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## Chapter II

### THE CHARACTER OF COSTS

THE term "costs" has been interpreted so diversely by accountants, businessmen and economists that a preliminary statement on the relation of cost investigation to the process of price formation becomes a necessary basis for further discussion. At the outset one must recognize a distinction between: the concepts and conventions of those who contribute actively to such managerial decisions as pricing, calculation of income and tax determination, and the intellectual constructs of those who attempt to describe, explain or appraise the process and results of these decisions, particularly for the economic system as a whole. The former are primarily the working rules and habits of thought of the accounting profession; the latter are the attributes of economists. Reflecting these differences in objectives, accounting practices are influenced by the accepted rules of income statements and balance sheets, by managerial convenience, and by the expense of accounting records, whereas economic concepts ordinarily presume rather simplified situations conducive to logical elegance.<sup>1</sup>

An understanding of the central tenets of both cost accounting and the economic theory of costs is especially imperative for an appraisal of the results and methods of empirical research, because ordinarily inquiries of this sort must utilize accounting data. In general terms, economic analysis specifies a limited number of determinants of costs—the rate of utilization of plants and other facilities, the prices of the factors and agents employed by the firm in the

<sup>1</sup> Differences in objectives or terminology should not, however, obscure the common ground (to be examined later) between these two disciplines.

production of goods and services, the technical efficiency of these factors, and the size and scale of the enterprise. This framework has the advantage of providing channels through which circumstances affecting costs may be conceived to flow. Logically, changes in costs may be broken down along these lines, so that the economist can set up useful categories for the study of both the sources and the consequences of cost variations. Such a model of economic theory fails, however, to resolve the difficulties of actually distributing changes in costs among these elements: satisfactory techniques for splitting up specific cost variations into categories of theoretical origin have not yet been devised. Accounting practice, on the other hand, has usually confined itself to the measurement of total costs or of statistically convenient subdivisions; in many cases its conventions and concepts are designed primarily to facilitate measurement rather than to supply the most pertinent information for managerial judgment. Thus incremental or marginal costs, which are of admitted importance to many decisions, have received scant attention from accountants, perhaps largely because of the complexities of measurement.

The hiatus between economic theory and accounting has diminished somewhat in recent years. There is less desire for a complete divorce, less mutual repudiation of the legitimacy of the other field of investigation. Accountants have been developing special techniques, such as "break-even charts," "specific costs," and "budgeting," to provide information that an economist would regard as germane to business decisions. At the same time economists have been compelled to reformulate their theoretical framework to include advertising expenditures and extremely diverse market conditions. But a great deal remains to be done in the process of translating theoretical structures into statistically measurable concepts, and of expanding accountancy into a more logical and useful system. The present volume is intended as a step in that direction.

The first two sections of this chapter are given over to

summary descriptions of the respective approaches to "costs" of economists and accountants. These sections are necessarily preliminary to the lengthier discussion of particular aspects of costs in Part Two of this report. A third section of the chapter is devoted to a brief exposition of the chief types of empirical cost studies thus far undertaken; this material, too, will be examined in greater detail in later chapters.

### *1. Economic Theory and Costs*

The central problem of traditional economic theory has been to explain the allocation of a fixed quantity of productive resources among possible alternative uses and to determine whether the total product is thereby maximized. Yet before one distribution of resources can be found superior to another, it is necessary to know not only the physical productivities of possible combinations of resources but also the "importance" of one kind of product as compared with others. Since the first is a matter of engineering measurement, and the second, in our institutional setting, a question of the tastes and preferences of individuals (conditioned in part by the distribution of income in the community), it is customary to consider quantitative determination of these factors as beyond the province of economics. At the same time a formal knowledge of both factors for the central problems of allocation is presumed when input-output relations (production surfaces), scales of preference (indifference maps or utility surfaces), and the distribution of income are regarded as given.

