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Academic Research in Accounting and Auditing

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HISTORICAL BACKGROUND

In 1916 academic accountants founded the American Association of University Instructors in Accounting, later renamed the American Accounting Association (AAA). Initially serving as a means to facilitate communication among accounting educators, permit discussion of subjects of interest in the field, and promote curriculum improvements (Zeff, 1966), AAA soon became a major force in the development of accounting research.

It was for this purpose that AAA launched *The Accounting Review* in 1926, with William Paton as editor. The early years of the *Review* emphasized accounting, law, and economics, to the detriment of auditing and taxation. The lack of legislative bodies in this field allowed authors to suggest a wide range of possible

solutions to accounting problems. Eric Kohler, editor of the *Review* from 1928 to 1943, began an editorial column promoting the development of accounting principles, and in 1936, AAA published *A Tentative Statement of Accounting Principles Underlying Corporate Financial Statements.* Chatfield (1975) states that "*Review* articles of the late thirties laid the conceptual foundation for most of the Accounting Research Bulletins which appeared during the next two decades" (p. 4).

Before the mid-1950s, the literature of accounting research consisted mainly of opinion and internal logic. During the 1950s and early 1960s, however, scholarly work in accounting turned toward empiricism and interdisciplinary approaches.

The 1950s saw considerable attention given to accounting valuation, electronic data processing, and the need for scientifically supported assertions and theories. Cases and empirical data began to appear in the literature, introducing more scientific approaches to accounting research. The early 1960s brought other disciplines into the field, techniques from mathematics and economics being the most frequent imports. In 1963, the University of Chicago began publication of the *Journal of Accounting Research,* which emphasized empirical research and brought about considerable change in the nature of the support of accounting theories. It has had a major impact on the formulation of contemporary accounting thought.

In the 1970s, accounting research borrowed still more from other disciplines, including statistics (audit sampling and the empirical testing of theories), psychology (behavioral hypotheses and theories), sociology (contingency theory and agency theory), and economics (efficient market studies). *The Accounting Review* and the *Journal of Accounting Research* became more academic and theoretical, presenting major difficulties for lay comprehension, while the many professional journals sponsored by public and management accountants seldom if ever presented major research contributions. Today the gap between these two types of publications is wide, though a few new publications such as the *Journal of Accounting, Auditing and Finance* are attempting to bridge it. The aim of this chapter is to provide a framework enabling practitioners to comprehend the current status of accounting research and its prospectives.

Early accounting researchers were either practicing accountants with little formal training or economists who approached accounting problems with an interest in economic valuation and resource allocation issues. The first uses of empirical methods in accounting research were made by accountants trained in schools of commerce or business. They focused on the relationships between accounting and economic events and attempted to improve and simplify accounting measures. The present generation of researchers usually comes from doctoral programs in business administration that encourage the use of an interdisciplinary approach to problem solving and point out the need for supporting fields of specialization. Researchers are often well versed in quantitative methods, the behavioral sciences, econometrics, and social issues. More and more accounting research is being conducted jointly—by accountants and economists, by accountants and behavioral scientists (e.g., Driver and Mock, 1975), and by accountants and mathematicians. The keen demand for accounting academics has attracted many academics from other disciplines to accounting problems and to collaborations with accountants.

Accounting researchers have been using the tools imported from other disciplines very creatively, often contributing technology to the original field. Many accounting researchers currently publish in behavioral, statistical, and economic journals, using the theories, approaches, and results developed under interdisciplinary methods.

STATE OF THE ART

Buckley (1976) has classified the methodologies of contemporary research into four main categories: analytic, archival, empirical, and opinion. As shown in Figure 48.1, the selection of a methodology or strategy for investigating a given research problem leads to further choices of domain (i.e., the setting in which the research will take place) and research technique.

Methodology can be defined as the sequential decision process used for the selection among alternative paths in a research process. Mock (1972) described the methodological decision process as a sequential, but interactive, decision tree. In more common day-to-day use, the word *methodology* refers to the principal approach adopted for the resolution of a particular research problem. Intrinsic to the notion of research is the concept of scientific method, whereby knowledge is advanced through logical thinking and experimentation. Two basic approaches (Buckley, 1976) may be used for the development of scientific evidence: (1) *induction*, whereby new theories are developed, and (2) *deduction*, whereby new theories are tested. Deduction therefore is implemented through the hypothetic-deductive method, in which theory-based hypotheses are formulated and methodologies used for their testing.

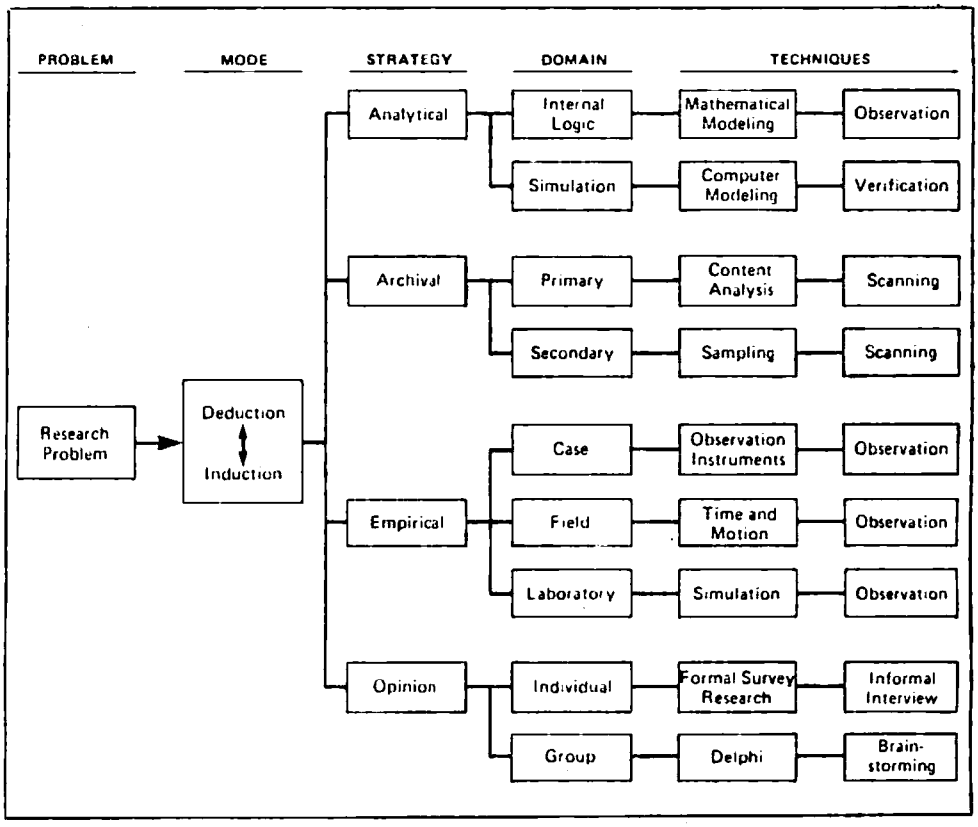

FIGURE 48.1 METHODOLOGIES FOR ACCOUNTING RESEARCH
ADAPTED FROM: Buckley, 1976.

Prior to the 1950s, scholarly research emphasized individual opinion and internal logic. Current research has almost abandoned the individual opinion approach, favoring more empirical and analytical methodologies. This chapter discusses these potential methodologies and their principal characteristics.

Research Methodologies

Analytic. Analytic research uses mathematical representations, economic theory, and logic for the analysis of accounting phenomena. In an internal logic study, this methodology entails extensive mathematical development from a set of postulates; in a simulation study, it uses electronic data processing for the representation of economic and accounting phenomena. The newly developed field of information economics has produced several studies that use the analytic approach. Originally introduced by Marschak (1969) and Marschak and Radner (1972), information economics has found a large number of applications in accounting (e.g., Demski and Feltham, 1976).

Simulation, though still in its infancy, has great promise. Once the cost and complexities of using computers in simulation have been overcome, this approach will be fully incorporated into the researcher's arsenal of tools. One use of simulation in accounting is the comparison of different multiple-ranking criteria as applied to management accounting (planning) by Lin (1978).

Archival. Archival research is basically a variation of empirical research that works with data already recorded and prepared for the researcher or with data recorded by another source and gathered by the researcher.

Primary archival research utilizes prerecorded data of research databases (such as those provided by COMPUSTAT and the Center for Research in Security Prices) for hypothesis testing. This type of research is called *ex post facto* research, because the collection of data and the study design come after the occurrence of the data-producing events. Typical examples of primary archival research can be found in the efficient market research discussed in Chapter 47 (e.g., Ball and Brown, 1968; Basu, 1978).

