

A CONCEPTUAL FRAMEWORK FOR THE
DETERMINATION OF OPTIMUM
MARKETING MIX

Thesis for the Degree of Ph. D.
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Adrian John Klaasen

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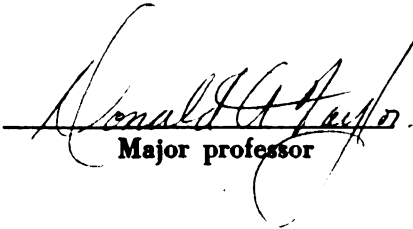
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**A CONCEPTUAL FRAMEWORK FOR THE DETERMINATION
OF OPTIMUM MARKETING MIX**

By

ADRIAN JOHN KLAASEN

A THESIS

**Submitted to the College of Business and Public Service
of Michigan State University in partial
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ABSTRACT

One of the generally recognized goals of the American economic system is the improvement of the standard of living. Improved productivity is a prerequisite to raising the standard of living in a free-enterprise society.

There are two aspects of productivity: as applied to the production of goods and as applied to the marketing of goods. Historically, the former has attracted the greater amount of investigation. This dissertation is concerned with exploring the possibilities of developing new efficiencies in the marketing of goods. To this end a conceptual framework is constructed which will serve as a basis for the application of the scientific method for the optimum solution of marketing mix problems. A model of a perfectly efficient marketing effort is created deductively, and from this model the following postulates are stated and developed:

1. The marketing task requires
 - A. the creation of exchange utility
 - B. the expansion of demand
 - (1) by creating place utility
 - (2) by creating time utility

(3) by communication

(4) by product variation

2. The marketing of each product requires the performance of a unique but identifiable functional mix whose composition will depend upon the characteristics of the product and the motivations of the consumer.
3. There exists a large inventory of techniques and institutional arrangements (the marketing mix components) whose abilities to perform the basic marketing functions are measurable.
4. Optimum marketing mix shall have been achieved when the discrete set of functions required to market a given product has been matched with a set of marketing mix components in such a way that no better match can be made.

The rationale for the determination of optimum marketing mix is based on the relationship between marketing effort and economies of scale. Each producer can increase the amount of his product demanded, by one of two methods: (1) reduce prices, or (2) use demand-expanding techniques. If the demand for his product is price elastic his best strategy may be to use pricing appeals to increase sales. If the demand for his product is more sensitive to any or all of the demand-expanding functions, he should use these techniques for expanding sales. The limits to which either price strategy or demand-expanding techniques can be used is determined by the economies of scale accruing from the increased sales. An essential departure from traditional marginal theory in this analysis

is the substitution of the "planning curve" for the marginal cost curve as a basis for determining economies of scale.

It is concluded from this reasoning that optimum marketing mix shall have been achieved when the following conditions are met: (1) the relative sensitivity of demand of each product to the performance of each of the marketing functions has been established, (2) a functional mix has been determined which will equate the marginal product of each function to every other function, (3) the functional mix has been matched with marketing mix components in such a manner that no change in matching will produce more effective performance, and (4) the further expansion of marketing effort will no longer produce offsetting economies of scale.

No attempt is made to develop techniques for measuring demand sensitivity to any of the available demand-expanding strategies because continuing studies of this nature are being carried on by producers as well as many marketing function specialists. This dissertation presents a conceptual framework into which appropriate data can be fitted, and from which a comprehensive plan of action will emerge.

Models are used to illustrate the concept of optimum efficiency and to illustrate the application of empirical data in the use of demand expansion via the creation of place utility. The thesis concludes with an economic analysis of the conceptual framework.

PREFACE

When one explores the unknowns of business in enough depth, he is likely to find himself in a realm of social science that can be identified by some title other than business. It is difficult to find an investigation in depth which cannot be properly classified under economics, social psychology, statistics, communication, or some other social science. For this reason, this thesis violates the traditional concept wherein the investigator probes into the depths of a limited segment of a discipline; a generalistic approach has been substituted for that of a specialist, and the subject of investigation is the entire marketing process as it is conceived by the individual firm.

The writer has accepted the risk of abandoning tradition in yet another respect. This is not an original research project in the fact-gathering sense. It is a careful, systematic investigation which attempts to establish useful generalizations from which laws or theory may be developed. Precedents for such an approach are numerous, outstanding among which are Frank Knight's Risk, Uncertainty, and Profit, and Chamberlin's Monopolistic Competition. The ideas expressed herein are ideas in the Platonic sense—models or archetypes

of which all real things are imperfect imitations and from which their existence derives.

My interest in the subject treated in this dissertation was kindled by a lecture by Dr. Thomas Staudt in 1955 in which he explored the concept of "plasticity"—the sensitivity of demand to sales promotion techniques. In the final exam the class was asked to illustrate this concept using the traditional graphics of economic analysis. Chapter VII reflects my continuing interest in the problem. Dr. Eugene Kelley, Dr. William Lazer, Dr. Stanley Hollander, and the late Dr. Karl Boedecker made many helpful suggestions in the early stages of research.

I am especially grateful to the members of my doctoral committee for their advice and generous assistance. The chairman, Dr. Donald Taylor, showed infinite patience during the periods of revision. Dr. David Moore and Dr. Arthur Warner were very helpful in keeping this dissertation in bounds.

Adrian J. Klaasen

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CHAPTER I

INTRODUCTION

The first and most ancient goal of an economic system is the provision of a maximum total of satisfactions from a limited amount of scarce resources. These satisfactions consist of goods and services.¹ One of the criteria which may be used to measure the effectiveness of an economic system in the attainment of this goal is the standard of living² which a society is able to achieve under the system.³

There are two sets of institutional arrangements that traditionally share the responsibility of producing and distributing⁴

¹George Stigler, "The Goals of Economic Policy," The Journal of Business, XXXI (July, 1958), 169.

²"Level of living" may be a more desirable description technically, but in deference to popular and universal usage we shall use the expression "standard of living" throughout this thesis.

³It is assumed here that a community's standard of living is an accurate measure of the extent to which a community's wishes are fulfilled. Some idea of the complexity of the problem of establishing a standard of perfection may be obtained from reading Chapter I of Tibor Scitovsky, Welfare and Competition (Chicago: Richard D. Irwin, Inc., 1951).

⁴There are many terms which are used both by economists and businessmen which have different meanings for each group. The

want-satisfying goods and services, namely, government and private business firms. Therefore the achievement of a higher standard of living will depend upon the efficiency with which these two agencies perform the economic functions—and furthermore, a much greater share of the responsibility will be exacted from the private business sector than from government in a free enterprise economy such as American capitalism.

Point of View and Scope

Marketing and economic efficiency

The desirability of raising the standard of living of a society is not seriously challenged in any responsible quarter. Tosdal¹ points out that the achievement of a high material standard of living to most people represents progress in the attainment of human welfare. The purpose of this study is to apply the scientific method toward the solution of problems which may ultimately permit greater

term “distribution” is one such expression. To the economist “distribution” refers to the allocation of the products of production among the various factors of production—land, labor, capital, and entrepreneurship. The businessman usually considers “distribution” as synonymous with “marketing”—the movement of goods from producers to consumers. This second interpretation should be used whenever this expression appears in this writing.

¹Harry R. Tosdal, Selling in Our Economy (Chicago: Richard D. Irwin, Inc., 1957), p. 1.

efficiency in the performance of some of the economic functions by the business firm. The United States has already reached a higher degree of affluence than any society in the history of civilization.¹ Nevertheless, complacency is not justified—it still has a large segment of its own population poorly fed, housed, clothed, and educated. Among the other nations of the world ideological choices are being made on the basis of the relative ability of the free-enterprise economic system vis-à-vis collectivism to create higher levels of material well-being. Thus an examination and enumeration of the processes which have contributed to the present state of affluence in this country may help to develop generalizations which will be useful both here and elsewhere.

The foregoing is summarized in the following propositions. First, that a higher standard of living is a desirable social objective; second, that the achievement of a higher standard of living is

¹ A footnote on page 2 of Tosdal (*ibid.*) authenticates this claim as follows: “The statistical supports for the assertions concerning the levels of living in the United States are to be found in many places, e.g., in governmental documents such as Federal Reserve Board Surveys of Consumer Finances and various other articles in the Federal Reserve Bulletin, Bulletins of the U.S. Department of Labor. Also see Economic Report of the President (annual issues) and ‘National Income, 1955 Edition,’ Supplement to Survey of Current Business, U.S. Department of Commerce. Professor William E. Rappard in his recent The Secret of American Prosperity (New York: Greenberg, 1955), devotes the first part of his book to ‘The Fact of Economic Superiority of the United States Today.’”

a function of a community's economic system and third, that in a free-enterprise economy the business firm is the strategic determinant of the standard of living. In other words, the efficiency of an economic system depends upon the productivity of the components of the system and in the American free-enterprise system the business firm is by far the most important component.¹

The task of providing goods and services for the satisfaction of consumer wants divides itself into two distinct activities—namely, “production” and “marketing.” In this dissertation the word “production” is used in its narrow meaning,² that is, “the creation of

¹A rough approximation of the relative importance in terms of money values of government-produced goods and services compared to privately produced goods and services can be reached by making the following comparisons based on 1956 data:

Privately produced goods and services	
purchased by consumers (1956)	\$266 billion
Privately produced goods and services	
purchased by government	\$ 79 billion
	<u>\$345 billion</u>

Excess of total government goods and	
services over amount purchased from	
private producers (\$108 billion – \$79	
billion)	\$ 29 billion

From this we can see that the private sector of the economy produces over eleven times as many goods and services as the combined local, state, and federal governments. Source: U.S., Department of Commerce, Survey of Current Business, Annual Review Number, February, 1957, pp. 11, 14.

²To the economist, production means the creation of all the utilities—form utility, place utility, time utility, and possessory utility. A more detailed explanation of this concept will be found in Chapter VII below.

form utility.”¹ The activities involved in production, therefore, are completed when a product reaches a producer’s shipping room, ready for distribution to the market.

The limitations imposed on the concept of production by the above definition permits use of the word “marketing” to describe all the remaining activities which the individual firms engage in to perform the total economic task. This is consistent with the definition of marketing as set forth by the Definitions Committee of the American Marketing Association:

Marketing—The performance of business activities that direct the flow of goods and services from producer to consumer or user.

Comment. This definition seeks to exclude from marketing those semi-manufacturing activities that result in changes in the form of merchandise which represents material modifications in its characteristics or uses. It seeks to include such activities when they result in changes in form primarily designed to make the product more salable and only incidentally to affect its use, such as packaging.

The task of defining Marketing may be approached from at least three points of view.

(1) The “legalistic” of which the following is a good example: “Marketing includes all activities having to do with effecting changes in the ownership and possession of goods and services.” It seems obviously of doubtful desirability to adopt a definition which throws so much emphasis upon the legal phases of what is essentially a commercial subject.

¹The creation of form utility consists of growing, making, fabricating, or assembling things which receive want-satisfying qualities as a result of these changes in physical form.

(2) The "economic," examples of which are: "That part of economics which deals with the creation of time, place, and possession utilities."

"That phase of business activity through which human wants are satisfied by the exchange of goods and services for some valuable consideration."

Such definitions are apt to assume somewhat more understanding of economic concepts than are ordinarily found in the market place.

(3) The "factual or descriptive" of which the definition suggested by the Committee is an example. This type of definition merely seeks to describe its subject in terms likely to be understood by both professional economists and business men without reference to legal or economic implications.¹

Within the framework of these two definitions, the activities of a business firm can be viewed as consisting of production and marketing. The propositions stated above assume that there is a direct relationship between a community's standard of living and the collective productivity of the firms comprising its economic system in the performance of each of these functions—production and marketing.

The application of the scientific method for the solution of production problems was intensified in the nineteenth century with the studies of Frederick Taylor² and the writings of Henri Fayol.³ So successful were the techniques which were developed as a result

¹ Journal of Marketing, October, 1948, p. 205.

² Frederick W. Taylor, The Principles of Scientific Management (New York: Harper and Bros., 1911).

³ Henri Fayol, General and Industrial Management, trans. Constance Storrs (London: Sir Isaac Pitman and Sons, Ltd., 1949).

of the application of scientific methods, that there has been a persistent growth in the efficiency with which the production function has been performed of from 3 percent to 5 percent per annum depending upon whether or not adjustments are made for changes in the general price level. In the United States economic output per worker is the greatest ever achieved by any economic system.¹

There are, on the other hand, a great many misgivings about the growth in efficiency in the performance of the tasks of marketing. Gordon A. Hughes, speaking at the 1953 Intermountain Marketing Conference, said:

It is generally believed that distribution absorbs approximately 50¢ of the consumer dollar. There is great opportunity and reward in our highly competitive economy to increase the efficiency and effectiveness of our distribution operations. While much progress has been made in increasing the efficiency of production, relatively less progress has been made in the development of techniques and methods for improving the efficiency and effectiveness of distribution. It is the joint responsibility of business and educational institutions, aided by foundations, associations, and even government, to develop new methods and techniques for analyzing and making more efficient the process of distribution.²

¹ A review of the findings in this respect is presented by Solomon Fabricant in "The Study of Economic Growth," Thirty-ninth Annual Report (New York: National Bureau of Economic Research, Inc., 1959).

² From a speech entitled "The Marketing and Sales Challenge Ahead," published in a collection of speeches in Utah Business Papers Number 1 (Salt Lake City: Bureau of Economic and Business Research, University of Utah, 1955).

Charles H. Sevin writes:

Even in the more efficiently managed firms there is some misdirected marketing effort. There are important opportunities for reducing costs, lowering prices, and increasing profits in almost every distributive operation. The results of every distribution cost analysis that has been made indicate that the potential benefits to be derived from these and other methods of quantitative analysis and from the application of selective-selling policies would be every bit as spectacular as those which have been achieved by cost accounting and scientific management in the factory.

The fact that the large proportion of the consumer's dollar goes to pay for the cost of marketing goods is not in itself objectionable. It does suggest, however, that efforts to reduce the ultimate cost¹ of goods might well be concentrated on this larger segment.

Victor Lebow is still more outspoken:

It is a fact that while in production the trend is toward lower costs per unit, distribution takes a mounting share of the consumer's dollar.

It is a fact that while in consumption our capacity to absorb the products of our fields and factories grows—what with higher living standards for more people, more leisure, increased security—distribution embraces an ever larger proportion of our working force, our potential producers of wealth.

In contrast with the economies and efficiency of mass production we see the multiplicity and duplication of lines within the wholesale and retail establishment. And finally, against the trend toward integration in production we see the process of atomization in distribution, exemplified by the record total of almost three million outlets for goods and services.²

¹ Charles H. Sevin, Distribution Cost Analysis, U.S. Dept. of Commerce, Economic Series No. 50 (Washington: Government Printing Office, 1946).

² Victor Lebow, "Mass Distribution," Current Readings in Marketing, compiled by George F. Frey and Raymond Buteux (New York: Printers' Ink Publishing Co., Inc., 1954).

The general consensus arising from a multiplicity of investigations using numerous techniques of cost measurement seems to confirm the above quotations that productivity in marketing has not kept pace with productivity in the so-called goods-producing industries.¹

Increased productivity in marketing will raise the standard of living either by making a greater amount of goods and services available to consumers from a given input of resources or by reducing the amount of inputs necessary to maintain existing consumption levels. Increased marketing productivity will result in either a net gain in total satisfactions to the consumer or a net reduction in disutilities or dissatisfactions. It will contribute to economic growth and therefore a high level of employment by expanding the demand for goods. Merely producing goods does not increase total satisfactions unless demand is expanded so that all the goods produced are taken off the market at a price sufficient to induce their offer. It will permit the accomplishment of both of the above objectives—an

¹ See Paul W. Stewart and J. Frederic Dewhurst, Does Distribution Cost Too Much? (New York: Twentieth Century Fund, 1939); Paul D. Converse and Harvey H. Huegy, Elements of Marketing (3d ed.; New York: Prentice-Hall, 1946), Harold Barger, Distribution's Place in the American Economy Since 1869 (Princeton, N.J.: Princeton University Press, 1955).

increased standard of living and economic growth—in an environment of personal freedom and free choice.

Marketing efficiency and business management

It has not been necessary in the competitive system in the United States to belabor the importance of efficiency in marketing to the business executive because he has discovered that not only the profitability of the firm, but its very survival, has depended upon the rapid solution of problems of efficient distribution. His discovery that for some people shopping from a mail order catalog provided more efficient marketing methods than were available to them before led to the development of present-day large mail-order retailers. His discovery that goods could be presold through branding and advertising led to the tremendous growth in the use of nonpersonal selling and the complementary growth of self-service markets. His discovery that the consumer was willing to use his own transport devices in performing the transportation function led to the development of cash-and-carry stores and regional shopping centers. When he discovered that preselling had effectively replaced salesmen and that this in turn increased the price-elasticity of demand for some kinds of goods, the discount house came into being and flourished.