With these data as the starting point, there have been formulated certain principles of "economizing" which characterize two types of decisions: first, the choices of consumers in assigning their income among alternative expenditures<sup>2</sup> and the preferences wage earners exercise between leisure and work; and second, the decisions of

<sup>2</sup> "Savings" can be regarded as an alternative "expenditure"; the choices are between present and future income.

enterprises concerning the size and scale of plant and equipment, the amount and proportion of the factors, and the volume of sales. Decisions of the first type are designed, of course, to secure optimum conditions of existence, those of the second to maximize profits. For the consumer with a specified income, these judgments indicate that the marginal rate of substitution among goods (including future goods and leisure) is equal in all directions and equal to price ratios. The businessman is supposed to combine factors in such a way that the ratios between their marginal productivities are equal in all directions and that the contribution of an additional unit of a factor to the value of output is equal to the price of the incremental unit. These decisions impinge on each other through markets in which prices are established and exchanges transacted for finished goods and services as well as for factors of production. As a result of these decisions by consumers, businessmen and wage earners in this simplified model, the allocation of productive factors among possible uses is formally achieved.

When attention is concentrated on the conduct of a single enterprise operating in a total system, each decision concerning scale of plant and equipment, combination of factors and amount of output is predicated upon a series of expected<sup>3</sup> cost-price relations. Costs indicate the terms on which raw materials, various kinds of labor, and other factors may be acquired *and* processed. Prices represent the terms on which the fabricated goods may be disposed of to others. Any change in these cost-price structures involves a change in the profit alternatives open to producers or the consumption alternatives available to purchasers.<sup>4</sup>

Costs are a barrier to the use of resources; the greater the cost the greater the resistance. The cost of a factor per unit of product depends not only on the factor *price*, but also on

<sup>3</sup> Since every decision is directed toward the future, although not necessarily toward the same point in time, "expected" is to be implied in similar instances.

<sup>4</sup> E. S. Mason, "Price Policies and Full Employment" in *Public Policy*, edited by E. S. Mason and C. J. Friedrich (Harvard University Press, 1940), p. 28.

its *physical productivity*. The physical productivity of resources in turn is influenced by the rate of their use and the general state of the industrial arts.<sup>5</sup>

Competitive economic theory has operated upon the highly restrictive assumption that the decisions of the single enterprise could neither affect the prices at which factors were secured or processed goods disposed of, nor influence the amount demanded at any price by the market as a whole. The only way in which a firm could influence the part of the structure of cost-price relations immediately confronting it would be through the physical efficiencies in combination of the factors it employed, or through varying its output. Unable to exert any effect on prices, the firm would devote itself to determining the most profitable scale of plant and the rate of output.

If many decisions of businessmen are to be explained or appraised, this simplified model must be supplemented by more complex patterns. The process of making decisions within a firm is complicated (as is any explanation) by the fact that many contemplated activities do have repercussions on cost-price relations. For instance, an increase in output may change the price at which products may be sold as well as that at which factors may be purchased. Although the decision has its origin in the context of a given system of cost-price relations, one must first appraise the effects of contemplated actions on these relations, and then reconsider the proposed decision which may be expected in turn to alter the system of cost-price relations.

The extent of the repercussions on cost-price structures that might arise from a contemplated decision depends on the character of the markets in which the firm buys and sells.<sup>6</sup> In certain types of markets, particularly those with a few sellers, it may be virtually impossible to systematize the complex interactions between a contemplated decision

<sup>5</sup> "Factor prices," "rate of use," and "state of the arts" are discussed in some detail in Part Two of this report.

<sup>6</sup> Some effects of different types of market and cost situations on price formation are discussed in Part Three of this report.

of one enterprise and the probable responses of others. Where cost-price relations may be affected by a single firm's influence on prices of finished goods or of factors, not only do the decisions as to the scale of plant and lowest cost rate of output become more complex, but new ones confront the businessman. The firm now has some choice (the range of alternatives may be large or small) as to prices for disposing of finished goods or for purchasing supplies.

In order to develop a simple and tractable explanation of the way in which these decisions are made, economists have selected a few among many possible relationships and integrated them into a logical system. In the light of this group of relationships the business executive is regarded as making his decision. One of the tasks of later chapters will be to evaluate the usefulness of such a system for an understanding of business practices; this will require appraisal of the variables included in ordinary economic analysis and those usually excluded by the *ceteris paribus* assumption.

