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Pricing a product cannot be done by hard and fast rules. Management's ultimate objectives must always be considered. Does it want short-run or long-run profits? Does it want to block competitors?

METHODS VS. OBJECTIVES IN PRICING POLICY

by Donald L. Rogoff University of Missouri and Robert A. Lynn Kansas State University

THERE are several well-established methods for pricing, and the merits and shortcomings of each have been extensively discussed. Direct costing has been the object of much recent exposition and analysis.¹ Breakeven approaches, with refinements, also continue in some

use, despite their limitations.² A price set in part on the basis of a target rate of return is used by several major industrial firms, including General Motors, Sears, Alcoa, and U.S. Steel.³ Statistical decision theory has emerged as a valuable technique to aid the executive re-

sponsible for the pricing decision.4

All such pricing methods require the use of reliable input data, especially costs and volume. In addition, all of these methods rest on assumptions, but are the assumptions underlying pricing systems valid? For example, marginal analysis assumes that fixed costs are constant and, therefore, not relevant. It assumes that there is idle capacity and, therefore, no opportunity

¹ See, for example, Richard J. L. Herson and Ronald S. Hertz, "Direct Costing in Pricing: A Critical Reappraisal," Management Adviser (formerly Management Services), March-April, 1968, pp. 35-44; Robert W. Lentilhon, "Direct Costing—Either . . . Or?" The Accounting Review, October, 1964, pp. 880-883; NAA Research Report 37, "Current Applications of Direct Costing" (New York: National Association of Accountants, 1961).

² Raun, Donald L., "The Limitations of Profit Graphs, Break-even Analysis, and Budgets," *The Accounting Review*, October, 1964, pp. 927-945.

³ Kaplan, A. D. H., Joel B. Dirlam, and Robert F. Lanzillotti, *Pricing in Big Business*, Washington, D. C., The Brookings Institution, 1958, pp. 130-153, 188, 317. R. F. Lanzillotti, "Pricing Objectives in Large Companies," *American Economic Review*, December, 1958, pp. 924-927.

⁺One application is explained by Franz Edelman, "Art and Science of Competitive Bidding," *Harvard Business Review*, July-August, 1965, pp. 53-69. Also see Paul E. Green, "Bayesian Decision Theory in Pricing Strategy," *Journal of Marketing*, January, 1963, pp. 5-14.

cost attached to the "sunk" resources. A gross margin orientation assumes demand is relatively inelastic and the response of buyers is relatively unimportant. A cost orientation to pricing assumes competitive reaction is not a major factor.

A manager emphasizing cost in his pricing policy assumes costs are precise. A book publisher ignores competition and demand when he refuses to price a book until he receives the cost estimate.5 Pricevolume-cost may be a more useful frame of reference than the usual cost - volume - profit relationship where sales and selling price are assumed as given. Technology, perhaps erroneously assumed constant in the relevant planning horizon, is increasingly making it possible to alter costs through changing product content. These are examples of some of the assumptions implicit in pricing methods. If these assumptions are untrue the methods yield suboptimal results and the decisions that follow are not consistent with the firm's objectives-even when the firm's objectives are explicitly known and understood.

This article argues that the pricing method should reflect actual management objectives. In some cases the objectives are made clear, in others they are merely implied or assumed. In many cases methodology may either presuppose objectives that are not the most important ones, or it may tend to narrow their range at precisely the moment when they should be broadened, e.g., the time when a new product is initially priced.

Since pricing is a means to an end, an explicit formulation of the company's pricing objectives is essential. The basic guides to pricing are the firm's overall goals. The broadest objective is to assure continued existence. However, aside from survival, company objectives relate to rate of growth and market share as well as making money.

Controversy continues to sur-

round the question of how much money is sought. Anthony would argue, for example, that profit maximization is not a valid assumption to explain the behavior of businessmen because it is immoral and too difficult to measure and implement. He bases his case on corporate philanthropy and interviews with executives who speak of satisfactory or reasonable, not maximum, profits.6 Ralston Purina plans to spend \$30 million in St. Louis on a public housing redevelopment proposal (LaSalle Park) with a rate of return well below its cost of capital. This fact supports Anthony's view that "the objective of a business is to use its resources as effectively as possible in supplying goods and services to its customers and to compensate equitably those who supply these resources."8 Ralston Purina apparently wants to enhance its public image as well as upgrade the ghetto that surrounds its corporate headquarters.

