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Volume 2 Selected Papers

Objectives of Financial Statements

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A User Oriented Development of Accounting Information Requirements

Joshua Ronen

Introduction

Accounting objectives should be based on economies of information, i.e., cost and benefit considerations.¹ If accounting information were a commodity sold at the market clearing price, it could be argued that forces of market equilibrium could insure that accounting information would be produced and communicated at an optimum level consistent with equating the marginal methods and benefits and marginal costs of information. However, accounting information does not constitute a "private good" in the sense of exchangeability at the marketplace; rather, it is provided without charge by the firm to the consumers—in this case, the various users of accounting information.² Under these circumstances, the determination of the costs and

¹ Theoretically, the benefit of information is measured by the consequences of decision changes that occur as a result of the information. The cost of information is the value of resources committed to obtaining and communicating it.

² The aspects of private goods vs. public goods and the implications of optimal conditions of welfare as well as the underlying factors in determining what constitutes public goods are extensively discussed in the literature. For a good example, see Harold Demsetz, "Some Aspects of Property Rights," *Journal of Law and Economics* (October 1966), pp. 61-70. What makes accounting information in particular a public good is probably the difficulty in guaranteeing exclusive access to the information if it is sold.

It could be argued that accounting information is indirectly sold at the market in that it is used in the determination of stock prices and thus an implicit price is stated through stock price movements. Notice, however, that this process is very indirect (unlike intermediate products which have established market prices) and is influenced by the uncertainty of the resulting benefit that would potentially accrue to the firm through provision of information. By contrast, in respect to private goods, firms are generally price takers in the context of a competitive market, and thus subject to much less uncertainties than in the case of accounting information. More elaborate discussion of this aspect appears later in the paper.

benefits must be made outside the market system.

Although both costs and benefits need to be investigated, it is probably advisable first to identify the benefits of different kinds of information.³ Even when the cost of some accounting information is prohibitive, the search for alternative means of obtaining the information could be justified if the benefits are large enough. Failure to consider some accounting information merely because its cost is high cannot be justified.

There are various ways to investigate the benefits which could lead to identifying desirable accounting information:

1. The information required by normative decision models of major user groups could be determined.

2. Decision models *actually* used by major user groups could be identified through interviews, controlled experiments, etc., and their information requirements determined. These decision models could either agree with or differ (as a result of universal behavioral tendencies) from the normative models.

3. Preferences of users as to different kinds of accounting information could be identified through interviews and questionnaires.

While all three avenues should be followed⁴ primary emphasis should be placed first on information requirements of normative models because:

1. The normative model is the procedure that a rational man follows in making a particular decision in a specified set of circumstances. Consensus among writers regarding the soundness of normative models indicates that a majority of users is likely to follow the normative model. Thus, the benefit of information used in the model would accrue to many users and the sum total of the benefits resulting from providing the information is apt to be large.

2. Normative models can serve as a standard of reference to evaluate actual decision models. If deviations are found to be systematic and universal across many individuals, the deviations could be used to modify the

³ While there is a lower limit for costs (zero), the upper limit for benefits is indefinite. Thus, while costly information may not be eliminated from consideration (since the benefits could be even larger), information that has small benefit could be eliminated from consideration since the cost is bound to be positive. Starting the investigation with the benefits allows an eventually smaller subset of information to be considered and therefore saves research time and effort.

⁴ The implication of the findings of the three avenues to the objectives may be inconsistent. Decisions as to whether (a) the normative model should be modified to accommodate systematic inconsistencies, (b) information should be provided so as to satisfy presently used models without paying attention to normative considerations or (c) individuals should be trained or otherwise influenced to follow the normative models would have to be made. Unless all avenues are followed, however, such inconsistencies may remain unidentified.

normative model. Normative models are selected as a standard of reference since they are consistent with action or behavior that is generally found to be empirically valid.

3. Accounting objectives inferred from expressed preferences of individual users would be varied and would lead to a great number of sub-objectives.⁵ Criteria would ultimately have to be developed to narrow the resulting multitude of objectives so that the accounting alternatives to be considered would be limited to a feasible subset. The criteria would be implied by prevalent normative decision models. It would be advisable to conduct inquiries into individual preferences in light of the requirements of the normative models.

Benefits Identified Through the Analysis of Normative Decision Models

If it can be determined that many decisions frequently made by more than one user utilize the same piece of information under a relatively large set of circumstances, then the sum total of these benefits may well exceed the cost of providing that information systematically. Thus, it is useful to identify distinct sets of decisions for which information requirements are relatively common and for which the relationships among the information used, the resulting decisions, and the consequences are relatively stable. Once these commonalities are discovered, the benefits would then be compared with the costs of systematically reporting the common information within the accounting system.

Although individual users of accounting information have a multitude of goals and types of decisions, the broad objective of the economy as a whole is defined to be the efficient allocation of resources.⁶

⁵ For example, consider the set of objectives that can be inferred from the expressed preference of an individual to be provided information on replacement costs. Some objectives that can be induced from this expressed preference and that are consistent with it (to mention only a few): (a) the wish to know the cost of reproducing the firm and its operations, (b) assessing managerial ability to maximize holding gains and minimize holding losses, (c) evaluating the managerial decisions with respect to timing of asset purchases, (d) judging the firm's future ability to finance its operation if it were to replace its existing assets and thus assess its chances for survival, etc. From these objectives numerous higher level objectives could be induced, such as the prediction of future holding gains or losses (inferred from objective (b) above), assessing future managerial ability to maneuver and capitalize on new opportunities (induced from both objectives (b) and (c) above), and evaluating the likelihood of default and material losses as a result of ceasing the firm's operations (inferred from objective (d) above).

⁶ This includes the efficient allocation of resources within the firm as one part of the economy, and it thus implies the provision of information to control and motivate actions within the firm to insure efficient allocation of the firm's resources.

When this objective is pursued within a private enterprise system in which it is assumed that individuals seek to maximize their wealth, the accounting objectives must be formulated so that the use of accounting information by individuals to maximize their wealth causes resources to be allocated most efficiently in the economy.⁷ Therefore, we need to study decision models used by individuals to maximize their wealth. Inasmuch as it is unrealistic to discuss the multitude of decision models that vary across decisions and individuals, we must attempt to classify decisions into groups that are homogeneous in their information requirements.

There are two primary classes of decisions generally made by individual consumers within the private sector of the economy: consumption decisions and investment decisions. The groups of decisions are interdependent. This discussion assumes a predetermined level of consumption as given and considers investment decisions only. While different groups of decisions may require different information, there are many commonalities in information required for making investment decisions.

