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Bruce Robersom

James Wesley Deskins

Charles Carpenter

Joseph F. Schirger

Myron Uretsky

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Authors

Bruce Robersom, James Wesley Deskins, Charles Carpenter, Joseph F. Schirger, Myron Uretsky, and John R. Curry

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BOOKS

The Future of Private Pensions by MERTON C. BERNSTEIN, *The Free Press of Glencoe, a Division of The Macmillan Company,* New York, 1964, 385 pages, $12.50.

The nation's extensive and growing system of private pensions is designed to fill the gap between a respectable standard of living for the elderly and what Social Security and their individual savings can provide for them. As now constituted, it is not meeting that objective, Mr. Bernstein finds. He has a number of suggestions for redesign to assure that it will.

Today about one out of every two workers in commerce and industry in the United States is covered by a privately financed pension plan. Just what does that statement mean? Under a grant from the Walter E. Meyer Research Institute of Law, the author, an attorney, arbitrator, and lecturer at the Yale Law School who has served as a pension consultant to the Treasury Department and Department of Health, Education and Welfare, set forth to find out.

After wading through a mass of statistics (and bemoaning the dearth of them on such vital subjects as job tenure), he reached these conclusions:

Pension plans actually cover only between a third and a quarter of the working population. Many groups are excluded — part-time, seasonal and other irregular workers; employees of many small organizations; and a high proportion of workers outside manufacturing, for example, in the service trades and agriculture. Furthermore, those excluded are often precisely those who most need pension protection—the low-skilled, the low-paid, women, and Negroes.

Many of those covered will never get the retirement checks they expect. Even among steady workers in nonfarm employment, only about

one-sixth to one-quarter will benefit. Voluntary separations, individual discharges, mass layoffs, the closing of plants, and the failure of enterprises will greatly reduce the number who can attain the years of continuous service required to qualify ultimately for pension payments.

Thus far the private pension plans benefit the higher-salaried employees most. Benefits decrease as one moves down the industrial ladder, with the lower-paid and more casual workers who change jobs most frequently receiving the least.

Even those who actually collect on their pension plans will, in a larger number of cases, get less than they now hope to receive. Tenure is the chief determinant of the size of pension benefits, and current turnover rates suggest that many employees will not have enough tenure in their final jobs to earn more than a minimal pension. Thus, the benefits paid, even when added to Social Security benefits and private savings, will not provide even a subsistence income for a large percentage of retired workers, still less for their widows.

Vesting provisions, benefit guarantees, and multi-employer plans all represent attempts to solve the problem. But all, Mr. Bernstein finds, have major shortcomings in practice.

Instead, Mr. Bernstein proposes a private clearing house system for transfer of pension rights among employers. Its operations would be managed by the government or by a consortium of private institutions now operating pension plans or by both. It would utilize such devices as "transfer values," now employed in Norway and regarded as feasible by British actuaries.

He also suggests other improvements:

Changes in federal tax laws to make employee contributions to pension plans tax-deductible and to require adequate funding as a condition of deductibility of employer contributions,

A partial employment retirement system under which employees who want to continue on a job may do so,

Methods of providing low-cost coverage for employees of small organizations and in the service trades,

Abandonment by unions of their opposition to contributory plans, which usually provide superior benefits and employee safeguards.

Mr. Bernstein's book is not intended, he emphasizes, as a criticism of those who initiate, administer, and guide retirement plans. "These people," he says, "are, by and large, quite cognizant of the possible shortcomings of their plans. They also are aware how much better their plans are now than they were a decade or more earlier. Many also feel that . . . they are unquestionably better than no plans at all. This and more I grant. . . . Nonetheless, this book is designed to question whether the improvements are good enough."

After reading Mr. Bernstein's provocative discussion, many readers will be inclined to agree with him. In any case, his arguments are worth the consideration of any executive or consultant involved in the design of pension plans.

Overhead Cost Control by PHIL CARROLL, *McGraw-Hill Book Company*, New York, 1964, 295 pages plus index, $8.50.

In this concise, lively book a well-known industrial engineer takes a look at one of accountants' favorite subjects, attacking many of their shibboleths in the process. His views should be refreshing for accountants and useful for operating executives.

In many large companies overhead costs are the largest single element of cost, and their trend is upward. This well-known fact is much bemoaned in industry, but, Mr. Carroll declares, the concern is not necessarily justified. Indeed, he says, the day of total automation, when all employees are overhead, may will be the millennium.