Secondary archival research deals with literature surveys and summarizations of the literature (e.g., Hofstedt, 1976). Papers that summarize prior research often serve as a basis for model building and internal logic developments. For example, Libby and Lewis (1977) surveyed the human information processing (HIP) literature in accounting, and classified existing studies into three main approaches: (1) the lens model, (2) probabilistic judgment, and (3) cognitive style. Such surveys provide an assessment of the state of the art in a particular area of accounting and suggest paths for future research, but they seldom propose or test new theories.

Empirical. Empirical research, one of the main accounting research approaches, uses case studies, field research, and laboratory studies.

A *case study* usually involves no experimental design and no explicit control features (i.e., there is no attempt to separate external effects from the effects being studied). Instead, the researcher introduces a particular method into a real-life setting and then carefully monitors the results. For example, Mason (1969) introduced a new method for corporate planning and monitored its implementation in a

corporate situation. No control groups were set up to perform the same tasks by traditional methods; it was simply assumed that the changes observed after the introduction of the new method were its effects.

Field research involves experimental design, with at least one experimental and one control group, but no explicit environmental control, since it is maintained in a real setting. Thanks to the control group, the results of a field study may be valid and even applicable to other situations, but many field studies show mixed results because of the interference of exogenous factors. Another difficulty is that many firms and corporations are reluctant to become the subject of field studies because the experiment may produce adverse effects. However, Stedry (1960) and Stedry and Kay (1966), in a field study of the effect of budget participation on employee performance, demonstrated one way of removing this difficulty by using a large manufacturing firm with several subsettings in which they found different levels of managerial budget participation.

Laboratory studies have experimental design and environmental controls, allowing the researcher to determine the sources and effects of the experimental treatments. These studies may yield significant results in a laboratory setting, but it may not be valid to extrapolate them to real life. In a typical example, Mock (1976) used a business game to examine the effects of the timeliness of information on decision makers. Both managers and graduate students were subjects. A variation is shown in a recent study by Newton (1977), who, rather than bring partners of CPA firms into the laboratory, performed a laboratory study by taking fictitious cases to the partners. She asked them to evaluate the cases in terms of materiality and discuss issues and rules for materiality judgments.

One of the key problems in laboratory studies is that of surrogation. A laboratory experiment may feature any or all of the following: (1) a surrogate problem or case representing a real-life problem, (2) a surrogate environment representing a real-life situation, or (3) surrogate decision makers representing real-life decision makers. Inadequate surrogation along any of these lines may render the results of a study invalid or decrease their generalizability.

In recent years an increasing number of laboratory studies have been performed, but their focus has been on research issues and theories imported from other disciplines, not on current practical accounting problems. The standard-setting organizations and accounting firms could greatly benefit by using the laboratory method for examining disclosure issues and their impact on decision makers.

Opinion. Individual opinion research basically consists of an expert (e.g., Paton, 1922) expressing his opinions on particular accounting procedures or theories and presenting some logical support for these opinions. The line that separates individual opinion research from internal logic research is a fine one. Early accounting research, which usually did not explore the internal logic of its postulates or perform analytic development to any great extent, belongs more clearly to the individual opinion category (Smith, 1954), but modern research in scholarly journals tends to emphasize internal logic and linkages with the literature even if the message is really individual opinion. Individual opinion articles are still prevalent in professional journals (e.g., *The Journal of Accountancy*), despite a trend toward more articles devoted to practical solutions to problems rather than advocacy. Scholarly journals generally restrict opinion research to the opinions of established academics or practitioners.

Group opinion research served as the link between the classical phase of accounting research and the empirical phase. Several studies of the opinions of practicing CPAs served as the basis for rule making. A variation of the traditional opinion survey has been used recently by researchers who manipulate hypothetical or real situations to examine particular issues through cases or questionnaires. This approach has the advantage of using real decision makers in their normal surroundings to deal with a laboratory problem. Such studies may be classified as empirical field research, as laboratory studies, or as group surveys, depending on the nature of the task, the experimental design, and the controls on the questionnaire.

Research Techniques and Concepts

Accounting research, like many other specialized fields of endeavor, has its own vocabulary for the techniques and concepts it uses. Here are definitions and explanations of the most frequently used terms in the research vernacular.

Modeling. A *model* is a symbolic or physical representation of a particular phenomenon or system. *Modeling* is the construction of such a representation. Models are called *stochastic* when probabilities are used to describe events, and *deterministic* when events are assumed to be certain if logical conditions are satisfied. Models are the essence of any theory. They may be completely abstract, mathematical representations, or iconic (physical) representations. An airplane, for example, may be represented by an abstract term such as flying machine, as a set of equations, or as a piece of metal to be tested in a wind tunnel. Models that prescribe behavior are called *normative*, and those that simply represent phenomena are called *descriptive*.

Most research defines an area of study and states a set of axioms about that area. These axioms constitute a model that may be as theoretical or abstract as the researcher desires.

Simulation. Simulation entails the use of models to test particular conditions or hypotheses. A simulation may be either behavioral or computer-based. Examples of behavioral simulation are role playing, the use of computer models to test individual decision making, war games, and scenarios. Computer-based simulations use electronic data processing for the representation of phenomena and their testing under different conditions.

A simulation must, in most instances, define the starting conditions (e.g., empty system, average-loaded system, or overloaded system) and the length of the period being simulated, which can range from microseconds in some instances to decades in others. A simulation must also define the statistical distributions of the events being considered and potential rules (heuristics) to be used in conjunction with the model. Many computer languages, such as DINAMO, Symscript, and SIMULA, specialize in computer simulation.

Statistical Measurement. Many different statistical techniques are used for empirical research, but they can be classified into two main categories: *parametric*, in which a statistical distribution is assumed, and *nonparametric*, in which few distribution assumptions are made. The ability to assume a statistical distribution,

such as a normal distribution of values, is contingent on the measurement scale used (Stevens, 1959).

Events may be measured in increasingly powerful scales, depending on the nature of the process being measured. According to the basic principles of measurement theory (Mock, 1976; Sterling, 1970), economic events (transactions for example) occur in what is called the empirical relational system (ERS), the system of relationships in the real world. But these events are measured through a numerical relational system (NRS), in which events are placed into categories and implicit relationships between these numbers exist. Depending on the nature of the ERS, different measurement scales are used. The four main types of measurement scales are nominal, ordinal, interval, and ratio.

A *nominal* scale is used when events can only be classified into discrete categories with no perceptible dimensional relationships among them. For example, a nominal scale is used to identify different persons if their characteristics and relationships are not comparable.

An *ordinal* scale allows for the establishment of dimensional relationships among the different categories, though the magnitudinal relationships have no meaning. For example, if a housewife is asked to rate five cereals in terms of her preference, it does not mean that the cereal rated first is twice as good as that rated second. Measurements in ordinal scales are not additive; they only present ordering characteristics. For example, it is safe to assume that if cereal number 1 is preferred to cereal number 2, and number 2 is preferred to number 3, then number 1 is preferred to number 3.

An *interval* scale is a more powerful scale than the ordinal because the intervals between the elements have relational meaning. For example, if yesterday's temperature was 20°F and today's temperature is 40°F, it cannot be said that today is twice as warm as yesterday. But if tomorrow's temperature is 80°F, it may be said that the difference (interval) between the temperatures of yesterday and today is half of the difference between today's temperature and tomorrow's.

A *ratio* scale is the most powerful scale of measurement. It is discrete, its categories can be ranked, their intervals have meaning, a zero exists and has meaning, and there is meaning to the measurement's absolute value. For example, a plant purchased for $1 million is twice as expensive as one bought for $500,000.

Different measurement scales apply to different accounting issues. Since a firm with $20,000 in cash has twice as much cash as one with $10,000, a ratio scale can be used. But firm A with $400,000 recorded in goodwill cannot be said to have twice as much in goodwill (in the abstract sense) as firm B with $200,000 recorded. It can only be said that firm A has more goodwill recorded than firm B, and an ordinal scale is being used.

Statistical analysis is considerably less powerful in weak measurement scales than in strong ones. Nominal and ordinal scales only allow the use of nonparametric statistics, whereas interval and ratio scales allow the use of both parametric and nonparametric statistics. There are nonparametric versions of most statistical tests, but they are considerably weaker in deriving inferences.

In addition to classical statistics, where events are considered in their ex ante (a priori) statistical distribution, business is increasingly using Bayesian statistics (Winkler, 1972). Bayesian statistics allow for the revision of a priori probabilities in view of posterior events. This permits more realistic assessment of the probability of the occurrence of a particular event.