The relationships which—in contemporary theory—the firm is depicted as knowing in the process of formulating its decisions are: the way in which receipts from sales can be expected to vary with alternative schedules of output and with alternative outlays on selling costs; how costs of building plant and organization may vary with alternative schedules of output; how costs of producing output with given equipment may vary with alternative schedules of output; and how factor prices, in particular, can be expected to change with output. The firm is then presumably in a position to maximize its profits by building that scale of plant and organization at which the cost of a slight addition to plant is just equal to the added revenue, and by operating the enterprise at the level of output at which marginal costs equal marginal receipts. This last decision necessarily involves a simultaneous solution of the price at which the output is to be sold and factors obtained.<sup>7</sup> Selling

<sup>7</sup> Unless price discrimination between customers requires a further decision.

costs will be incurred (with prices determined) up to the point at which an additional expenditure will add to revenue an amount just equal to the selling costs plus the cost of manufacturing the additional units to be sold.<sup>8</sup>

Thus the economist provides a formal solution<sup>9</sup> to the decisions that confront the business executive by selecting a limited number of relationships upon which the final judgment is to be based and making certain restrictive assumptions as to the objectives of the business enterprise. The character of this solution to entrepreneurial decisions will emerge more clearly after a brief review of several *general* misapplications and limitations of the logical model.<sup>10</sup>

In the first place, the logic of economic theory cannot and should not purport to describe closely and accurately the practices of business in making decisions. What it can hope to do is call attention to the data which pertain to particular decisions on the assumption that executives seek to maximize profits or, more accurately, the value of the proprietorship interest in the firm. Yet business objectives may, in fact, be concerned with such matters as maintaining the firm's share in the market, in building up a powerful enterprise or in politically expedient action. And human conduct, even as exemplified in business decisions, certainly has many aspects other than profit motivation which deserve serious study.<sup>11</sup> In short the profit maximization assumption

<sup>8</sup> If output is provisionally determined, selling costs will be increased up to the point where the increment to the revenue due to increased price will equal the selling expenditure necessary to achieve the higher price.

<sup>9</sup> This solution is ordinarily represented graphically in terms of marginal and average cost curves (rather than total functions). See Edward H. Chamberlin, *The Theory of Monopolistic Competition* (Harvard University Press, 1933); Joan Robinson, *The Economics of Imperfect Competition* (Macmillan, London, 1934); and Jacob Viner, "Cost Curves and Supply Curves," *Zeitschrift für Nationalökonomie*, III (1932).

<sup>10</sup> Particular aspects of the economic theory of costs are scrutinized in greater detail in the appropriate chapters in Part Two of this report.

<sup>11</sup> See the work of R. A. Gordon, "Ownership and Compensation as Incentives to Corporation Executives," *Quarterly Journal of Economics*, (May 1940), pp. 455-73.



must not be taken as a description of all business motivation, although it may serve as a useful first approximation.

Second, the economic theory specified above is based on the notion of *a* businessman making decisions. Actually most important decisions in modern business are probably the products of a group. Interests and considerations which in a small individual proprietorship are concentrated in a single person are institutionalized, in a large firm, in departments and "pressure groups." The importance of this fact in the process of decision has not ordinarily been appreciated, and is certainly a matter requiring further study. A related fact is the extent to which effective units of economic control fail to correspond directly with the usual concepts of a firm or an enterprise. A company or corporation may be part of a larger unit of control, and subject to decisions based upon the cost-demand-rate-of-output relations for the entire cluster of enterprises.<sup>12</sup>

It is equally imperative, in the third place, to understand that the logical structure of economic theory assumes that the executives of a control unit have accurate and complete knowledge of the relationships indicated above. They are presumed to know the manner in which their costs vary with output, how receipts can be affected by advertising outlays, and the character of the dependence between volume of sales and receipts. While later chapters consider in more detail what business executives "really" know about these relationships in their enterprise, it is probably safe to say that in general they have very little precise information, and at best only certain broad ideas derived from experience. The accounting records cannot be very revealing as they are the results of many divergent factors during a single period. It is an exceedingly difficult task to isolate the effects of a single relationship in the total picture, and one seldom undertaken by accountants. For instance, it is

<sup>12</sup> G. F. Shove of Kings College, Cambridge, has developed this line of thought. He uses the term "interest group" rather than "firm." See also Paul M. Sweezy, "Interest Groupings in the American Economy," Appendix B, *The Structure of the American Economy*, Part I, Basic Characteristics (National Resources Planning Board, Washington, 1939).

possible to learn from accounting records how sales and advertising expenditures have varied. But sales may have fluctuated because of factors other than advertising expenditures: changes in the income of the community, the policy of competitors, factor price variations, etc. The simple relation between advertising outlays and sales, which economic theory presumes the business executive to know, is far from easy to isolate in quantitative terms.