Predictability and Comparability. Estimating the future levels of variables relevant to an investment decision is the basis for making the decision. For example, a decision to purchase a machine is based on an estimate of cash flows generated by it. The cash flows from an equity security are the dividends that will be received while the security is held plus the market value of the security when it is sold. Since it is always necessary to predict relevant variables to make investment decisions,⁸ one of the primary objectives of accounting is to facilitate the prediction of relevant variables. And indeed this objective has been extensively discussed in the literature in terms of the "predictive ability criterion."⁹

In addition, investment decisions are not made in a void; they usually are made in the context of choice among alternative competing activities. Thus, given a particular level of wealth, the primary decision is how to allocate that wealth among competing investment alternatives. Under these conditions the task is to compare the estimates of future relevant variables of the

⁷ Whether there are market forces which lead to optimal allocation as a result of individual actions or whether there are possible sub-optimality that necessitate information regulation is discussed in Joshua Ronen, "The Need for Accounting Objectives in an Efficient Market," contained in this volume, pp. 36-52.

⁸ Note that most of the current and noncurrent economic decisions in a firm can be viewed as investment decisions. Thus, an investment in a human resource is expected to generate services and therefore cash flows in the future. Advertising expenses that are related to public relations activities of the firm are no different.

⁹ W. H. Beaver, J. W. Kennelly, and W. M. Voss, "Predictive Ability as a Criterion for the Evaluation of Accounting Data," *Accounting Review* (October 1968), pp. 675-683.

investment alternatives and to choose that alternative promising the highest expected benefits. Comparability among the investment alternatives therefore needs to be specified as another important objective for accounting reports.

The Investment Model: Risk and Return. Stating the objectives of predictability and comparability is not sufficient. To make statements about the specific content of accounting reports, we must also specify what objects are to be predicted and compared. For example, predictability of future accounting income may be useful in satisfying the comparability criterion only to the extent that accounting income is the dimension along which different firms or their securities should be compared and ranked.¹⁰

As the normative investment model most generally used is the one based on portfolio analysis, it can thus be used as a basis to determine desirable accounting output. But the portfolio model should not be viewed narrowly, irrespective of the role of securities in the capital market in efficiently allocating the ownership of the economy's capital stock. Under equilibrium conditions, the savings made available through voluntary decisions on postponement of consumption must be invested in the best combination of securities, i.e., the combinations that produce the highest increment in social wealth (where wealth is understood to incorporate individual preferences of investors).

The Relationship with Economy-Wide Goals. To provide appropriate signals for optimal resource allocation, there must be an environment in which firms can make production and investment decisions and in which investors are able to choose among the securities that represent ownership of the firms' activities on the assumption that security prices "fully reflect" all available information. It is precisely because the empirical research related to the operations of the efficient markets supports the contention that

¹⁰ For a discussion of the impropriety of setting merely the predictability of accounting profit as a criterion, see Lawrence Revsine, "Predictive Ability, Market Prices, and Operating Flows," *Accounting Review* (July 1971), pp. 480-489. Any income is an artifact produced by a set of rules or "generally accepted accounting principles." It is quite plausible that accounting income could be a better predictor of future accounting income (which is measured on the basis of the same rules and conventions) than a measure of income reported on the basis of other measurements and rules such as current operating income, exit value income, etc. In fact, two recent studies support this contention. (See John K. Simmons and Jack Gray, "An Investigation of the Effect of Differing Accounting Frameworks on the Prediction of Net Income," *Accounting Review* (October 1969), pp. 757-776, and Frank Werner, "A Study of Predictive Significance of Two Income Measures," *Journal of Accounting Research* (Spring 1969), pp. 123-136.) The real question is whether future accounting income is the proper measure to be forecasted to form the basis of comparison among firms and whether there are other measures either replacing or in addition to the historical accounting income that better serve that purpose.

security prices "fully reflect" available information at any time¹¹ that the portfolio model is an appropriate basis for determining the objects to be predicted using accounting numbers. This is so because the objects to be predicted from the normative viewpoint must also be utilized to become legitimate objects of accounting.

Since security prices have been found to "reflect fully" all publicly held information and to react unbiasedly to new information, they can be said to reflect the intrinsic or "fundamental" value of the securities.¹² But, for security prices to serve as appropriate signals for optimal resource allocation, the intrinsic value of the stock must coincide with the economic value of the firm, which is defined as the risk-adjusted discounted value of the firm's prospective cash receipts and disbursements.¹³ Unless the security's intrinsic value coincides with the economic value of the firm, allocation of resources in the economy is sub-optimal since the marginal cost of capital would not be equal to the marginal expected rate of return. Thus, Pareto optimality conditions are violated.¹⁴

¹¹ For an extensive review, see the following:

Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance* (May 1970), pp. 383-417; "The Behavior of Stock Market Prices," *Journal of Business* (January 1965), pp. 34-105; and "Random Walks in Stock Market Prices," *Financial Analysts Journal* (September-October 1965), pp. 55-59.

Eugene F. Fama, L. Fisher, M. C. Jensen, and Richard Roll, "The Adjustment of Stock Prices to New Information," *International Economic Review* (February 1969), pp. 1-21. Benoit Mandelbrot, "The Variation of Certain Speculative Prices," *Journal of Business* (October 1963), pp. 394-419, and "Forecasts of Future Prices, Unbiased Markets and 'Martingale' Models," *Journal of Business* (January 1966), pp. 242-255.

Richard Roll, "The Efficient Market Model Applied to U.S. Treasury Bill Rates" (Unpublished Ph.D. thesis, University of Chicago, 1968).

Paul A. Samuelson, "Proof That Properly Anticipated Prices Fluctuate Randomly," *Industrial Management Review* (Spring 1965), pp. 41-49.

Myron Scholes, "A Test of the Competitive Market Hypothesis: The Market for New Issues and Secondary Offerings" (Unpublished Ph.D. thesis, University of Chicago, 1969).

Roger N. Waud, "Public Interpretation of Discount Rate Changes: Evidence on the 'Announcement Effect'," *Econometrica* (March 1970), pp. 231-250.

¹² As defined in Joshua Ronen and George H. Sorter, "Relevant Accounting," *Journal of Business* (April 1972), pp. 258-282, intrinsic value is the value that encompasses in an unbiased fashion all the relevant determinants of an entity. These intrinsic values depend on the earnings prospects of a company which in turn are related to economic and other factors some of which are peculiar to this company and some of which affect other companies as well (see Fama, "Behavior of Stock Market Prices," p. 36).

¹³ See Eugene F. Fama and Merton H. Miller, *The Theory of Finance* (New York: Holt, Rinehart and Winston, 1972), chap. 4, and M. H. Miller and F. Modigliani, "Dividend Policy, Growth and the Valuation of Shares," *Journal of Business* (October 1961), pp. 411-433.

¹⁴ For a discussion of Pareto optimality conditions, see, for example, E. J. Mishan, "A Survey of Welfare Economics, 1939-1959," *Economic Journal* (1960).

If the portfolio model is used in making investment decisions that result in the determination of stock prices, then for optimal resource allocation, the information inputs utilized in the models should best reflect the economic value of the firm, i.e., the prospective cash flows and their risks.¹⁵ Stated another way, assuming that the portfolio model is used by investors and given that (a) security prices should reflect the economic value of the firm and (b) that security prices fully reflect the available information and unbiasedly and instantaneously adjust to new information, the primary objective of accounting emerges as providing information that facilitates the prediction of prospective cash flows and their risks.¹⁶ The derivation of this objective is shown schematically in Figure 1, opposite.