Statistical Hypothesis Testing. A *research hypothesis* is usually a theory-based statement about a particular phenomenon. It is tested in a null form, the form that states that the phenomenon does not exist. If the test shows that the null hypothesis must be rejected, an effect has been found.

Statistical testing of a hypothesis either succeeds or fails to yield results that are *significant* at a certain level. The significance level indicates the probability that the results were due to chance. A significance level of 5%, for example, means that if an effect is found, there is a 5% probability that it was found by chance. Suppose that 100 partners of CPA firms are told of a particular audit situation and asked if they agree that a real problem exists. Sixty partners say that a problem exists and forty say there is no problem. From a statistical table that appropriately represents the distribution, the researcher finds that in only 5% of such cases would these numbers occur by chance. Thus, if the null hypothesis stated that no more than half of the partners would find the situation problematic, the null hypothesis could be rejected at a 5% level of significance.

The statistical tests most commonly used in accounting research are (1) descriptive statistics, (2) regression analysis, (3) analysis of variance, (4) factor analysis, and (5) mathematical programming approaches. The general objectives, prospective uses, and strengths and weaknesses of these tests are examined below.

Descriptive statistics. This is the simplest form of statistical test and involves description of populations, subpopulations, or population parameters. It usually involves frequencies (counts) of elements belonging to the different categories being considered, means, cross-breaks (cross-tabulations), modes, and chi-square tests. Descriptive statistics are commonly used for nominal scales, survey studies, and studies in human resource and social accounting. In these types of research, theory is not highly developed.

Regression analysis. The behavior of one variable, called the *dependent variable*, on the basis of another, called the *independent variable*, is explained through regression analysis. The relationship between the two variables, if any, can often be described by a *linear regression*. A simple linear regression can be represented by a formula of the type

$$Y = a + bX$$

where Y = dependent variable, X = independent variable, and a and b = constants derived in the analysis. For example, if fixed costs in a small hospital are $2,000,000 a year and variable costs $300 per patient-day, the hospital total costs could be represented by

$$TC = \$2{,}000{,}000 + (\$300 \times PD)$$

where TC = total costs and PD = number of patient-days.

Figure 48.2 plots the total costs of a hospital against the number of patient-days for 12 different months. With this data, regression analysis can be used to construct an equation representing total costs as a function of a constant and a slope (variable cost per unit) multiplied by the number of patient-days (dependent variable).

Several statistics are used in connection with regression analysis. R^2 is an index that shows what percentage of the variation of the dependent variable is explained by the independent variable. R^2 ranges from 0, signifying that none of the variation

is explained by the independent variable, to 1, signifying that all of the variation is explained by the independent variable. *F* values are used to measure the goodness of fit, or in other words, the significance of the quality of fit.

Regression analysis is basically an attempt to find a straight line through a set of observations with a reasonable fit. The regression line is the most likely estimator of a linear representation of the phenomenon under study.

An extension of simple regression is *multiple regression,* which is still linear but has multiple independent variables. With multiple regression, an *F* test can be used not only to establish the quality of the fit but also to test the significance of a particular variable as a part of the explanatory model. For example, if regression is used to construct an explanatory model of uncollectibles, bad debts will be the dependent variable, and aging of receivables, macroeconomic factors, and other factors may be independent variables. The overall *F* statistic serves to evaluate goodness of fit. As a rule of thumb, the higher the *F* the better the fit. An *F* value can be calculated for each independent variable to decide whether it should be included in the overall model. If the *F* value is too small, showing no significance, the variable can be left out of the model. Another rule of thumb is that for each independent variable included in the model, there must be about ten observations of all variables. Thus, if the researcher wants to construct a model with three independent explanatory variables, he may need 30 or more observations to ensure model stability.

Analysis of variance. Analysis of variance, as Kerlinger points out, "is not just a

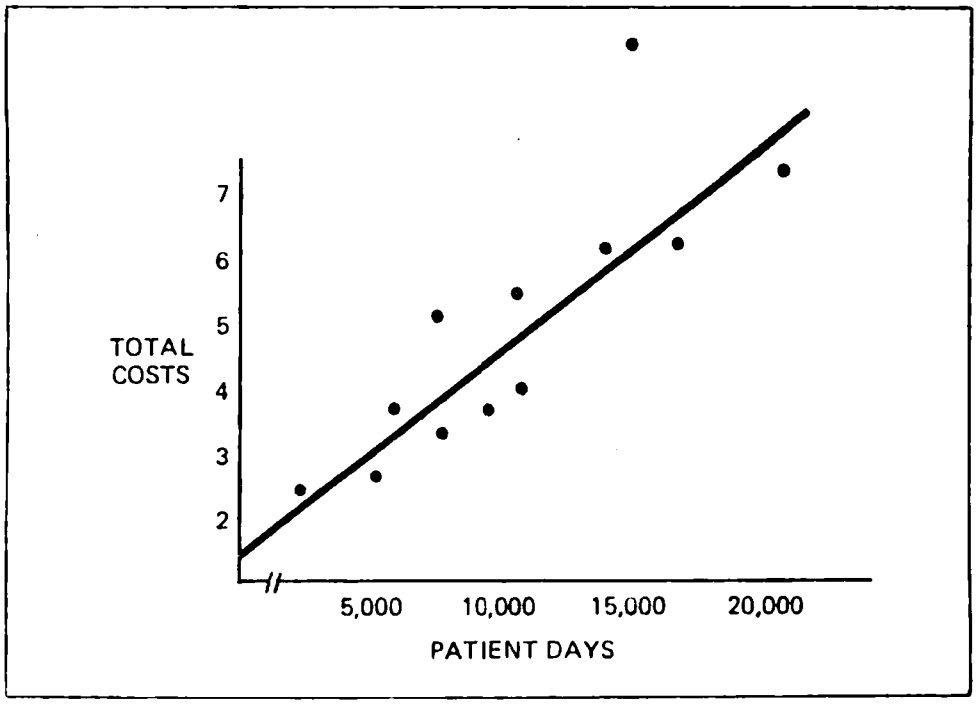

FIGURE 48.2 HOSPITAL COST ALLOCATION EXAMPLE—REGRESSION LINE AND TOTAL

statistical method. It is an approach and a way of thinking" (1973, p. 216). It is probably the most frequently used method of hypothesis testing and data analysis. By this method, the total variance of all measurements is broken down to the variance between groups and the variance within a group. If the variance between groups is wider than the variance within a group, there may be evidence of a particular effect, but if the variance within a group is wider than that between groups, the results are probably not significant.

The simplest form of analysis of variance is the comparison of two groups. Suppose that a CPA firm decides to test a new approach for staff training using new educational materials. They divide the trainees into two similar groups and train one with the new method and the other (the control group) with the old method. Scores on the old final exam are used to test the efficacy of both. Analysis of variance is used to test the effect of the new training method. A common statistic used in this situation (one way, two groups) is the *Student t* test. Computer programs are used to calculate the *t* value, and the significance of the result can be looked up in a statistical table. If several educational methods were being tested, then a one-way, multiple-group situation would arise, calling for use of an *F* statistic.

If the firm suspects that the different results of the two training programs may be due not only to the training method but also to the program instructors, it may use analysis of variance with four groups of trainees. The first group is trained with the new method and instructor 1, the second group with the old method and instructor 2, the third group with the new method and instructor 2, and the fourth with the old method and instructor 1. This design, called *factorial design*, separates the effect of the instructor from the training method and from the interaction of the two variables. These approaches are shown in Figure 48.3.

When sample sizes are small or the data being considered is ranked ordinal, parametric statistics are not applicable. Several nonparametric tests are available, such as the Kolmogorov-Smirnov test for goodness of fit and the Kruskal-Wallace and Friedman analysis-of-variance tests. These nonparametric tests can be found in Siegel (1956) or any good nonparametric statistics text.