As these relationships can hardly be expected to remain constant in a world of changing tastes and technology, economic theory takes it for granted that executives are able to recognize these changes and make suitable adjustments. But perception and subsequent readjustment take time; frequently they are impeded by mistakes of judgment, partly because in actuality the number of variables is larger and the character of relationships is vastly more complex than the postulates of economic theory would suggest. One could scarcely expect, therefore, that an enterprise would be optimally adjusted to the cost-price structure at any or every instant of time. Despite the lack of direct conformity between economic theory and the activities of business executives, the observer may find the simple set of selected relationships adequate for his general purposes of explanation and appraisal. They may not, however, be directly usable by the business executive who has to make decisions from day to day, or by those concerned with revising business practices by legislation or preachment. Such revision must necessarily presuppose a knowledge of the actual alternatives which present themselves to the business executive. One of the aims of Part Two of this report will be to examine the methods by which these relationships can be approximated empirically. It will then be necessary to appraise the usefulness of such data to both the economist and the businessman.

## 2. *Accounting Practice and Costs*

Accounting is a tool of business management. It was evolved from double-entry bookkeeping with the growth

of machine production and the corporate enterprise, particularly in the nineteenth century. These changes in technique and business institutions brought with them large capital outlays, professional management, and diffused ownership which required the tools of cost and financing accounting. With the advent of modern manufacturing, knowledge of the cost make-up of a product became indispensable to "efficient" operations. This information required "a revolution in commercial bookkeeping, in which an article's cost was simply the purchase price."<sup>13</sup>

Since accounting is not an automatic machine, its use frequently requires decisions which the firm's executives alone can make. "Accounting must be regarded as a process involving the recognition of custom and convention and the use of judgment, rather than as the application of rigid and unvarying rules."<sup>14</sup> At one time, for instance, it was not general practice to take into account depreciation on buildings in calculating "costs." The United States Supreme Court supported this view by holding in a railroad case that "only such expenditures as are actually made can with any propriety be claimed as a deduction from earnings."<sup>15</sup> The conventional (though not arbitrary) character of accounting practice is illustrated by the problems of depreciation and obsolescence allocation, inventory and asset valuation, reserves for contingencies, and cost allocation among products. Much has been done in recent years by the accounting profession, the Securities and Exchange Commission, the Bureau of Internal Revenue and other agencies of government, and by teachers of accounting, to standardize and integrate these conventions.<sup>16</sup>

<sup>13</sup> A. C. Littleton, *Accounting Evolution to 1900* (American Institute Publishing Co., New York, 1933), p. 367.

<sup>14</sup> George O. May, *Twenty-Five Years of Accounting Responsibility, 1911-1936* (Price, Waterhouse and Co., New York, 1936), Vol. II, pp. 306-07.

<sup>15</sup> *U. S. v. Kansas Pacific Ry. Co.*, 99 U.S., 459 (1870). See also May, *op. cit.*, p. 307.

<sup>16</sup> See T. H. Sanders, "Proposed Reforms of Accounting," *Business and Modern Society* (Harvard University Press, 1938), pp. 113-51.

Cost accounting, in particular, has introduced many new and refined techniques—standard costs, break-even charts and budgets are only a few—to provide business executives with more accurate information on which to base decisions. The development of these types of analysis is not surprising in view of the complex and diversified decisions business executives must reach. Cost information pertinent to one problem may be inadequate for another. For instance, the costs used in calculating income for dividends or taxes may be inadequate for the setting of a price on an additional order, or may fail to indicate whether it would be profitable to add an additional plant or machine.