Despite this evidence we believe profit maximization is a legitimate and moral objective of business along with compatible goals such as survival, growth, excess risk avoidance, etc. An enlightened management scoring high on public relations and social consciousness may view profit as the result of serving customers. It is following the adage, "He profits most that serves best."

Corporate philanthropy may not help maximize profits or the stock price immediately but in the longer run the reputation of a good corporate citizen will favorably affect sales and profits. More to the point, however, is the fact that corporate philanthropy is less than 1 per cent of corporate profits—not an impressive argument against profit maximization.⁹

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⁵ The cost estimate depends on selling price and volume assumptions.

⁶ Anthony, Robert N., "The Trouble with Profit Maximization," *Harvard Business* Review, November-December, 1960.

⁷ Ralston Purina Magazine, No. 1, 1970, p. 7.

⁸ Anthony, op. cit., p. 7.

⁹ Rogoff, Donald L., "The Forecasting Properties of Insider Trading," unpublished D.B.A. thesis, Michigan State University, E. Lansing, 1964, pp. 138-42.

Experience and observation reveal that people prefer more of a benefit rather than less; they prefer a good thing sooner rather than later; and they prefer a future benefit that has a higher rather than a lower probability of being received and enjoyed. Even these goals are sometimes in conflict and involve trade-offs. For example, more now may mean less in the future, or more in the future will likely involve more risk, i.e., a higher probability of a smaller or even negative benefit

Balancing conflicting goals

People prefer less risk and more safety to the reverse. They also prefer more income and profits rather than less. Minimizing risk and maximizing rewards are conflicting and incompatible goals. The more you pursue one, the less likely you are to achieve the other. The art and skill of good business judgment is knowing how to balance conflicting goals.

In a business enterprise, the assumed primary objective of man-

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agement is to maximize the longrun profits of the firm. The ultimate determinant of what is good pricing policy is whether or not it achieves this objective. This principle may be contradicted by such expressions of business goals as the following:

- 1. To increase sales volume and market penetration,
- 2. To maintain historic rate of return on assets,
- 3. To strengthen financial position,
- 4. To reduce costs,
- 5. To increase inventory (and other asset) turnover,
- 6. To increase the size of plant and facilities.
- 7. To improve prestige and maintain entrepreneurial spirit.
- 8. To improve employee relations
- 9. To protect company assets,
- 10. To achieve industry leadership.
- 11. To improve company's reputation with customers, suppliers, creditors, and other interest groups, and,
- 12. To secure economic power.

However, these are only intermediate goals; the real objective in each case is (or should be) to maximize long-run profits. When business managers translate their overall objective of maximizing profits into objectives referring to different parts of the firm, it is often necessary to state objectives in non-profit terms such as those above. When this is done, care must be taken not to lose sight of the ultimate objective.

Multiple goals are created as an approximation for a single "real" goal that cannot be measured in practice. Business profits are a case in point. The determination of real income according to financial

theory requires the calculation of the present value of the firm at the beginning and end of the period over which income is being measured. This, in turn, requires a knowledge of future cash flows and an appropriate discount rate. The goal is to maximize the present value of the residual owner's investment, i.e., the stock price. Because of the serious problem of forecasting expected values, this goal lacks operational guidance for making decisions.

True (or economic) income defies measurement, but accounting income does not. The profit is measured by the accountant by matching costs and revenues. This procedure provides a usable and reasonable approximation of true income, despite unreal assumptions and arbitrary allocations of costs and revenues among different time periods.

Accounting profit as defined and measured depends primarily on historical costs, and, therefore, may be inconsistent with future income. Because of this, managers are often held responsible for goals subsidiary to net income and "profit maximization." For example, managers define goals in terms of targets for cost reduction, employee turnover, market penetration (or participation), etc.

Sometimes multiple goals are a means of coping with interactions, tradeoffs, and complexity. Often a single goal cannot embody all of the relevant factors and interrelated effects that have a bearing on selecting a course of action among the available alternatives. In this event, multiple goals may succeed in conveying additional information about desired behavior in the face of interactions.¹⁰

¹⁰ Whinston, Andrew, "Price Coordination in Decentralized Systems," unpublished Ph.D. thesis, Carnegie Institute of Technology, Pittsburgh, 1962, pp. 33-44.