Factor analysis. Factor analysis has become much more widely used in accounting research with the ready availability of computers (e.g., Milani, 1975), for its

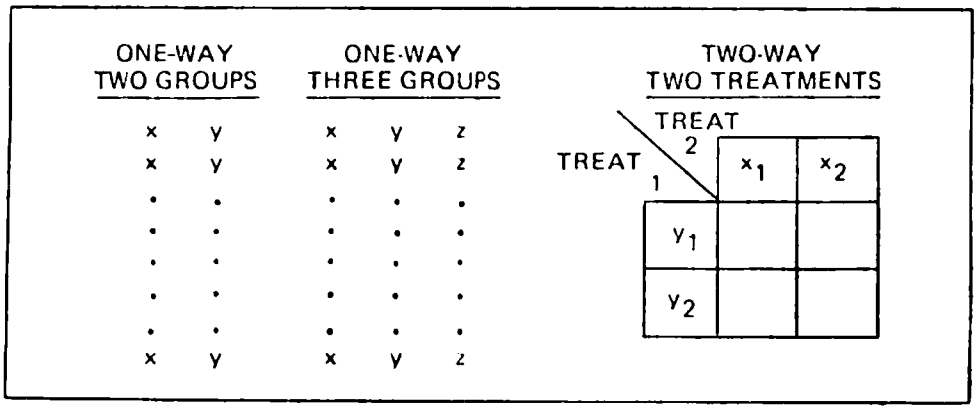

FIGURE 48.3 ANALYSIS OF VARIANCE

inherent mathematical complexity makes it difficult to apply by manual methods. It is a technique for determining the number and nature of underlying variables within a larger set of information. Suppose for example, that a researcher wants to investigate the factors that influence auditor performance. He may measure such variables as auditor behavioral characteristics, auditor training, nature of the engagement, timing of the engagement, budget of the engagement, and many others. With factor analysis he can reduce this large set of variables to a considerably smaller number. The variables identified in this way are the factors that have the greatest influence on variations in auditor performance. In research designed to test an existing theory through the behavior of experimental groups, analysis of variance remains a powerful method of assessing the results. But in studies that measure a great many variables and produce masses of numbers, it can be very difficult without factor analysis to pinpoint the factors that underlie the phenomenon under investigation and to arrive at theories describing its behavior. Many applications of factor analysis are currently being made in accounting research, notably in the areas of capital markets and human information processing. Its potentialities are wider still, particularly for use in audit research.

Mathematical programming. This term is an overall description for many techniques, including *linear programming, dynamic programming, integer programming,* and *optimal control.*

Linear programming, the workhorse of operations research, has been used widely in the literature and in practice (Charnes and Cooper, 1961; Summers, 1972). Dynamic programming has been used sporadically in auditing and information economics. Integer programming, optimal control, and other mathematical programming techniques are still infrequently used as tools in accounting research. For most of these techniques, elaborate software packages are already available, thus enabling users to avoid extensive computation.

Linear programming may be useful to the practitioner as well as to researchers. It always entails an objective function such as a maximization (of profits for example) or a minimization (of costs or audit hours) and is subject to a series of constraints. These constraints may reflect the production capabilities of a firm, the limitations of the skills of its components, or the limitations in cash available for a particular period. The linear programming formulation also contains parameters related to particular features of the process, such as units of contribution margin or number of production hours.

Figure 48.4 shows a small linear programming problem for the profit maximization of a small CPA practice in a particular month. X stands for hours of audit work, Y for hours of tax work, and Z for hours of consulting work. Substituting the functions in Figure 48.4 into a linear programming package would lead to an optimal allocation of staff efforts. The optimal allocation is the one that leads to the highest profit possible, subject to the constraints.

Optimal solutions often contain fractional results. Unfortunately, some types of problems do not permit fractions, as when a capital-budgeting linear program suggests the solution of building two thirds of a steel mill. But *integer programming* algorithms have been developed for such situations, and may be applicable as well to CPA engagement planning. Integer programming would accept engagement planning as a profit maximization problem and provide an integral solution.

Dynamic programming, another mathematical programming technique, is used for dynamic situations where the optimal solution at a particular point is contingent

OBJECTIVE FUNCTION: Maximize profit $= 25X + 20Y + 40Z$
WHERE: 25, 20, and 40 are the profit contributions for each of the different activities
SUBJECT TO:

$$X + Y + Z \leq 480$$

(number of maximum hours available)

$$Z \geq 80$$

(two of the consulting staff are not qualified to do audit or tax work)

$$X + Y \geq 200$$

(five auditors will not perform consulting work)

$$X \leq 200$$
$$Y \leq 160$$
$$Z \leq 120$$

(no overtime allowed, too expensive)

$$X,Y,Z \geq 0$$

(non negativity constraint)

FIGURE 48.4 LINEAR PROGRAMMING FORMULATION EXAMPLE

on the path leading to that point and on the forthcoming branches. PERT/CPM charts are solved analytically through dynamic programming.

In addition to these programming techniques, the accounting research literature has increasingly used *time-series analysis* for estimating future trends, including stock valuation, corporate valuation, and earnings forecasts. Among the time-series techniques are those called moving averages, exponential smoothing, Box Jenkins, and X-11.

Methods of Gathering Data. Two basic approaches can be used for gathering information: obtrusive and unobtrusive. Subjects of *obtrusive* methods know they are the objects of research attention; *unobtrusive* methods go unnoticed. Obtrusive methods include the use of questionnaires, interviews, controlled experimentation, hypothetical cases, and the introduction of new techniques in field settings. Obtrusive methods are frequently used in accounting research. Unobtrusive methods range from concealed microphones and one-way mirrors to subtler approaches such as observing the pattern of carpet wear, the accretion of dirt in library books, and small drops of glue in magazines. These methods may be valuable tools but have not yet been used by accounting researchers (Webb et al., 1966).

Much of the data used in accounting studies is gathered in surveys. "Survey research studies large and small populations (or universes) by selecting and studying samples chosen from the populations to discover the relative incidence, distribution, and interrelations of sociological and psychological variables" (Kerlinger, 1973, p. 410). Surveys can conveniently be classified by the method of

obtaining information: (1) interview, (2) questionnaire, (3) panel, or (4) controlled observation.

Interview. Because they are performed orally, either face to face or by telephone, interviews allow for flexibility in the content of survey questions. On the other hand, they may allow biases to be introduced through facial expressions, voice tones, the order of questions, and other subtle cues. Nevertheless, the interview remains the most useful and powerful tool of social scientific research. There are several ways to obtain information through interviews. Instead of asking direct questions, an interviewer may present hypothetical cases (e.g., Newton, 1977). Another method is for the interviewer to announce one objective when he really has a different one in mind. For example, a researcher seeking information on the facilities used and resources spent for executives' offices may disguise his objective by stating that he is studying corporate reactions to the Foreign Corrupt Practices Act of 1977.

Interviews also vary in the extent to which they are structured. Highly structured interviews usually follow a schedule and leave the interviewer with very little latitude on the wording of questions or the choice of topics to be explored. This format allows for the careful pilot testing of the interview, restricts interviewer bias, and provides better comparability among responses. Unstructured interviews, by contrast, allow for much more discretion on the part of the interviewer, for the exploration of possibly interesting but unplanned routes of inquiry, and for the rewording of questions to make them more intelligible to the interviewee.

Whether direct or indirect, structured or unstructured, interviews take a long time, often one or two hours each. This can result in small samples and high expenses in data gathering.

An example of interview research is the recent study conducted by Vasarhelyi (1978) on staff scheduling of medium-sized and large CPA firms. First, the researcher interviewed two schedulers of medium-sized firms and used the answers to structure a questionnaire. However, to avoid the risk that a printed questionnaire might distract the interviewees and lead to undesired biases in the responses, he administered the questions verbally from memory. Twelve schedulers of Los Angeles offices of CPA firms, including all the Big Eight firms, were interviewed. Each interview lasted from one to three hours. To encourage less guarded answers, the interviewer took notes instead of recording the interviews on tape, and collected all the printed forms and materials the firms allowed him to take. The findings of the study suggested that very little modern technology or management science was being used by the CPA firms, that their practices were reasonably similar, that their systems were somewhat inefficient but very people-oriented, and that schedulers were an extremely important factor in the profitability of the firms.

A different style of interview was used by Fleming (1979) in preliminary research for a staff budgeting study. Using a tape recorder, she interviewed the top audit partners of a large CPA firm with a free format. The interviews served as a basis for developing issues and a theory to explain engagement practices by CPA firms. This theory was then tested with a questionnaire distributed to more than a thousand CPAs.

Questionnaires. Mailed or directly administered questionnaires are commonly used in accounting research because of their lower cost, homogeneity of admin-

istration, and ease of external and internal validation. But unless the questions are very carefully worded, ambiguity and misinterpretation will invalidate the survey findings.

A recent survey (Rhode, 1977) was based on a questionnaire distributed to audit partners and staff in an attempt to determine the influence of certain aspects of the auditor's work environment on his professional performance. Of 4,888 CPAs screened in the original sample, 2,770 (56%) responded to a request to participate and 2,016 (41.2%) met all the criteria for participation and were mailed questionnaires. Of this sample, 41% filled out and returned the questionnaire, which asked 91 questions on many of the critical issues in the quality of audits. The conclusions were basically positive toward the profession, but the survey disclosed instances of substandard performance.