The use of ad hoc decisions and strategies has produced a truly amazing complex of techniques and institutional arrangements which are now available to the marketing strategist. Each of these tools has proven successful for a particular good in a particular market. Competitors as well as noncompetitors have observed the successful use by one firm of a particular combination of these techniques or institutional arrangements, and therefore, they have often been induced to try the same strategy, only to find it ineffective for their particular product or their particular market. As a result of the accepted trial-and-error rationale in the design of marketing programs a tremendous amount of waste has been absorbed by the economy.

A number of scholars of marketing and management have recognized this problem.

After a firm has spelled out its market objectives and has laid out a program to achieve them, a basic step in carrying out this program is the allocation of the available resources to the specific marketing activities. The problem of how to effectively allocate resources to various programs is a very complex one and one that continues to challenge the top brains in marketing management. Take, for example, the problem of how much money should be spent on advertising. It is extremely difficult to measure the results of specific advertising expenditures. In general it is hard to separate the results of any specific marketing operations from the effects of other activities. For example, to what extent are sales attributable to the success of the advertising program or to the skill with which the salesmen present their sales message? As a result of the lack of clear-cut productivity measures for many marketing programs, it is difficult to answer

such questions as "should advertising programs be cut back or expanded if sales volume falls off?" Similarly, if sales volume is diminishing, should more salesmen be hired or should efforts be concentrated on increasing the efficiency of those already employed? These are difficult questions for marketing management, particularly since it is aware that competition may be intensifying its efforts if the market is shrinking.¹

Formal marketing planning as it is practised today in many companies probably represents the biggest single waste of time and money in the entire corporate realm.²

We know what we need: a systematic supply of organized knowledge for the risk-making and risk-taking decisions of business enterprise in our complex and rapidly changing technology, economy, and society; tools for the measurement of expectations and results; effective means for common vision and communication among the many functional and professional specialists—each with his own knowledge, his own logic, and his own language—whose combined efforts are needed to make the right business decisions, to make them effective, and to produce results. We need something teachable and learnable if only because we need far too many people with managerial vision and competence to depend on the intuition of a few "natural-born" geniuses; and only the generalizations and concepts of a discipline can really be learned or taught.

We know that these are urgent needs. In fact, the future of the free enterprise system may depend on our ability to make major managerial and entrepreneurial decisions more rationally, and to make more people capable of making and of understanding such decisions.³

¹ Al N. Seares, Scientific Management of Marketing Operations (New York: Society for the Advancement of Management, 1959), p. 15.

² Andrall and Pearson, "An Approach to Successful Marketing Planning," Business Horizons (School of Business, Indiana University, Winter, 1959), p. 74.

³ Peter Drucker, "Potentials of Management Sciences," Harvard Business Review, January-February, 1959, p. 26.

Evidence that conceptual skill has been applied with energy and vigor to the management of marketing is by no means easy to find. The assumption that marketing, because it is by nature unpredictable, must be handled forever in terms of artistry rather than skill, should be challenged.¹

Distribution's function is to ensure that production charges plus distributive charges give the lowest possible total price having regard to what the consumer wants and the services he expects in connection with his purchase. The consumer's needs and demands are many and always changing. Some want personal service, (a "suit made to measure cut in personal style"); others are content with a good stock size, ("chosen from a range of ready-made garments"); all want to be able to make a choice within or between shops and get the product that they feel satisfies them best at the price they want to pay.

Distribution strives to cut down costs on processes no longer required by the potential consumer, while keeping to a minimum new costs necessitated by new demands made upon it. If, for example, the consumers do not want to walk upstairs to shop, shops might have to be laid out on a single-floor or else incorporate escalators or elevators to hold their custom; these might seem unnecessary costs perhaps in more austere or leisurely times. Decisions are always having to be made, as to the prospective gain or loss any such possibility would entail. Such "necessary" costs (given the economic discipline which competition provides), must however invariably add to the value of the product.

In the fact that consumers as a whole are never fully satisfied lies the spur to the necessary competition; this competition ensures that distribution gets as close as it can towards giving satisfaction. The extent of that satisfaction is really our "standard of living," the content of that competitive activity provides the "value added" by distribution.²

¹Reavis Cox, "Three-in-One Marketing," Harvard Business Review, November-December, 1956, p. 61.

²Report of the Commission on Distribution of the International Chamber of Commerce, "How to Reduce Distribution Costs," Brochure 204 (March, 1959), pp. 5-6.

During the last few years it has become increasingly evident that the study of marketing is a discipline worthy of the development of basic theories and a conceptual framework into which the individual studies can be fitted. The American Marketing Association has commissioned a number of leaders in marketing thought to attempt to develop a satisfactory conceptual framework for the further development of marketing concepts. So far the results have been a collection of widely diverse opinions regarding what is needed.

The planning and implementation of marketing strategy is a highly confidential operation in most American business firms. The important role the process of trial and error plays in the allocation of resources to perform the marketing task is evident to all who examine the process. The marketing errors which are such an important part of decision-making under this method are not only costly to the firm making them but are a waste of resources for society. There appears to be a need for a systematic supply of organized knowledge to transfer decision-making from dependence on the intuition of a few geniuses to the use of the scientific method based on generalizations and concepts of a discipline which can be learned and taught. Perhaps a re-examination of the requirements for developing management skills creatively and objectively will be useful.

Katz¹ points out that management skills can be divided into three classifications: (1) technical skill—proficiency in the use of specific methods and processes; (2) human skill—the qualities of leadership which are essential to inducing effective teamwork; and (3) conceptual skill—proficiency in visualizing what the enterprise really is and what it is supposed to do.

American businessmen have shown great resourcefulness in acquiring and developing technical marketing skills.² They likewise have shown great aptitude for organizing and managing large selling organizations as exemplified by the Fuller Brush sales organization, the marketing department of the General Electric Company, the huge concentrations of advertising talent employed on Madison Avenue, and the thousands of sales clerks employed by Woolworth. It is difficult,

¹Robert L. Katz, "Skills of an Effective Administrator," Harvard Business Review, January–February, 1955, p. 33.

²For instance, see "A T and T Promotes 'Shop by Phone,'" Business Week, November 21, 1959, p. 126; "New-fangled Routes Deliver the Goods—Faster and Cheaper," Business Week, November 14, 1959; "Caviar in the Supermarket," Fortune, January, 1959, p. 101; "Low Budget Campaign Boosts Sales 500%," Printers' Ink, January 26, 1960, p. 40; "Multiple Packaging—A Merchandising Tool," Journal of Marketing, January, 1959, p. 287; "Toward a Better Understanding of Supermarket Site Evaluation and Rentals," a contributed paper at the December Conference of the American Marketing Association, 1957.

however, to find similarly striking examples to demonstrate an equal intensity in the use of conceptual skills.

Business managers have successfully attacked the problem of marketing efficiency on two fronts. The first may be described as those activities and investigations which seek to improve the efficiency of the performance of a specific task. Examples of this type of activity are found in almost every competitive business situation, and include such detailed activities as (1) discovering effective sales messages to be used in personal selling, (2) measuring advertising media effectiveness, (3) studies in the use of copy and illustrations in advertising, (4) motivation research, (5) investigations leading to lowering transportation costs as are typically conducted by traffic managers, and (6) the use of operations research for decision-making.

The second method seeks to improve marketing efficiency by eliminating waste. This is primarily an accounting procedure, and the techniques for its development have been pioneered by Longman and Sevin.¹ Under these studies accurate costs for performing

¹The problem of controlling and reducing marketing costs is also the concern of several other segments of business activity besides marketers. The National Association of Cost Accountants is one such group. Important contributions to effective techniques for analyzing distribution costs are found in the following N.A.C.A. publications: E. W. Kelley, "Distribution Cost Analysis," N.A.C.A. Bulletin, September, 1952, p. 187; Francis E. Swisher, "Distribution

marketing functions by products or customers or other criteria are used and then the yardstick of profitability is used to determine whether or not these activities should be continued. In theory this approach seeks to find remedies for misdirected effort. This method suggests, for instance, that management can reduce costs and increase profits by abandoning a complete-coverage attitude in applying marketing effort. A policy of directing or confining marketing effort as much as possible to profitable customers, profitable order sizes, profitable sales territories, profitable commodity lines, and so on, is often called selective selling. In the determination of a policy of selective selling, distribution cost analysis is a valuable tool.

Helpful as these methods have proved in the past, a conceptual framework within which specific studies may be fitted should also prove useful in advancing marketing efficiency. Although the general purpose of this study is to apply the scientific method to the solution of marketing efficiency problems, the specific purpose is to develop a conceptual scheme which will contribute to the efficiency with which managerial marketing performance will be achieved by the individual firm.

Costing," N.A.C.A. Bulletin, September, 1955), p. 173; Frank S. Howell, "A 'Contribution' Approach to Distributing Costing," N.A.-C.A. Bulletin, October, 1954, p. 214.

Method of Study

The conceptual framework approach

The development of a conceptual scheme requires departures from traditional methodology. Although extensive knowledge of the general phenomenon investigated is essential, it is not acquired with the rigor and precision generally associated with more intensive study of specific aspects of the phenomenon. The generalistic approach therefore requires a sacrifice in the depth of the investigation in favor of a broad interdisciplinary study which attempts an overview of the entire environment to which marketing decision-making is exposed.

Lazarsfeld¹ suggests that a concept is "a rather vague image or construct that results from the authors' immersion in all the detail of a theoretical problem." The creative act may begin with the perception of many disparate phenomena as having some underlying characteristic in common. When a group of observed regularities arrange themselves into a vaguely conceived entity whose relationships seem to be meaningful, a concept has been produced. If a

¹Paul F. Lazarsfeld and Morris Rosenberg, The Language of Social Research (Glencoe, Ill.: The Free Press, 1957), Introduction, p. 15.

design of sufficient strength is constructed so that the vaguely held observations may be maintained in a fixed position until observable data can be fitted into their proper places a conceptual framework will have been developed. The elements which are fitted into the framework may be referred to as components, dimensions, or similar specifications. They may be derived at logically by processes of induction or deduction, or they may be empirically observed correlations between the various components or dimensions.

The purpose of the conceptual framework is to provide support for a group of component variables so that a condition is created under which the effect on the whole may be observed as one or another variable is changed. From these changes one may expect to observe cause-and-effect relationships, and these in turn may permit useful generalizations to be made. These useful generalizations may then be treated as hypotheses and subjected to verification. Upon verification based upon empirical evidence, the hypotheses are accepted as established theory or scientific principle.

Marketing mix

In this study an attempt is made to identify the “component variables” and to formulate relationships among them which will permit more precise use of the firm’s resources in the conduct of

marketing activity. The combination of techniques and institutional arrangements which the business firm uses for the accomplishment of the marketing task is called the "marketing mix."

The creation of the expression is generally credited to Neal H. Borden, professor of marketing at Harvard University. The following quotation adequately describes Professor Borden's concept:

In his marketing operations the businessman is constantly in search of a "marketing mix" that will produce a profit for any product or line of products that he has to sell. Generally, in his striving to maintain or improve profit position, he is an empiricist trying changes in the several procedures and policies that make up what we call a "marketing program." His success as a marketer depends pretty much on his understanding of the forces of the market that bear upon any product or product line and his skill in devising a "mix" of marketing methods that conform and adjust to these forces in ways to produce a satisfactory net profit figure.

A study of the marketing programs or mixes that have been evolved under this empirical approach shows a tremendous variation in their patterns. This variation is reflected in the operating statements of manufacturers. Among such operating statements there is little uniformity, even among manufacturers in the same industry. There are no common figures of expense that have much meaning as standards, as hold true for many retail and wholesale trades, where the methods of operation tend to greater uniformity. Instead, the ratios of sales devoted to the various functions of marketing are widely diverse. This diversity in methods and in expenditures by categories even within an industry is accounted for largely by the fact that products, the volume of sales, the market covered, and the other facts that govern operations of each company tend to be unique and not conducive to uniformity with the operational methods of other companies, although there are tendencies towards uniformity among companies whose product lines are subject to the same market forces. As noted, in any category of expense the percentage of sales spent may cover wide ranges. For instance, the advertising expense figure, which reflects the burden placed

upon advertising in the marketing program, will be found to vary among manufacturers from almost zero percent to over 50%. Similarly, the percentages of sales devoted to personal selling will cover a wide range among different businesses.

To illustrate, proprietary remedy manufacturers often have no salesforce at all. Advertising is used to sell the product to consumers and advertising literally "pulls" the product through the channels of distribution. At the retail level little or no effort is made to secure selling support. In contrast, manufacturers of other types of products, e.g., heavy machinery, often put relatively little of the burden of selling upon advertising and rely primarily on the "push" of personal selling by either a direct salesforce or the salesforce of distributors.

The part played in the marketing programs by the distributive trades varies markedly. Sometimes the trade plays a considerable part in the sales program and the close support and cooperation of the trade is sought, as has generally been true with heavy appliances. In other instances the part played by the trade is not highly important and little effort is devoted to securing trade support, as is true among the proprietary medicine companies cited above. Likewise, the employment of promotional devices and of point of purchase effort in marketing programs varies widely.

In the matter of pricing and pricing policy, wide variation is likely to be found. In some instances competition is carried out largely in price and margins are narrow. In other instances prices are set with wide margins and competition is carried out on nonprice bases, such as product quality or service or advertising. In some instances resale prices are maintained; in others they are not.

And so we might go on citing wide differences in the practices of branding, packaging, and servicing that have been evolved.

In short, the elements of marketing programs can be combined in many ways. Or, stated another way, the "marketing mixes" for different types of products vary widely, and even for the same class of product competing companies may employ different mixes. In the course of time a company may change its marketing mix for a product, for in a dynamic world the marketer must adjust to the changing forces of the market. The search of business in any instance is to find a mix that will prove profitable. To attain this end, the various elements have

to be combined in a logically integrated program to conform to market forces bearing on the individual product.¹

A careful reading of this statement implies two conditions relevant to the task of efficiently performing marketing activities:

(1) There are variations in market forces (the demand of the market for the performance of specific functions) that bear upon any product, and these market forces must be identified. (2) There are numerous marketing mix components available in the form of marketing techniques and institutional arrangements that may be employed.

The "component variables" with which the practitioner must deal, then, are the market forces and the marketing mix components. A compatibility must be achieved between these if optimum marketing mix is to be reached. Optimum is "the best or most favorable degree," and the meaning in the expression "optimum marketing mix" means that assortment of marketing mix components which will yield the highest degree of effectiveness in the performance of the marketing task possible for a given product. Not only is the correct selection of the components required, but the correct proportion of each component to the whole. In other words, optimum marketing mix shall have been achieved when no increase in effectiveness can

¹Neil H. Borden, "Note on Concept of the Marketing Mix," Copyright, 1957, by the President and Fellows of Harvard College.

be achieved by changing either the identity or the proportion of the components selected to do the task.

The above is an oversimplification of the total problem. The objective of optimizing the marketing mix calls for the determination of standards to evaluate the extent to which the objective has been achieved. Two firms selling the same product may have used different combinations of marketing mix components with apparently equal success. However, it is not always clear whether or not each has achieved optimum marketing mix. The first task, therefore, is to construct a model which clarifies the concept of optimum efficiency.

Within the conditions of optimum efficiency, the firm must match market forces with marketing mix components. Conceptually, market forces may be viewed as being the demands of the market for the performance of specific functions. These functions must be identified and a determination must be made of the degree to which each of the functions must be performed for a given product. The vast array of marketing mix components (institutions and techniques) must then be evaluated in terms of their capacity to perform the required functions. The functions required must then be matched with the marketing mix components in an optimum manner.

Three basic postulates

In keeping with the above, three postulates have been established as follows:

- I. The accomplishment of the total marketing task requires the performance of basic identifiable functions.
- II. Every product requires the performance of a unique functional mix and the composition of this discrete set of functions depends upon the characteristics of the product and the consumer motivations which induce the purchase of the product.
- III. There exists a large inventory of techniques, methods, and institutional arrangements capable of performing some or all of the marketing functions with varying degrees of efficiency. Each of these components of the marketing mix is susceptible to grading as to its ability to perform individual marketing functions; optimum marketing mix shall have been achieved when the discrete functional mix for a given product and the appropriate marketing mix component have been matched in such a manner that no change in matching will reduce the cost or increase the effectiveness of performing the designated marketing task for the product.

As postulates, the above statements are assumptions that provide the first premises in a train of reasoning designed to construct a conceptual scheme for the determination of optimum marketing mix. Their formulation derives from "the author's immersion in all the detail of the theoretical problem." To investigate each detail with the traditional fact-finding methods would constitute a task far beyond the capability of any single researcher. Rather, reliance is

placed on the investigations of others and the capacity to observe markets and market behavior over the years.