Much of the concern about overhead costs stems from what Mr. Carroll calls the "silly habit" of treating them as a per cent of direct labor. Actually, he points out, labor plus overhead is a sum. Additions to one may result in reductions from the other. What counts is the total.

Use of the overhead ratio as a measure of performance is essentially negative, Mr. Carroll asserts. Methods improvements designed to improve direct labor productivity cost money, and the more they save on direct labor the more they increase the overhead ratio. "From the opposite view, a drop in overhead ratio elicits applause. This can happen when monies are wasted in declines of direct labor productivity."

This does not mean, of course, that all increases in overhead are good. Systems adornments that do not control costs are wasteful. The trick is to evaluate overhead costs in terms of value received.

Mr. Carroll analyzes the influence exerted on overhead costs by such factors as definitions of direct labor, complexities and volumes of products, systems, productivities of people, customer cycles, and company goals, and tells how to use such techniques as time study and incentives to control them. His suggestions are concrete and practical; his style is simple and direct. His book should be useful to executives, accountants, engineers, and anyone else concerned with improving efficiency.

Effective Use of Statistics in Accounting and Business by JOHN B. O'HARA and RICHARD C. CLELLAND, *Holt, Rinehart and Winston, Inc.*, New York, 1964, $5.95 hard cover, $3.95 paper.

A senior partner of Price Waterhouse & Co. and a University of Pennsylvania professor illustrate, through 33 case examples, how statistical techniques can provide solutions to problems in accounting and general management.

In recent years statistics has won new prominence as a tool of management analysis and control. Yet many executives and accountants shy away from it because they are unfamiliar with the terminology and untrained in the techniques.

In this book the authors attempt

to show what can be done—and how to do it—with techniques no more advanced than those of algebra and elementary applied statistics. They are careful to explain terms and explain the rationale behind each method. They start with such simple arithmetic applications as ratio analysis, index numbers, the LIFO method of inventory valuation, and compound interest formulas before moving on to statistics.

Statistical applications covered include the use of means and standard deviations in determining average investment performance; regression and correlation analysis for profit analysis, establishing liability for product warranty, and devising sales incentives; random sampling and probability distribution for evaluation of clerical performance, estimating losses of customers, and taking inventory; and statistical techniques for inventory and production control. Each technique is demonstrated by realistic cases, some to be solved by the reader.

With a little effort, the businessman with only minimal background in mathematics can use this volume to wet his feet in—and whet his appetite for—a field of growing importance to management.

MAGAZINES

Converting the Accounts Receivable Function to Punched Cards by Harvey W. Protzel, *Journal of Machine Accounting*, April, 1964.

The conversion of an accounting function to punched cards calls for careful study, detailed planning, and precise execution without which confusion, error, and delay are inevitable. An actual case history is described step by step to illustrate the merits of effective advance preparation.

Before adopting any new methods, a company should determine what it would like to accomplish if a change were made. The subject company desired a more frequent aging of accounts receivable than the current quarterly report. Past due notices were not being prepared as often as was considered necessary or on any planned basis, and a reduction in operating costs was desired. A feasibility study was made to determine the best method to reach the predetermined goals.

A detailed report of the feasibility study contained recommendations for revising the system. It was stipulated that punched card equipment should be used since most of the information needed in the required cards could be obtained as a by-product of the current sales analysis application. The status of customer accounts would always be approximately three days more current than under the present system. An aged analysis would be produced twice each month, and at the same time past due notices could be prepared mechanically. Savings of approximately $1,000 per month should be realized, and one-time costs were estimated to be $800 for equipment and $3,000 to $4,000 for conversion. Naturally the decision was to proceed.

A plan of action was devised to accomplish the following steps: preparation of a detailed procedure manual to include changes required in related functions and design of all forms and cards; placement of orders for all new forms and cards and other supplies and equipment; education of personnel; and preparation of written conversion procedure. These steps were subdivided into detailed items to be performed and target dates were assigned for each action. Every step to be taken in advance of conversion was scheduled in order to gauge rate of progress.

The conversion procedure was planned as diligently as the operating procedure. Employees selected to supervise the operation were given a copy of the procedure and card forms, and classes were held to make certain there was complete understanding. Conversion was completed between the close of business on Friday and Monday morning, on schedule and without accident.

