reflect present economic situations and must consider two related economic areas, the firm and the external business environment. Two models have been accepted as satisfactorily meeting these criteria.

The discounted cash flow model compares the appropriate cost of capital rate with a discount rate which equates the present value of cash inflows expected from a potential project with the present value of cash outflows expended to finance the project. If a project has a rate of return (discount rate) higher than the cost of capital, it should be accepted.

The present value model compares the present value of cash inflows and the present value of cash outflows both of which are discounted at the cost of capital rate. If a project has a present value of cash inflows larger than the present value of the cash outflows, it should be accepted.

Management goals

Basic assumptions relating to the goals of a firm underlie most capital budgeting models, according to Dr. Copeland. He says the "assumed" objectives of management are to maximize the profits of the firm or to maximize the value of the firm. He further states that these objectives are unrealistic. Management does not have knowledge of marginal revenues and marginal costs to maximize profits. Neither does management have information concerning optimal capital structure and dividend policies to maximize the value of the firm.

Copeland points out that short-run considerations must be viewed in order to describe the operational objectives of management. Such things as the flexibility in future financing, control of the firm, risks involved, and the timeliness of the decision must be considered. Copeland contends that management's main objective is to remain as management. Truly, if stockholders are not satisfied with a firm's progress they will sell their stock. Management thus remains as management unless their performance is totally unsatisfactory.

Each decision made by management is evaluated for its effect on income, control, risk, timeliness, and flexibility. Since management is most concerned with maintaining itself as management, it does not weigh all factors equally. The rewards for success are more important than the penalties for failure.

This is because management's position is only threatened when its performance is unsatisfactory.

A firm faces two types of risk. Internal risk is the percentage of debt to equity in a firm's capital structure. It refers to the safety of the owners' and creditors' interests. Internal risk is subject to the control of management. External risk is not subject to management's control. It relates to environmental factors. This is the risk of uncertainty in stability of future earnings, liquidity safety, and marketability of assets.

Risks can be integrated into the discounted cash flow model in two ways: (1) a risk factor can be added to the cost of capital depending on how much risk is involved in the project, (2) only the most conservative cash inflows and the highest cash outflows can be considered.

Capital projects are very important to the long-run success of a firm. The cost of providing funds to finance these projects is important. This includes future costs of financing and opportunity costs associated with internally financed projects. Profitability is of particular importance to management. Earnings per share is the most important figure to stockholders in measuring a firm's performance. With a satisfactory earnings-per-share goal in mind, management will accept those projects which, in aggregate, maintain future earnings equal to or above present levels.

Timeliness of projects and the determination of sources of funds will affect the performance of the firm also. Prior planning is necessary because of the length of time required to implement most projects. Timeliness is important in the determination of the source of funds because the cost and availability of funds is related to Federal monetary policy, stock market conditions, and the short-run outlook of the industry.

Flexibility is important because a flexible firm should be able to make alternative use of its assets or be able to dispose of them and also be able to change its capital structure to its best advantage. Capital asset flexibility affects future profitability and liquidity. Capital structure flexibility affects both the availability and cost of future financing.

Assuming the sources of financing can be matched with the proposed projects, the cost of capital figure will be:

1. For debt—after-tax interest rate plus a risk factor.
2. Replacement projects financed internally—earnings per share plus a risk factor.
3. Projects in excess of replacements financed internally—the risk factor.
4. For equity—earnings-per-share factor plus risk factor.

If the source of financing cannot be determined, then the cost-of-capital figure should be the one related to the next future source of financing.

A. Bruce Chill
Oklahoma State University

Optimal Depreciation Policy: Pricing the Products of Durable Assets by William J. Baumol, *The Bell Journal of Economics and Management Science,* Autumn, 1971.

Professor Baumol analyzes depreciation policy from the viewpoint of an economist. He develops depreciation rules that result in optimum asset utilization and considers the impact of other factors on such rules.

Until recently, economists have shown little interest in depreciation policy. They tended to view depreciation as a taxation device. The economic conception of the investment decison does not focus on depreciation because residual value is not pertinent to that decision.