Reliability. Although predictability and comparability are two necessary ingredients (or sub-objectives) of the process of assessing future flows and their uncertainties, predicted and comparable flows and their uncertainties should not and probably will not be used if they are unreliable. Thus, reliability is an objective that is deduced from the higher level objectives in the hierarchy and is presented as a third sub-sub-objective in Figure 1.

Perhaps reliability can best be defined through its elements. Many factors can contribute to the reliability of information. One is whether the information resulted from a consensus about a value or an event that is contestable. The magnitude that results from the consensus would be more reliable than if the consensus involved noncontesting parties. For example, market prices result from the consensus arrived at by buyers and sellers.

¹⁵ The informational inputs to the portfolio model (which generally assumes that returns on stock are normally distributed) consists of (a) the one period return on securities which is defined as:

$$r_{jt} = d_{jt}/p_{jt} + (p_{j,t+1} - p_{jt})/p_{jt}$$

where r_{jt} is the return on the security during time period t , d_{jt} is the dividend payment during time period t , $p_{j,t+1}$ is the price of security at the end of time t , and p_{jt} is its price at the beginning of time t , and (b) the risk associated with the expected return which is generally measured as a standard deviation of the normally distributed return, although other investigators [e.g., see Fama "Behavior of Stock Market Prices," Maurice G. Kendall, "The Analysis of Economic Time-Series, Part I: Prices," *Journal of the Royal Statistical Society*, XCVI (1953), pp. 11-25; Benoit Mandelbrot, "Variation of Certain Speculative Prices"; Arnold Moore, "A Statistical Analysis of Common Stock Prices," (Unpublished Ph.D. thesis, Graduate School of Business, University of Chicago, (1962)); M.F.M. Osborne, "Brownian Motion in the Stock Market," *Operations Research* (March-April, 1959), pp. 145-173; S. James Press, "A Compound Events Model for Security Prices," *Journal of Business* (July 1968), pp. 317-335; and Richard Roll, "Efficient Market Model Applied to U.S. Treasury Bill Rates" (Unpublished Ph.D. thesis, University of Chicago (1968)] tested a broader class of distributions and, in particular, the class of stable Paretian or Pareto-Levy distributions which include the normal distribution as a special case.

¹⁶ Clearly, it can be argued that this information need not necessarily be provided by the firm (either through its accounting system or otherwise). This particular point as well as the interesting question of whether market forces exist that guarantee the provision of this information without the necessity of formulating accounting objectives is discussed by Ronen, "Need for Accounting Objectives in an Efficient Market."

OBJECTIVES HIERARCHY: INFORMATION BENEFITS

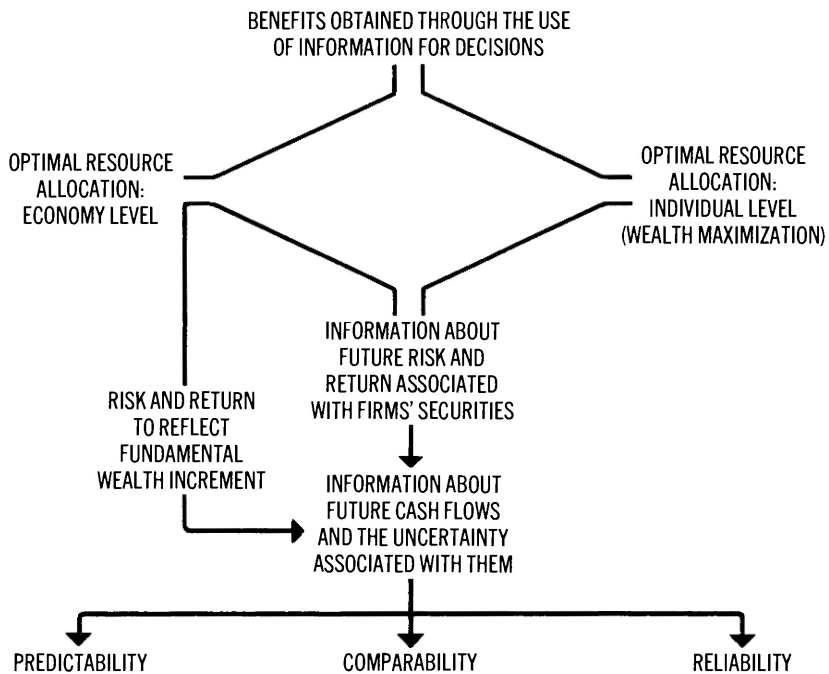


Figure 1

Sellers wish to obtain as high a price as possible for the commodity sold; buyers wish to pay as little as possible. When these contesting parties come to a consensus as reflected in market prices, the market prices can be said to be reliable estimates of the future utility and benefits of the commodity.

The ability to validate information or magnitude of events is another element of reliability. The magnitude of events such as forecasts can be validated through comparing the forecasts with actual occurrences over time. Future forecasts would be considered to be more reliable if the deviations between past forecasts and actual results are small. Information can also be validated through the ability to verify the magnitudes in question. Verifiability can be obtained either through visibility of the magnitudes, for example, through actual cash transactions, or through documentation of the magnitude, as by a legal contract or court decision. The sub-objectives relating to reliability are depicted in Figure 2, page 88.

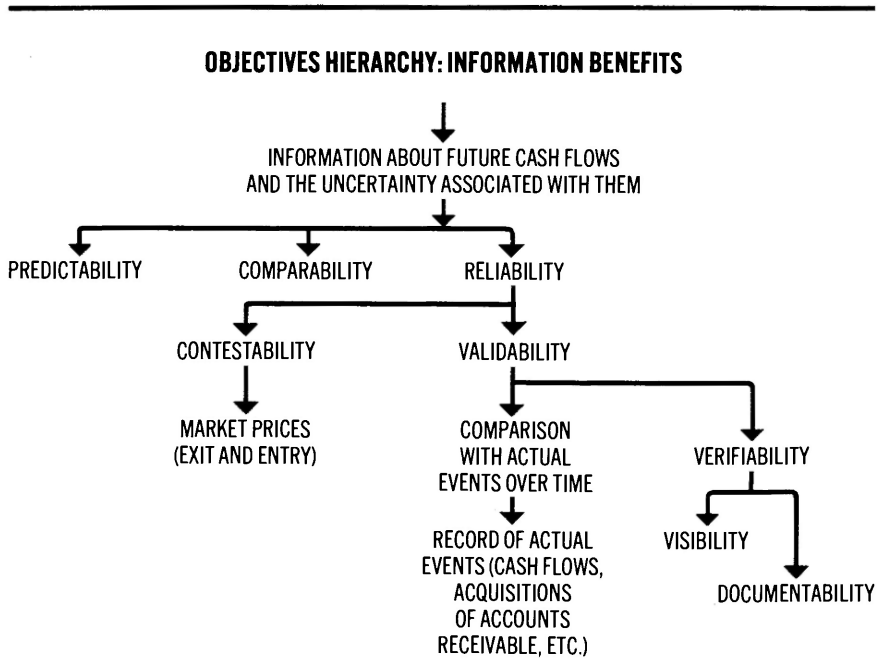


Figure 2

Benefits Obtained Through Actions Made Possible by Steps Required in Providing Information. The process of providing information yields two types of benefits. One type results from using the information; the other results from the actions of individuals motivated by the mere necessity to provide the information. The necessity to provide the information may cause actions that are either beneficial or harmful to the efficient allocation of resources. The mere provision of information may facilitate the control and coordination of factors of production (including the firm's labor force) and goal congruence (conformity of the actions of the firm's personnel with the goal of the firm as a whole). The data required for providing information may also be used to trace the actions of the various employees of the firm and to facilitate control. From the sub-objectives of control, coordination and congruence we can deduce the need for providing forecasts and budgets to coordinate future activities and also the need to keep a record of actual events for comparison with forecasts.