Several questions may be raised that cast doubt on the validity of these results. First, how candid were the auditors, all CPAs, in a survey sponsored, in effect, by the AICPA? Also, how accurate were the auditors' self-perceptions? How biased were the questions? Were all the key areas covered? And finally, was the responding sample representative?

Isaac and Michael (1971) list the following potential shortcomings of questionnaires in general: (1) other techniques may be more appropriate to the investigation of specific research questions, (2) they may not have been given a pretest, (3) they may be too long, (4) they may be given a bad format and presentation, and (5) the researchers may fail to check for respondent bias.

Panels. Groups or panels of people may be used as representatives of larger populations. Some panels consist of experts who are better informed or more insightful than the larger population. A currently popular method of panel survey is the *Delphi method* (Helmer, 1966), in which experts forecast events or explain phenomena through a complex set of controlled interactions that are monitored and moderated by the researcher.

Controlled observation. In this survey method, either an artificial setting is created or careful controls are placed in the real setting to gather observations on a particular process. In one example, Baker (1976) used participant observation to examine the behavior and activities of a partner of a CPA firm. This technique, imported from anthropology, may allow considerable insight into some basic questions. However, a more usual form of controlled observation in accounting research is the laboratory method.

Research Databases. Large computer-readable databases on corporate financial statements and stock market prices have markedly facilitated research in many areas, particularly security price research. Two particularly useful databases are provided by COMPUSTAT and the University of Chicago's Center for Research on Security Prices (CRSP). CRSP tapes contain data on daily security prices from the major stock exchanges and facilitate studies on the effect of accounting announcements on the market valuation of stocks. COMPUSTAT tapes include annual and other reports in addition to high, low, and closing stock prices for the period reported, but do not provide daily prices.

Another database is the National Automated Accounting Research System (NAARS), developed jointly by the AICPA and Mead Data Central Inc. NAARS

contains data from annual reports, prospectuses, and other releases of thousands of publicly traded companies. This database is supplemented by a literature file containing such material as APB opinions and Accounting Research Bulletins, FASB statements and interpretations, CASB statements, and AICPA Technical Practice Aids. (See Chapter 49 for a detailed discussion.)

Other databases of great potential value to researchers await development. Despite the currently surging interest in auditing research, audit data have been difficult to obtain, because public accounting firms are reluctant to disclose information about audit engagements, particularly working papers. The development of a large audit database could do for audit research what CRSP and COMPUSTAT have done for security price research. A limited database was recently developed by Kinney (1979) from the working papers of 44 audit engagements; using the auditor's requested adjustments shown in the working papers, the researcher tested the effectiveness of proposed models of analytical review. Another database has been developed by Neter and Loebbecke (1975), with data on four actual audit populations.

MAJOR RESEARCH CONTRIBUTIONS

In a literature survey concentrating on academic research and dealing only tangentially with the professional accounting literature, Vasarhelyi and Berk (1980) studied nearly twelve hundred articles published in five major American accounting journals during the 15 years from 1963 to 1978, classifying them by area of research. They found that although the areas of research are not mutually exclusive, each article could be fairly categorized by its research emphases. Security price research, the major application of empirical methods in the last decade, is discussed in Chapter 47. The other areas, discussed below, are (1) accounting theory, (2) behavioral accounting research, (3) audit research, (4) institutional studies, and (5) accounting information systems.

Accounting Theory

The changes in accounting theory that have occurred over two decades were examined by the AAA Committee on Concepts and Standards for External Financial Reports in a study entitled *Statement on Accounting Theory and Theory Acceptance* (1977b). This study concluded that "a single universally accepted basic accounting theory does not exist at this time. Instead a multiplicity of theories has been and continues to be proposed. . . ." The committee proceeded to identify three prominent approaches to the construction of accounting theory: (1) classical models, (2) decision usefulness, and (3) information economics.

The classical approach is taken by two schools. The true-income school, which includes Paton (1922), Sweeney (1936), and Edwards and Bell (1961), advocates current accounting practice, and its explanation is mixed with missionary zeal and suggestions for reform. The inductive school, which is represented by Hatfield (1927), Gilman (1939), Littleton (1953), and Ijiri (1975), attempts to rationalize and sometimes even to justify major elements of current accounting practice with the use of normative deductive reasoning.

The decision-usefulness approach focuses either on the decision model or the decision maker. Scholars who focus on a model first describe a decision model or criterion and then consider alternative accounting structures to implement it. Among them are Sanders, Hatfield, and Moore (1938), May (1943), Staubus (1954), Chambers (1955), Sterling (1972), and Revsine (1973). If the focus is on decision makers, their reactions to various accounting data are studied in order to identify the best reporting alternatives. This school makes use of the behavioral accounting research (BAR) literature, which will be discussed later in this chapter, and of security price research (SPR). The work of Ball and Brown (1968), Beaver (1968), and Gonedes (1974) typifies the focus on decision makers.

The information economics (I/E) approach treats information as a conventional economic commodity, the acquisition of which constitutes a problem of economic choice. It offers an explicit, rational, individual-based analysis of accounting policy questions that encourages the examination of the desirability of regulatory intervention by isolating general relationships and the effects of alternative scenarios.

Inflation Accounting. The inflation accounting (valuation) literature merits particular attention because of the current interest that regulatory bodies are showing in this field of accounting theory. Vasarhelyi and Pearson (1979) surveyed more than 500 articles in the inflation accounting literature and classified them as shown in Figure 48.5.

The researchers found this literature to be heterogeneous. In the first phase of writing on the subject, articles called attention to the problem. The second phase was largely characterized by normative attempts to resolve it. In the third and current phase, writers are looking for compromises among methods, industries, and countries. Vasarhelyi and Pearson predict that a fourth phase will produce "sounder research methodologies which apply mathematical models, simulation and, to a lesser extent, case studies to the inflation accounting problem" (1979, p. 23). In any case, the literature makes it clear that academics and practitioners are far from agreement on inflation accounting issues.

Behavioral Accounting Research

The classic works in behavioral research related to accounting include Simon and Newell (1971), Bonini et al. (1964), Brummet, Flamholtz, and Pyle (1968), and Caplan (1966, 1968). Two collections of readings have also had a major influence on current thinking in the field. Burns and DeCoster (1969) provided an interdisciplinary approach to problems dealing with human behavior and the accounting process. Then Rappaport and Summers (1973), jointly with Schroder, Driver, and Streufert (1967), provided the main interdisciplinary input for the development of human information processing research. Another important work is that of Green (1966), who distinguished between four groups of people affected by accounting information: (1) subjects whose behavior provides data for accounting reports, (2) accountants who prepare the data, (3) accountants who examine the data, and (4) recipients of the reports.

Hofstedt (1976) compared behavioral accounting research (BAR) with security price research (SPR) and concluded that (1) both have mainly involved empirical

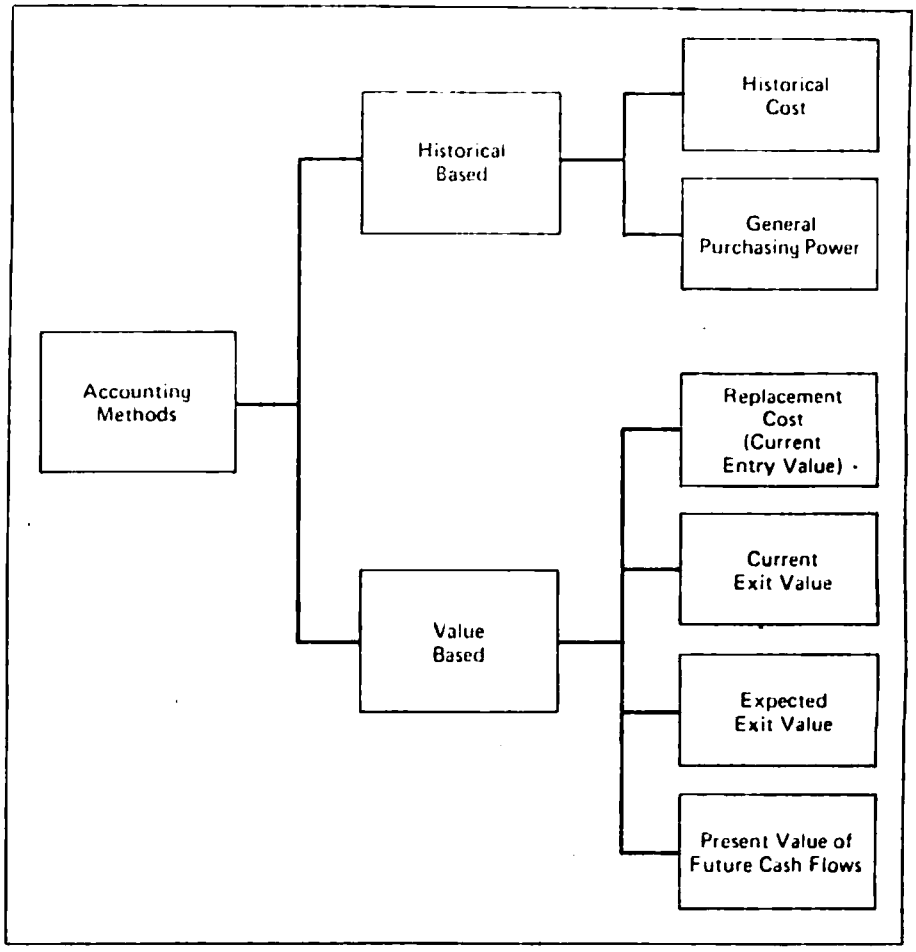

FIGURE 48.5 MAIN LINES OF THOUGHT ABOUT REPORTING UNDER INFLATIONARY CONDITIONS
ADAPTED FROM: Vasarhelyi and Pearson, 1979.