To the extent that costs enter into such decisions, the business executive is interested in costs to be incurred, "those that lie ahead, those which are contingent on the particular proposal being considered; not those which have already been incurred, those to which the business is already committed. This distinction between the expenses which *have been* incurred and the expenses which *are to be* incurred is important to the reasoning of the business executive who is trying to determine a policy."<sup>17</sup>

It will be useful to identify certain types of decisions that businessmen make and to indicate briefly the differences in the character of cost calculations involved in each. In one class, one may group a number of decisions, such as declaration of dividends, profit sharing, and tax payments, which depend directly on measures of the *income* of the enterprise in a given period. Other decisions, such as expansion, wage increases, S.E.C. registration, and pricing, may be more indirectly related to income figures of a past accounting period. Aside from recording revenues and costs (outlays), the determination of income must involve the matching of costs against revenue for a specified period. Since the use of durable goods involves outlays in one period with the intent that they bear "fruit" in subsequent periods, any income calculation must be "conventional" for

<sup>17</sup> R. S. Meriam, "Some Notes on Cost" (mimeographed). The economist makes similar distinctions in the terms "short" and "long" run.

a period shorter than the life of the enterprise.<sup>18</sup> "If the accounting period were increased from the customary year to a decade, most of what is now treated as capital expenditure would become chargeable to income; while if the period were reduced to a day, much of what is now treated as current maintenance would become capital expenditure."<sup>19</sup> The late Justice Brandeis once suggested that there could be no wholly dependable computation of net income until the particular enterprise had run its course.

In recent years interest in the calculation of income for periods much shorter than a year has increased greatly. Not long ago the Committee on Accounting Procedure of the American Institute of Accountants adopted as a text the dictum that "a fair determination of income for successive accounting periods is the most important single purpose of the accounting reports of a corporation."<sup>20</sup> The crux of income accounting is to match costs and revenues for a short period in order to determine income. The problem is to decide what costs should be regarded as incurred in earning the revenue of the period. Some costs, like direct labor expenses, raise no serious problems because they are incurred in the period and present no reasonable basis for being applied to prospective revenue.<sup>21</sup> Others, such as outlays for plant, equipment, research, and patents, are directed almost entirely toward prospective rather than current revenue. For the current period such costs depend on estimates of the performance of the acquired asset in future periods.

<sup>18</sup> For an interesting view of assets as "prepaid expense" see Wyman P. Fiske, "Amortization, Depreciation, Obsolescence and Replacement," *Transactions of the American Institute of Chemical Engineers*, XXX (1933), p. 1.

<sup>19</sup> George O. May, *Improvement in Financial Accounts*, Lecture on the G. Lowes Dickinson Foundation, Graduate School of Business Administration, Harvard University (April 12-14, 1937), p. 4.

<sup>20</sup> William A. Paton, "Recent and Prospective Developments in Accounting Theory," *Business Research Studies* No. 25, Publication of the Graduate School of Business Administration, Harvard University, XXVII, No. 2 (March 1940), p. 5.

<sup>21</sup> *Ibid.*, p. 7. Periods of conventional length are implied.

Costs for the calculation of current income are made up of these two groups: those which are not intended to contribute to future revenue and *some* part of the outlays which do. Hence the determination of income is not only a starting point for other decisions but an important decision in itself. The costs employed to calculate income of an enterprise and as a basis for dividend payments may be different from those used in income calculation for tax purposes. The Bureau of Internal Revenue may prescribe depreciation rates quite other than those adopted by a firm. Or the firm itself may feel that depreciation rates used in calculating income are not satisfactory for the decision whether or not to expand or re-equip a plant. A manufacturer of a standard cotton fabric, for instance, follows the practice of charging depreciation at the rate of one cent per pound of finished product. This results in a lower total depreciation charge than is permitted by Internal Revenue regulations and employed in tax reporting.<sup>22</sup> The difference arises largely from the fact that the use of the Internal Revenue depreciation rates overestimates costs and underestimates income (for dividend policy) under conditions of chronic partial utilization of plant and equipment. In other instances, especially in firms whose equipment is affected by rapid obsolescence, the Internal Revenue rates may be lower than those the enterprise uses for its own purposes.

A second important area of executive decision in which cost records play an important part is the internal control of operations. Decisions of this nature require a type of cost information different from that used in the determination of income. Here the problems are whether to purchase a new machine, how to reduce costs of operation, how to improve a product to given performance standards in the cheapest way, and whether to add or discontinue a line of products. To assist management to make these and similar decisions numerous techniques have been developed

<sup>22</sup> A survey of the many methods of allocating depreciation through time is made in Chapter IV. The Bureau of Internal Revenue has permitted other methods than the straight line for tax purposes.

in cost accounting, many of them specialized to the particular problems of the industry or firm. Reference may be made to the general use of budgets, standard costs, and specific or incremental costs.