The more you pursue one, the less likely you are to achieve the other

For example, suppose that the president of a company wants to assign goals to the vice president of manufacturing that will lead to maximum long-run profits. If the vice president is told to focus on cost reduction, this may adversely affect sales revenue through product quality and availability. Therefore, the vice president should be held responsible for quality and delivery goals and others as well as costs.

Higher sales, lower profits

An organization should expect to get exactly what it asks for. Each executive will attempt to "optimize" in terms of the goals assigned to him, whether profitable or not.¹¹ For example, if a sales manager is held responsible solely for sales volume, he may achieve increased dollar sales at the expense of reduced corporate profit (by granting too many price concessions to customers, for example).

These subsidiary goals force the businessman to think of longer range profits as well as immediate profits.

Profit goals are undoubtedly important ones, but profit can be overemphasized. This is particularly true in the common case where short-run profits are the ones used in pricing calculations, while long-run profits are those in which management is really interested.

Perhaps profits can be maximized in the long run by restraining them in the short run with a lower price, a higher product quality, or a more extensive promotional campaign than the one that would maximize short-run profits. This course would build volume and establish customer and dealer loyalty.

Most pricing methods concentrate on short-run profits and thus they carry an implicit objective that is very likely to be self-defeating in the long run. The probable reason for this is that it is easier to obtain data on which to base the decision. Basing pricing decisions on long-run implications introduces greater uncertainty and is indeed more difficult. Short-run methods and objectives may be inconsistent with long-run goals.

Perhaps General Motors, for example, is maximizing long - run profits by not maximizing yearly profits because such aggressive behavior would increase the risk of Government antitrust action. The breakup of General Motors into smaller companies is probably viewed as the antithesis of survival.

Playboy magazine provides another example of a policy with adverse short-run profit implications. The Wall Street Journal many years ago reported that Playboy magazine refuses to accept advertising for products and services (such as acne preparations, hair restorers, home study courses, etc.) designed to improve its readers' physiques or intellects because it does not want to remind its audience of their shortcomings. If true, the management of this successful enterprise is willing to forego incremental profits (where marginal revenue exceeds marginal cost) for long-run circulation and "image" goals probably because these goals implement long-run profit maximization.

The difficulty with profit maximization is a measurement problem compounded by a semantic problem. Although not generally accepted (by Anthony, Simon, Baumol et al.), many practitioners and teachers, perhaps most, accept the

proposition that management's basic objective is to attempt to produce "maximum profits" or to produce "the greatest possible return on the stockholder's investment over the long run consistent with reasonable risk."

The problem with this kind of statement as a guide to pricing or anything else is that it is not operational because it is too vague. What is the stockholder's investment? Do you use his cost or the current market value or the company's book value? How long is the long run? Over what time period should "maximum return on stockholders investment" be measured?

The most difficult question is: What is reasonable risk? This question has not been satisfactorily answered with respect to individual investments, much less overall corporate (assets, strategies, and) goals.¹²

¹² See for example D. B. Hertz, "Risk Analysis in Capital Investment," Harvard Business Review, Jan.-Feb., 1964, pp. 95-106, and "Investment Policies That Pay Off," Harvard Business Review, Jan.-Feb., 1968, pp. 96-108; Frederick S. Hillier, "A Basic Approach to the Evaluation of Risky Interrelated Investments," Technical Report No. 69-9, Operations Research House, Stanford University, California, and "The Derivation of Probabilistic Information for the Evaluation of Risky Investments," Management Science, Vol. 9, No. 3, April, 1963, pp. 443-457, and The Evaluation of Risky Interrelated Investments, Vol. 1 of the TIMS-ONR monographs in Budgeting Interrelated Activities, Amsterdam, 1969; Harry M. Markowitz, Portfolio Selection, Wiley, New York, 1959; Bertil Naslund, Decisions Under Risk, The Economic Research Institute, Stockholm School of Economics, 1967; Martin H. Weingartner, "Capital Budgeting of Interrelated Projects: Survey and Synthesis," Management Science, Vol. 12, No. 7, March, 1966, pp. 485-516; and Robert F. Byrne, New Approaches to Budgeting, Vol. 2 of the TIMS-ONR monographs on Budgeting Interrelated Activities, Amster-

¹¹ Much of this material is liberally borrowed from Simon and Emery. Herbert A. Simon, "On the Concept of Organizational Goal," Administrative Science Quarterly, Vol. 9, No. 1, June, 1964, pp. 1-22, and James C. Emery, Organizational Planning and Control Systems, New York, The Macmillan Company, 1969, pp. 115-119.