The method of study requires the deductive development of the optimum conditions. Postulate I requires the determination of basic marketing functions. Postulate II requires the determination of the unique functional mix which the marketing of each product requires. Postulate III requires the cataloging of marketing techniques and institutional arrangement as well as an evaluation of their capacity to perform the basic market functions. The “component variables”—functions to be performed and alternative marketing techniques and institutions—are matched in a model which satisfies optimum conditions.

Limitations

It is conceded at the outset that the above approach presents an oversimplification of the problem of directing total marketing effort. This is deliberate. The organizational structures of many firms betray a proliferation of autonomous departments including those of merchandising, product development, sales, advertising, public relations, with little indication that a clear-cut concept of the total marketing task exists. A broad conceptual framework will

provide the basis upon which not only policy and organization decisions may be made but also specific research areas can be identified.

Second, the optimum matching of functional mix with marketing techniques and institutions could be completely ineffective if, after the proper technique is selected, it is poorly executed. This is a problem of workmanship or implementation. The conceptual framework provided in this study will result in the selection of optimum techniques and tools, but a large and important task remains—that of skillful execution. Nevertheless, the optimum marketing mix concept provides an important tool to prevent misdirected effort. Just as a brilliantly executed maneuver on the wrong battlefield is useless, so brilliantly written advertising copy is to no avail if the performance of the communication function is irrelevant in a given situation.

Perhaps the most severe limitation derives from the fact that the present state of the arts does not permit the implementation of some of the concepts presented in this paper at this time. To permit this limitation to interfere with the conceptual requirements would be to assume that no further progress would be made in developing the arts of investigation and measurement. Such an assumption is not warranted. Frontiers in the field of consumer motivation, price

elasticity of demand, income sensitivity, and other areas of marketing relevance are constantly being pushed back.

Order of Presentation

Chapter II, "The Concept of a Perfectly Efficient Marketing Effort," presents a simple model to illustrate the concept of optimum marketing mix. It is based on the logic that additional expenditures may be made for each marketing function as long as the resultant production economies of scale are sufficient to offset the expenditures.

The accomplishment of the total marketing task requires the performance of basic identifiable functions. Chapter III reclassifies these functions into (A) the creation of exchange utility and (B) facilitating the expansion of market demand. The latter consists of (1) creation of place utility, (2) creation of time utility, (3) communication, and (3) product variation. The chapter is entitled "Marketing Functions Reclassified."

Chapter IV is entitled "Relationship of Sensitivity of Demand to the Performance of Basic Marketing Functions." It undertakes to illustrate how the discrete functional mix may be determined for various products by analyzing the product characteristics and the consumer motivations which induce the purchase of the product. It

suggests the use of rating scales to measure the sensitivity of demand to the performance of the creation of place utility, the creation of time utility, communication, and product variation.

Marketing mix components are inventoried and discussed in Chapter V, "Marketing Mix Components—Institutional Arrangements for Performing the Marketing Functions." In addition to reviewing the existing institutions and techniques available for the performance of the marketing functions, methods for grading these components on their ability to perform each function are suggested.

"The Application of Empirical Data," Chapter VI, illustrates by the use of a model the nature of the data to be collected for the application of the theoretical framework which has been developed. Essentially, the necessary data are whatever are required to establish the sensitivity of demand to the performance of each of the basic functions and the relative costliness of performing each of the functions by the existing marketing mix components. The model is limited to performing the transportation function (creating utility of place) by the use of parcel post.

Chapter VII is entitled "The Use of Economic Analysis to Determine Optimum Marketing Mix." This chapter undertakes to fit the managerial theories presented in this dissertation into the economic theory of the firm. Modifications are made in generally

accepted economic analysis to permit application to business conditions as they exist in the real world.

Chapter VIII, "Summary and Conclusions," reviews the **concepts** presented, points out where their usefulness may lie, and **suggests** some of the changes which an acceptance of the principles **will** imply. An appendix is attached containing the results of **research** to determine the relationship of transportation costs and **expanding** geographical markets based on the use of parcel post: **data** which were used in the Chapter VI model.

CHAPTER II

THE CONCEPT OF A PERFECTLY EFFICIENT MARKETING EFFORT

The conditions of marketing efficiency are essential in achieving the optimum marketing mix. The firm attempting to improve its marketing practices must adjust to the optimum conditions. Simply stated, optimum marketing mix is achieved when the firm makes expenditures for the performance of marketing functions equal to the economies of scale resulting from the larger levels of output achieved through marketing inputs. In this chapter a hypothetical illustration is used to demonstrate the conditions of optimum efficiency.

A number of references will be made in this chapter to “economies of scale.” Although this term is defined more precisely in Chapter VII, which undertakes an economic analysis of the optimum marketing mix theory, it is well to clarify the concept at this point.

The basis for determining economies of scale is the “planning curve.” It assumes that the typical manufacturer of consumer goods is operating in an industry of decreasing costs. The planning curve is determined by the following conditions, all of which require forecasts by the firm making the planning curve:

1. What are the ultimate limits of expansion of output which are realistic for the product?

2. At what factory prices is the firm prepared to undertake each level of output? The presumption is that factory prices will be (a) high enough to justify making the offer to produce and to earn a "reasonable" profit, and (b) low enough to avoid attracting new competitors.

The planning curve as thus conceived will have the following characteristics:

1. It will slope downward to the right to reflect the decreasing cost characteristics of the industry.

2. It will have a steeper slope at the low output end and will tend to flatten out at high output levels.

3. It will be much broader and smoother than either marginal cost curves or incremental cost curves because it will reflect long-term objectives rather than the limitations of existing plants and production schedules.

4. It will eventually turn upward.

5. For all practical purposes it represents the factory price-quantity relationships for all output levels that the firm is willing to

consider in its long-range plans without the addition of demand-expanding costs. It may be useful to view this curve as representing firm quotations covering a wide range of outputs F.O.B. the factory gate.

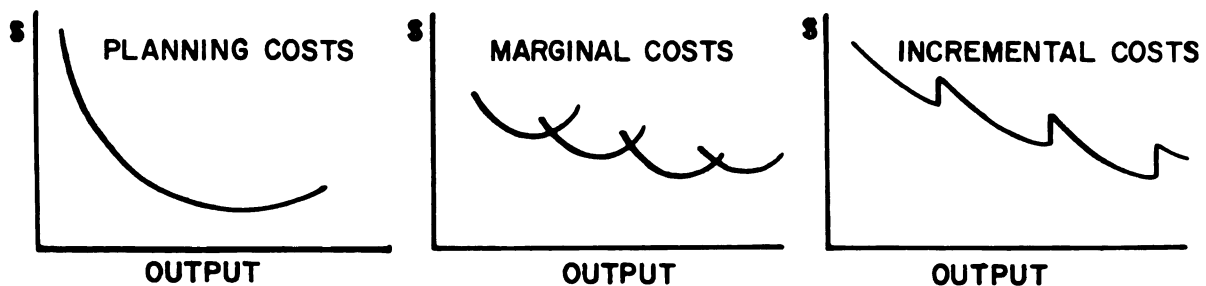
“Economies of scale” as used in this chapter may, therefore, be defined as the decrease in the factory price as shown on the planning curve as larger levels of output are reached.¹

An Illustrative Model

A number of simplifying assumptions are made in the development of this model. In reality they must be taken into consideration and it is the purpose of Chapters III and IV to examine them in more detail.

The Model Company makes the Modelet, a device useful to the housewife in her housekeeping duties. Because of the characteristics

¹The planning curve is not to be confused with two similar concepts; namely, the marginal cost curve and the incremental cost curve. The graphic distinction is illustrated below:



of the product and the needs of the housewife, one out of every twenty housewives will purchase a Modelet if given the opportunity, at the price of \$20 each. This implies that there is a latent demand for this product—a demand which exists because a need existed before the appearance of the Modelet. Such a need might have been the result of the natural inclination of a person to try to avoid or reduce the onerousness of performing household tasks, the desire for a product which will permit a task to be performed better, the joy of viewing such a product as part of the home decor, the pleasure or relaxation which is anticipated would result from the use of such a product, or any one of many rational or emotional needs which might have resulted from a person's total environment. Latent demand is therefore that which exists prior to the existence of the means by which the demand may be satisfied. Where latent demand exists, a transaction will result from the simple act on the part of a seller of making an offer to sell.

The Model Company has determined that it will offer the Modelet at \$20 per unit at its factory if it can sell 500 units. The company would not make this offer if the \$20 price did not include a satisfactory profit to the company. Therefore, it is assumed that

all production costs at the factory gate include a sufficient profit to induce the company to make the offer.¹

A Modelet weighs ten pounds. A housewife will travel ten miles to shop for a Modelet. Within ten miles of the Model factory there are 50,000 people, of which 10,000 are housewives who are potential buyers. Based on the earlier assumption of one out of twenty making a purchase when given an opportunity, the company can expect to sell 500 Modelets at \$20 each.

Within a 100-mile radius there are a million people, and using the optimum conditions for transporting Modelets (perhaps by parcel post) for \$1 each the handicap of distance can be overcome. When reduced to its simplest form the problem now becomes one of whether or not the additional transportation cost can be offset by economies of scale. In other words, by adding transportation the new geographical limitations will permit the sale of 10,000 Modelets instead of 500, ceteris paribus. If the savings in production cost due to this new production schedule are \$1.25, the Model Company will be wise to continue its territorial expansion, because the demand-creating cost (\$1.00) is less than the resultant economies

¹This is consistent with the concept of costs as defined by Marshall, Chamberlin, Robinson, and others. See Chapter VII for further discussion of this point.

of scale (\$1.25). In fact, optimum production efficiency requires that geographical expansion continue up to the point where economies of scale no longer are sufficient to offset increasing transportation charges.¹ The company, therefore, can continue to expand the geographical area up to the point where the average freight or transportation cost increases are equal to the savings resulting from economies of scale. At this point average revenue equals average cost. For purposes of further model development, it is assumed that when transportation costs are \$1.50 the break-even point between transportation costs and economies of scale has been reached and the volume at this point is 20,000 Modelets.

It is further assumed that it costs \$.03 per month to store Modelets, and that by storing them new economies of transportation

¹This statement requires a definition of "optimum efficiency." In economics, a distinction is generally made between "economic" and "technical" efficiency. Here, however, we are concerned with optimum efficiency in respect to an individual firm, and our definition can be broadly stated as that condition under which a given input of the factors of production is made to produce the maximum amount of consumer satisfactions consistent with profits which will produce competitive equilibrium. For a discussion of the problems involved in defining "efficiency," see Scitovsky, pp. 148, 179, 233-41, 365-67, 428; Kenneth Boulding, Economic Analysis (3d ed.; New York: Harper and Bros., 1955), p. 581; Joan Robinson, Economics of Imperfect Competition (London: Macmillan Co., 1942), pp. 341-45; Roland Vaile, E. T. Grether, and Reavis Cox, Marketing in the American Economy (New York: The Ronald Press, 1952), pp. 652-63.

are uncovered because this permits the shipment to storage points in carload lots. This in turn permits the expansion of the market to the point where the increased storage costs are exactly offset by the decreased transportation costs plus decreased cost in production due to further economies of scale. It is further assumed that an additional \$.30 per unit in storage costs will expand the market to 30,000 Modelets, at which point average storage costs will equal average savings accruing from economies of scale. If the additional \$.30 per unit expenditure will permit the reduction of transportation costs from \$1.50 to \$1.40, it is evident that the addition of a component to the marketing mix has reduced the previous total marketing mix cost. It is important to observe the effect of this principle as additional marketing mix components are added.

The exchange function has been implicit in all the above transactions. At this point some observations are in order regarding the cost of performing the exchange function. In the first place, a prerequisite to exchange is the ownership of goods or money by two parties. The question of whether ownership costs per se should be considered part of the cost of performing the exchange function is moot. For the sake of simplicity in the model it is assumed that the ownership cost up to the time of sale for the producers of the

Modelet are production costs and that the ownership costs after the exchange become the cost of the consumer. One might argue that the cost of holding money for which the goods were exchanged, including banking and the risks involved in handling the money, are legitimate exchange costs. A second potential exchange cost is the exchange in evidence of ownership, which in its simplest form is merely the exchange of a bill of sale for currency. In a mail-order business this cost may be computed in the cost of a clerk's time plus the overhead involved in having a clerk available. A third item of exchange cost is the cost of making an offer and an acceptance, the two basic requirements of exchange. These costs are assumed away in the illustration since it was specified that a given number of Modelets would be sold merely by making them available, the formal offer being tacit and the acceptance by the consumer being a payment of money. The total exchange cost to this point will be disregarded. All that is acknowledged is that they are real and measurable but of relatively little importance in the illustration.

So far an existing demand based on an existing desire and need for the Modelet plus the ability to pay for it has been assumed. Experience shows, however, that this demand may be expanded to the point where every housewife becomes a potential user of the Modelet.

A number of communication devices are available to the Model Company to stimulate demand. Perhaps the most obvious of these is conversation between two people representing the buyer and the seller. The advantage of this type of communication is that it is two-way and permits a question-and-answer type of discussion. In practice a sales person is available to answer questions and to explain the Modelet in addition to making the Modelet available in the form of an offer. In this way an expansion of the market is achieved which permits further economies of scale. In addition to the possibility of using a salesman for carrying on this communication there are possibilities of using numerous sales promotion devices and advertising media. Each of these sales promotion devices and media is uniquely suited for the accomplishment of the communication task based on the characteristics of the product to be sold and the needs or desires of the customer. The expansion of the use of communication to expand the market can continue in the same manner as the expansion of the previous functions up to the point where the additional cost incurred exceeds the savings accruing from reduced production costs. For the purpose of developing the model, it is assumed that the company can spend \$1.20 per Modelet for communication before the point is reached where

additional communication would cost more than the savings due to economies of scale.

A final means of increasing the market is product variation. If the customer has a choice of colors when buying a Modelet, or if new designs are offered annually, another 10 percent of the potential users of the Modelet can be induced to make purchases. Again, a per-unit expenditure of an amount equal to the per-unit saving accruing from increased economies of scale can be justified for making product variations. As long as product variations are limited to an extent less than the point at which expenditures for them and production savings balance, optimum efficiency will not have been reached.

It is assumed that this point is reached when product variations costing \$.50 per unit have been made. The total marketing costs of the company, using each activity optimally, are as follows:

Creation of place utility	\$1.40
Creation of time utility	.30
Communication	1.20
Product variation	.50
	<u>\$3.40</u>

Conclusions from these observations, based on the severely limiting assumptions, can, therefore, be stated as follows:

The Model Company will have achieved maximum total sales and optimum marketing efficiency when 3.40/20.00 of the price of

Modelets, or 17 percent, is spent for total marketing effort in the proportions which follow:

140/2000	for creating place utility	= 7.0 percent
30/2000	for creating time utility	= 1.5 percent
120/2000	for communication	= 6.0 percent
50/2000	for product variation	= 2.5 percent

Within this framework of optimum marketing mix those charged with the responsibility of marketing management must perform the following tasks:

1. Identify the functions which must be performed.
2. Determine the degree in which each function is needed for different classes of products.
3. Identify the marketing institutions and techniques capable of performing these functions in the required degree.
4. Match the functions required with the marketing components in an optimum way.

It is to these problems that the remaining chapters of this thesis are devoted.

CHAPTER III

MARKETING FUNCTIONS RECLASSIFIED

Postulate I

In this chapter Postulate I is examined in detail. The accomplishment of the total marketing task requires the performance of basic identifiable functions.

It has been recognized by many writers that a productive area for the development of marketing theory might be found in a "functional analysis" approach. As long ago as 1917, writings began to appear which sought to clarify the study of marketing by dissecting its functional components.¹ Important contributions in the area of functional analysis were made by Vanderblue,² Ryan,³

¹See, for instance, L. D. H. Weld, "Marketing Functions and Mercantile Organization," American Economic Review, VII (June, 1917), 306-18.

²H. B. Vanderblue, "The Functional Approach to the Study of Marketing," Journal of Political Economy, XXIX (October, 1921).

³F. W. Ryan, "Function of Elements of Marketing Distribution," Harvard Business Review, CXXXII (January, 1935).

Jones,¹ Staudt,² and McGarry.³ To the sophisticated investigator it is apparent that each list of functions that has been developed is the result of a conscious attempt to tailor a list to fit the particular needs of the investigator. This explains to some extent the fact that a list of functions developed by someone interested in cost accounting will generally include those functions which lend themselves to separate costing. Other writers have placed major importance on those functions which are directly involved with transferring title; e.g., buying and selling. Some writers have listed as many as 120 functional elements which must be performed if the entire marketing task is to be accomplished.