research, (2) both addressed pressing, practical, and important research matters, and (3) the questions asked in studies of both types tended to take the form, How does this data affect behavior? The difference is that SPR asks the question on a general level, while BAR asks it on an individual level. He also found that

> . . . BAR is pre-paradigmatic. We have not yet reached the point where "normal science" can begin. Although the argument does not spring from the . . . analysis directly, I would contend that certain glimmerings of paradigms are emerging: perhaps the clinical judgment (e.g., Wright, 1977) or the cognitive style (e.g., Dermer, 1973) researchers will be the first to attain such status within accounting. [p. 54]

Human Information Processing. Behavioral accounting research is a general category. In recent years one of its branches has evolved into what is called human information processing (HIP) research. Libby and Lewis (1977) have classified HIP research into three main approaches or paradigms: (1) the lens model, (2) probabilistic judgment, and (3) cognitive styles.

The *lens model* (Brunswik, 1952, 1956), as adopted by information processing researchers such as Dudycha and Naylor (1966), Tucker (1964), and Ashton (1974b), is used to analyze situations where individuals make decisions about real events based on imperfect information. Regression equations, correlation, and ANOVA have been used to model the individual's decision-making process. In many respects, the lens model is similar and complementary to the information economics approach. A combination of these approaches (e.g., Mock and Vasarhelyi, 1978) presents interesting prospects for research.

The *probabilistic judgment* approach focuses on the stochastic nature of events and their sequentiality. According to this approach, each information cue is considered in the decision model, and its probability is revised upon the outcome of events. Two main lines of thought evolved from probabilistic judgment studies, one of which dealt with Bayesian revisions (Barefield, 1975; Dickaut, 1973; and Kennedy, 1975) and the other with decision-maker heuristics and biases (Swieringa et al., 1976; Tversky and Kahneman, 1974; and Uecker and Kinney, 1975). Probabilistic judgment models seem to indicate that humans are not particularly good Bayesian probability revisers nor are they really rational decision makers.

Cognitive style studies basically deal with human decision-maker characteristics and their effect on the use of information cues in decision making (Mock, Estrin, and Vasarhelyi, 1972; Dermer, 1973; Driver and Mock, 1975; and San Miguel, 1976). These studies may serve to identify, explain, and describe human decision-making heuristics and biases. The cognitive style approach illustrates the nature of interindividual differences and the possibility of their classification into categories of similarly behaving decision makers. But these categories, in spite of often being statistically discriminant in terms of decision-maker behavior, fail to present the stability and consistency necessary for the potential development of information systems related to decision makers.

Libby and Lewis (1977) conclude that "although human information processing research is receiving research attention by accountants, such research in accounting contexts is still in its infancy" (p. 263). Most HIP studies satisfactorily replicated psychologists' findings, with some interesting exceptions still to be explored in the accounting literature. Lens studies now need expansion toward more elaborate settings, environments, and feedback effects.

Another survey of the HIP literature, conducted by the HIP Committee of AAA (1977a), classified the research into the same three main categories as did Libby and Lewis, but also added a fourth: process tracing (Hogarth, 1975; Payne, 1976; Clarkson, 1962; and Mock and Biggs, 1978). Without recognizing process tracing as a separate paradigm, Libby and Lewis (1977) stated that

> it shows great promise for providing more detailed descriptions of the way in which information is combined. Such models are not subject to the insensitivity of the linear model to alternative weighting schemes as are the traditional lens model approaches. [p. 264]

An entirely different classification of the HIP literature has been suggested by Driscoll and Mock (1976). This classification is illustrated in Figure 48.6.

In sum, the HIP literature provides insight into the actual ways in which accounting data is used by decision-makers. Although the mapping of cognitive processes is still not complete, and basic thought processes are far from understood, aggregate patterns and probabilistic tendencies have been recognized. Potentially, this work can lead to basic paradigms describing information needs to be met by corporate disclosure. Such questions as the level of aggregation of cost information in income statements, the desirability of disclosing contingencies in the body of statements rather than in footnotes, and the frequency of reporting may be resolved by HIP paradigms.

Budget Research. Another field of behavioral accounting research investigates organizational budgeting. Vasarhelyi and Mock (1977) have divided budget research into three areas: (1) organizational research, (2) behavioral research in budgeting, and (3) information and human information processing research in budgeting.

The organizational studies include Bruns and Waterhouse (1975), Mock (1973), Holstrum (1971), Ijiri et al. (1968), and Cyert and March (1963). These studies relate organization, organizational structure, and organizational performance to mode of and approach to budgeting.

The behavioral studies of budgeting deal with motivation, participation, attainability of goals, reinforcement of achievement, and employee attitudes toward the budget and the organization. Among them are Stedry and Kay's (1966) classic field study of foreman task-difficulty perception; Milani's (1975) field study of budget participation in relation to on-the-job performance; Cherrington and Cherrington's (1973) laboratory experiment on different budget situations and controlled rewards (reinforcement contingencies); and Ronen and Livingstone's (1975) elegant conceptual work applying the expectancy model to a set of disjointed behavioral budget research findings.

The budget studies that focus on informational issues (e.g., Mock, 1972; Welsch, 1973; and Vasarhelyi and Mock, 1977) basically deal with ways to present information, the type of variance information to be presented, and types of budget reports.

The conclusions of the behavioral research on budgeting confirm that participation in budgeting decisions is important to most employees, but even more so is the communication of valid information on the budget-reward process. Subjects of the Cherrington and Cherrington study (1973), for example, performed well and were reasonably satisfied under autocratic budget-setting methods as long as their performance was measured basically on their output and not on budget variance. Once budget variance was part of the evaluation process, budgetees were very dissatisfied if they could not participate in formulating the budget under which they would work.

Audit Research

The criticism by congressional subcommittees in 1976 and 1977 aimed at the public accounting profession and its standard-setting process has prompted new research efforts in several areas. Criticism of the audit practices of large firms in