Unit volume and market share goals may be consistent with or in conflict with earning maximum long-run profits. We would question any standard based on history or past performance, rather than analysis with explicit assumptions. They may no longer be relevant. Times change and as industries mature a prior year's average historic return might prove too high for today's conditions and more limited opportunities. Here the question of the irrelevancy of sunk costs in total assets is raised.

Profit margin ignores the impact

Profit margin ignores the impact of volume in cost-volume-profit relationships. Pricing to maintain profit margin per unit may decrease volume, turnover, and total profits. Profit may be maximized at a lower return on sales if there is a significantly greater turnover of capital assets.

Profit can sometimes be maximized on a lower return on assets if assets are larger in size and financed relatively more from debt sources. The rate of return goal ignores the absolute amount of assets. If assets are shrinking, maintaining the historical return on those assets results in smaller profits. Whereas, if the assets of a company are growing, a (small) sacrifice on the return as a percentage of those assets may be in order and improve the EPS and the stock price.

Maintaining (or improving) your market share in a declining industry (such as buggy whips, for example) is insensitive to goal Computation achievement. measurement problems persist. The computation of historic return on assets is itself suspect as a goal on computational grounds. For example, gross assets fail to adjust the rate computation for the depreciation of the assets included in the denominator. Thus, the computed rate of return understates the true rate of return (or profitability) on capital. Also, judging investment outlays by the return which they would return on total invested capital, rather than equity investment, implicitly assumes that all projects have the same debt-bearing capacity.

In practice many other objectives influence pricing policies. For example, quantity sold and percentage share of the market may be alternative objectives, not merely companion goals of profit maximization. Sometimes they are used because long-run cost and revenue data are unavailable.

William J. Baumol has advanced the hypothesis that price is often set at a level which will maximize dollar revenue, subject to the constraint of some minimum necessary profit.¹³ Price would, therefore, be lowered below the profit-maximizing level toward the level at which marginal revenue is zero, and at which total revenue is maximized. Baumol reasons that high dollar sales attract customers to the "popular" product, cause banks to be receptive to a firm's financial needs, encourage distributors, and make it easier to retain and attract good employees.¹⁴ In addition, growth in sales may attract the interest of the investment community in the firm and exert a favorable influence on stock values.

The sales maximization model (objective or goal) is probably inefficient. It probably leads to "fat" in the operations. When sales are growing, there is less motivation for cost control. There might be a tendency to let things slide, to approve questionable expenditures, to postpone decisions to terminate unproductive personnel, etc. But in a business downturn there is more emphasis on cost cutting. This results in an overreaction during periods of poor business, such as we have seen in the early 1970's.

Besides dollar sales volume the number of units sold and the percentage share of the market are points of great interest to management. Temporary price cuts, given as volume bonuses, are often used in the automobile industry as man-

¹⁴ *Ibid.*, pp. 45-46.

The sales maximization

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¹³ Baumol, William J., Business Behavior, Value and Growth, revised edition, New York, Harcourt, Brace & World, Inc., 1967, pp. 45-50.

ufacturers seek to raise their level of market penetration.¹⁵ Such a low price may be consistent with favorable long-run profits and may thus represent a wise decision even if it is too low to maximize immediate profits. A pricing system based on short-run profits could easily be self-defeating in the long run.

Unit volume is an especially important pricing goal in such cases as these:

- Where a product (such as an automobile) has a high level of visibility and where it is essential to have a "popular" product.
- Where high unit sales are needed to aftract or retain strong dealers.
- 3. Where unit sales records are prominently publicized.
- 4. Where brand loyalty (once obtained) is high and where repeat sales are important.
- Where high unit sales provide a basis for organizational growth, when such growth is sought by management.¹⁶

Competition is an important factor in most pricing decisions. Pricing methods sometimes are built on cost analysis procedures and flexible markup systems that reflect such factors as the capital turnover rate. It such a method is valid only when competition is not a major element in the price decision. Where management wishes to maintain a parity with competition or a certain margin below or above competition, cost and markup play a minor role.