For optimal allocation of the firm's resources, managers and employees need to have profit maximization as a goal. This motivation can be facilitated both by the preparation of budgets and subsequent comparison of results

with budgets,¹⁷ and also by compensation of the firm's personnel at amounts that equal their marginal productivity. From this latter objective we again derive the need to record actual events and performance. For the forecasts to be effective in producing desired benefits both within the firm and outside of it, internal and external forecasts should be the same. This aspect of the benefits of providing accounting information is schematically depicted in Figure 3, page 90.

Timeliness and Availability of Accounting Information. To optimize resource allocation, it is also desirable to minimize the time lags between the point at which new information about expected cash flows and their uncertainties first become known and the point at which allocation decisions are made. The faster that new information is made available, the shorter the time lapse until the decision is made and consequently, the shorter the period during which the economy's capital is not optimally allocated. Therefore, information on expected cash flows and their uncertainties should be disseminated as fast as possible once it becomes known. This constitutes the sub-objective of timeliness derived in Figure 4, page 91. How fast information should be disseminated and the frequency of the dissemination depend on the cost/benefit relationships.

To allocate resources optimally, it is also necessary to maximize the number of individuals who possess information on expected cash flows and their uncertainty about different firms. The wider the dissemination of knowledge about alternative combinations of risk and return relative to different securities, the more likely are resources to be channeled to their best use as a result of competitive bids for the more profitable securities. Accordingly the sub-objective of wide public dissemination of accounting information is derived in Figure 4.

Information for Social Goals

Another derivative of the objective of optimally allocating resources within the economy consistent with private maximization of wealth is the need to equate marginal social cost and benefits with marginal private cost and benefits. Loosely speaking, where the actions of the firm affect only its own costs and benefits there would be no divergence between private values (costs and benefits) and social values. In this case, the decision and actions taken in pursuit of the firm's own interests will result in the optimization of both private wealth and the economy's wealth. Where the actions of an individual firm do affect, however, the consequences of other firms' or indi-

¹⁷ Budgets may have a beneficial effect in motivating the work force, but they could also reduce motivation as a result of the manner in which they are generated and their magnitude. The behavioral link between the preparation of budgets and ultimate productivity is complex. For a discussion of this issue, see Joshua Ronen and J. Leslie Livingstone, "An Expectancy Theory Approach to the Motivational Impacts of Budgets" (Unpublished manuscript, The University of Toronto, 1973).

OBJECTIVES HIERARCHY: INFORMATION BENEFITS

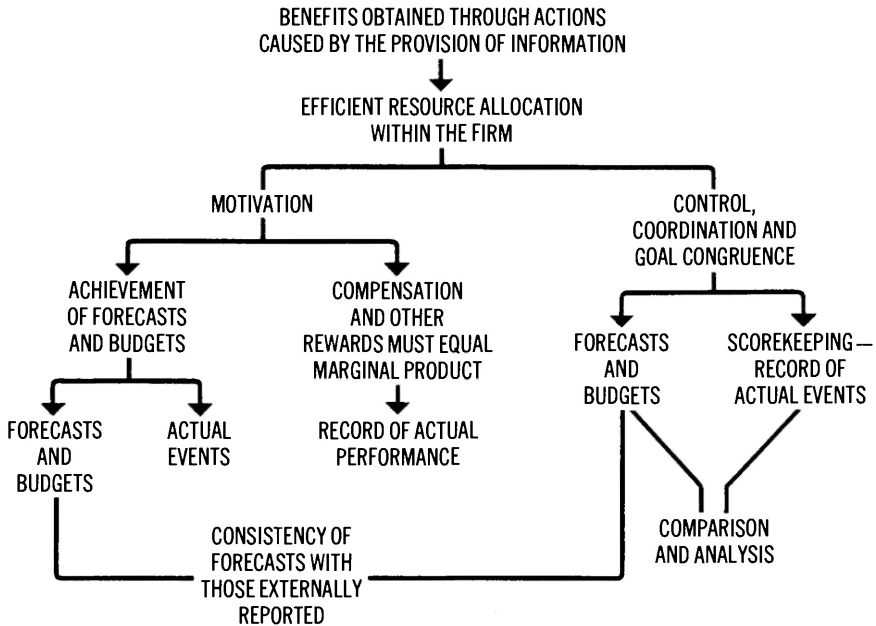


Figure 3

viduals' actions, then pursuing only private benefits *may* not result in the optimization of social benefits or in an efficient allocation of resources. In this case, an accounting objective that is restricted to the consideration of private benefits and costs may require the communication of data that will not meet the social objectives.

It is possible that private profit maximization by a firm will also bring about an efficient allocation of resources, even when the firm's actions directly affect the consequences of other firms' actions. This would be the case when the firm takes into account these effects before it makes its decisions. If the firm is to maximize its profits in the most rigorous sense, it must take into consideration the effect of its actions on other firms or individuals. These effects fall within the normal economic definition of opportunity costs and should therefore be explicitly considered along with other costs in making rational decisions. Reflecting opportunity costs make it possible for accounting report users to properly assess managerial per-