McGarry has provided a pertinent and penetrating analysis of marketing functions:

Functional analysis should enable the analyst to evaluate the activities that are performed in terms of ultimate objectives

¹F. M. Jones, "A New Interpretation of Marketing Functions," Journal of Marketing, VII, No. 3 (January, 1943).

²Thomas A. Staudt, "The Managerial Functions of Marketing," condensed from materials in a forthcoming book and reprinted in Eugene J. Kelley and William Lazer, Managerial Marketing (Homewood, Ill.: Richard E. Irwin, Inc., 1958), p. 156.

³Edmund D. McGarry, "Some Functions of Marketing Reconsidered," a selected essay reprinted in Reavis Cox and Wroe Alderson, Theory in Marketing (Chicago: Richard D. Irwin, Inc., 1950), p. 263.

and thus to emphasize those that are necessary and subordinate or eliminate those that are not. Such an analysis should give perspective to the study of marketing and make clear the place of the process in the conceptual scheme of the economy.

Through the study of functions, changes in the structure of marketing caused by shifting, combining, or eliminating activities from one agency to another should be made understandable.

Obviously, such purposes as these cannot be attained as long as functions are defined merely as certain activities, even when an attempt is made to separate the good from the bad or the major from the minor activities. When this is done, all that is accomplished is a description of the process involved; and activities such as looking into the future, guessing as to what is in the consumer's mind, and so on ad infinitum, might just as well be called "functions" as the activities usually selected. No one will deny that these are important activities of marketers and that description is a necessary first step in analysis, but it is difficult to see how any particular purpose is served by enumerating them as separate functions.

The term "function" should be so defined as to meet the purpose for which it is used. The function of the heart is not simply to beat, which is its activity, but rather to supply the body with a continuous flow of blood. The term "functional architecture" implies that a building is designed for a purpose. In like manner, "functions of marketing" should denote a purposefulness in the marketing process; and the term should be used only in connection with activities that must be performed in order to accomplish the general purpose. Thus, accounting is not a function of marketing, although no one would think of carrying on business without it. The term "function" should be restricted to the sine qua non of marketing, those things without which marketing would not exist. (It is recognized, of course, that different sets of functions may be formulated for different levels of analysis and for different purposes.)¹

He also recognized that a statement of marketing functions presupposes a clear-cut definition of the marketing task. He views this to be:

¹Ibid., p. 267.

The ideal to which marketing aspires is to distribute to consumers all the goods that full employment of all resources makes possible in such a way that each can secure what he wants within his income, with a minimum of delay and inconvenience. Under these circumstances, in a capitalistic economy, each would be able to buy what he could afford, and the money received from his buying would result in the financing of further production without waste. The continuous flow of goods to consumers and the continuous flow of money back into production are implied.¹

McGarry further points out the inadequacies of the lists of marketing functions which have been developed to date.² In the first place, he states that classical economic theory implies the existence of a demand for goods because by definition an economic good is something which is wanted and is scarce. The classical economists devoted very little thinking to demand creation. Another weakness in some lists of functions stems from the fact that traditionally there was a clean-cut break between production and consumption. An important element of marketing directly involves production. The creation of goods with a maximum ability to provide satisfactions requires an investigation of the attributes a good should have in order to maximize the satisfactions which accrue from the consumption of these goods. In other words, it becomes a major task of marketing to reconcile the notion of what potential users

¹Ibid., p. 268.

²Ibid., p. 264.

desire with the products that businessmen find it practical to provide. Because McGarry recognized these weaknesses he provided a new list of marketing functions which he hoped would be adequate for further development of marketing theory. Although it is recognized that this new list of six different necessary functions is much more inclusive than any of the previous lists, it still does not serve the purpose for this analysis.¹

Following the recommendations made by McGarry, a new list of functions has been developed as follows:

A. The creation of exchange utility.

1. An offer by a seller.
2. An acceptance by a buyer.

B. Facilitating the expansion of market demand.

1. Creation of place utility.
2. Creation of time utility.
3. Communication.
4. Product variation.

Each of these is now examined in detail.

¹The McGarry list of functions is as follows: contactual, merchandising, pricing, propaganda, physical distribution, termination.

The Creation of Exchange Utility

The exchange function consists of making an offer and receiving an acceptance of the offer. If we look back at the nature of "utility," such as exchange utility, we find that the meaning is synonymous with that of creating satisfactions, and if the exchange of goods for other goods or for money increases the total satisfactions accruing to the parties to the transaction then a utility will have been created. It is obvious that for each goods sold the seller's satisfaction is increased because the subjective value which the seller places on the good must be less than the market value and for each good purchased the buyer increases satisfactions because he would not buy a good unless his subjective valuation of a good were higher than the market value. Therefore, both buyers and sellers increase their satisfactions when goods are exchanged under conditions in which the buyer's subjective value is greater than the seller's subjective value.

The function of creating possessory utility consists of those acts which may be described as making an offer and receiving an acceptance and which increase total satisfactions because the subjective value of a product to the seller is less than the market value and the subjective value of the product to the buyer is greater than

the market value. There are many other facets which may vary the total satisfactions accruing from the simple act of exchange, but these cannot be clearly identified until the functions of communications and product variation have been identified.

An examination of some of the preconditions to the performance of the function of creating possessory utility follows. The first condition which must exist before a buyer can sell a good to another is that he must own the good. Therefore, one of the preconditions is ownership.

The fundamental actions necessary to make an offer or to register any acceptance require a further condition to be met besides ownership; namely, the ability to communicate. The decision-making processes which result in the determination of the seller to offer some of his property for sale at a given price are not subject to investigation in this paper. It is obvious, however, that the mere arrival of a decision to sell will not result in a sale until this decision has been communicated to a potential buyer. One of the important issues that this investigation raises is whether the skill with which an offer is transmitted from a seller to a potential buyer is logically a part of demand creation or can be isolated as a pure exchange function. The answer to this question depends upon the answers to such empirically derived questions as the following:

(1) Does the display of a beautiful pair of shoes under ideal conditions in a luxuriously appointed prestige store window in a metropolitan uptown area consist of merely an offer to sell or is there inherent in this situation an element of demand creation? (2) Does the offer to sell an umbrella during a downpour constitute skill in making an offer or is the creation of time utility justifiably chargeable to demand creation? (3) If we are seeking to offer cigarettes in an optimum manner is the existence of a vending machine for this purpose on every single street corner an example of a highly efficient offer or have we created new demand by exploiting the creation of place utility?

The same problem may be approached from the viewpoint of the buyer. Is there a difference in the effectiveness or ease in which a buyer may indicate his acceptance of an offer? Is it not easy to accept a book publisher's offer when he has enclosed a stamped, self-addressed envelope and requires only that an "X" be marked in a block in order to indicate acceptance of his offer? The publisher has reduced the problem of communication to its simplest elements in making acceptance easy. It would appear that there is an element of difference in the various ways in which an offer and an acceptance may be communicated and that this difference

will have a bearing upon the selection of the goods to be bought by a consumer and the determination of from whom they will be bought.

A third condition is mentioned which has an effect upon an offer and an acceptance, and this consists of the actual physical movement of the goods involved in an exchange, whether it be the good itself or merely an evidence of ownership. When a large variety of offers are made to a buyer he will accept the offer, everything else being equal, which requires the least physical and mental effort on his part to transfer the actual ownership of the good. In this respect an offer made by a milkman to deposit a quart of milk on the doorstep is more attractive than the offer made by a market to offer a quart of milk at the counter. Similarly, the offer of a newspaper at the front door every evening is a more appealing offer than an offer of the same paper at a newsstand several blocks away.

A case can be made to show that all variations which enhance a sale may be either additional skills in communication, additional skills in furnishing time and place utility, or actually some form of product variation. The position is taken in this thesis that these things which enhance the effectiveness of an offer can justifiably be considered as part of demand creation.

Expansion of Demand

The expansion of demand has become the major marketing activity for many firms in the contemporary American economy. Whereas the creation of exchange utility has been recognized widely as the traditional function of the marketer, the importance of the demand creation function has been disregarded by the early economists, and its importance seems to go begging still.

The conditions which required that one's entire income be spent for "necessities" no longer exist for the great majority of American spending units. Therefore, most spending units are able to consider part of their income as being available for discretionary spending. It is this portion of income which is, therefore, available for either spending for consumption goods, spending for investment, or saving. Demand creation is successful when it induces spending units to spend a greater portion of their income than they would have spent in the absence of demand creation. Its importance to the maintenance of a high level of economic activity is in direct relationship to the size of the national income available for discretionary spending. In a society in which incomes are so small as to preclude discretionary spending, demand creation is redundant. The United States society, however, seems to find itself constantly

enlarging the portion of its income which is available for discretionary spending and therefore the demand expansion portion of marketing activity must become increasingly more important in the United States if a high level of economic activity is to be maintained.

There are four marketing functions which can be used to expand demand according to the first postulate. They are the creation of place utility, the creation of time utility, communication, and produce variation.

The creation of place utility

The creation of place utility may be viewed as transportation, but for purposes of this study it is a much wider concept than the movement of goods. This is perhaps due to the fact that an institutional arrangement as static as a vending machine may still create place utility. If cigarette smokers find the nearest source of cigarettes to be a drugstore a mile away, the mere placement of a cigarette machine at a service station a block away gives local consumers a chance to reduce the distance they must travel to make their purchases; hence the vending machine, although remaining in a single spot, provides for the creation of place utility.

Basically the whole problem of the creation of place utility stems from the fact that the points of production in an economy

which exploits the division of labor are necessarily different from the points of consumption. The extent to which production efficiencies result from economies of scale will determine the number of production points, and the geographical distribution of the population will determine the points of consumption. The burden of reaching across these distances is not entirely one for the marketer because the consumer is willing to travel some distance for most of the purchases he makes. The problem, then, is directly related to the type of goods; i.e., convenience goods must be brought relatively close to the consumer, whereas shopping goods will be sought by the consumer over a much wider area.

Creation of time utility

The second function which contributes to the expansion of demand is the creation of time utility. A number of factors create a situation in which the production of a good at the precise time that it is required for consumption is indeed a rare coincidence. In the first place, consumers' whims and unpredictability require that suppliers carry a minimum stock in anticipation of consumers' needs.

Secondly, some goods are produced seasonally and consumed continuously, and thus a time gap exists which it is the marketer's

task to fill. Even if goods are not produced seasonally for reasons of seasonal weather variations or other natural seasonal changes, it is sometimes more efficient to produce a good in certain periodic spurts than continuously and here again, if the good is consumed continuously, performance of the creation of time utility is required. Conversely, if goods are consumed seasonally and produced continuously—as is the case with summer wear, ice skates, golf equipment, and many other goods—the creation of time utility expands the demand for all whose very availability inspires a desire on the part of consumers to acquire them.

The creation of time utility expands demand in a third manner by contributing to the efficiency with which some goods may be transported; the result of lower transportation costs in expanding demand has been described above.¹ An example to illustrate the contribution which storage can make to lower transportation costs occurs whenever Great Lakes shipping, which is limited to navigation months but is a highly efficient method of moving bulk goods, is used to ship materials which are either produced or consumed continuously. Without storage at either the shipping or receiving point, less efficient methods of movement would be required.

¹ See p. 34.

Communication

The importance of communication as a third function in the stimulation of demand is self evident. All those stimuli which are capable of creating impressions on a prospective purchaser's mind and all the senses which are capable of receiving stimuli are integral parts of the total system of communication. It is the most ubiquitous of the functions—indeed all of the other functions require a degree of communication for their implementation. Communication may be carried on via any or all of the senses: hearing, tasting, seeing, smelling, or feeling. It may involve the use of symbols, signs, pictures, samples, packages, the written word, or the spoken word. Communication may be unilateral or two-way. It may be private or public, directed to an individual or directed to a community or mass audience. In marketing it includes such diverse activities as the transmission of accounting data by way of mathematics, personal selling, window display, mass-media advertising, word-of-mouth advertising, person-to-person selling, the use of trade shows, packaging, shelf display, billboards, or any other technique which creates an awareness of a product in the mind of a potential purchaser. The level of communication may be conscious or subconscious and includes whatever impressions are made by subliminal techniques.

Product variation

The last function necessary to complete the collection of techniques for demand creation is the function of product variation. Product variation includes all those activities which tend to make one product more desirable in the mind of a buyer than a similar product, by means of differentiation. Although product variation is usually associated with the techniques used by one producer to transfer demand from one product to another, there can be little question that product variation also increases the desirability of many consumers' goods and, therefore, induces larger total purchases than would be the case without product variation. Annual design changes in the automobile industry illustrate the point.

Product variation may be found in many forms. Among the product variation techniques used to make a product distinctive are such practices as variation of colors in which a product is offered; variations in design and styling; variations in texture; variations in size; variations in packaging including the method of packing, the size of the package, and the design and color of the package; variations in formula or recipe; and variations in consistency.

Product variation may also be classified on the basis of the senses which are used to detect the variation. In this connotation

products may be varied to appeal to different tastes, smells, touches, senses or hearing, or visual preferences.

Product variation or differentiation is a conscious attempt to convert a product from a class of homogeneous goods to heterogeneous goods. If goods are freely substitutable one for another, demand creation by any one producer will be useless to him, and therefore, demand creation implicitly requires that a producer use product variation to create a heterogeneous product.

Perhaps one of the greatest changes in management philosophy in the past twenty years is the recognition that the final determination of the product to be presented to the market is no longer arrived at by production considerations alone, but is often determined on the basis of marketing appeal. In general, the economies of scale resulting from the increased demand which product variation generates is more than sufficient to offset the diseconomies of scale which the conversion from a homogeneous product to a heterogeneous product entails.

The significance of product variation as a marketing strategy can be developed by exploring the reasons why producers supply a large selection of goods instead of a single standardized item and why the magnitude of the selection varies with the product uses and consumers' buying motives. A general division of all product

variations can be made based on the rationale for their development: one group of variations are production oriented and result from decisions made purely on the basis of solving production problems, the other group results from merchandising activities which are consumer oriented and are designed purely to gain the favor or preference of the consumer.

This chapter has expanded the postulate that the accomplishment of the total marketing task requires the accomplishment of the following functions:

A. The creation of exchange utility.

1. An offer by a seller.
2. An acceptance by a buyer.

B. Facilitating the expansion of demand.

1. Creation of place utility.
2. Creation of time utility.
3. Communication.
4. Product variation.

It seems impossible to completely separate the making of an offer from demand creation, and this would appear to pose a problem for analysis.

This complication is resolved by including any embellishments to an offer, such as might be made through the creation of time

utility, place utility, communication, or product variation, to be in fact an element of demand expansion. Thus the four functions as outlined above are still sufficient to cover all marketing activity.¹

It makes little difference for purposes of this analysis whether some form of communication, for instance, is purely part of making an offer, purely a demand-expanding activity, or as is more likely, an indivisible combination of these two.

In addition to the four basic functions required to perform the marketing task, two important conditions must exist: the seller must own the goods before he can sell them, and buyers and sellers

¹The traditionally accepted marketing functions of buying, selling, transportation, storage, financing, market information, standardization and grading, and risk-bearing can all be fitted into the four basic functions as stated in postulate number one as follows:

Marketing Function	Creation of Place Utility	Creation of Time Utility	Communication	Product Variation
Buying			X	
Selling			X	
Transportation . . .	X			
Storage		X		
Market information .			X	
Financing		X		
Risk-bearing	X	X		
Standardization and grading . . .				X

must be capable of making decisions. Although some authors¹ make separate functions out of what seems to be a purely decision-making activity, decision-making is treated as a sine qua non of all business activity, and ownership of goods by sellers is an assumed precondition to all marketing activity.

Book Co., Inc., 1934), uses a similar chart to show the relationship between specific marketing functions and the utilities they create:

“Table I—The Marketing Functions and Utilities

“Marketing Function	“Utility Created, Direct or Indirect
“Quality-determination function .	Form (direct or indirect) Possession (indirect)
Storage function	Time (direct)
Contactual function	Possession (indirect)
Negotiatory function	Possession (direct)
Measurement function	Possession (indirect)
Packing function	Form (indirect)
Transportation function	Place (direct)
Financing function	Time (indirect)
Payment function	Possession (indirect)
Risk-bearing function	Possession (indirect) Form (indirect) Time (indirect) Place (indirect)”

¹ McGarry, for instance, treats “pricing” as a marketing function. Reavis Cox and Wroe Alderson, Theory in Marketing (Chicago: Richard D. Irwin, Inc., 1950), p. 269.