The punched card procedure is described in detail with illustrations of cards and report forms. The point is emphasized, however, that an attempt to install this procedure in another company in an identical manner would be a mistake. Each company must be studied individually and the procedure should be custom designed

Bruce W. Roberson, CPA
The University of Texas

Business Forecasting by Byron L. Newton, *Northwest Business Management*, Spring, 1964.

For small businessmen who know little or nothing about business forecasting, this article summarizes some basic techniques.

Northwest Business Management is a quarterly publication of the school of business and technology at Oregon State University. Its objective is to "render useful service to owners and managers of small- and medium-size business firms by presenting articles and information of a practical nature which, if applied . . . could lead to improved business performance."

This article seems to fit the objective of the magazine. It offers a short, elementary discussion of some procedures that have been found to be useful in making short-run forecasts of demand using published business indicators.

The author lists the major sources of these business indicators and, for each publication, describes the types of information it contains, where it can be obtained, and its price. Other sources of information on business trends are suggested.

Out of the multitude of business indicators, which one, or ones, does a businessman use for prediction of what is of interest to him—sales of his product? The following advice is given: "To be of value as an indicator, the relationship between the indicator series and the series to be predicted must be logical and must be one which reasonably can be expected to hold in the future."

The main part of the article deals with forecasting procedures. The author shows methods which can

be used to make a forecast of an annual aggregate (such as sales) based on (1) a coincident series (one whose movements through time tend to coincide with the series to be predicted); (2) a lead series (one which has the same pattern of movements as the series to be predicted, but whose "turning points" precede those of the series to be predicted by a known average period of time); (3) trends in the percentage of another aggregate, e.g., individual firm sales as a percentage of GNP; and (4) a two-variable linear regression model—the independent variable being any series. The reader should pay particular attention to (4) and heed the author's caution about the limitations of (3).

Most businessmen who now do any business forecasting through the use of economic time series will have gone beyond the techniques discussed in this article. However, for a businessman now making no conscious forecasts at all, awareness of this type of forecasting and the use of the methods discussed would probably represent an improvement.

Thus, while the article may disturb the statistician by its use of "freehand" techniques and by what is left unsaid, it fulfills the objective of its publisher. Application of its techniques would improve the performance of many small businesses.

JAMES WESLEY DESKINS
The University of Texas

Profits from Abroad: What Management Has Learned About Overseas Operations by GEORGE D. BRYSON, *Management Review*, March, 1964.

The writer offers some general suggestions for the more effective organization and operation of export activities in order to take advantage of new foreign markets which offer potential profits. Increased industrialization in Europe, Latin America, and Japan has sharply improved the marketability of American machinery, methods, and products. Furthermore, a new familiarity with American styles has opened new markets for our products, with the lowering of trade barriers.

An important consideration in export activities is the interest and enthusiasm of management. Mr. Bryson offers the reader the following questions to indicate the development of this interest:

How much do you personally know about the export sales and profits of the business?

How long has it been since you made a thorough analytical study of your export business and its prospects?

How often do you see and talk with your export manager?

What is your attitude toward traveling expenses for the export manager and his staff?

When did you last approve a budget for marketing and promotion in a foreign market?

What percentage of your firm's marketing investments last year went into foreign markets?

Information on the profitability of each product should also be available for both domestic and foreign markets.

Export activities should be tailored to an international market and should not necessarily conform to the same practices and policies as domestic operations. Although the manufacturer need not respond to every consumer whim, a sensitive response to consumer preferences is desirable.

The more abbreviated export organization includes the export director, secretary, and three managers. The manager of sales and service is responsible for the local agents in the world. Another manager handles order processing and translation, while the third, the accounting manager, is primarily assigned credit, billing, and collections. A more aggressive program, however, would require an additional manager, concentrating on marketing research, and three area supervisors, who report directly to the export director and are assigned to groups of countries for the better supervision of sales agents and for more effective promotion.

Under this plan, the order-processing manager performs a service function for the area supervisors. He can determine the causes for delays reported to him by the area supervisor. Proper corrective action could then be taken and improved service result.

The writer favors locating the accounting manager with the export department, delegating additional responsibility for budget projections, profitability estimates, and foreign exchange, besides collections, billing, and credit. Locating the accounting manager in the export department gives him more familiarity with its particular problems of pricing, control, etc. He could assist the area managers in the preparation of realistic budgets, especially since these managers are essentially salesmen, who are "notoriously bad budgeters."