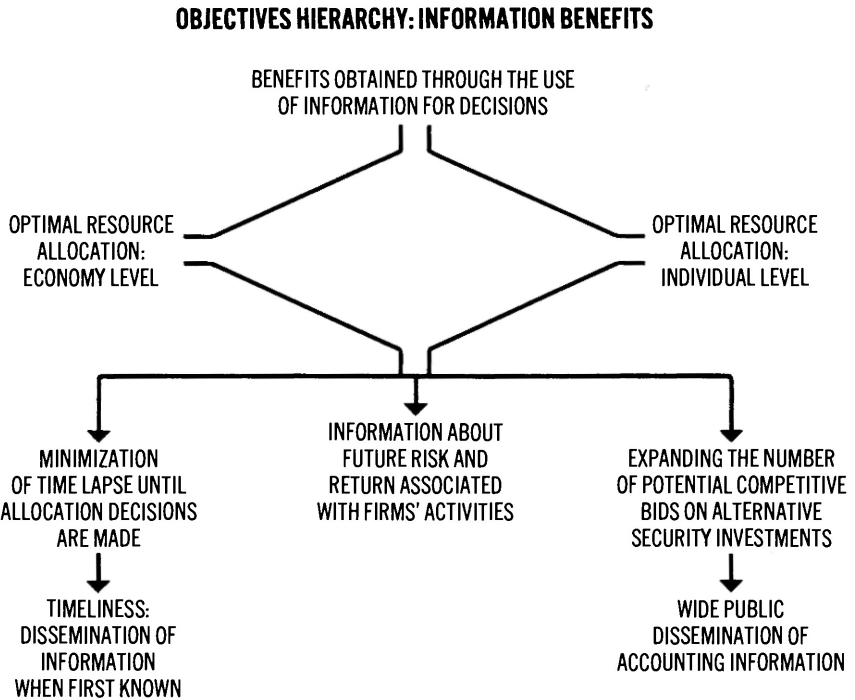


Figure 4

formance. But, in addition, if income figures that result from actual past transactions are deemed to be at all important (both in providing a record of actual past transactions to fulfill the stewardship function of accounting as well as in providing the means to validate past managerial expectations), it is evident that these opportunity costs should be treated in the same manner as other production costs.

The issue becomes more complex when the effect of the firm's actions on others is not or cannot be adequately considered when making decisions within the firm. This would be the case, for example, when the price mechanism of the market, which enables the firm to consider such facts directly in its decisions, either does not exist or is too costly. Operationally, this means that transaction costs such as conducting negotiations, drawing up contracts and inspection are higher than the benefits of adjusting the firm's actions on the basis of the expected effects of these actions on other entities.

In this case, pursuing private interests will not lead the firm to bring about a socially desirable allocation of resources, and governmental intervention, through the legal determination of rights, regulations, and policing, may eventually become necessary.¹⁸ Indeed, because of its power, the government may be able to bring about corrective action at a lower cost than would a private organization. Although the governmental machine may be extremely costly, it may be the alternative to private action. Under these circumstances, the gathering and communication of information about social costs are desirable even in the absence of a potential solution at the private level because:

1. The communication of such information may (subject to the determination that the information is best processed by the firm creating the harmful side activity) lead to a proper kind of governmental intervention that achieves efficient allocation of resources, also indicating that such information should be helpful in determining which of the alternative social arrangements is optimal for dealing with the externality.

2. On the assumption that an efficient market would eventually lead to desirable social action, the communication of information about the cost to the firm that will probably be associated with whatever social arrangement emerges will provide the user of financial statements with better means to appraise the future prospects of the firm.

In Figure 5, opposite, the sub-objective of equating marginal private costs and benefits with marginal social costs and benefits is therefore indicated as a derivative of the optimal resource allocation within the economy, consistent with the optimal allocation at the individual level. Any divergences between marginal private costs and benefits and marginal social costs and benefits need to be reliably predicted and compared among firms. This need is reflected in Figure 6, fold-out, by an arrow connecting the objective of equating the private values with social values to the sub-objectives of predictability, comparability and reliability.

The sub-objectives developed so far from the overall objective of optimal resource allocation (individual and economy-wide levels) can be summarized as follows:

1. Providing information about future risk and return associated with the firm's security: This leads to the requirement of information about future cash flows and their uncertainty.

2. Timeliness: Dissemination of information when first known in order to minimize the time lapse until allocation decisions are made.

¹⁸ For a more lucid discussion of this issue, see R. H. Coase, "The Problem of Social Cost," *Journal of Law and Economics* (October 1960). Also, for a more detailed treatment of the accounting implications of social costs and benefits, see Joshua Ronen, "Accounting for Social Costs and Benefits," contained in this volume, pp. 317-340.

OBJECTIVES HIERARCHY: INFORMATION BENEFITS

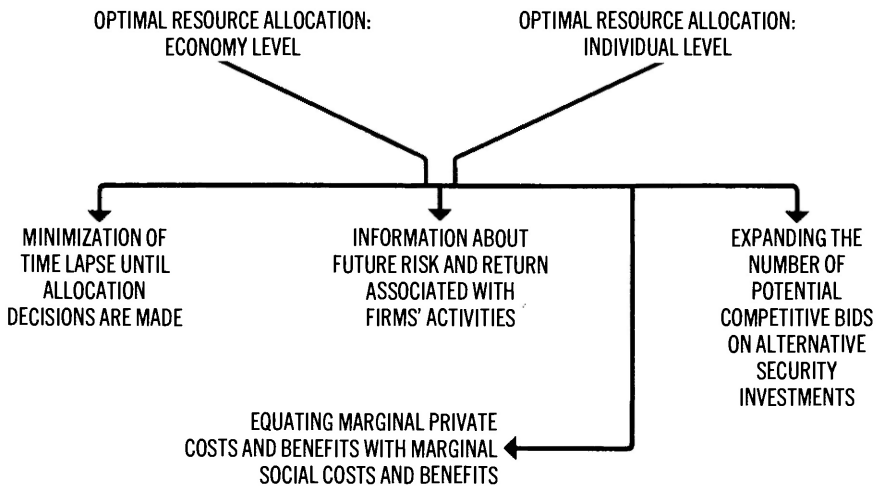


Figure 5

3. Wide dissemination of information to expand the number of competitive bids on alternative security investments.

4. Providing information about divergences between marginal private costs and benefits and marginal social costs and benefits.

From the objective of providing information on future cash flows and uncertainty, the sub-objectives of predictability, comparability and reliability were derived. That is, the accounting objectives so far can be summarized as the timely and wide dissemination of information that enables users to reliably predict and compare expected cash flows and their uncertainty, as well as predicting and comparing divergences between private and social values across firms.

Elements of Predictability and Comparability. Elements of predictability and comparability are diverse and could vary in their degree of importance depending upon the firm's circumstances. However, some general guidelines can be developed as sub-objectives derived from predictability and comparability. Figure 6 which reflects the total hierarchy of objectives and sub-objectives (and which incorporates Figures 1 through 5) depicts the development of the predictability and comparability elements.

Prediction can be facilitated if the events that are to be predicted can be associated with other events or dimensions which are either known or more easily predicted.¹⁹ The most obvious information that helps predict future events is a record of the past occurrences of that event. Past occurrences of an event could be extrapolated into the future in accordance with simple rules (at the rudimentary level of analysis) or through use of a more formal and rigorous prediction model (e.g., time series analysis).²⁰ Thus, we derive the sub-objective of providing information on past cash flows to improve the prediction of expected flows.

Secondly, fluctuations in the firm's volume of output may explain variations in some of the costs. Therefore, knowledge of (or estimate of) future output volume may well facilitate the prediction of future levels of cost with more accuracy than if the nature of the association between volume of output and costs was either not known or not disclosed. Since costs fixed relative to output will occur at about the same magnitude and costs that are variable in relation to output will tend to fluctuate,²¹ providing information separately about these fixed and variable costs may make possible a better prediction of future costs.