CHAPTER IV

RELATIONSHIP OF SENSITIVITY OF DEMAND TO THE PERFORMANCE OF BASIC MARKETING FUNCTIONS

Postulate II

According to Postulate II, there is a unique functional mix required for the most efficient marketing of every product, and the identification of the composition of this discrete set of functions is dependent upon the characteristics of the product and the consumer motivations which induce the purchase of the product.

An examination of this postulate requires that the sensitivity of demand for each good to variations in the proportion of each function stirred into the functional mix be measured and compared with the sensitivity to variations of each of the other functions. The first step is one of measurement and ordering. Each of the four functions will be treated separately, and an attempt will be made to classify goods on the basis of their sensitivity of demand to the performance of each function.

The Creation of Place Utility

Transportation is usually not associated with demand creation. It is simple, however, to demonstrate that the demand for a given product may be expanded by the addition of transportation services. For instance, a catalog might be circulated in a geographical area of 100,000 population wherein the entire 100,000 people would be within a reasonable walking distance of the source of the merchandise offered, and therefore catalog prices could be on an F.O.B. store basis. If the supplier of this product is willing to absorb transportation costs up to a 100-mile radius of his store he will circulate his catalog among all the prospective customers in this larger geographical area. His potential market or demand will have been increased by the number of people living in a 100-mile area of the store, less those living within walking distance. It is important to note that the entire demand curve has been shifted; no change in the price to the consumer has been made, and therefore this is not merely a movement along the first demand curve. If the supplier is willing to absorb transportation costs to everyone living within a 500-mile radius of his place of business he again will have expanded the number of people who will purchase his product at a given price and therefore he will have again shifted the demand

curve with a net total increase in demand. If he can absorb transportation costs over the entire country, as some mail-order firms do with certain items, he will have found that he has expanded his potential market to the entire population merely by absorbing transportation costs. In other words, in providing transportation he has expanded the demand for his product.

In a basic functional analysis such as this the creation of place utility may be viewed as an independent variable, as might be the case if parcel post were used. Generally, however, the introduction of an additional function—namely, the creation of time utility—will change the character of the place utility function, making it a dependent variable; this fact must not be overlooked in the search for optimum marketing mix. This idea will be developed in a later chapter when the importance of the use of existing institutional arrangements for the performance of the marketing task is recognized.¹

The creation of place utility, therefore, encompasses all the activities required to move goods and services from the producer to the point of ultimate consumption. It includes whatever facilities are required to physically place the products of a farm on the

¹See page 104, including footnote 1; also see Figure 2.

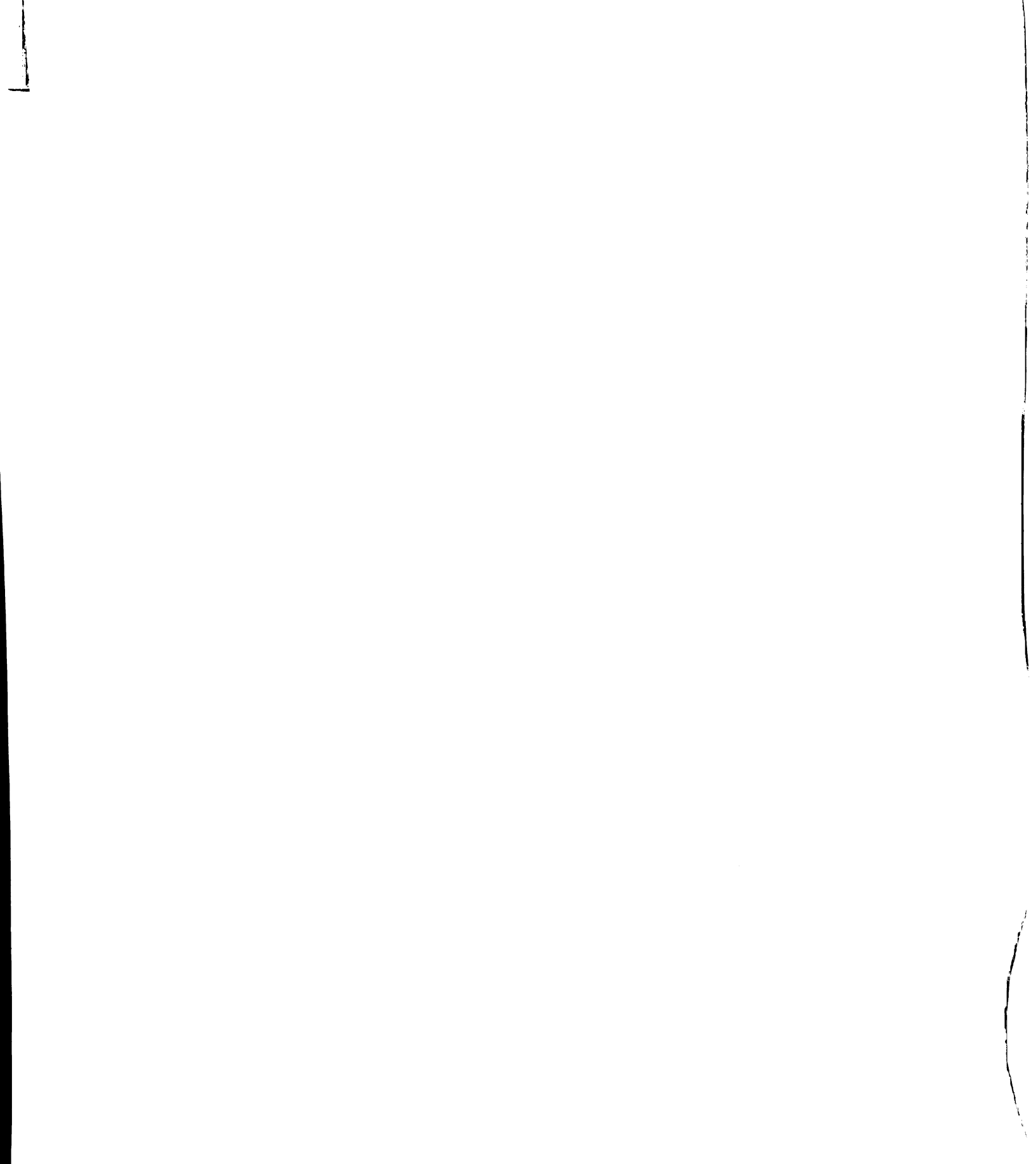
consumer's dining room table, the products of a forest at the construction site or at the point of final consumption, the product of factories in the hands of ultimate users, the product of mines to the finished metal object useful to a consumer. It is difficult to imagine any tangible product whose ability to create optimum satisfactions is not enhanced by the performance of the place utility function.

It has already been shown that, as long as transportation costs can be more than offset by economies of scale, a producer can expand the demand for his product by expanding the geographical area of his market. Ceteris paribus, the ultimate maximum of geographical expansion will be related to the cost of transportation relative to the value of the product. It can be said, therefore, that each good has a certain sensitivity of demand to the function of place utility and this sensitivity of demand will depend among other things upon the cost of performing the function relative to either the total marketing cost or to the value of the goods before marketing costs are added. If the cost of creating place utility is high in relation to the value of a product, it is likely that a producer can expand the demand for his product more readily by absorbing the place utility costs than by absorbing the cost of performing any of the other marketing functions; the demand for his product may then be said to be highly sensitive to place utility.

This can be illustrated by the use of two examples: A coal mine operator may have an incipient demand for his coal at the mine entrance of 100 tons per day at \$3.00 per ton. He can expand this demand to 1,000 tons per day by the simple expedient of furnishing transportation. Creation of place utility is the largest functional cost of marketing for the coal industry, and this in turn reflects the fact that the value of coal is relatively low per pound. Therefore, the demand for coal from the standpoint of the mine operator is relatively sensitive to the performance of the place utility function.

In contrast, the maker of a fine perfume will find that the absorption by him of transportation charges will have a negligible effect on the demand for his product. This follows from the fact that these costs are relatively unimportant in the marketing of perfume, because the value of perfume is high per pound. The demand for perfume is therefore relatively insensitive to the performance of the place utility function.

In these two examples the difference in sensitivity of demand to place utility is attributable largely to the difference in the value per pound of coal and perfume. It should be pointed out that there are many other factors which contribute to the cost of place utility other than bare weight, and to the extent that they increase the cost



they also increase the sensitivity of demand to the performance of the place utility function. Goods which are easily broken are more difficult and costly to move from place to place, and therefore fragility may be added to value per pound as a determinant of place utility sensitivity. Other factors to be considered are the possibility of spoilage in transit, the ease or difficulty of physical handling, the need for special containers or packing, the relationship of bulk to weight and to value, and the size of a typical unit sale.¹

The caveat that value per pound is only one of the determinants of the sensitivity of demand to the performance of the place utility function has been made in the paragraph above. Nevertheless, it is useful to illustrate one method of rating consumers' goods on this basis. An incomplete list of goods in order of their sensitivity of demand to place utility based on value per pound is shown in Table 1.

A similar ordering might be made, using the same group of products, on the basis of fragility, bulk, the need for special

¹The relevance of the size of a typical purchase will become evident when one compares the typical order for cement blocks, for instance, with a typical order for domestic water-softening salt. The value per hundredweight is very low in both cases, but a typical order for the former consists of truckload lots while a typical order for the salt would probably consist of a single 100-pound bag.

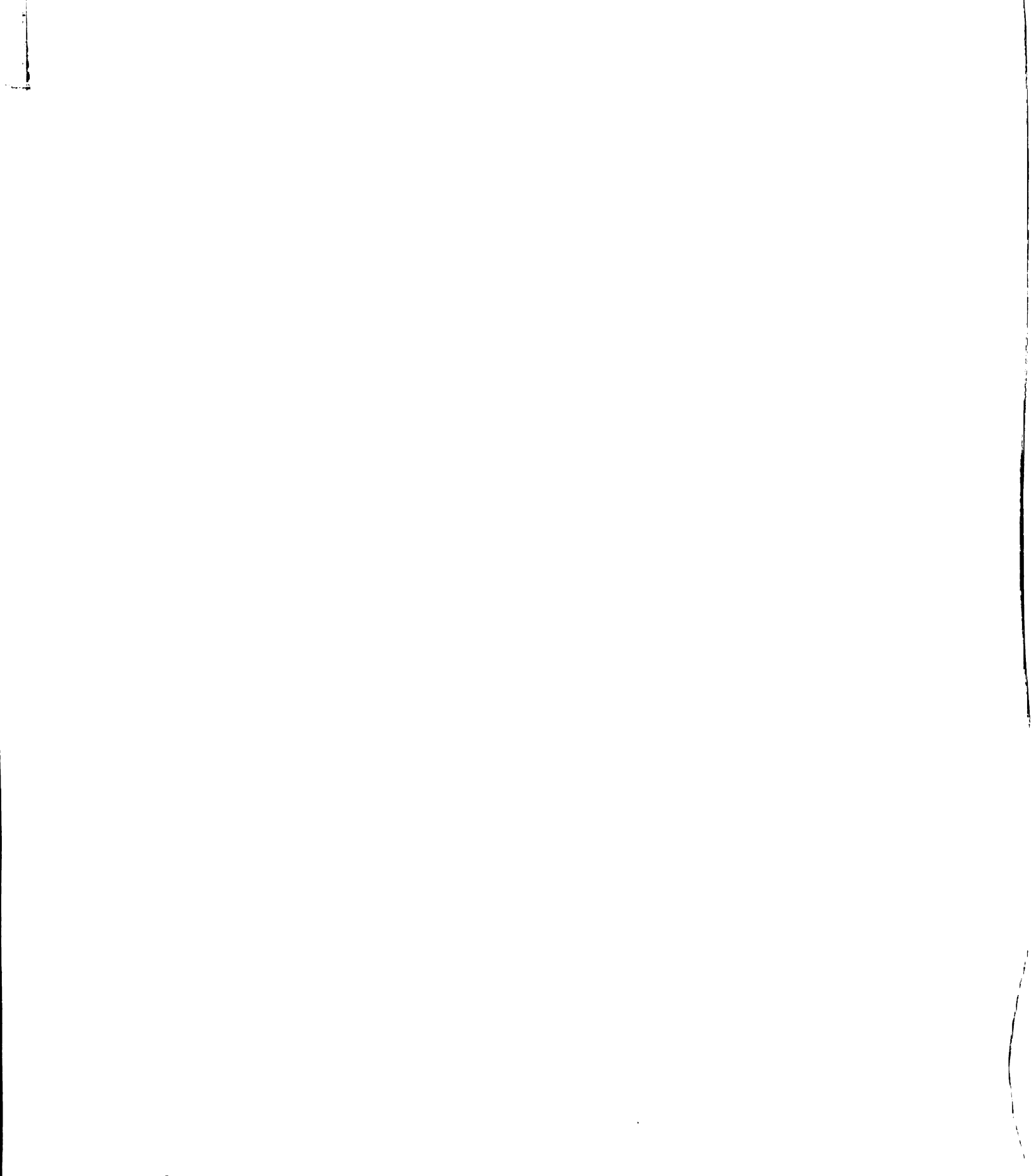


TABLE 1
AVERAGE VALUE PER POUND OF SELECTED ARTICLES
AT POINT OF PRODUCTION

Article	Value per Pound (cents)
1. Cement blocks	0.5 ^a
2. Fuel oil	1.0 ^b
3. Bottled soft drinks	4.5 ^a
4. Bread	13.2 ^a
5. Puffed cereals	15.0 ^c
6. Furniture	40.0 ^d
7. Refrigerators	46.5 ^e
8. Automobiles	60.0 ^f
9. Cigarettes	134.0 ^a
10. Men's shoes	248.0 ^e

^aCalculated from data collected by personal interview with manufacturers.

^bInterstate Commerce Commission, Freight Revenue and Wholesale Value at Destination of Commodities Transported by Class I Line Haul Railroads, 1956 (Washington, D.C., 1958), Appendix A, p. 15.

^cInterstate Commerce Commission, Value of Service in Rate Making, Statement No. 5912 (Washington, D.C., 1959), Appendix A, p. 10.

^dIbid., p. 6.

^eInterstate Commerce Commission, Freight Revenue . . . 1956, p. 17.

^fIbid., p. 16.

containers or handling, and finally a composite ordering which would accurately reflect the ease or difficulty of creating utility of place for each commodity in relation to every other commodity. The purpose of such ordering is so that proper weights may be attached to the importance of creating place utility for each classification of goods.

The postulate which this chapter seeks to develop states that the discrete set of functions which each good requires to be performed in marketing is determined by the characteristics of the goods, and the motivations of consumers. How does the latter affect the weight assigned to the importance of place utility in the marketing mix?

The most obvious differences in consumer motivations are reflected in the classification of goods as "convenience" or "shopping" goods. Those goods which are purchased at the most convenient outlet at the time of demand will require wide distribution, and this in turn will require extensive creation of place utility.¹

¹The creation of utility of place is not synonymous with transportation in this thesis, but embraces a much wider concept. Any device which reduces the travel required by the consumer to make a purchase in this connotation is effectively creating utility. Therefore, even such static devices as vending machines are capable of creating place utility because they decrease the disutility caused by the consumer having to travel long distances to purchase convenience

Contrariwise, if the consumer does not suffer a disutility by transporting goods, there is no penalty attached to requiring the purchaser to travel a longer distance to make a purchase.¹ It is interesting that the vast majority of food buyers place virtually no money value on a delivery service which a market may offer. This is confirmed by the observation that housewives traditionally will compare food prices of a self-service supermarket on the same basis with the prices quoted by a full-service market and feel that the merchant offering the lower price is presenting the greater value. It follows that an appraisal of the importance of the place utility function in marketing a given product therefore includes any necessary modifications which may be brought about by consumer motivations.

Since this thesis seeks to establish a conceptual framework for improving marketing efficiency, the establishment of specific problem-solving formulas is beyond the scope of the investigation. It will be useful, however, for illustrative purposes to suggest a

items. In like fashion, intensive distribution creates a greater place utility than selective distribution.

¹In spite of the fact that most dealers discourage the idea, a surprising number of people from states other than Michigan take delivery of their new automobiles at the factories in Michigan, and the writer has a feeling that the psychological motivation which is evidenced by this phenomena has by no means been optimally exploited by the automobile industry.

possible methodology for ordering the relative importance of each of the marketing functions on the basis of its importance to the performance of the entire marketing task for a specific commodity. Ten commodities have been chosen for this illustration.

The first task is to place a valuation on the importance which creating place utility plays in expanding demand for each commodity. There are at least five conditions which are relevant to such a valuation for each commodity. These conditions are value per pound, value per cubic foot, fragility, perishability, and ease or difficulty of handling. Each of the conditions will vary in importance, and therefore a realistic valuation will require that a judgment be made regarding the relative weight that each condition shall carry in the determination of the final valuation. Table 2 illustrates one method by which the valuation of place utility in expanding demand may be determined. This table also illustrates how the data appearing in Table 1 (page 66) can be used to add objectivity to the determination.