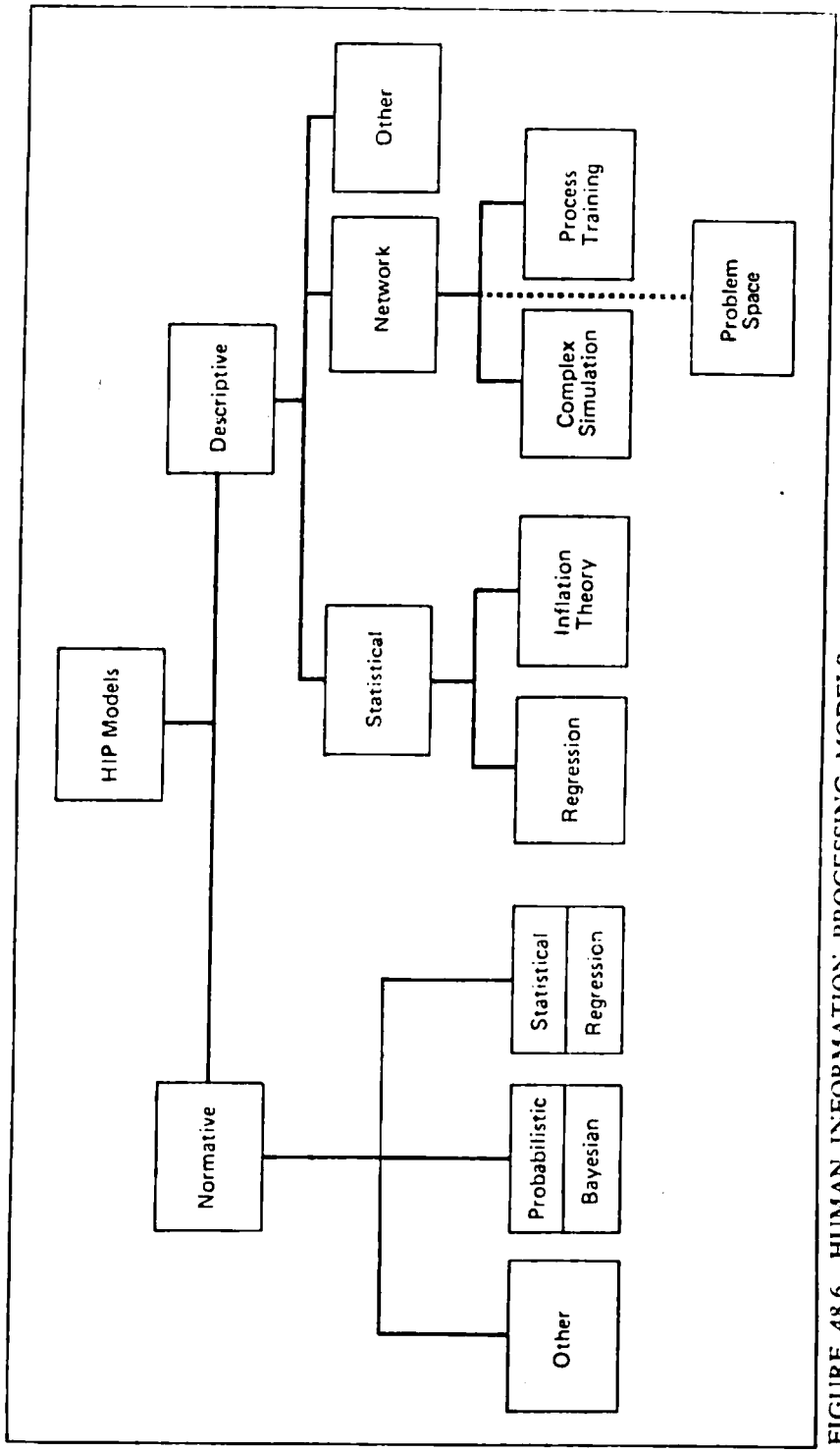

FIGURE 48.6 HUMAN INFORMATION PROCESSING MODELS
ADAPTED FROM: Driscoll and Mock, 1976.

particular, and of the firms' influence on standard-setting bodies such as the FASB, the AICPA, and the SEC, has motivated new research interest in the auditing field and in institutional matters.

Lin et al. (1980) surveyed the auditing literature and attempted to identify its underlying theories and domains. This survey dealt exclusively with the academic literature, to the exclusion of professional literature, authoritative pronouncements, and literature dealing with the use of electronic data processing in auditing. The studies surveyed were found to fall into three main categories: (1) classical theories of auditing, (2) decision theory and decision models, and (3) auditors as decision makers. Classical audit theory has been the subject of four major studies: Mautz and Sharaf (1961), AAA (1973), Toba (1975), and Kissinger (1977). These are mainly normative works and are based on philosophical rules of evidence and a priori arguments. They provide broad guidance on the audit function, but a homogeneous and comprehensive basis for audit work has still not been achieved.

Decision theory and models. A large number of studies were classified by Lin et al. (1980) as being concerned with decision theory and decision models. They were subdivided into the areas of (1) overall audit planning and information economics, (2) statistical sampling, (3) internal control evaluation and compliance tests, and (4) substantive tests.

Studies on *audit planning and information economics* include Ijiri and Kaplan (1971), Demski and Swieringa (1974), Scott (1973, 1975) and Kinney (1975b). This approach seems to provide the tools for the formulation and analysis of auditor environment and task relationships. Insights gathered from these studies are valuable and generalizable but provide little direct, long-term application to audit practice.

The numerous studies on *statistical sampling* are mainly concerned with proposed sampling plans, sampling objectives, and sampling risk. Among them are Loebbecke and Neter (1975), Teitlebaum and Robinson (1975), Kaplan (1975), Kinney (1975a), and Hansen and Shaftel (1977). This extensive literature represents the most notable direct influence of research on the audit profession. Statistical sampling (see Chapter 14) is rapidly becoming integrated into auditing practices, but more research is still needed, particularly on the costs and benefits of alternative sampling plans, their relationships with different sampling objectives, the nature of accounting error distributions, and the nature of general population distributions and biases.

Internal control evaluation has been the subject of considerable study by Brown (1962) and King (1964). These studies used many different theories, approaches, and methodologies, but had little effect on the profession or the practice of auditing. Studies by Cyert and Davidson (1963) and Arkin (1974) dealt with the issue of internal control compliance tests, and this research has found its way into audit practice; but the works by Sorensen (1969), Smith (1972), and others using the Bayesian approach have not yet had any impact. Other studies such as Cushing (1974) and Burns and Loebbecke (1975), which used analytical methods and computer simulation, respectively, to evaluate internal controls, seem promising but are still very far from widespread applicability. Another promising approach, the assessment of prior probability distributions by auditors, has been explored by Corless (1972), Chesley (1975), and Felix (1976).

In the area of *substantive tests and analytical review*, researchers have studied

stochastic processes, decision theory, and regression analysis in estimating errors and intervals, dollar value of accounts, and error distributions. For example, regression analysis, statistical theory, and the time-series models were used by Stringer (1975), Albrecht and McKeown (1977), and Kinney (1979), respectively, in studies of the analytical review process. Surprisingly enough, this area, despite its practical importance, has generated little scholarly research. Substantive testing often makes use of statistical sampling, which has been extensively explored, but the processes of source document selection, identification, and validation have not been researched at all. The area of analytical review still needs considerable research on its objectives, its interrelationship with the other parts of the audit process, and its techniques to predict potential areas of adjustment (Kinney, 1979).

Auditors as decision makers. The third major research category identified by Lin et al. (1981) is that concerning auditors as decision makers. This area, which overlaps the HIP research discussed above, identifies a particular issue of auditor decision making and applies a laboratory methodology to study the processes that come into play. As with other HIP research, audit decision-making studies focus either on the individual decision maker or on groups of auditors in situations requiring decisions.

Among the studies focusing on individuals, Ashton (1974a, b), Corless (1972), and Joyce (1976) described the audit decision models used by individual judges. Ashton, for example, used a lens-type model to represent the auditor's judgment of the quality of internal controls of a particular firm. His findings indicate that a linear model performed well. Individual differences in judgment were significant, while interjudge ratings were highly correlated, indicating some degree of consistency and a considerable amount of self-insight on the part of the judges.

The *group approach* (e.g., Hofstedt and Hughes, 1977) attempts to construct a joint model of auditors in audit decisions and test the model's predictive power. Boatsman and Robertson (1974) used a field experiment to model materiality judgments based on environmental (company-related) cues and found that the aggregate model, developed using discriminant analysis, was reasonably accurate in predicting individual judgments.

Lin et al. (1981) concluded that "a tentative integrated model is needed to integrate the key phases and theories underlying audit research related to decision theory/decision models" (p. 31). They also suggested that the area of internal control evaluation holds great potential for research and proposed a set of more creative research approaches, such as the use of pattern-recognition techniques, the representation of audit biases in auditor reliance, the use of factor analysis for the analytical review process, and the subclassifying of individual audit decisions.

Institutional Studies

Institutional studies deal with problems in the establishment of accounting legislation (e.g., FASB, 1978c; AAA, 1978), the processes of public reaction to such legislation (Sutton, 1979), and the incorporation of contemporary accounting thought into accounting legislation (AAA, 1978).

"Concern about the economic consequences of financial accounting standards,"

the FASB has noted, "is not new. It plagued the Accounting Principles Board and has permeated responses to FASB discussion memoranda and exposure drafts since the Board's inception" (FASB, 1978c, p. i). In 1978, the FASB sponsored a conference, coordinated by Dr. George Staubus, to obtain academic input regarding these consequences and the methods to examine them. Staubus (FASB, 1978c, p. vii) summarized current research on the subject by asking six questions:

1. Can standard-setting bodies, ex ante or ex post facto, determine the methods that yield the greatest benefits to society?
2. Can standard-setting bodies rely on market efficiency to minimize the economic consequence of financial accounting standards?
3. Can financial reporting affect the allocation of resources?
4. Should standard-setting bodies consider the macroeconomic impact of their decisions and make decisions on their perception of public values?
5. Should accounting standards favor others besides the users of data?
6. Should standard-setting bodies deliberately mandate what they believe to be an inferior accounting method?