This article recognizes two distinct concepts of depreciation. The first is the traditional use of depreciation to determine residual value which is of more interest to the accountant than the economist. The second concept of depreciation, closely related to the first, focuses on the effect of depreciation on price. Depreciation as a cost to the firm has an effect on the price of the firm's product. Thus, the choice of a depreciation policy will affect the stream of revenues received for the product. In this setting, Professor Baumol sets forth an optimal depreciation policy.

Simplifies task

Professor Baumol then considers the effect of increasing maintenance cost, decreasing productivity, and continued expansion of capacity on depreciation policy. An interesting property of his solution is that it becomes unnecessary to forecast more than one period in the future in determining depreciation or long-run marginal cost if capacity is expanded during each period—a property which would simplify the accountant's task of gathering the required information and computing the depreciation and marginal costs.

David F. Carter
University of Illinois at Urbana-Champaign

It's Time to Cut Down on Advertising Waste by Philip Kotler, Fred C. Allvine, and Paul N. Bloom, *Business and Society Review/Innovation,* Winter 1972-73.

This article points out some possible consequences of irresponsible advertising policies. It should foster grave concern in the advertising department of many major American corporations because some of the consequences which the authors mention not only could happen, but already have happened!

Describing the enormous annual expenditure on advertising in the U.S., the authors direct the read-

er's attention to those expenditures which merely transfer consumer preference from one brand of a given product to another brand of the same product, for example aspirin advertisements. Wasteful expenditures such as these and the attendant social costs have caused the Federal Trade Commission to seek power for affirmative disclosure, substantiation, corrective advertising, and counteradvertising.

Other consumer advocates, such as Ralph Nader, have proposed additional approaches to the advertising waste problem. From the numerous proposals advanced, the authors have selected the following five for brief discussion:

1. Nationalize the culprit industries, reduce the number of brands in competition, and restrict advertising to largely informational purposes;
2. Establish a regulatory agency with the power to control prices, marketing expenditures, and profits;
3. Create smaller and more competitive firms through divestiture;
4. Permit industry self-regulation with the consent of the Government; and
5. Educate the public through factual (as compared to persuasive) information about products.

It should be emphasized that the authors do not advocate these approaches; they merely observe them as proposals which have been made by others. The first three proposals appear to be drastic, but as one reads this article numerous present examples of the second and third can be recalled.

Kotler, Allvine, and Bloom analyze in depth a sixth control technique—direct regulation of advertising. It is in this analysis that the strong hand of Government influence is most ominous. The four forms which direct regulation can take are:

1. Direct limitation on advertising expenditures,
2. Economic penalties for advertising (essentially tax-related penalties),
3. Economic incentives for reduced advertising, and
4. Reduced access to the media.

Regulation by industry

It does not appear to be feasible nor justifiable to apply any of these measures "across the board." Thus any application will probably occur on an industry-by-industry basis following an audit in which a particular industry is deemed to have abused its advertising responsibility.