The Interstate Commerce Commission uses value per cubic foot, perishability, fragility, special services required, and other characteristics of goods in their rate-making studies, and they have been able to quantify most of these characteristics so that objective comparisons can be made as illustrated in Table 2. It is apparent that bread, cement blocks, and bottled soft drinks are highly sensitive

TABLE 2
SENSITIVITY OF DEMAND TO TRANSPORTATION^a

Product	A (40)	B (20)	C (20)	D (20)	E	F
1. Automobiles	3	4	4	4	360	7
2. Cement blocks	10	10	1	1	640	3
3. Bread	7	7	4	10	700	1
4. Bottled soft drinks .	8	8	8	2	680	2
5. Men's shoes	1	1	2	6	220	10
6. Refrigerators	4	3	4	2	340	8
7. Fuel oil	9	9	1	1	580	4
8. Cigarettes	2	2	3	5	280	9
9. Furniture	5	6	6	4	520	6
10. Puffed cereals	6	5	4	7	560	5

^aScoring is from 1 to 10, with the larger score indicating greater sensitivity to the function based on these criteria. Key to columns: A = Value per Pound; B = Value per Cubic Foot; C = Fragility; D = Perishability; E = Cumulative Sensitivity Score; F = Order of Sensitivity. The numbers in parentheses below the column designations are weights.

to transportation costs; thus the creation of place utility probably is the function which most severely limits the extent to which the market can be expanded. In this selected group shoes are the least sensitive, and therefore in the selection of a marketing mix for shoes the performance of the place utility function will be subjugated to the performance of those functions which are relatively more important in the marketing of shoes.

The point may be raised that an evaluation of the sensitivity of demand of commodities to the other basic functions—namely, the creation of time utility, communication, and product variation—presents much more formidable problems than the evaluation of sensitivity to place utility. However, all the measurements required are conceptually realizable, and, as the skills in research and quantification become more mature, it should be possible to reach a high degree of accuracy in achieving useful functional formulas.

The Creation of Time Utility

The creation of time utility is a potent force in expanding demand. An example may illustrate: If the entire annual crop of strawberries is offered for sale only during the two weeks during which they ripen, it is likely that the average price at which the market will absorb them will be lower than the price which can be

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charged if, through the creation of time utility, the annual production can be marketed in an orderly manner over the entire twelve-month period without glut or scarcity. To the extent that this is true, the demand curve for the annual crop will have been shifted to the right and upward and the result will be either a greater unit demand at a fixed price or a willingness to pay a higher price for a given quantity.

A classification of products on the basis of their sensitivity of demand to the creation of time utility can be simplified by first isolating the attributes which contribute to this sensitivity. Foremost among these attributes is the perishability or indestructibility of a good. Newspapers, ice, cut flowers, and fresh milk require a maximum of time utility effort to market successfully because of their perishability. Coal, canned goods, and building materials, in contrast, do not require speed in handling.

Goods that are consumed seasonally and produced continually, or vice versa, are also apt to exhibit a sensitivity of demand to the creation of time utility. Examples of goods exhibiting these characteristics are swimming suits, umbrellas, bock beer, oysters, and sleds. Unpredictability of need such as might occur in the case of medicines or umbrellas may also enhance the value of time utility.

Consumer motivations are likely to be reflected in their propensity to perform storage functions, thus relieving the marketer of this task in certain goods. Fear of accidents may transfer the storage of first-aid materials from a marketer to a consumer. Fear of shortages has often been reflected by heavy investment on the part of consumers in such items as sugar, salmon, and other foods when there exists a threat of war. The economy of buying in case lots sometimes justifies consumers' performance of the storage function.

In a manner similar to that used in ordering the importance of the creation of place utility, it is now possible to make some judgments regarding the relative sensitivity of demand to the creation of time utility as shown in Table 3. The creation of time utility will occupy a dominant place in the marketing budget for bread, it is much less important in selling furniture, and of least importance in marketing refrigerators and cement blocks.

Communication

The third function whose performance is required is that of communication. This is perhaps the most ubiquitous of the functions and it is difficult to conceive of any marketing activity being accomplished without communication. Nevertheless, that there is a wide

TABLE 3
SENSITIVITY OF DEMAND TO THE CREATION
OF TIME UTILITY^a

Product	A (50)	B (20)	C (10)	D (20)	E	F
1. Automobiles	4	6	4	7	500	3
2. Cement blocks	1	6	2	1	210	10
3. Bread	10	1	10	4	680	1
4. Bottled soft drinks .	2	7	6	1	320	8
5. Men's shoes	6	5	3	1	450	4
6. Refrigerators	3	3	3	1	260	9
7. Fuel oil	1	10	2	8	430	5
8. Cigarettes	5	2	5	1	360	7
9. Furniture	4	4	4	3	380	6
10. Puffed cereals . . .	7	3	5	4	540	2

^aScoring is from 1 to 10, with the larger score indicating greater sensitivity to the function based on these criteria. Key to columns: A = Perishability (obsolescence, real and artificial, may contribute to perishability); B = Seasonal Production and/or Consumption; C = Reluctance of Consumer to Store; D = Special Handling Required; E = Cumulative Sensitivity Score; F = Order of Sensitivity. The numbers in parentheses below the column designations are weights.

disparity among goods in their requirement for the performance of the communication function can scarcely be challenged. It is because of this wide range of communication requirements that each specified good lends itself to ordering into a spectrum of communication sensitivity. To a motorist with a nearly empty gas tank on a lonely road the mere sight of a gas pump will attract him. The interpersonal communication can be limited to "fill 'er up." In contrast, the purchase of a large life insurance policy or an automobile may be the culmination of a long exposure to numerous communication media including sensory perception by all the senses, interpersonal direct communication, mass media communication both paid and spontaneous, word-of-mouth advertising, hearsay, and subconscious or subliminal impressions.

Reusch and Bateson elaborate on the communication function as follows:

But communication does not refer to verbal, explicit, and intentional transmission of messages alone; as used in our sense, the concept of communication would include all those processes by which people influence one another. . . . Sensory impressions received and actions undertaken are registered; they leave some traces within the organism, and as a result of such experiences people's views of themselves and of each other may be confirmed, altered, or radically modified. . . . The impressions received from the surroundings, from others, and from the self, as well as the retention of these impressions for future

reference, can all be considered as being integral parts of a person's communication system.¹

There is a massive accumulation of literature on many narrow aspects of communication—excellent texts on the use of advertising—many volumes on the technical aspects of interpersonal communications, good coverage of the skills of journalism and copywriting, and interesting measurements of the relative value of visual aids vis-à-vis oral presentations. For present purposes it is necessary to examine the most elemental aspects of communication and variables which determine the sensitivity of demand of goods to the communication function.²

¹J. Ruesch and G. Bateson, Communication the Social Matrix of Psychiatry (New York: W. W. Norton and Co., 1951), p. 7.

²The titles of depth investigation lend themselves to sophistication which is generally denied the generalist. In a section on decision-problem paradigms, Miller and Starr have developed a number of interesting analytical models such as a brand-share model, a brand-loyalty model, media-selection models which seek to minimize cost per exposure, and suggestions for using Minimax solutions and game theory in the selection of competitive strategies. David W. Miller and Martin K. Starr, Executive Decisions and Operations Research (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960), p. 171. Katz and Lazerfeld demonstrate a relationship between the flow of marketing influence and gregariousness, and a similar relationship between fashion leadership and a woman's position in her life cycle; girls most important, matrons least important (Personal Influence). In the field of communication, similar investigations in depth may be found in the following writings: Colin Cherry, On Human Communication (Boston: The Technology Press of Massachusetts Institute of Technology, 1957); Susanne Langer, An Introduction to Symbolic

In his chapter entitled "How Communication Works," Wilbur Schramm lays down some conditions which must be fulfilled if the message is to arouse its intended response:

1. The message must be so designed and delivered as to gain the attention of the intended destination.
2. The message must employ signs which refer to experience common to source and destination, so as to "get the meaning across."
3. The message must arouse personality needs in the destination and suggest some ways to meet those needs.
4. The message must suggest a way to meet those needs which is appropriate to the group situation in which the

Logic (New York: Dover Publications, 1953); R. D. Luce and H. Raiffa, Games and Decisions (New York: Wiley, 1957); "Communication Analysis and Organization Planning," Cost and Profit Outlook (Philadelphia: Alderson and Sessions Co., April, 1954); K. W. Deutsch, "On Communication Models in the Social Sciences," Public Opinion Quarterly, XVI (1952), 356; Bryson, Lyman, and others, The Communication of Ideas (New York: Harper and Brothers, 1948), p. 37; Paul Lazarsfeld and Morris Rosenberg, The Language of Social Research (Glencoe, Ill.: The Free Press, 1957); C. E. Shannon and W. Weaver, The Mathematical Theory of Communication (Urbana: The University of Illinois Press, 1949); Seymour Banks, "The Use of Incremental Analysis in the Selection of Advertising Media," Journal of Business, XIX (1946), 232; Bernard Berelson, Content Analysis in Communication Research (Glencoe, Ill.: The Free Press, 1952); Elihu Katz and Paul Lazarsfeld, Personal Influence (Glencoe, Ill.: The Free Press, 1955); J. Ruesch and G. Bateston, Communication the Social Matrix of Psychiatry (New York: W. W. Norton and Co., 1951); Wilbur Schramm, The Process and Effects of Mass Communication (Urbana: The University of Illinois Press, 1955); N. Wiener, Cybernetics, or Control and Communication in the Animal and the Machine (New York: Wiley, 1948); Joseph T. Klapper, "The Comparative Effects of Various Media," a memorandum written for the Public Library Inquiry (New York: Bureau of Applied Social Research, Columbia University, 1949).

destination finds himself at the time when he is moved to make the desired response.¹

It should be recognized that a "message" in the broad sense in which communication is intended to be interpreted in this dissertation includes such diverse concepts as an engagement ring, a peace pipe, or a yacht trip. When a young man presents his sweetheart with an engagement ring, they have communicated an important message to each other for which all other communication media may be ill-suited or redundant. Similarly, communication may be effected by actions which convey special meanings, as was the case in the early days when the Indians settled tribal differences by passing the peace pipe around. Thus the use of entertainment to convey a solicitation or message of appreciation may be included in the general concept of communication.

In earlier parts of this chapter it was shown that each good requires the performance of a unique degree of intensity: first, the creation of place utility; second, the creation of time utility; and now, the problem is to devise ways of identifying the degree of intensity which will be required of the communications function. The degree to which communications is important in the marketing of a

¹Wilbur Schramm, The Process and Effects of Mass Communication (Urbana: The University of Illinois Press, 1955), p. 13.

specific product depends upon the specific tasks which are required of communication in the marketing of this product. Therefore, it is useful to review the marketing tasks which communication is called upon to perform.

On the basis of deductive reasoning, the most important marketing task would appear to be that of negotiation. Negotiation by its very nature requires two-way communication; i.e., it requires that arguments pro and con be received and accepted, that offers and counteroffers be discussed, and that claims and refutations be heard. In the second place, the very nature of negotiation suggests an interpersonal relationship. Negotiatory activities are therefore time-consuming and require high degrees of social skills.

A second task of communication in performing the marketing function is that of persuasion. Persuasion is an important element in influencing people to the extent that they are induced to buy goods that they would not otherwise purchase. This task, however, does not require interpersonal relationships although these are known to be highly effective; mass media often lend themselves well to the task of persuasion.

A third marketing task which is placed on the function of communication is the making of an offer and the registering of an acceptance. In the case of a door-to-door salesman this again is

an interpersonal experience, but mass media are often used to make offers as illustrated by the catalogs of the large mail-order houses, the advertisements of the supermarkets in the local newspapers, the billboard advertisement which invites one to stay at the local motel, and the countless daily impressions made by radio and television shows throughout the nation. The distinction between a simple offer to sell and a persuasive argument urging the buyer to buy a particular differentiated product or service is almost indistinguishable, but for this analysis each requires different intensities of the application of the communication function and therefore theoretically at least this distinction must be recognized.

Probably the least demanding task of communication is that of identification. Most goods can be identified by visual perception; however, in the case of a homogeneous product such as flour each producer may prefer to identify his own product by packaging. Furthermore, especially in the case of medicines, many products look alike and the consumer depends upon communication through a label for proper identification. Identification therefore calls on such communication devices as the use of color and form, the printed word in labels, packaging, and the use of trade-marks to stimulate visual perception. Texture, weight, odor, sound, and many other

characteristics may be used to influence perception by the other senses.

Perhaps communication can even be carried one step further; namely, to the mere creation of awareness. Any demand for non-existent goods might expand greatly upon the expectant purchaser's becoming aware that it did exist. Awareness provides a mental image which may be stored for future reference so that even though there is no present demand by a buyer for a given product, the awareness that such a good exists may result in a demand for it under different circumstances. When a person is well he has little demand for medications which are available for the amelioration of his particular illness, but an awareness created while he is well may be converted into demand when the occasion arises.

In summary, the following list, although by no means exhaustive, will provide a basis for developing an inventory of the tasks which the communication function can perform: (1) communicating negotiations, (2) communicating persuasions, (3) communicating offers and acceptances, (4) communicating identifications, and (5) communicating awareness. For example, one of the nominal tasks of communication might be the establishment of awareness in a prospective purchaser that a vending machine is located in a certain location; this awareness may result in a future purchase of a

package of cigarettes as a result of the low-level communication task. In contrast, the negotiatory task as is represented by the sale and purchase of a power plant involves tremendous amounts of communication. Drawings and symbols as represented by blue-prints, the use of the printed word in the form of specifications, interpersonal relationships consisting of negotiated prices or bid prices, mass media, and even communication consisting of traveling to other plants to personally inspect products made, may all be classified as part of the total communication task where negotiation is an important part of marketing.

It is now necessary to order a number of products on the basis of their sensitivity of demand to the performance of the communication function. Table 4 illustrates how this task might be accomplished. The scoring shown is for illustration only, but if it is an approximation of what empirical evidence might indicate it is possible to recognize the fact that automobiles and refrigerators will require considerable emphasis on the performance of the communication function while fuel oil and bread do not show much demand-sensitivity to communication.

TABLE 4
SENSITIVITY OF DEMAND TO COMMUNICATIVE INFLUENCES^a

Product	A (20)	B (10)	C (20)	D (10)	E (20)	F (20)	G	H
1. Automobiles . . .	8	8	7	5	4	9	690	1
2. Cement blocks . .	5	2	1	1	2	3	250	8
3. Bread	1	2	1	8	1	1	180	10
4. Bottled soft drinks	3	5	3	5	5	1	340	7
5. Men's shoes . . .	10	6	5	5	2	3	510	4
6. Refrigerators . .	7	6	7	4	7	8	680	2
7. Fuel oil	3	3	2	1	2	2	220	9
8. Cigarettes	1	7	4	8	5	1	370	5
9. Furniture	9	5	6	3	4	8	620	3
10. Puffed cereals .	2	4	3	5	6	2	350	6

^aScoring is from 1 to 10, with the larger score indicating greater sensitivity to the function based on these criteria. Key to columns: A = Need for Negotiation; B = Sensitivity to Persuasion; C = Effectiveness of demonstration; D = Importance of Identification; E = Flexibility of Primary Demand; F = Need for Information; G = Cumulative Sensitivity Score; H = Order of Sensitivity. The numbers in parentheses below the column designations are weights.

Product Variation

The remaining function whose importance, like the foregoing three, depends upon the characteristics of goods and the motivations of consumers, is the function of product variation. Product variation refers to those techniques which the producer may utilize to add variety and individuality to the goods which he offers in the marketplace. Included among these techniques are the offering of a range of colors, a variety of sizes and shapes, a choice of materials, style changes, guarantees and warranties, terms of payment, optional accessories, and packaging variations. Before the advent of mass production, product variation occurred as a necessary condition of individual handicraft. Following the industrial revolution, the economies of scale became available to the production of all kinds of goods, including goods whose attributes of homogeneity and uniformity gave them added value as well as those goods which lost some of their appeal to consumers as a result of their uniformity and lack of distinctiveness. The natural result of this obstacle to consumer satisfaction was the development of superficial changes in the product which were not of sufficient scope to interfere with the economies of scale to which the goods were amenable but which did to some extent enhance the appeal of the goods to the consumer.

The extent to which product variations are capable of expanding demand depends upon the usefulness of product variation in producing consumer satisfactions. In an item such as a nail, uniformity is a very desirable quality, and the usefulness of product variation is virtually limited to the variation of nail sizes.¹ By contrast, a woman's fear of "meeting herself coming down the street" after she has made a substantial investment in a new spring outfit precludes uniformity in the production and marketing of women's clothes. Here then product variation becomes the sine-qua-non of consumer satisfaction.