A distinction must be drawn between those techniques—for example, standard costs—which are regular features of the accounting system of the enterprise and those involving estimates only as problems arise. For instance, the decision to take an order at a particular price, or at what price to submit a bid, requires an estimate of the cost of this single transaction. The distinction drawn above between costs that have already been, and those which would be, incurred by the contemplated transaction is important in this connection.<sup>23</sup>

Standard costs are intended to provide the management with a norm by which to judge the "efficiency" of current operations. By a very detailed breakdown of cost elements, involving for a complicated product thousands of individual items, management can concentrate on the elements that show wide deviations from the standard. This focusing of attention upon particular operations is one of the central points in favor of a standard cost system.<sup>24</sup> It is not entirely a simple matter, however, to select the most satisfactory standards. To what extent should these standards represent past achievement and to what extent, for instance, hopes of future performance? No general answer can be provided; the judgment of the executives decides each particular case. As a matter of practice, the standards set up for labor and materials costs are frequently the equivalent of engineering estimates of performance that "should" be achieved when operations have been mastered by wage earners.<sup>25</sup>

The "burden" used in standard costs is based on an allo-

<sup>23</sup> See Eugene R. Nevins, "Estimating the Special Order," *National Association of Cost Accountants Bulletin*, Vol. XVI, No. 8 (December 15, 1934), Section I.

<sup>24</sup> William A. Paton, *Accountants' Handbook*, 2nd ed. (Ronald Press, 1935). Section 26 discusses standard costs.

<sup>25</sup> At given wage rates and prices of materials, these costs amount to estimates of the input-output relations the economist regards as data.

cation of fixed costs to a level of output for which there is reasonable expectation of achievement on the average over the future. This, at least, is the prevailing practice, although some firms have used simply the technical capacity of the firm to produce as a basis for standard burden costs. For instance, out of 177 replies to a questionnaire of the National Association of Cost Accountants, 138, or 78 percent, based the normal or standard burden on ability to produce *and* sell while the remaining 39, or 22 percent, used capacity to produce.<sup>28</sup> Furthermore, these 39 firms were concentrated, for the most part, in industries with fairly stable demands. When actual rates of operation in a period vary from the average of expected rates, this difference is frequently written off to profit and loss through an underabsorbed and overabsorbed burden account. The important thing to be noticed about these standard costs for the present purpose is that they are not strictly historic costs; they involve a standard of expected performance.

A third field of executive decision to which cost records are important embraces the problems that cluster about price determination. As the next chapter shows, the price decisions of an enterprise interact not only with the level of the structure of prices, but also with differentials by region, size of order, terms of credit, model, etc. Cost information may be used in setting these differentials as well as in determining the level of prices.

While the kinds of costs relevant to pricing decisions and the way in which they influence price structures are briefly considered in Part Three of this report, it should be noted for this general summary that costs which help to determine price structures may be quite different from those customarily applied to problems of income or internal management and control. In periods of depression, the executives may find that some price which will not cover all

<sup>28</sup> National Association of Cost Accountants Research Study, "Practice in Applying Overhead and Calculating Normal Capacity," *National Association of Cost Accountants Bulletin*, XIX, No. 15 (April 1, 1938), Section III, p. 925.



costs but which is higher than one that would justify a temporary shutdown, will minimize losses. Thus any price may be accepted that covers variable expenses and contributes something to overhead without spoiling the market too much for the future. In such cases the costs most relevant to the pricing decision are the variable expenses.<sup>27</sup>

A decision with respect to price structures applies to a future period; the costs significant to this price decision are not those which prevailed in the past (income calculation). Nor are costs based upon engineering or technological standards decisive for pricing. The significant costs, rather, are those which may be expected to prevail in the period for which prices are being considered. In the preparation of costs for pricing decisions, standard costs or those of the past period may be taken as a starting point and modified in view of probable changes in factor prices, technical efficiencies, and conditions of operation.<sup>28</sup>

Finally, some types of cost records may be useful to management in providing a rationalization for a policy or decision. It may be necessary, for example, for a business organization to justify an action before the courts, an arbitration board, or certain other concerns. This function of costs has developed particularly since the N.R.A., the growth of Fair-Trade Practice laws, and the Robinson-Patman Act. Costs have a precise and final appeal to legislators and the public, to whom the ambiguities and shades of possible meaning are not always apparent. Hence an appeal to costs (a supposedly unprejudiced piece of evidence) may frequently serve the useful purpose of justifying a policy or action.<sup>29</sup>

<sup>27</sup> Even in markets where the enterprise has no choice as to the prices which may be charged, these variable expenses will significantly influence the decision whether to operate or close down.