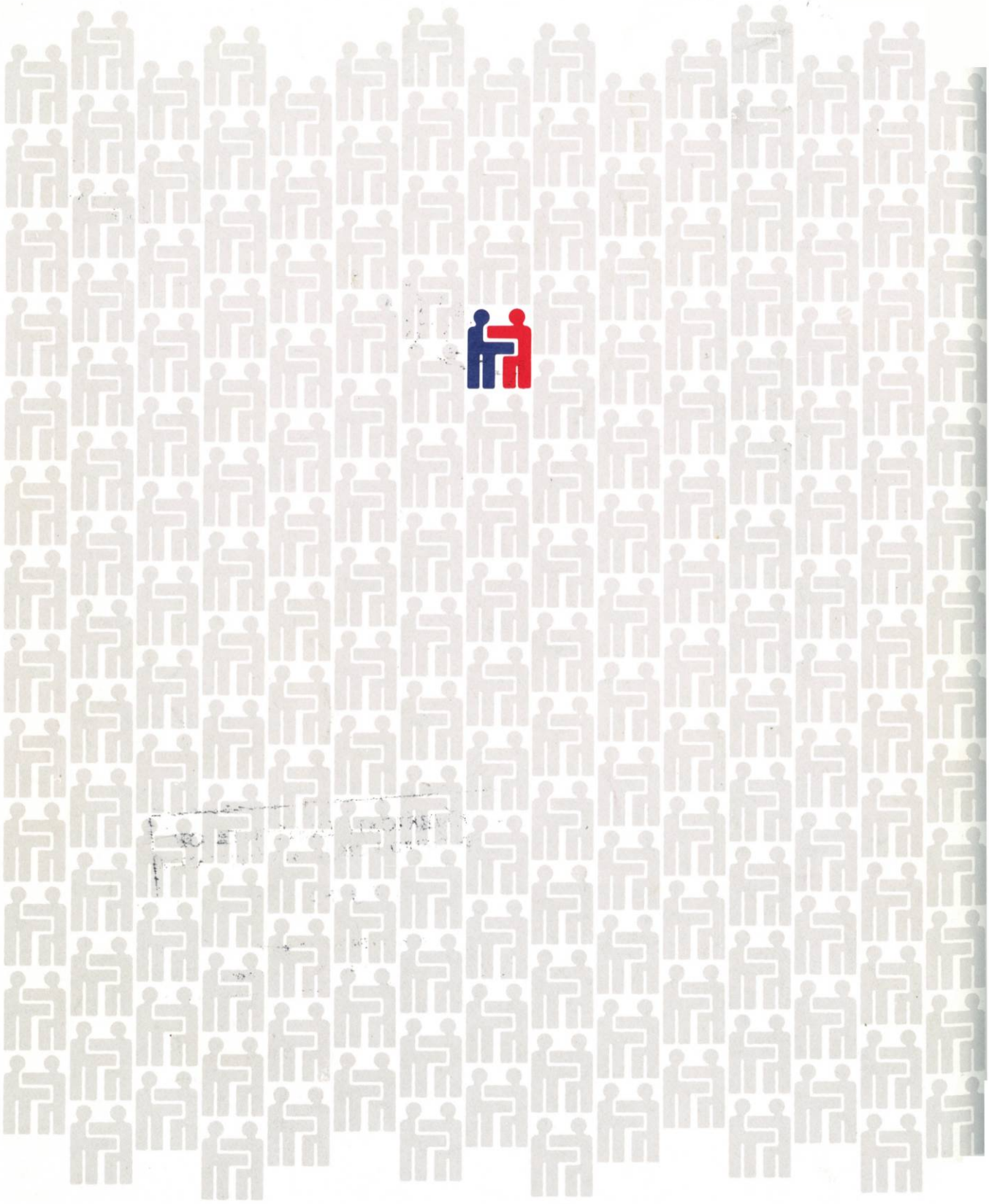
To avoid an intensive audit of marketing performance the authors believe an industry should be able to supply an affirmative answer to the following five questions:

1. Are there adequate product offers for each major price and taste segment of the market?
2. Are consumers provided with relatively full information about the offer?
3. Are advertising costs reasonable in relation to the commodity status of the industry?
4. Are rates of return in the industry competitive?
5. Is the industry free of incipient trends toward monopoly?

Their rating system based on these five questions reveals market performance problems in the aspirin and breakfast cereal industries, mediocre conditions in the automotive industries, and excellent conditions in the bread industry.

The article stimulates some serious considerations about the effectiveness of advertising, the inability of firms to avoid heavy advertising outlays without collusion or Government intervention, and, finally, the form that Government intervention might take. Advertising managers in firms whose product line is characterized by substantial brand advertising will find the article well worth reading.

BRUCE E. COLLIER
Oklahoma State University



The accounting profession is for all men and women—
black, brown, red, yellow and white.

Hire minority accountants.

AICPA

American Institute of Certified Public Accountants
666 Fifth Avenue, New York, N.Y. 10019