Six papers were presented at the FASB conference, most of them attempting ex post facto evaluations of the effect of particular accounting rulings or the opinion of a particular audience. The most interesting approach was that of Abdel-khalik et al. (in FASB, 1978c), who used Moody's bond rating to evaluate changes in market risk perception due to SFAS 13 on leases.

Ex post facto analysis can only provide insight into the effect that regulations have had in the past. There is no guarantee that the same effects can be expected of proposed rules. AAA (1978) states: "... 'a priori' problems are those for which solution frameworks or heuristics already exist. The value of having an 'a priori' policy procedure is to be able to deal generically with problems which have common attributes ..." (p. 34). Methodologies are needed to provide forms of a priori evaluation of proposed accounting rules other than individual opinion and visionary forecast.

Accounting Information Systems

Despite the rapid development of computer technology and its enormous effect on corporate accounting systems, research on information systems is still an emerging field. Until now, it has concentrated on only three aspects of this vast field: (1) the relationships between accounting and accounting information structures (Mock, 1969), (2) the behavioral effect of computerized accounting information (Vasarhelyi, 1977, and Libby, 1976), and (3) the use and audit of computer systems (Cash et al., 1977).

Major changes in the electronic data processing environment such as distributive processing, minicomputers, wire transfers, macrodatabases, and the dramatic decrease in data processing costs will have long-term, drastic effects on the way accounting information is measured, coded, organized, transmitted, and displayed. These factors need considerable research.

CONCLUSIONS

Accounting research is still in the preparadigmatic phase in the sense that there are no generally accepted comprehensive accounting theories that students, professors, practitioners, or standard setters may fall back on for performing their duties. Even though many of the most important societal functions are contingent on consistent, reliable, and unbiased reporting, accounting is a *pragmatic* science (or art) and will continue even without a well-based set of accounting paradigms or axioms.

The evolution of accounting thought and research allows the identification of a few common threads: methodologies, subject matter, contributing disciplines, and general findings.

Methodologies

Most traditional accounting thought was based on empirical practices and justified through academic treatises. These slowly evolved into normative studies that can be classified as a priori research, and then into a priori inductive studies attempting to integrate practical evidence and normative statements into a general framework. The early to mid-1960s witnessed the development of empirical studies consisting mainly of opinion surveys. Development of the security price databases led to increased emphasis on archival studies.

In the early 1970s, a considerable percentage of scholarly studies of an a priori nature were still observed, but there was also a marked increase in empirical studies of an archival nature and in laboratory and field studies. The late 1970s have yielded a multitude of studies utilizing diverse methods and approaches leading to the expectation that accounting research will be more and more scientific in nature, will use many different methodologies, and will search for empirically based unifying theories.

Subject Matter

Traditional accounting research dealt almost exclusively with accounting theory issues and normative procedural topics in the search for correct accounting methods. Historical analogy and a priori arguments were slowly evolving into studies of the impact of accounting events on the value of securities. This area of security price research expanded once the CRSP and COMPUSTAT databases became available for use in examining the effect of specific information on security prices. Another area of development was behavioral research, which slowly evolved into a series of different paths, such as the modern HIP research. Modern security price research is now moving toward the development of time-series econometric models and the use of the developing field of agency theory (Ng and Stoeckenius, 1979, and Ross, 1973). This field deals with information asymetries to explain auditor and market behavior through the use of analytic modeling.

Auditing studies have become more and more popular, using both security price methodologies and behavioral and HIP approaches. A particular type of a priori research that entails analytical modeling and study of the properties of accounting error distributions has also been emphasized, leading to major contributions in the area of substantive testing and sampling. Institutional studies using the principles of agency theory are becoming a popular field. In addition, there is a resurgence

of special schools of thought in accounting, emphasizing particular accounting settings such as not-for-profit and regulated industries; accounting history works are also flourishing. Special interest sections of the AAA in areas such as audit, not-for-profit, history, and management advisory services have been conducive to these developments.

Contributing Disciplines

Early accountants were economists and brought with them the influence of classical economics and the use of the scientific method. The field of finance combined with accounting in developing security price research, which imported technologies from neoclassical economics, econometrics, and statistics. Modern behavioral research heavily utilizes psychology and, to a lesser extent, also relies on imports from other social sciences. The tendency seems to be toward continued reliance on these fields and also towards increased imports from mathematics, statistics, and decision theory.

Accounting researchers have been using these tools very creatively and often contribute new and creative technology to the originating field. Many accounting researchers currently publish in behavioral, statistical, and economic journals.

General Findings

Accounting researchers understand the nature of the accounting profession's audiences and how accounting information is used. They realize that their heuristics are somewhat conservative, that decision processes are rather linear, and that decision makers have basic biases and poor self-insight. They are also aware that many of the disclosure decisions are dependent on context and that the change in value of currencies is a major reporting obstacle.

Accounting researchers theoretically tend to prefer value methods for inflation accounting but, for reasons of practicality, offer variations of the historical method as a solution, realizing that the standard-setting process is not one of theoretical optimization but of practical compromise with theoretical validity as a basis. They know that although accounting information does not have an effect on individual decision making, it does have a limited effect on the market on an aggregate basis.

The auditing field has accepted sampling and has incorporated a scientifically integrated approach to audit planning, internal control evaluation, and substantive testing. It understands the need for analytical reviews and the establishment of defensible audit practices. It realizes the need for controlling risk and minimizing legal exposure.

FUTURE RESEARCH

In the 1980s, accounting research will become still more interdisciplinary, more empirical, and more quantitative. With the increasing use of tools from management science, research will expand in the field of auditing. Researchers will study not only the performance and planning of audit tasks but also the management of CPA firms in such areas as staff scheduling, audit budgeting, the optimal allocation of audit procedures, and the minimization of audit costs while maximizing evidence search.

Research on information systems will also expand, and it will affect the quantities of information presented to users and the ways it is presented. Microfiche and the development of mass memories will alter the economics of the reporting process and its cost-to-benefit factors, leading to further-increased disclosures, multilayered reporting systems, and perhaps some type of stochastic reporting. The use of large databases will become part of the everyday activity of accountants and managers as they cope with immense quantities of legislation, legal precedents, and potential accounting and audit problems.

The accountant's universe is rapidly growing more complex. As a result, the 1980s will bring the need for further specialization and for expansion of the scope of accounting education and practice. Financial attestation will interact with legal attestation, with economic attestation in terms of valuation, and with statistical attestation in terms of probability-estimation reporting and sampling, all on a day-to-day basis.

SUGGESTED READING

American Accounting Association. *Report of the Committee on Human Information Processing.* Sarasota, Fla., 1977. This report reviews the developments in the study of human information processing in accounting. Studies are classified into four basic approaches: probabilistic judgment, lens model, cognitive style/cognitive complexity, and other. These are explained, literature examined, and the paths for future research suggested.

Burns, William, and DeCoster, Don, eds. *Accounting and Its Behavioral Implications.* New York: McGraw-Hill, 1969. This collection of readings has great historical value in the establishment of behavioral accounting as a respectable area of research.

Demski, Joel, and Feltham, Gerald. *Cost Determination: A Conceptual Approach.* Ames, Iowa: Iowa State University Press, 1976. This book is a major classic of the information economics approach. Its major contribution is in the area of analytical formulation of managerial accounting/cost issues.

Dopuch, Nicholas, and Revsine, Lawrence. *Accounting Research 1960-1970: A Critical Evaluation.* Urbana, Ill.: Center for International Education and Research in Accounting, University of Illinois, 1973. This set of readings from a conference on accounting research held at the University of Illinois provides discussions of developments in three accounting research areas.

Hofstedt, Thomas. "Behavioral Accounting Research, Pathologies, Paradigms and Prescriptions." *Accounting, Organizations and Society,* Vol. 1, No. 1 (1976), pp. 43-58. This paper compares the developments, paradigms, and theories of securities price research (SPR) with those of behavioral accounting research (BAR). The primary technique used is quotation analysis.

Lin, W. Thomas; Mock, Theodore; Newton, Lauren; and Vasarhelyi, Miklos. "A Review of Audit Research." *Accounting Journal,* forthcoming 1981. This article surveys the academic auditing literature for common trends and underlying theories.

Sterling, Robert, ed. *Research Methodology.* Lawrence, Kan.: Scholars Book Co., 1972. This book contains the papers and responses presented at the second Arthur Young Accounting Colloquium held at the University of Kansas in May, 1971. Seven of its papers also constitute the report of the American Accounting Association Committee on Research Methodology. Papers deal with security price research, accounting theory and methodology, behavioral accounting research, and other subjects.