It may be argued that product variation is essentially a production problem and cannot be implemented as part of the normal marketing process, which is often viewed as beginning at the producer's shipping dock. This notion loses its validity when one realizes that product variation usually is contrary to what a production department would recommend and is instituted primarily as a demand creation decision.

In making judgments regarding the sensitivity of demand to the use of product variation as a marketing strategy, it will be

¹Of course there are innovations even in this product where special production conditions justify nails with unusual characteristics.

useful to examine the product characteristics and consumer motivations which result in sensitivity variations.

Perhaps the most important characteristic which a product should have in order to exploit the function of product variation is a real usefulness for differentiation. Such usefulness might result from physical characteristics; i.e., shoes are required in a variety of sizes because feet are grown in a variety of sizes. Toothbrushes are useful in a variety of colors because there is a useful purpose in the matter of identification for various members of a household. Automobiles have a wide variety of uses and therefore a selection of various sizes and horsepowers is useful in fulfilling customers' requirements.

The second characteristic to look for in a product when making an evaluation of product variation strategy is whether the product will be conspicuously consumed. Those products which come into this classification gain a great deal of prestige and satisfaction for their consumers when they are unusual, when they attract attention, or when they possess any other differentiating characteristic which gives the user a mark of distinction or status. Clothing, automobiles, split-level homes, power lawn mowers, and imported foods are all examples of goods which may be used to build status, but only when they possess characteristics which set the user apart,

and this requires that product variation be used to reinforce the uniqueness or the distinctiveness of the product.

Some goods lend themselves to product variation more readily than others. When the cost of producing a variety of variations is relatively insignificant, this strategy is enhanced. On the other hand, when product variation is achieved at the cost of proliferating product lines, the strategy may backfire and as a result the anticipated advantages from product variation may be more than offset by added complications in performing the other basic marketing functions, to say nothing of possible increased production costs. Nevertheless, many variations are comparatively inexpensive, such as color variations on both the product and its packaging, the offering of optional equipment, interchangeable parts, self-supporting credit terms, and some types of warranties. To the extent that specific goods lend themselves to costless variations they are amenable to product variation as a demand-expanding function.

Those goods which are produced in a young industry or where the arts have been newly acquired will often find product variation to be very effective in expanding demand because people are expecting and looking for advancements. Television makers have exploited this feature effectively by producing a rapid series of changes and improvements which tend to create an artificial

obsolescence among the previously accepted models. The opportunities to follow this practice are not nearly so bright in the older industries where the advancement in the arts has a long history. Electric refrigerators are a case in point. For many years, design and engineering improvements provided an excellent reason for annual model changes. At least one manufacturer¹ concedes that the refrigeration industry has reached a point of relative maturity.

The consumer motivations which are reflected in increased demand for some goods due to product variation are very complex and probably incompletely understood. They can be summarized, however, in the observation that all people are different. They have different tastes, different ambitions, different mentalities, different incomes, differing ages, and different standards. The net result is that their needs—both real and imagined—are different, and for many purposes different needs require different goods. Especially where these differences are superficial, or easily accomplished without disturbing basic production efficiencies, product variation will play a large part in improving a vendor's offer, in expanding demand, and in increasing total consumer satisfactions.

¹Kelvinator has announced that present models will remain static until the changes in the arts justify changes which are more than pure window dressing.

Table 5 presents an illustration of how various criteria can be scored and how a judgment can be made based on these cumulative scores, as to the relative sensitivity of a selected group of products to the function of product variation. For this group, men's shoes are scored highest; it is presumed from this that a large selection of styles, colors, sizes, and brands will expand demand for the individual firm more in the men's shoe line than in any of the other lines shown. Furniture and automobiles are likewise highly sensitive to product variation. The middle position of refrigerators may tend to confirm what some firms are now beginning to suspect—that product variation no longer is an important demand-expanding function. As one would expect, fuel oil and cement blocks are at the bottom of the list.

In this chapter an attempt has been made to show how the marketing task for every product requires the performance of a discrete mix of the four basic functions; that the requirements for the creation of place utility, creation of time utility, communication, and product variation are unique for each differentiated product. These differences have been superficially illustrated by showing how such differences can be rated for a representative group of commodities, and suggestions have been made through deductive

TABLE 5
SENSITIVITY OF DEMAND TO PRODUCT VARIATION^a

Product	A (30)	B (20)	C (20)	D (30)	E	F
1. Automobiles	8	6	5	5	610	3
2. Cement blocks	1	1	2	2	150	10
3. Bread	3	4	4	2	270	7
4. Bottled soft drinks	4	3	2	5	490	4
5. Men's shoes	7	8	8	4	650	1
6. Refrigerators	6	3	5	4	460	5
7. Fuel oil	2	1	1	3	190	9
8. Cigarettes	2	2	2	3	230	8
9. Furniture	8	5	6	6	640	2
10. Puffed cereals	3	6	2	5	400	6

^aScoring is from 1 to 10, with the larger score indicating greater sensitivity to the function based on these criteria. Key to columns: A = Susceptibility to Conspicuous Consumption; B = Susceptibility to Superficial Variation; C = Actual Usefulness of Differentiation; D = Growth Stage of the Industry (1960); E = Cumulative Sensitivity Score; F = Order of Sensitivity. The numbers in parentheses below the column designations are weights.

reasoning for determining the relative effectiveness of each of the basic functions in expanding demand.

In Tables 2-5, ten different products were arbitrarily weighted on the basis of their sensitivity of demand to the performance of each of the four basic marketing functions. These arbitrary ratings were used for purposes of illustration only.

CHAPTER V

MARKETING MIX COMPONENTS—INSTITUTIONAL ARRANGEMENTS FOR PERFORMING THE MARKETING FUNCTIONS

Postulate III

According to Postulate III, there exists a large inventory of techniques, methods, and institutional arrangements capable of performing some or all of the marketing functions with varying degrees of efficiency. Each of these components of the marketing mix is susceptible to grading on the basis of its ability to perform individual marketing functions.

The development of this postulate proceeds by examining some of the methods which might be used to appraise the ability of existing institutional arrangements to perform each of the four marketing functions. In the course of this analysis a number of estimates are made regarding the ordering of marketing mix components. The implementation of the concepts developed in this thesis should be carried out on the basis of factual and conclusive evidence to substantiate the relative ability of each of the marketing mix components to perform each of these functions.



It is necessary to make judgments as to which of the marketing mix components possess the necessary attributes to perform each function most efficiently and in what order the marketing mix components can be placed. For purposes of illustration, a sample inventory of marketing mix components, which is by no means exhaustive, is used. In practice this list would be expanded to include at least all of the major advertising media, the techniques of sales promotion, the various types of common carriers engaged in transportation, all of the various types of warehouses engaged in storage, and general classifications of product variation such as variations in packaging, in color, in size and shapes, and in terms of sale and warranties.

Problems of quantification arise due to the temptation of adding dissimilar data together. Some assumptions have been made merely because the present science of quantification does not permit the implementation of some of the concepts contained herein. It is assumed that the science will continue to advance and some of the problems which seem insuperable at this writing will lend themselves to solution in the near future. Oversimplification has been used as a deliberate means of keeping the central theme clear of complicating impedimenta. The difficulty of avoiding irrelevant material in a study



of this kind has been recognized in the Miller and Starr book, Executive Decisions and Operations Research.

Creativity plays such an important part in the development of marketing strategies that it is quite often impossible to analyze the effects that competitive strategies will have on the outcomes. Many times, more than a single competitor exists. Each competitor has so great a number of possible strategies that the resolution of the decision problem is impossible. In the same way, the states of nature that affect the outcomes are hard to detail. The economy can change in too many ways to catalog them all. Consumer attitudes are dynamic and respond to factors that are outside the ordinary scope of consideration. All told, detection and listing of all relevant columns in the decision matrix cannot be a reasonable approach to the problem. To illustrate this, imagine that the decision-maker's strategy includes 5 possible product designs, 5 prices, 5 patterns of distribution, and 5 methods of communicating with the consumer. This is a total of 625 strategies. If there are 4 competitors, it is not unreasonable to assume that each of the competitors has 625 strategies available. Presuming that there are 5 states of nature, then the number of different conditions that can prevail is 476,837,158,203,125. Ironically, the only ludicrous thing about this number¹ is that it is far too small to describe the actual situation.

Nevertheless, the fact of oversimplification should not invalidate the general hypothesis which is contained in this postulate.

Inventory of Marketing Mix Components

Techniques available for creation of place utility

Rail transportation
Water transportation

¹David W. Miller and Martin K. Starr, Executive Decisions and Operations Research (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960), p. 171.

Truck transportation
 Air transportation
 Pipeline transportation
 Transportation by customers
 Locational density of outlets
 Geographical distribution of outlets

Specialist Institutional Arrangements available for the creation of
 place utility

Railroads
 Shipping companies
 Truck lines
 Airlines
 Pipeline companies
 Delivery service companies
 Railway express
 Parcel post

Techniques available for creation of time utility

Commodity storage
 Deferred payment plans
 Hourly availability
 Cold storage

Specialist Institutional Arrangements for the creation of time utility

Public warehouses
 Cold storage warehouses
 Field warehousing
 Transportation agencies
 Financial institutions

Techniques available for communication

Interpersonal aural
 Interpersonal visual
 Mass media
 Newspaper advertising
 Magazine advertising
 Television advertising
 Radio advertising

Outdoor advertising
 Direct mail advertising
 Publicity
 Using the product
 Sampling
 Display
 Packaging

Specialist Institutional Arrangements for communication

Salesmen
 Sales clerks
 Advertising agencies
 Newspapers
 Magazines
 Television stations
 Radio stations
 Billboards
 Direct mail services
 Store show windows
 Trade fairs and exhibits

Techniques available for product variation

Packaging
 Color variations
 Size variations
 Shape variations
 Weight variations
 Price range
 Supplementary services
 Warranties

Specialist Institutional Arrangements for product variation

Packing companies
 Repair shops
 Insurance firms
 Custom shops
 Alteration services

Generalists furnishing some of all of the basic marketing functions

- Functional middlemen
 - Auctions
 - Brokers
 - Commission merchants
 - Manufacturers' agents
 - Selling agents
- Merchant middlemen
 - Full service wholesalers
 - Cash and carry wholesalers
 - Mail order wholesalers
 - Drop shippers
 - Rack jobbers
 - Wagon jobbers
- Retailers
 - Department stores
 - Discount houses
 - Single line stores
 - Franchised retailers
 - Mail order houses
 - Vending machines
 - Supermarkets
 - House to house retailers
 - General stores
- The producer

In order to match successfully the discrete set of functions which each product requires for effective marketing, with the most effective means of accomplishing this functional mix, it is necessary to appraise each component listed in the above inventory on its ability to perform each of the functions. Probably the most effective method of making judgments of this nature at the present time would be to allocate the components' costs among the four basic functions and then to make a judgment based on the relative

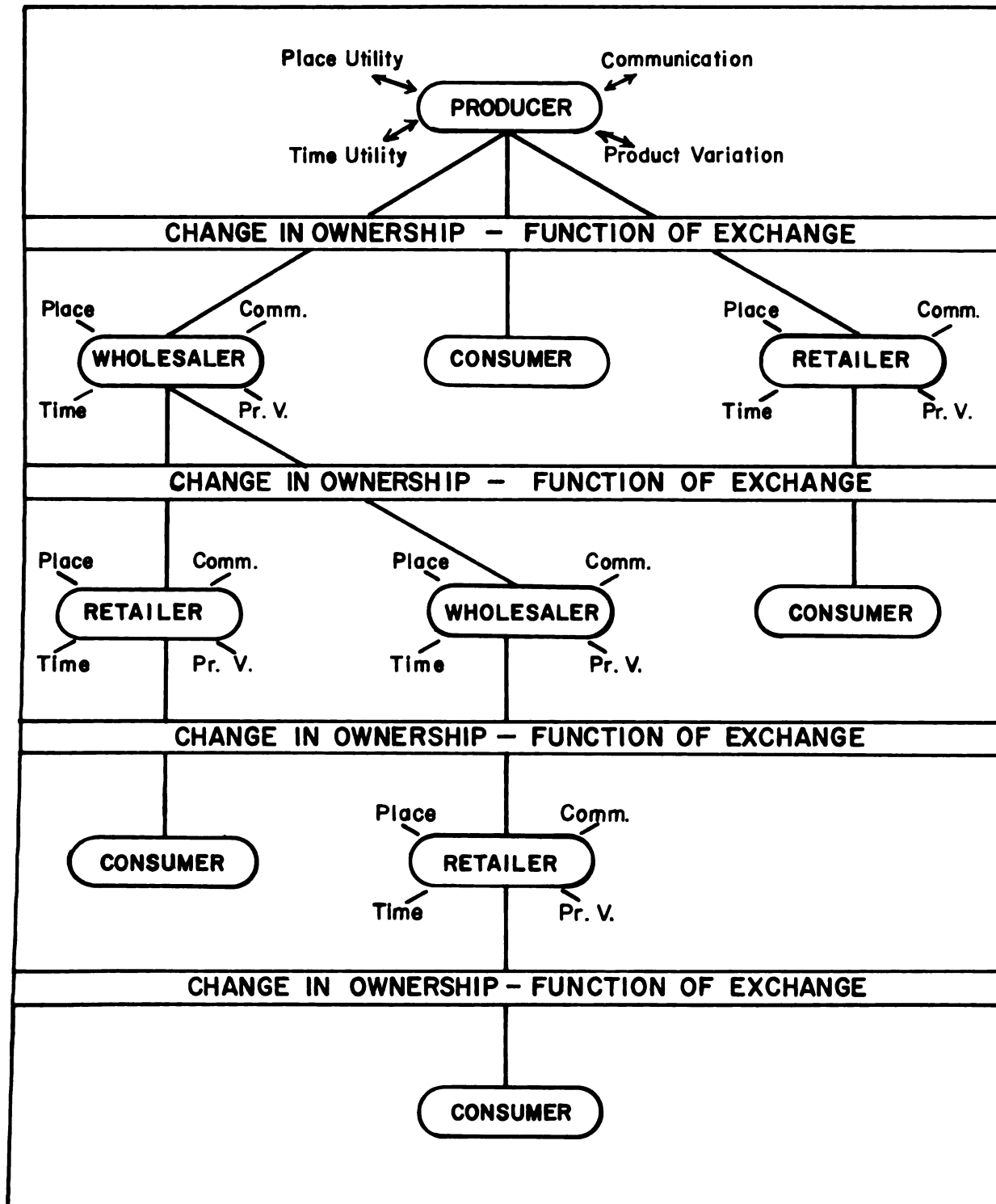


Figure 1. Function—channel of distribution relationship.

importance of each function based on its relative cost. The ubiquitous character of the functions is illustrated in Figure 1.

Some of the above components require further segmentation if a useful functional appraisal is to be made because of the wide range of differences which can occur within some of the above categories. In the field of wholesaling, for instance, it is necessary to distinguish a broker from a wagon distributor and a selling agent from a rack jobber because of the wide diversity of functions performed by each.

The judgments made regarding the ability of the various component parts of the marketing mix to perform their various functions are not intended to be critical. The rationale of the system proposed in this thesis does not say, "We ought to have this or that kind of a middle man." It merely attempts to measure the relative effectiveness of each middle man to carry out the functions of marketing. The assumption is made that each component of the marketing mix operating in a competitive climate has demonstrated that he is performing an efficient economic service by the mere fact of his survival.¹ The root of inefficiencies, therefore, does not lie in the

¹To those who object to the assumption that the distributive trades are in fact competitive it should be pointed out that this position is relative. Many of the manufacturers of consumers' goods

individual firm which is engaged in marketing activity as much as in the fact that some firms may be employed to carry out marketing functions when a change from one type of firm to another might make better use of their skill.

The Creation of Place Utility

The appraisal of marketing mix components begins by making judgments on their ability to perform the function of creating place utility. A catalog of all the marketing mix components which are capable of creating place utility would include all those listed above for the creation of possessory utility except the last one; namely,

have developed monopolistic positions through the use of differentiation. There are relatively few manufacturers of each type of consumer goods. Mass-production techniques have required mass accumulations of capital if an entrepreneur is to enter manufacturing. Thus free entry is limited by the ability to accumulate capital. In contrast, in the distributive trades retailers are seldom able to differentiate the goods sold in their own stores from goods sold in other similar stores. There are a very large number of firms engaged in the distributive trades—almost 2,000,000 retailers and over 250,000 wholesalers; and a further contrast is that free entry into the distributive trades is a normal condition. All three of these conditions—ease of entry, large numbers of buyers and sellers, and homogeneous goods—are typical conditions of pure or perfect competition. Important exceptions to competitive conditions exist when selective distribution is used involving franchised dealers or when political activities result in frictions such as the fair-trade laws. Although the tendencies toward imperfect competition or monopolistic competition will undoubtedly increase, they do not seem to be important enough at this time so that our assumptions should be relaxed.

producers' salesmen at the point of production. This single institutional arrangement is the only one that requires that the consumer perform the entire function of creating place utility. In addition to all the components which create possessory utility there is a group of specialists. Of major importance are the common carriers; namely, the railroads, the trucking industry, water transportation, pipelines, and airlines.