<sup>28</sup> For a discussion of the cost accountant's role in industrial pricing see *Cost Accounting and Industrial Pricing* (National Association of Cost Accountants, 1939), pp. 41-81.

<sup>29</sup> See Herbert F. Taggart, *The Cost Principle in Minimum Price Regulation*, Michigan Business Studies, VIII, No. 3 (University of Michigan Press, 1938), Chs. 1 and 2. "A business man may be content with

### 3. *Empirical Cost Studies*

The concluding section of this introductory chapter on costs is intended to indicate briefly certain types of empirical cost studies to which there has been extensive reference. Among this group, the analyses that may be used by persons who make price decisions or by those who seek to understand or appraise price structures (particularly the latter) will receive detailed critical examination in Part Two of this study. Cost inquiries of this sort do not, however, readily fit into the scheme of cost determinants suggested by economic theory. They are not primarily intended to isolate the independent effect of the rate of plant utilization or technological progress on cost variations. Nevertheless, they do reveal important information about the cost practices of business enterprises and provide some check on other inquiries more directly related to the framework of economic analysis.

(1) One of the simplest types of cost studies is a comparison of the items in profit and loss statements of single firms or groups of firms for a single period or over time. It is quite easy, for example, to calculate the ratio of labor expense to sales, or of advertising expense to sales. The most highly developed of such studies are those on variety chains, drug stores and department stores made regularly by the Harvard School of Business Administration, and the cost analyses frequently undertaken by trade associations. The significance of these investigations is limited, however, by the fact that market positions and methods of conducting business may vary extensively. Differences in accounting breakdowns, too, may make accurate comparisons difficult. One would expect such studies to be most satisfactory in

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rules of thumb when he himself is the only one to use the information, and he is free to superimpose on the cost data as much of his own experience and judgment as he pleases. When he is to be held accountable for his actions before a public tribunal, however, he must needs demand that the guides furnished him be explicit and the limitations be equitably adjusted to his own circumstances" (pp. 5-6).

fields where firms are fairly similar in size, technique and market situation. The results can then be used by business executives to provide a general picture of at least a few elements in the costs of an entire market. By comparing its costs with the average costs of competitors or of comparable firms in other markets and observing whether it spends more or less per dollar of sales on advertising, labor, or transportation, a firm may obtain some notion of its relative position. Again, since these costs give an over-all picture of a market, they may exert some influence on price. Thus an individual firm may be influenced to set its price more in conformity to average costs. Although surveys of this sort have been little used by students of cost-price problems, those which are yearly investigations could be utilized to special advantage in studies of the cyclical behavior of cost components.

A recent investigation of the uniform accounting, cost statistics and studies of trade associations<sup>80</sup> shows that such activities are usually directed toward cost control or pricing policies, or both. The comparison of the cost ratios or individual items of expenditure in one firm with those in others may reveal striking instances in which costs are out of line. A lumbermill, for example, discovered by comparing wastage ratios that its machines were being run faster than the most economical rate. Comparative costs for firms utilizing different methods of doing business may indicate profitable changes in organization. In one case, the issue of paying expenses for salesmen per mile or furnishing them with cars was studied with profit. There are many different ways in which cost inquiries by trade associations may influence price structures. An ink company discovered, for instance, that its practice of distributing free samples of printer's ink was rather expensive, and it thereupon discontinued the custom. A more direct relation is seen in the following statement of purpose from the paper

<sup>80</sup> C. A. Pearce, "Trade Association Survey," *Monograph No. 18*, Temporary National Economic Committee, Ch. VI. A sample of uniform cost systems was drawn from thirty industries.

box industry: "The main idea we kept in mind in preparing this manual was to make it as fool-proof and simple as possible. A person without much knowledge of the business can figure prices on this manual."<sup>81</sup>

(2) A great many bulk-line cost studies of markets have been made. They show for a group of firms at one time (with comparable factor prices among firms) the average costs of turning out a unit of product. A bulk-line cost curve is obtained by arraying the firms from the lowest cost to the highest. Sometimes the costs are weighted by the relative importance of the firm judged by the proportion of the total output produced. Bulk-line cost curves are always approximately J-shaped.