TABLE |
ALTERNATIVE PRICES AND PROFITS FOR A NEW PRODUCT

| | Alternative 1 | Alternative 2 |
|--|---------------|---------------|
| Years 1 and 2 | | |
| Price | \$ 3.00 | \$ 2.15 |
| Cost | 2.00 | 1.90 |
| Unit Sales | 10,000 | 20,000 |
| Unit Sales as Percentage of Total Market | 100 | 100 |
| Profit per Year | \$10,000 | \$ 5,000 |
| Years 3, 4, and 5 | | |
| Price | \$ 2.25 | \$ 1.75 |
| Cost | 1. <i>75</i> | 1.60 |
| Unit Sales | 8,000 | 24,000 |
| Unit Sales as Percentage of Total Market | 50 | 75 |

Price cuts are used to keep competition from entering a market. For example, Germany had a monopoly in certain pharmaceuticals and fine chemicals in the pre-World War I period. 18 It exercised a policy of pricing drastically below cost to prevent competitors, like Monsanto, for example, from entering the fine chemical field. Shortrun profit maximization is not consistent with the long-run objective of minimizing the competition that you face. Minimizing competition may be compatible with long-run investment values and profit maximization, as in the case of General Motors cited earlier.

Finding the "right" price

A price may be "right" with respect to one possible objective, while it is "wrong" with respect to another objective. Suppose market tests and customer attitude surveys indicate that potential elasticity of demand for a new product is high. 19 This means that the quantity sold will be more than proportionately responsive to price cuts and produce increased sales revenue. A small reduction in price of product will lead to a more than

proportionate increase in the number of consumers who are willing and able to purchase that product.

Table 1, above, shows the case of this new product with total cost per unit estimated at \$2.00 for 10,000 units and \$1.90 for 20,000 units. The previously mentioned market tests indicate that a \$3.00 price could be charged if sales of only 10,000 units are regarded as satisfactory, while a \$2.15 price would be required to assure initial sales of 20,000. It will be assumed that the total investment would be the same, regardless of volume. The short - run profit - oriented price would be \$3.00, as Table 1 indicates, because this alternative is twice as profitable in years one and

The lower price shown in Alternative 2 would speed customer acceptance of the product, and it would also retard the entry of competitors. With the higher price, on the other hand, let us assume that by year three this firm would be selling only 8,000 units (50 per cent of the market) while competition forced price down to \$2.25. If the firm's management has a market share objective of 75 per cent, it can select Alternative 2 and cut price more deeply to \$1.75. This would be the unit cost level of a lower volume producer, and thus entry by competitors would not be invited.

As production runs become larger under Alternative 2, unit costs are lowered from \$1.90 to \$1.60 and price can be further decreased enabling additional economies of scale. This environment will exclude marginal producers from the

¹⁵ See for example Douglas A. Condra,
"9 Divisions Offering Incentives to Spur Sales," Automotive News, May 27, 1968,
pp. 1, 4.

¹⁶ Lynn, Robert A., "Unit Volume as a Goal in Pricing," *Journal of Marketing*, Vol. 32, October, 1968, p. 36.

¹⁷ McAnly, H. T., "Administrative Expense and Profit in Product Pricing," *The Journal of Accountancy*, August, 1963, pp. 33-38. He states, "Application of an over-all percentage for administrative expense and return on capital may result in serious mistakes in setting prices for individual products."

¹⁸ Haynes, William, American Chemical Industry: A History, VI, New York, Van Nostrand, 1949, p. 283.

¹⁹ An earlier article in this journal illustrates how a survey of your salesmen's opinion may help you estimate elasticity, i.e., anticipate the effects of a proposed price cut on volume for existing products when budget constraints preclude market research surveys. Philip L. Blumenthal, Jr., "Predicting Sales Effects of Discount Changes," Management Adviser, March-April, 1971, pp. 37-44.

market. In such a hypothetical situation, pricing Alternative 2 is optimal from the beginning because it leads to more rapid consumer acceptance, discourages competition, excludes alternative producers, and leads to higher market share and sales volume for a longer period of time.