Contracts and agreements for franchises, sales arrangements, etc., should be reviewed for timeliness and their applicability to local conditions. A review may reveal some contracts to be obsolete and no longer reporting an adequate profit.

Management must be willing to invest in foreign markets for the future. With this in mind, the sales and service managers should prepare a three-year budget, estimating the investment at the beginning and, under various volume assumptions, the length of time that it will take to recover this investment. Management should also have established targets for export sales for the next three, five, and ten years, with anticipation of increasing the percentage of total sales from the export sector of the business.

Credit standards take a different form in many foreign countries from those in the U. S. and therefore, foreign credit policy should be distinguished from the domestic. With foreign credit responsibility assigned to an export employee, he could organize all the factors relating to foreign sales to facilitate the most intelligent decisions.

Billing and collections should be

as close to the sales agents as possible, to clear up misunderstandings and arrange for the collection of problem accounts. If central billing is used, the export manager should control the flow of materials to and from the machines.

CHARLES CARPENTER, CPA
University of Illinois

A Comparison between the Discounted Cash Flow Model and a Model Which Assumes an Explicit Reinvestment Rate for the Uniform Income Flow Case by JOHN R. CANADA, *The Engineering Economist*, Spring, 1964.

In this article, John R. Canada explores the differences between the calculated rates of return of the discounted cash flow model and an explicit reinvestment model. The calculated rates of return for the discounted cash flow model are plotted against the rates of return of the explicit return model for reinvestment rates of 0, 6, 12, and 20% and for salvage values of 0, 50, and 100% of original cost.

Three plots are presented in the report: one for a project life of two years, one for ten years, and one for 20 years. In addition, the author has developed a general mathematical relationship between the rates of return of the two models.

Figure 4, which is a plot of the "Relative Magnitude of Deviation, Discounted Cash Flow Model Compared to Explicit Reinvestment Model (for a) Ten Year Project Life" brings home the general theme of the paper: "that the reinvestment assumption of the discounted cash flow model may well be inappropriate in the general case, and hence it would be wise to use the explicit reinvestment model so as to avoid a potential pitfall." Canada's point is well taken since the discounted cash flow model implicitly assumes that the cash flow from one project is reinvested in the firm at the rate of return calculated for the project under study. In many cases this assumption is not realistic, and hence the return that the company expects to earn from the cash flow should be explicitly recognized by the model. If the analyst wishes to adopt the model that Canada employs in his paper, it is possible to determine the effect of the discounted cash flow reinvestment assumption by referring to one of the graphs or to the general mathematical relationship between the calculated return of the two models.

The rate of return of the explicit reinvestment model employed in the article is defined as the cash receipts minus cash disbursements per year *less* the uniform annual sinking fund depreciation charge divided by the investment in the project. Thus, the model implicitly assumes that only the depreciation flow is reinvested at the reinvestment rate. The earnings imputed to the depreciation flows are credited to the cash profits —i.e., the cash receipts less the cash disbursements—assigned to the project in the form of the reduced depreciation charges of the sinking fund method. Since most companies reinvest a portion of the cash profits as well as all the cash flow from depreciation, the calculated return of the reinvestment model of the article could be adequately described as the minimum reinvestment return.

However, since the model fails to discount the cash profits, the term minimum reinvestment return is not descriptive in all cases. Where the projected life is long and the reinvestment rate is relatively high, the calculated return of the explicit reinvestment model of Canada's article can be overstated. With this point in mind, one can see that Canada's comparisons and conclusions would have been more meaningful and conclusive if the cash profits *less* the charge for sinking fund depreciation had been discounted.

Without too much difficulty one can redefine the explicit reinvestment model so as to incorporate the discounting of the cash streams. The derivation of the relationship between the calculated returns of the two models (pp. 6-8) is sufficiently detailed to permit the analyst to modify the mathematical relationship between the models so as to incorporate a discounted form of the explicit reinvestment model employed in the article.

JOSEPH F. SCHIRGER
New York University

The Role of Small Business Equipment by T. J. DIGGORY, *The Canadian Chartered Accountant*, May, 1964.

Nonelectronic equipment still has a major role to play in office operations. This article emphasizes its importance to large and small companies.