A number of these studies were made years ago by the Price Section of the War Industries Board to serve as a partial guide to the setting of prices. Prices had to be high enough to call forth the required output; hence they had to cover the costs of the "bulk-line" producer.<sup>82</sup> In the period 1920-33, the Tariff Commission made approximately 120 such investigations.<sup>83</sup> These studies are of limited significance not only because of questions of comparability among firms as to products and accounting practices, but also because of diverse rates of operation and different factor prices.<sup>84</sup> They have sometimes been used, however,

<sup>81</sup> C. A. Pearce, *loc. cit.* In reference to these same activities of another association, it was said: "The principal achievement of the association has been the preservation of competition in its original sense of 'to strive together for common interests.'"

<sup>82</sup> F. W. Taussig, "Price Setting as Seen by a Price Fixer," *Quarterly Journal of Economics* (February 1919), p. 205.

<sup>83</sup> *Range and Variety of Costs of Production*, Part III, Economic Analysis of the Foreign Trade of the United States in Relation to the Tariff, 72nd Congress, 2nd Session, Senate Document No. 180, Part III. For a discussion of the method utilized by the Tariff Commission see Appendix A.

<sup>84</sup> For an application of bulk-line cost curves to some of the questions asked by economists in the field of cost-price relations, see Kemper Simpson, "Price Fixing and the Theory of Profit," *Quarterly Journal of Economics* (November 1919), "A Statistical Analysis of the Relation Between Cost and Price," *Quarterly Journal of Economics* (February 1921), and "Further Evidence on the Relation Between Price, Cost, and Profit," *Quarterly Journal of Economics* (May 1923).

by purchasing departments of large concerns to secure some idea of the cost structure of the market.

(3) Before decisions can be made by business executives on such matters as expansion of plant, the introduction of new machines, or a variation in product or process, the alternatives open to them must be canvassed. All the relevant data on these alternatives, including costs, are frequently prepared by the engineering and accounting departments of a firm or by a consultant firm that specializes in such work. These cost estimates on which actual decisions are based are another source of cost information, and one seldom explored by economists.<sup>85</sup>

(4) There have been some attempts at studies of costs for the system as a whole, or for large sections of it, based upon aggregates. For instance, an index of labor costs per unit of output can be found by dividing a payroll index by a production index.<sup>86</sup> For particular industries such studies suffer from the lack of comparability in the coverage of payroll and production indexes. Although they are useful for some general purposes, the over-all figures can hardly throw much light on the process of decision formation.

(5) There have been a large number of studies in the field of agriculture which should be differentiated from studies of industrial enterprises because of the peculiar problems and treatment of data occasioned by the proper valuation of owner or family labor, home-grown factors of production (e.g., manure), and the valuation of farm products to the farmer's family.<sup>87</sup> Studies have been made also of the costs of obtaining one particular factor, such as

<sup>85</sup> E. H. Phelps Brown, "Cost Categories and the Total Cost-Function. Second Report of the Econometrica Committee on Source Material for Quantitative Production Studies," *Econometrica*, IV (July 1936), pp. 242-63.

<sup>86</sup> See Chapter VII, below.

<sup>87</sup> The importance of these problems is apparent in such studies as *An Economic Study of Dairy Farming in Grafton County, New Hampshire, 1930*, New Hampshire Agricultural Experiment Station, Bulletin 260.

power.<sup>38</sup> These investigations are similar to those classified under (1) above, in that they are derived from income statements, but they warrant separate mention because of the special features of agricultural enterprise.<sup>39</sup>

<sup>38</sup> See L. A. Reynoldson, W. R. Humphries, S. R. Speelman, E. W. McComas, and W. H. Youngman, *Utilization of Power on Corn Belt Farms*, United States Department of Agriculture, Technical Bulletin 384.

<sup>39</sup> See M. K. Bennett, "The Development and Purposes of Farm-Cost Investigations in the United States," *Quarterly Journal of Economics* (February 1926), pp. 273-94.