Certainly, output is not the only dimension or variable with which the movement of costs or any other variables that are to be predicted can be associated. Association can be made with inputs, with activities such as product lines and segments of firms, etc.²² In addition, present practice

¹⁹ This is the primary motivation for the common regression analysis. See, for example, George Benston, "Multiple Regression Analysis of Cost Behavior," *Accounting Review* (October 1966), pp. 657-672, and Robert Jensen, "Multiple Regression Models for Cost Control—Assumptions and Limitations," *Accounting Review* (April 1967), pp. 265-272.

²⁰ For example, several studies revealed that accounting income could be a better predictor of itself, that is, of accounting income (if the latter is obtained through the same system of rules and measurement as the former) than the other types of income (such as replacement cost income). Also, studies under way explore the statistical properties of time series of events to develop criteria for improving predictions. Thus, providing information about cash flows may help improve the prediction of future cash flows either directly or through the development of such criteria.

²¹ See, for example, R. S. Gynther, "Improving Separation of Fixed and Variable Expenses," *NAA Bulletin* (June 1963), pp. 29-39, and National Association of Accountants, *Accounting Practice Report No. 10*, "Separating and Using Costs as Fixed and Variable," *NAA Bulletin* (June 1960).

²² The objective of associability leads (when associability is made with product lines) to the separate reporting by product lines and segments that is the subject of much debate now. Clearly, the degree to which such information is to be reported on product lines is the subject of research into the cost of this form of reporting. Part of the cost may be the reduced motivation and ability to generate profits through revealing information beneficial to competitors. This latter occurrence would violate the objective of motivation and the sub-objective of the equality of reward with the individual marginal product that appears elsewhere in the hierarchy as discussed above.

suggests that the associability of costs with manufacturing and selling and administrative functions may motivate the separate reporting of costs by functions. Predictability seems to be the implicit objective that accountants have in mind when they disclose the underlying components such as revenue, cost of sales, and operating expenses, which determine the resulting net income figure. In fact, recent evidence suggests that separate components of the income measurement process may be better forecasted than net income itself which is an algebraic sum of the components. Thus, firms were found to be able to forecast revenues, for example, with more accuracy and precision than net income.²³

The Time Dimension. One of the major dimensions with which events are generally associated and which is important in prediction is the time dimension. Events that are associated with time are said to be recurring events. Those which are not associated with time are called non-recurring events. The items that are generally grouped as operating expenses and operating revenues tend to be recurring items, whereas the non-recurring items are usually labeled as extraordinary revenue or expense items. Prediction on the basis of a series of past events is made with less errors if the process that generates these events and their measures is well defined and stable. The firm's return is generally the aggregate of many and different processes. When prediction is based on a separate component, each identifiable with a particular generating process, it is apt to be more accurate than when it is based on an aggregate measure that obscures the underlying relationship. Thus, better prediction is presumably made possible by analyzing the time trend of income generated by recurring events more than by analyzing a trend of income that results from both recurring operations and less stable processes. Therefore, disaggregation of events along the dimension of recurrability becomes another criterion that facilitates prediction.

Discriminability Among Information Sources. Associability of events of interest with past events or past dimensions is not the only criterion that may facilitate the improvement of prediction. An important element in facilitating prediction is obtaining estimates (even though subjective) from people who may possess information about the future that makes their own prediction of future relevant events an important input into the predictions of the users of financial statements. The persons who may have some knowledge about the future are likely to be the firm's management.

As indicated earlier, the object of prediction is expected future cash flows and the uncertainty associated with them. But both the cash flows and their uncertainty depend on the specific plans and actions which are affected by and *first* known to the management of firms. Since such plans are de-

²³ See R. A. Daily, "The Feasibility of Reporting Forecasted Information," *The Accounting Review* (October 1971), pp. 686-692.

signed to give the firm a competitive edge, they are bound to have significant informational content.²⁴

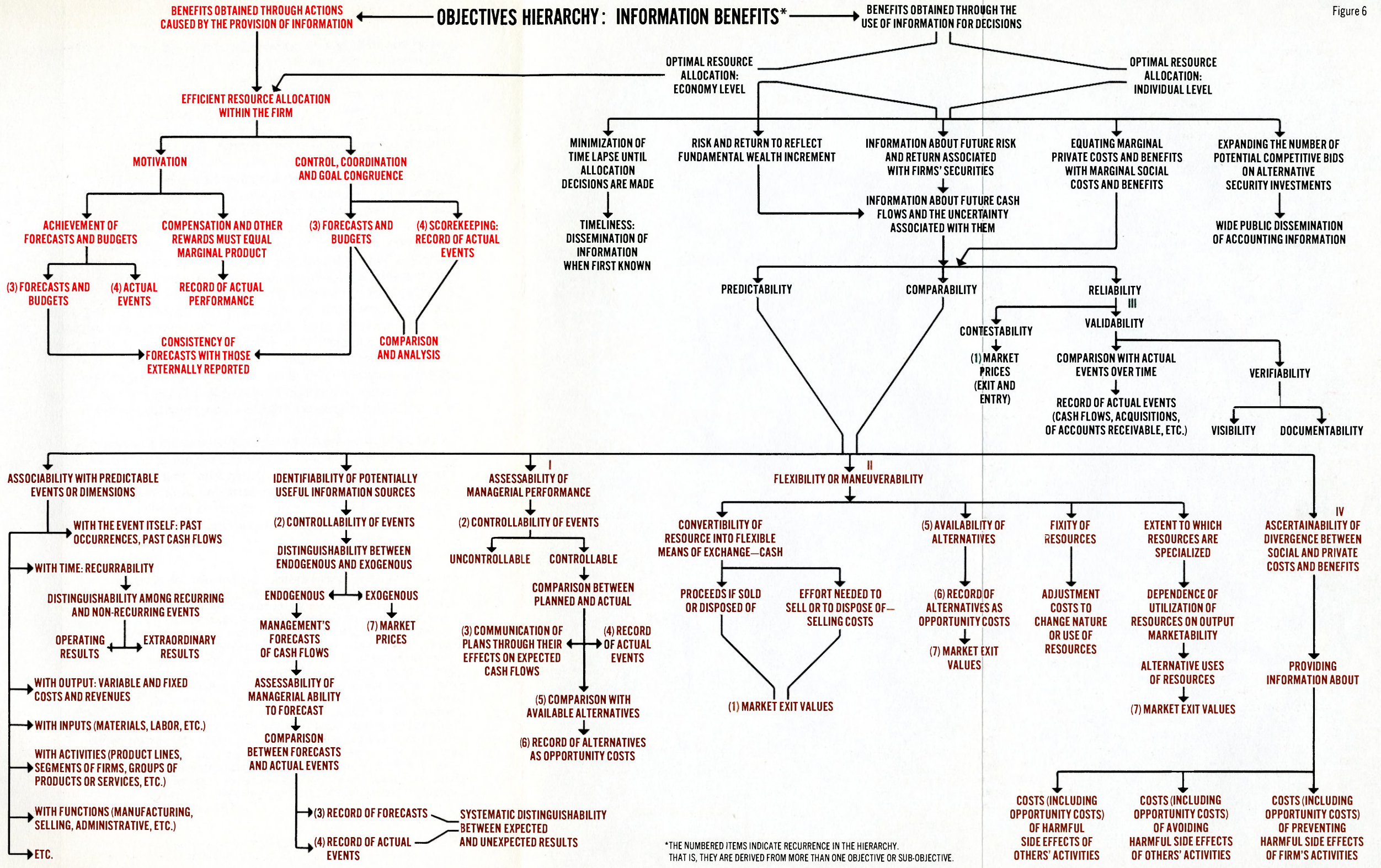
Because a firm's management is the first to know its plans, timely forecasts may prove to be a valuable input to the users of financial statements in predicting future cash flows. Management is in the best position to assess the effects that its specific plans (unknown to others unless communicated) have on future cash flows. It would therefore seem desirable for management to communicate its expectations concerning these cash flows.²⁵ Managers, however, are not infallible. Expectations based on their plans may diverge from actual results because of the randomness of the underlying events or different interpretations of future events by managers and the market. The difference in interpretation may exist because of two major factors that affect future cash flows: (a) market and industry events that affect all the firms—exogenous factors, and (b) the particular performance of the firm in question, that is, the specific plans or resources, employment decisions made by management, etc. These specific firm decisions are responsible for whether the firm accumulates more or less value than the industry or the market. These are the endogenous factors.