The highly publicized electronic computer has overshadowed small business equipment. In this article Mr. Diggory re-emphasizes the vital role played by more prosaic machines in paperwork management.

Small business equipment is defined as "the machinery, devices, and aids used in the office which are, for the most part, operator-oriented and generally of a mechanical or electro-mechanical rather than electronic nature." Such equipment is an important and integral part of all total systems, regardless of the size and sophistication of the company involved.

A periodic analysis of systems, including an appraisal of the adequacy of the equipment, is a vital aspect of paperwork management. Executives should be constantly on the alert for indications of systems weaknesses before they develop into critical problems.

The systems review should be based on the principles of work simplification. Only after a systematic review and revision of present systems should the application of new mechanical aids and devices be considered.

The selection process for new equipment may start with suppliers' proposals, but management should not rely entirely on this source. A personal study, taking into consideration such factors as the present system and future needs, reliability of the equipment and the supplier, and the impact of the mechanical devices on the

office personnel, is essential. On the basis of such a study the various suppliers' proposals can be evaluated and a decision reached.

A systematic study of the type outlined by the author will help to avoid the pitfalls he mentions—mechanization where no particular advantage has been demonstrated, choice of equipment which is too narrow or too broad for present and future needs, and over-reliance on suppliers' package systems studies.

This timely article focuses attention on an aspect of paperwork management that has been neglected in recent years. The systems manager and the practitioner should not overlook the potential of small business equipment and should keep abreast of new developments in the field.

DONALD E. STONE
The University of Wisconsin

Risk Analysis in Capital Investment by DAVID B. HERTZ, *Harvard Business Review,* January-February, 1964.

It's hard to get businessmen very excited about the dispute over the best way to calculate the return on investment for capital projects. They realize that the unreliability of the data that go into the various formulas—forecasts of sales and costs—is a much bigger problem. This article outlines a way, based on probability mathematics, to take these elements of uncertainty into account in the calculations.

The mathematical precision with which the time-adjusted rate of return of a capital investment can be calculated has little value without critical evaluation of the assumptions on which the data used in the formula are based. Each one of the many variables—such as anticipated sales prices and volumes—is subject to uncertainty. The decision maker needs to know the effects that these uncertainties have on the return he is likely to achieve. Mr. Hertz suggests the use of statistics, namely the application of subjective probabilities to each variable in order to quantify the element of risk at every anticipated rate of return.

A simulation of the way these factors may combine as the future unfolds is the key to extracting the maximum information from the available forecasts. The analysis requires three steps:

1. Estimate the range of values for each of the variables entering into the decision. For each value determine its probability of occurrence.

2. Select at random one value for each variable and combine these values to compute one possible rate of return.

3. Do this over and over again to define and evaluate the odds for and against the recurrence of each possible rate of return. The average expectation will be the average of the values of all outcomes with each rate weighted by its probability of occurrence. The variability of outcome values from the average should also be determined, as management would presumably prefer lower variability for the same return if given the choice.

In the process of accumulating data, it is necessary to probe and question each of the respective experts involved; e.g., the market researchers should be able to state whether the estimated selling price can be considered certain or whether the selling price should be estimated to lie within a definite and logical range. In the typical decision the range is usually ignored.

However, it is easier to estimate accurately a range than a specific single value. Historical data can be utilized as a guide to possible variations in selling prices and costs. For those variables which have no history (as in the case of a new product) the person making the estimate should be more willing to prepare a range of relevant data and its probability than to submit one figure. Additionally, it should be emphasized, the less certainty there is to an "average" estimate, the more important it is to consider the relevant range.

For companies that already put a lot of effort into calculating projected rates of return, this additional probability analysis adds little to the work load. With the aid of a computer this simulation method produced in one trial "3,600 discounted cash flow calculations, each based on a selection of nine variables within two minutes at a cost of $15 for computer time," Mr. Hertz reports. The result should be a more accurate portrayal of risks and possible rewards.

SHIRLEY M. ARBESFELD
New York University

Internal Pricing in Firms When There Are Costs of Using an Outside Market by J. R. GOULD, *The Journal of Business,* January, 1964.