From the standpoint of long-run (five year) profits, however, Alternative 1 would still be "right," since profits are always higher with the higher price alternative. For a management which regards the lower profits as acceptable and which seeks mainly high dollar sales, high market share, and a very competitive or low price reputation among consumers and dealers, Alternative 2 is the "right" one. Such a policy applied to this product might well have favorable effects on the sale and acceptance of other members of the product line.

To make an intelligent decision certain data are needed. Market research could shed light on the vital price-volume relationship. For all objectives cost information is needed. Historical costs are seldom relevant, of course.20 By year three in Table 1 they would be grossly misleading. The sort of costs needed would be projected costs at various volume levels.21 Perhaps what is needed is an idea of the probability distribution of the unit costs that might be encountered at volume levels that have not yet been experienced. Cost estimates would serve more to outline the general bounds of the profit constraint than they would to present exact figures.

Where a price is "right" based on a volume objective, but where profit is inadequate, it is often better to re-design the product than to raise the price. The product itself is a variable, and it may be one that offers considerable latitude to management. Data regarding the cost of various product alternatives would be basic to a decision in this area.²²

Choosing among alternatives

Our view of the breadth and variety of management objectives is undergoing a basic change.23 We need to continue to expand these conceptions and to adapt pricing nontraditional methodology to views of organizational theory. Marginal analysis is a valid technique for aiding in the choice among alternatives where efficiency or lowest cost is the decision criterion. It is especially useful in short - run instances where sales volume, which affects costs, may be correctly assumed to be independent of the choice.

The alternative choice problems where marginal analysis is useful tend to be those where the possible alternatives can be fairly clearly specified, and where it is possible to make reasonably good estimates of the costs and revenues implications of each alternative. Examples are capital equipment decisions, buy-or-lease decisions, and production scheduling decisions, to mention a few.

Many of these problems are complex, difficult, and involve large sums of money—but relative to such problems as pricing, choice of product line, marketing strategy, and the direction of research efforts, they are simple. Problems like equipment replacement, buy - or lease, plant layout, and production

runs affect costs such as material, labor, depreciation, interest, and taxes and, therefore, profits but not sales and the customer. Problems like pricing, product mix, and market strategy affect sales as well as costs, volume, and profit. It is problems like these that are not likely to be solved in practice by rules based on profit maximization, at least profit maximization based on short-run cost and volume data and other questionable assumptions.

This article stresses the importance of understanding the firm's long-run objectives and making pricing decisions that take these into consideration. There may be a substantial difference between the "maximized" short-run profit of economic theory or some one-shot bidding situations and the target rate of return employed on a continuing basis.

Are the methods and objectives of your organization realistic and operationally meaningful in view of the constraints imposed by the product and the market? Pricing methods that assume short-run profits as a goal, which are based on historical cost data that ignores volume changes, or which do not consider competition, are likely to miss the mark widely.

A pricing method must reflect the objectives of management; it must not assume these objectives. The "profit" goal as implemented for pricing, i.e., short-run profit maximization, may be overrated. Volume objectives that seek to build a market position or reputation, even at the expense of shortrun profits, may be very useful goals, particularly for the multiproduct firm. Goals such as market penetration may rate notice as a builder of markets. These markets can be the real determinants of long-run profits.

Accounting data to support such objectives are needed. The most relevant data may be the hardest to find, and impossible to express in exact terms. As always, however, a rough idea about a needed item is better than an exact measure of an unnecessary or misleading one.

²⁰ Chambers, R. J., "Prospective Adventures in Accounting Ideas," *The Accounting Review*, April, 1967, p. 243.

²¹ See George J. Benston, "Multiple Regression Analysis of Cost Behavior," *The Accounting Review*, October, 1966, pp. 657-672, especially p. 662.

²² Chamberlin, Edward H., "The Product as an Economic Variable," Toward a More General Theory of Value, New York, Oxford University Press, 1957, pp. 105-37

²³ Caplan, Edwin H., "Behavioral Assumptions of Management Accounting," The Accounting Review, July, 1966, pp. 496-509. In this important article integrating accounting and modern organization theory, the author argues for expanding the scope of management accounting theory and practice. For example, he writes, "Accountants will have to develop an increased awareness and understanding of the complex social and psychological motivations and limitations of organization participants."