Exogenous factors, contrary to the endogenous, are primarily beyond the firm's control. They may be predicted by relying on the market's expectations as reflected in market prices, but the best source for predicting endogenous factors is probably the firm's management. Thus, the dimension of controllability of events becomes an important criterion in facilitating prediction.²⁶ The dimension of controllability facilitates prediction not only directly through identifying the source from which expectations are to be obtained—market transactions and market prices for the exogenous factors and management's forecasts for the endogenous factors—but it also facilitates prediction through enabling users to assess managerial performance. Clearly, the past ability of management to forecast, perform and carry out

²⁴ This is generally information that is not currently and systematically made widely available to the market. Some evidence on this is provided by Scholes, "Test of the Competitive Market Hypothesis," who found that corporate insiders often have monopolistic access to information about their firms which if made available would contribute to a better allocation of resources (see Ronen, "Need for Accounting Objectives in an Efficient Market").

²⁵ Notice that the detailed plans themselves do not have to be made available, only the management expectations concerning cash flows which are contingent on these plans. Consequently, there should be no reluctance by management, out of fear of leakage to competitors, to reflect this information.

²⁶ A perfectly competitive firm does not possess any particular advantages that allow it to affect its output price by varying its supply and will therefore not earn more than the normal rate of return. It can be said then that the firm's increment in its wealth is determined entirely by exogenous market and industry factors. A monopolistic firm possesses a unique asset (skilled labor force, managerial know-how) that enables it to affect the price of its differentiated product. In this case, the firm can be said to bring its *endogenous* variables to bear on its output price aside from the industry-wide exogenous factors, and it can thus produce higher than a normal rate of return.



plans successfully is an indicator of future performance and therefore represents important input to the prediction process. Further, information about management's particular plans and their results provides insight into risk-taking tendencies of management and, therefore, the future likelihood of engaging in risk-taking activities. Thus, the ability to identify potentially useful information sources can enhance the predictability of relevant events. This is indicated as one of the sub-objectives emanating from the predictability and comparability objectives in the hierarchy shown in Figure 6.

Controllability is only one dimension that could facilitate the identifiability of potentially useful sources (through indicating, for example, that management is potentially a more useful force for predicting the endogenous factors under its control than for predicting the exogenous factors outside its control). Other dimensions may also make identification of the more competent sources for providing information on future events possible. For example, among exogenous factors, different information sources have different degrees of usefulness and competence in providing information about relevant events. Interest rate fluctuations, the money reserve, and credit terms are factors; information concerning them is probably best obtained from the Federal Reserve. Information on the availability of raw materials and future prices, on the other hand, is probably best obtained through observing trends in the supplying industries. However, while other dimensions could be identified, only the controllability dimension is shown in Figure 6 since it serves to indicate a major dichotomy between the exogenous and the endogenous variables.

The distinction between the exogenous and endogenous variables leads (as shown in the hierarchy) to the identification of management as the most competent source for predicting endogenous variables. Since users are interested in expected cash flows and their uncertainty, management forecasts of endogenous variables can be communicated by assessing the endogenous effects on future cash flows accruing to the firm.²⁷

²⁷ While there are many ways for managers to communicate future endogenous events, the forecasts of cash flows by management were chosen in the hierarchy because: (a) such forecasts provide a quantification of the endogenous variables in dollars and (b) since the effects on cash flows will depend on the assumptions implicit in management's forecasts with respect to exogenous factors, such assumptions would be reflected through the forecasts of the total cash flows. These assumptions could also be explicitly stated when management provides its cash flow forecasts. It is important for users to know these assumptions, since if they are considered unrealistic, the quantification of the endogenous effect on the cash flows can then be modified. By communicating future endogenous events via their effects on cash flows, an aggregate measure could be provided if so desired. Provision of management's assessment of endogenous variables through forecasted cash flows certainly does not exclude other ways of communicating this information. Further research is needed to point out the better alternative means. For a recent suggestion to communicate management's probability distribution of forecasts conditioned upon different expectations with respect to exogenous variables, see Amir Barnea and G. Joseph San Miguel, "The Relevance of Earnings Forecasts" (Unpublished manuscript, New York University, 1973).

The best source for predicting the exogenous factors is probably the market itself. It has already been indicated that different sources could be of different competence or reliability in predicting exogenous factors. However, the research on efficient markets indicates that available information in a market (including information affecting exogenous factors relevant to the particular firm) is generally impounded in market prices (whether they are securities or other capital assets). Market prices, therefore, probably best reflect the effects of relevant exogenous factors on the firm. For example, fluctuations in the price of a firm's output reflects anticipated changes in the demand for that output, which is an exogenous factor that is relevant to the firm. Similarly, fluctuations in the market prices of inputs would reflect expectations with respect to changing conditions in the supplying industry and/or the emergence of competing inputs. This leads to the conclusion that market prices should be the source for predicting the exogenous factors that impinge upon the firm's activities, as shown in Figure 6 by the arrow extending from the exogenous branch of the exogenous and endogenous dichotomization.

Proceeding from the endogenous branch and the need for management to communicate its cash flow forecasts, it is necessary for users to assess reliability of the future forecasts. To do this they need to be able to assess management ability to forecast with reasonable accuracy. To assess management ability to forecast, comparison between management forecasts and actual events must be made.²⁸ Thus, the recording of forecasts *and* actual events (to be compared with forecasts) emerges as a desirable objective. To highlight the deviations of actual events from forecasted events, it is desirable to distinguish between expected and unexpected results of operations in the records. The quantification of unexpected events provides a record of management's "errors" and would be useful in assessing—through the observation of the magnitudes of these errors over an extended period of time—the ability of management to forecast within a reasonable degree of accuracy. Thus, Figure 6 indicates the systematic distinguishability between expected and unexpected results as an objective of accounting.