This article is concerned with the problem of pricing intracompany transfers of intermediate products for which market prices are available. For those products traded in a perfectly competitive outside market, where both the buying and selling divisions face the same price, the transfer price should merely be the market price. But, in this article, J. R. Gould addresses himself to the more formidable problem of transfer pricing in those situations where there is a cost of using the outside market; i.e., a difference exists between the price the buyer division would have to pay and the price the seller division could receive for the intermediate product. This difference may be caused by transportation costs when the integrated firm is located some distance from the outside market. Gould argues that the transfer price will always be either the buying price, the selling price, or some amount between the two, and that it can be determined.

The article is divided into the discussion of three problems of transfer pricing. In Part One, the author discusses the determination of individual division output policies which will maximize the firm's over-all profits. This determination may differ depending on the relative values of the buying price, the selling price, and the price at which MC equals NMR (MC is the marginal cost curve of producing the intermediate product in the selling division; NMR

is the net marginal revenue curve derived by deducting the marginal cost curve of processing the intermediate product in the buying division from the marginal revenue curve of the final product).

In Part Two, Gould points out the circumstances under which knowledge of the selling, buying, and transfer price will and will not permit decision making as to the possible abandonment of either the buying or selling divisions.

Part Three concerns the practical procedures for determining the transfer price. This determination depends somewhat on the relative scales of operation for the divisions. For example, if the scale of operations is much greater in the selling division than in the buying division, the selling division will always have a surplus to sell on the outside market. Therefore, central management should set the transfer price at the price the seller can obtain on the market. This will permit both divisions to operate at levels which will maximize their own profit, and also to maximize company-wide profit.

The author concludes with a warning of the weakness in judging divisions by their profits and at the same time permitting them to take part in determining the transfer prices upon which division profit is based. The importance of this weakness depends on the objectives involved in using transfer prices.

In summary, the author has attempted to provide some useful guidelines for the solution of a realistic problem situation.

J. F. Antonio, CPA
University of Illinois

Trimming Data Processing Waste by Henry Schindall, *Administrative Management*, March, 1964.

The author suggests some ways to keep a computer installation from increasing rather than cutting office costs.

For some companies the installation of automatic data processing equipment results in a sharp increase in over-all office costs. This increase is due in part to the cost of operating the data center and in part to the fact that other departments find they need more people and office machines to keep up with the new equipment. Computers have the ability to digest enormous quantities of data and to pour out great numbers of elaborate, detailed reports.

The first step in controlling the cost of operating the data center is to make sure that the reports that flow from it are used. Too often reports are prepared because the equipment is available, not because the reports are needed. Mindful of the high cost of data processing machines, management is afraid it is not getting its money's worth if the equipment is not used full time.

Management should list all the reports prepared by the data processing center and rank them according to importance. Reports that are not used and reports that add more costs than benefits should be eliminated, and those that are used should be revised and synchronized, omitting all unnecessary detail. It is better for the equipment to be idle part of the time than kept busy by preparing reports that are not worth the time and effort that go into them.

By cutting down on the number of reports prepared management also cuts down on the processing center's need for data. This permits departments that supply the center with information to operate efficiently by concentrating on supplying only useful data for needed reports.

To cut down on idle time, some companies permit such departments as research, engineering, and marketing to use the automatic data processing equipment for special projects. These projects, too, should be evaluated in terms of costs and benefits. Those that are retained should be assigned priorities and scheduled so as to utilize the equipment most efficiently.

In a punched card installation the main problem is labor cost. Not all accounting areas need 100 per cent verification. To prevent unnecessary duplication of effort, management should determine the type and amount of error that can be tolerated and the point at which it would be less expensive to correct the errors after they occur than to prevent them.

Now that more and more small companies are installing automatic data processing systems, the problems discussed and the recommendations made are particularly timely. Management must learn to use this equipment efficiently and effectively. It must not be overawed by the equipment's cost or capabilities nor should it treat the equipment as a toy. It should be recognized for what it is—a tool to be used to enable management to attain its goals or objectives.

Arthur V. Corr
New York University

On a Basic Class of Multi-Item Inventory Problems by Joseph L. Balintfy, *Management Science*, January, 1964.

This article suggests an approach to an analysis of that class of random multi-item inventory problems where joint orders of several items may save part of the set-up cost.

In the study of multi-item inventory problems, little attention has been given to the nature of interaction among items or the effects of certain combination orders. Results of individual order policies (separable multi-item inventory systems) have long been known. While the calculation of optimum order quantities and time periods for each item has the obvious drawback that the effects of interaction among inventory items are disregarded, this technique does offer the maximum flexibility in system design. Such policies permit the selection of the individually best models for each single item and the modification of individual models whenever necessary.

The decision rule proposed in this article to aid in obtaining the demonstrated benefits of a joint-order policy is based upon the single operative rule applied to individual order policies. Hence, the author

claims, it retains many of the advantages of individual order policies, and at the same time yields a saving in set-up cost by permitting joint ordering.

The orders in the system are triggered by the inventory level of individual items. For every item a "can-order" level is defined. The rule would then say that whenever an order for a particular item must be issued, the inventory level of the rest of the items will be checked and all items which are in the range between the reorder point and the can-order point will be ordered jointly.

This technique, the author concedes, is subject to several severe limitations. In his analysis the author makes the following assumptions: (1) All of the items in the inventory have identical and constant set-up costs; (2) not all of the set-up cost may be saved by following a policy of joint orders; (3) the carrying cost of each item in inventory is identical and constant; and (4) the optimum order quantity for each item is identical and constant. Additionally, the reorder period (not constant) is considered to be a negative exponentially distributed random variable.

These assumptions, except for the last one, were made for the purpose of exposition and because of analytical limitations in demonstrating the random joint-order policy. Professor Balintfy was forced to make the last assumption because of the current state of the art in solving machine interference-type multi-channel queueing problems. The assumption is made to make it possible to compute both optimum time periods and cost differentials due to the joint-order policy. (A FORTRAN program for this calculation is available at the Tulane Computer Center, New Orleans.)

Relaxation of these assumptions is necessary for the treatment of most practical problems, i.e., machine interference problems with general service time distribution, non-Poisson arrivals, and different arrival rates in different channels. While no analytical solutions have yet been found for these problems, Professor Balintfy does suggest two alternatives. Queueing problems are not extremely sensitive to slight changes in the slope of the distribution, and unscheduled activities tend to approximate Poisson processes. Granting this observation, the results presented may be taken as an indication of those to be derived in the general case. Alternatively, the determination of optimum reorder ranges may be attempted through the use of simulation techniques. No substantial work taking this approach has yet been published.

MYRON URETSKY
The Ohio State University

Responsibility Accounting and Reporting by PHILIP CREIGHTON, *Cost and Management,* January, 1964.

Responsibility accounting is "a system of accumulating costs and revenues and of reporting thereon which reflects the activity of each supervisor and executive charged with any responsibility." Essentially, it is a method of charging an executive or supervisor for those costs for which he is responsible. This is based on the idea that numerous responsibility centers exist in a business firm with a particular individual as the focus of this responsibility center.

The technical features of responsibility accounting are as follows:

1. Each responsibility center is charged or credited with *only* those costs and revenues for which it is solely responsible.
2. There are no prorations of any income or expense items.
3. This system of accounting reports is fully integrated into the general financial accounting system.

This results in reports which reflect an individual executive's activity for the period under review and show how effectively he handled his particular responsibilities.

To make sure that each executive is charged only with those figures about which he can do something, from the lowest-level supervisors' reports only the totals are carried upward to the next executive's reports. From his reports, in turn, only totals are reported upward. Each executive's own controllable costs are added to the totals which have passed upward and thus each report distinguishes between controllable and uncontrollable costs. This breakdown of costs also helps to keep executives out of each other's business.

Successful responsibility accounting requires:

1. *Support of top management.* This is absolutely necessary because "RA" is an expensive method of reporting. Initially, "RA" may look like another attempt of management to police the work of operating executives and may generate opposition.
2. *Support and understanding of supervisors.* Because of possible opposition from the executives who are to use "RA," it must be thoroughly explained and accepted in advance. The executives and supervisors must be shown that it is to their advantage to use "RA" as a means of gaining control over their operations.
3. *Good budgets.* There is no reason for recording the discharge of executive responsibility if no one knows just what responsibility an executive was charged with.
4. *A progressive management climate.* "RA" is a means of eventually developing and motivating executives and supervisors through self-discipline. It should not be used as a method for securing top management control.

"RA" requires that all costs and revenues be someone's responsibility. Only in such cases can it then be useful to the organization. Such allocation of responsibility is present only in mature organizations.

Mr. Creighton's article strongly points out the advantages of using responsibility accounting to assist an executive to determine his own efficiency and establish a standard for measuring his performance.

JOHN R. CURRY
The University of Texas