Assessability of Managerial Performance. Since the firm's progress hinges primarily on management performance, the ability to assess this performance is an important element in facilitating the predictability of the firm's flows and the comparability of these flows across firms. But to facilitate

²⁸ Thus, it could be argued that in the short run, managers could deceive users by deliberately communicating biased forecasts. But it should be remembered that managers who are likely to do so, when required to communicate forecasts, will probably "volunteer" biased forecasts in the absence of such a requirement. (As is well known, managers presently communicate forecasts in an ad hoc, sporadic fashion.) The requirement to incorporate forecasts systematically and periodically within the accounting system serves at least to deter biasing forecasts since it makes possible the subsequent systematic and periodic comparison of forecasts with actual events.

the assessment of managerial performance, it is essential to distinguish between controllable and uncontrollable events. Thus, the dimension of controllability is important in two respects: one for the identifiability of useful information sources and the other for the assessment of managerial performance. In the hierarchy (Figure 6) several situations are encountered where the same objective is derived from more than one higher level objective. This is indicated by numbers reflected in Figure 6. For controllable events, a comparison needs to be made between management's plans and actual results. The degree of management's success is assessed through both the soundness of their plans and the ability to meet these plans. Furthermore, both management's plans and actual results need to be compared with alternative plans and actions that were available to management. From the need to facilitate such comparison and evaluation can be deduced the objective of providing a record of alternative actions which, for example, could be reflected through the communication of opportunity costs. Thus, from the objective of assessment of managerial performance, two sub-objectives can be deduced which have already been derived through other objectives in the hierarchy. One is the communication of management's forecasts and the effect of specific plans on these forecasts and the record of actual events to be compared with the actual forecasts.

Flexibility or Maneuverability. Of primary importance for predicting the risk associated with the firm's cash flows (but also for assessing return) is the degree of flexibility or maneuverability that the management of the firm possesses in employing its resources. The more numerous the alternatives open to management for utilizing its resources, the greater its resilience to adverse environmental effects such as a decline in demand for its product. A systematic record of the alternative employments of available resources and possibly the resources' opportunity costs will facilitate the assessment of such alternatives. One readily available alternative for the firm's resources is disposal of them. Market exit values of the firm's resources quantify this alternative and are therefore an objective that is derived from the higher level objective of providing information on the availability of alternatives.

Market exit values also satisfy two other sub-objectives that may be derived from the flexibility criterion. These are the convertibility of the resources into flexible means of exchange and the extent to which resources are specialized. Clearly, the more convertible the firm's resources into cash and the greater the magnitude of cash that could be potentially received for them, the more flexible is the firm's management and the higher the degree of maneuverability of the firm's resources. If the market exit values of the firm's resources are small in their relative magnitude, a small number of alternative uses of these resources outside the firm is indicated, and therefore the utilization of the resources within the firm will be highly dependent on the marketability of the firm's specific output. The greater the extent to which these resources are specialized (in the sense of being thus dependent) the lesser is the degree of maneuverability available for management and the less flexible is management in using the assets.

Another factor that affects management flexibility is the degree of fixity of the resources. That is, the extent to which adjustment costs need to be incurred to change the use of the resources. The higher the adjustment costs, that is, the greater the fixity of the resources, the higher are the risks associated with the firm's flows in case adverse environmental effects cause the demand for the firm's output to decline. The flexibility and maneuverability criteria are sub-divided in the hierarchy into four separate (although in effect interrelated) sub-objectives:

1. Convertibility of resources into flexible means of exchange—cash: This sub-objective leads to the objective of providing market exit values as a reflection of the proceeds of resources, if disposed of, less the costs incurred to dispose of the assets.

2. Availability of alternatives: From this can be derived the need to record alternatives, such as opportunity costs. A readily available opportunity cost of the firm's resources is their proceeds. Thus, market exit values are derived again as a sub-objective.

3. Fixity of resources: From this attribute can be derived the need to communicate adjustment costs to change the nature of the use of resources.

4. The extent to which resources are specialized: To reflect the degree of specialization, there must be some indication of the dependence of the utilization of resources on output marketability. Such a dependence could again be reflected through communicating the possible alternative uses of resources, e.g., through use of market exit values.

From the objectives of flexibility and maneuverability two sub-objectives seem important. These are market exit values of the firm's resources and the opportunity costs of such resources, that is, a record of the resources' value in alternative uses. The numbers shown beside some of the sub-objectives in the hierarchy indicate *recurrence* in the hierarchy. In other words, they are derived from more than one objective or sub-objective. While greater recurrence of the sub-objective in the hierarchy does not necessarily indicate that a particular sub-objective is more important, this is likely to be the case.

Ascertainability of Divergences Between Social and Private Costs and Benefits

To make possible the prediction of future divergences between social and private values (costs and benefits) as well as the possible alternative means of dealing with these divergences either at the individual or the governmental level, information must be provided about both past and present divergences between social and private values. The information needs to be provided concerning the following:

1. The actual cost to a firm (including opportunity costs) of harmful side activity engaged in by other firms or entities: Probably, the firm is in the best position to measure and quantify the costs here in the form of direct expenditures or in the form of lost income that it incurs because of harmful externality

(such as pollution, noise, fumes, etc.) caused by another entity. It follows therefore that quantification of these costs for either private action or governmental intervention is best made and communicated by the firm itself, possibly as a part of its accounting system.

2. The costs of avoiding the side effects of others' activities: Certainly if the cost of avoiding the harmful side effects is less than the cost of the harmful side effects if not avoided, the cost of avoidance is relevant quantification of the social costs of the side effects (if the side effects only affect this particular firm). For any governmental action, this cost which can probably be best estimated by the affected firm is a necessary factor in determining the optimal action.

3. Another relevant factor in determining the optimal corrective action is the cost which the firm causing the harmful side effect would incur to prevent it. The magnitude of this cost must be compared to the cost of the side effect to the affected firm as well as to the cost of avoiding that effect by the firm before a decision about the appropriate corrective action can be made.

Summary

Figure 6 shows the hierarchy of objectives and sub-objectives. Each sub-objective was derived from the analysis of information needed to obtain a higher level sub-objective in the hierarchy. While the derivation of objectives and sub-objectives flows in the figure from top to bottom, i.e., from the highest level and the broadest objectives to lower level objectives, the formulation of the high level objectives was at least in part based on how and for what purpose presently provided information is used.

The importance of the framework depicted in Figure 6 lies in the way that objectives or sub-objectives are derived. While both benefit and cost considerations are required to identify objectives, we first concentrate on the identification of the more common benefits to be derived from accounting information. The benefits are based on pervasive normative decision models of major groups of users. Once the overall objectives are formulated, sub-objectives and sub-sub-objectives are derived until different proposed accounting formats and alternatives can be discriminated by assessing and evaluating them in light of the hierarchy of objectives.