Here again it is useful to make a number of observations which provide clues for the measurement of the relative efficiency of each marketing mix component, in the performance of the creation of place utility. In the discussion to follow, one of the simplifying assumptions is that the points of production are already located optimally; i.e., in such a manner that the savings in production due to location are greater than might be achieved by relocating the plants to conform with marketing pull. What are the basic problems of creating place utility for a product whose point of production is Chicago and whose potential consumption includes the whole United States? If transportation by water is cheaper than transportation in carload lots by rail, the goods of this producer should travel as far as possible toward the ultimate consumer by water. Secondly, carload lot railroad transportation should be used toward the consumer in all directions up to the point where the maximum efficiency

requires breaking bulk. Thirdly, somewhere between the point of breaking bulk from carload lots to smaller lots and the consumer are the boundaries of the area which the consumer is willing to cover in order to make a purchase. Within each area limited by the consumers' willingness to shop there exists an opportunity for a marketer. This point is a logical point for a retailer, and the point of breaking carload lot bulk is a logical place for a wholesaler. The balance of the transportation problem is reduced to one of the relative efficiency between (1) the wholesalers' delivery equipment, (2) a common carrier, and (3) the retailers' pickup equipment.

The components of the marketing mix have varying degrees of ability to perform each of the marketing functions, and each of the goods offered in the market place has unique characteristics which determine the relative importance of each function. In the matter of the creation of place utility this point can be demonstrated by a simple illustration. For the manufacture of refrigerators the marketing mix components most useful in the performance of creating place utility must be competent in the handling of heavy objects, and therefore, the final link between the producer and the consumer will be a component capable of delivering a refrigerator into a home. This is a transportation operation which the consumer is ill-equipped

to handle himself. In contrast, to the woman buying a new hat, or the man buying a new automobile, transportation becomes relatively unimportant.

Is it possible to develop yardsticks which measure the efficiency, either quantitatively or relatively, of each of the marketing mix components in performing the place utility function? The most logical criterion for the measurement of efficiency in transportation would appear to be the cost of transport per ton-mile. This information, of course, is available in the form of published rates in the case of common carriers. Where transportation is only one of a number of functions performed as is the case with all middlemen, a cost analysis would be required for each marketing mix component. Many studies have already been made in this area by such investigators as Longman,¹ Sevin,² Jones,³ and Crisp.⁴ There seems to

¹Donald R. Longman and Michael Schiff, Practical Distribution Cost Analysis (Homewood, Ill.: Richard D. Irwin, Inc., 1955).

²Charles H. Sevin, Distribution Cost Analysis, U.S. Dept. of Commerce Economic Series No. 50 (Washington: Government Printing Office, 1946).

³Robert I. Jones, "The Role of Merchandise Management Accounting in Cost Control," Advancing Marketing Efficiency (Chicago: American Marketing Association, 1959), p. 229.

⁴Richard D. Crisp, "The Marketing Concept toward Distribution Cost Measurement and Control," Distribution Costs: A Key to Profits (Chicago: American Marketing Association, 1958), p. 8.



be no practical reason why transportation cost data for middlemen could not be reduced to a cost per ton-mile basis for comparative purposes. These figures in turn could be converted into comparative figures per product unit so that the total cost of transportation using various marketing mixes could be established.

It was pointed out earlier, however, that transportation is only a part of the total task of creating place utility. Reducing the distance which the customer must travel is also a means of creating place utility. Ceteris paribus, this function is performed most efficiently by the marketing mix component which affords the greatest number of geographical locations for performing the exchange function. The degree to which a large number of outlets compensates for a higher transport cost should be mathematically determinable.

Most of the differences in rates between transportation agencies can be accounted for by the fact that additional functions are added to the "pure" transportation operation.¹ Figure 2 shows that wide variations in the charges for what are normally viewed as transportation services can be accounted for largely in terms of time utility. In other words, a positive correlation exists between

¹ A "pure" transportation agency of course does not exist because among other things it would require an ability to move goods instantaneously.

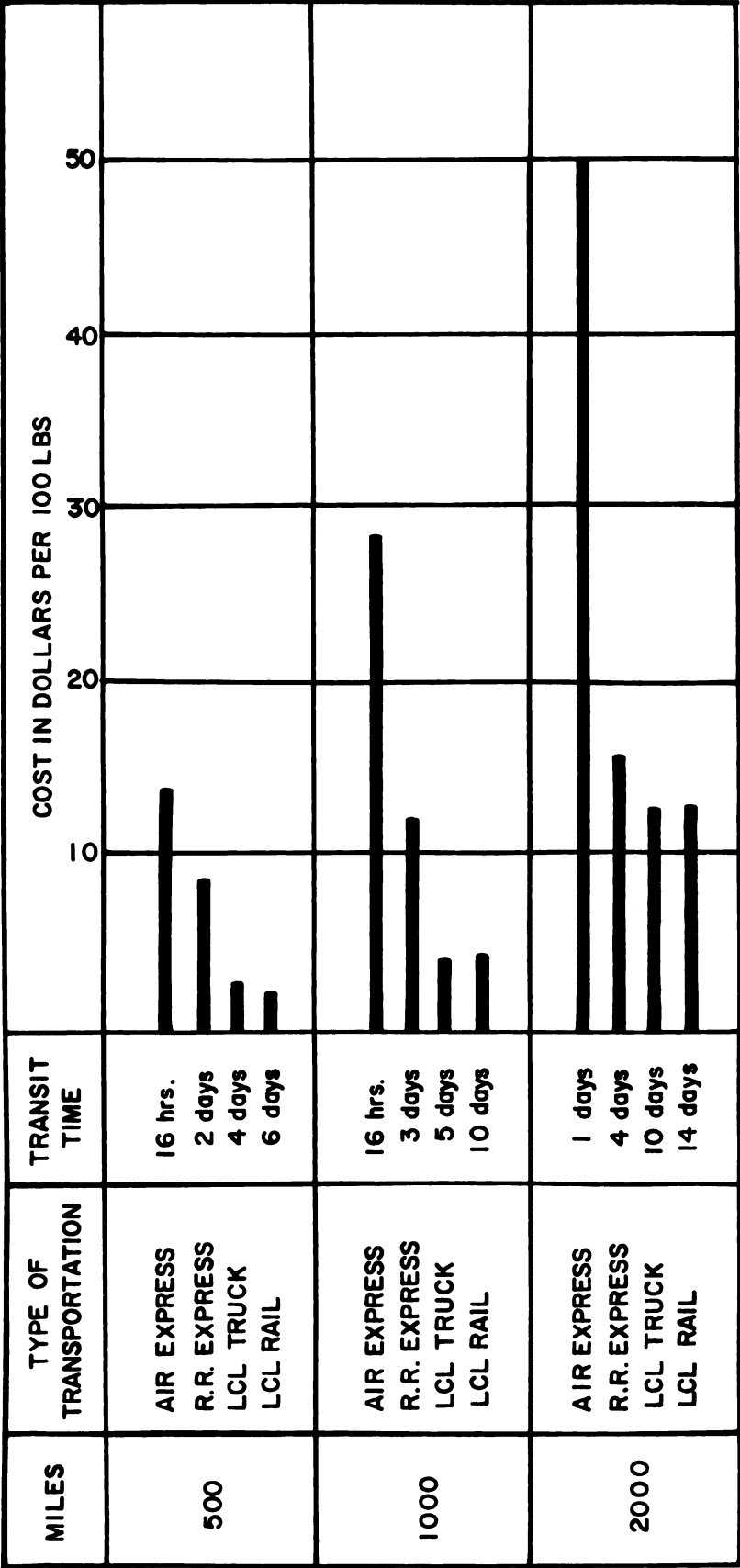


Figure 2. Relationship of transportation costs to the creation of time utility.

increasing charges and increasing speed in delivery. That part of the analysis which is concerned with the creation of place utility only, must therefore disregard the utility which may be created by rapid delivery.

It is readily apparent when one looks over a few of the possible marketing mix possibilities that there exists a wide range of abilities represented in the matter of using the most efficient methods of transportation. Assume for the moment that rail shipment in carload lots represents the lowest possible cost per ton-mile for the transportation of most goods. The likelihood of this opportunity being exploited in a channel of distribution consisting of a direct-from-producer-to-retailer relationship is small because for most goods, retailers cannot justify carload lot purchases. On the other hand, the existence of wholesalers is often justified largely on the basis of their ability to break bulk at the wholesale point, and in many lines of goods, a large part of all shipments received is in carload lots. Therefore, it is possible to generalize that, ceteris paribus, the existence of a wholesaler in the marketing mix indicates an improved efficiency in the accomplishment of the function of creating place utility, based on the ability to use efficient means of transportation. Undoubtedly this is one way in which the ability of various mixes can be measured and compared.

Another method which may be useful in scoring various mixes consists of rating each mix on the number of outlets which are available to the customer as a result of using the specific mix. It is assumed that place utility is created when the consumer's requirement for travel to obtain a given product is reduced. This reduction continues as the number of outlets increases if they are distributed in a pattern consistent with population distribution. Therefore, the mix which uses one thousand vending machines for the final retail transaction will have created more place utility than the mix using a single department store in the same market.

Certain classifications of goods require special equipment for efficient transportation. An example is that of fresh milk. Common carriers are ill-equipped to transport goods of this nature, and therefore, middlemen who are capable of supplying special services must be recognized as useful in expanding the efficiency of creating place utility. Judgments can be made regarding the relative usefulness of marketing mixes in performing special transportation tasks, and these judgments also serve as measurements of ability to create place utility.

A number of criteria can be found which can be used to place quantitative judgments for many of the components of the marketing mix, and by scoring and weighing the various criteria, a substantial

element of objectivity can be introduced into the determination of the relative efficiency with which each mix can perform any one of the basic functions. Ten mixes are used as an example of this procedure in measuring the ability of marketing components to create place utility in Table 6.

Of the ten choices shown in Table 6, the combination which appears to be most capable of efficiently creating place utility, based on the scoring shown in the table, is the producer-to-broker-to-full-service retailer. It follows, therefore, that for those goods for which the place utility function is very important, this combination may be the most efficient of the ten listed. In contrast, the cost of performing the same function by using the producer-to-vending-machine combination would seem to preclude its use for all except those commodities for which the creation of place utility is a relatively small part of the total marketing task.

The Creation of Time Utility

All of the marketing mix components which have the ability to create exchange utility also have the ability to create time utility. In addition to these components, all the institutional arrangements which exist for the purpose of storage are available for the creation of time utility. These include full service public warehouses, limited

TABLE 6

**METHOD FOR ORDERING ABILITIES TO CREATE PLACE
UTILITY FOR SELECTED MARKETING MIXES^a**

Marketing Mix	A (40)	B (20)	C (20)	D (20)	E	F
1. Producer to vending machine	1	0	0	9	220	9
2. Producer to vending machine plus media advertising	1	0	0	9	220	10
3. Producer to house-to- house salesmen	1	10	9	9	580	2
4. Producer to wholesaler to single-line retailer . . .	6	5	6	5	560	3
5. Producer to wholesaler to retailer using com- mon carriers	7	3	4	5	520	5
6. Producer to mail-order house	5	6	8	3	540	4
7. Producer to broker to full-service retailer plus media advertising . . .	7	4	7	5	600	1
8. Producer to department store	3	5	7	6	480	7
9. Producer to franchised retailer	2	5	5	7	420	8
10. Producer to wholesaler to supermarket	8	4	1	5	520	6

^aScores are based on a range of 0 for no ability to 10 for best ability to perform as specified. Key to columns: A = Use Efficient Equipment; B = Perform Special Services; C = Local Delivery; D = Intense Coverage; E = Weighted Total Score; F = Order of Competence. The numbers in parentheses below the column designations are weights.

service public warehouses, cold storage warehouses, field warehouses. A further source of time utility, but incidental to its main function, is the common carrier. Railroads, water transportation facilities, pipelines, airlines, and the trucking industry are engaged to a limited extent in the creation of time utility.

Inasmuch as each of the marketing mix components varies in its ability to create time utility and in its efficiency in the creation of time utility the task is to devise a rationale for scoring each component on these two points.

The following observations are germane to the appraisal of efficiency in performing the storage function. Storage requires housing, protection from the elements, and the furnishing of special temperatures and humidity in some cases. The cost of housing can be measured by the cost of rent; therefore, the cost of storage is a function of the cost of rent. It is reasonable to assume that the cost of storage by an institution located in high-rent areas is more than the cost of storage by those institutions located in low-rent areas. Based on this generalization, it can be stated that the cost of providing storage by department stores is greater than the cost of providing storage by neighborhood stores, and that likewise, the cost of providing storage by those institutions located within the city limits of metropolitan areas is greater than the cost of those

institutions which are located outside of the metropolitan areas where space is comparatively cheap. Secondly, the problem of storage is closely connected to the problem of transportation because, ideally, storage should be provided at some point on the route between the producing point and the consumption point, and care must be taken that extra transportation costs are not contracted for in the attempt to reduce storage costs. Further, it may be observed that whatever storage is involved as an incidental to transportation may be considered to be free because it is provided while paying for transportation whether it is used or not. Efficient storage also requires efficient handling in so far as handling is a necessary part of the storage operation; therefore, a warehouse with automatic conveyor systems and other advanced handling equipment can generally provide storage at a lower cost than those firms who are specialists in some other phase of marketing. The cost of handling as a proportion of the cost of storage becomes increasingly large as the length of storage time is shortened, and at some point the use of a storage specialist cannot be justified.

In some cases the consumer can provide storage more efficiently than a marketing mix component. When this is the case, the discovery of optimum marketing mix will indicate the fact that the product in question should be sold to the consumer in quantities

which will properly transfer this operation to the consumer. For instance, the cost of the space used when a consumer buries a fuel oil tank underground in the front yard of his home may be negligible, whereas if a middleman has to construct tanks, a sizable rent may be chargeable to them. Therefore, the savings of handling a large delivery over many small deliveries, plus the fact that no rent per se is chargeable to the storage tank of the consumer, may result in the net cost of storage to be lower when accomplished by the consumer than when accomplished by a middleman. It is recognized, of course, that there exists the possibility that the initial cost of many small tanks may exceed the cost of a single large tank.

Modern functional construction and materials handling equipment seem to favor single floor construction as a means of reducing total storage costs, especially in outlying areas. This results in an advantage in the use of outlying warehouses over central city warehouses based on this criterion; of neighborhood retail stores over department stores, and of manufacturers over both middlemen.¹

Here again it must be remembered that the creation of time utility is a much wider activity than mere storage—it involves the

¹This assumes, of course, that the price of land in industrial areas is less than in the lowest-priced commercial areas—a condition which is not necessarily true.

protection of goods against deterioration, style changes, fire, theft, and various other risks.

Some goods require fast delivery between the time of production and time of consumption, as is the case with baked goods and fresh milk. The accomplishment of this is also to be viewed as creating time utility because consumer satisfactions are increased as a result of rapid delivery. It appears, therefore, that a true appraisal of the ability to create time utility must be made on the basis of efficiencies obtained in specific areas of this function and then weights applied to these segments to obtain a final relationship.

Most of these criteria can be quantified, and there does not seem to be any insurmountable reason why each marketing mix component cannot be scored on the basis of its relative efficiency in performing the function of creating time utility.

An analysis of the creation of time utility soon produces an ambiguity. If the creation of time utility consists of performing those activities which make it possible for a consumer to acquire a good whenever he wants it, at least two opposing activities are involved. When a consumer wishes to buy bread as soon as possible after it is baked, the creation of time utility consists of reducing the time between production and final sale; when a consumer wants a product to be available to him at all times without respect to its

production date, the creation of time utility may consist of just the opposite of the first case, expanding the time between production and final sale.

The result of this ambiguity is that in devising criteria by which the ability of various mixes may be judged, one is forced to include some which tend to cancel each other out. It is likely that the solution to this dilemma will be found in further segmentation of this function.

Table 7 gives a simple illustration of how one might go about making a comparison of various mixes to produce utility of time. The scores shown are based on the observations that public warehouses are usually located in areas which permit relatively low cubic foot costs, wholesalers are next, neighborhood stores and supermarkets follow, and department stores—because of their uptown locations—last, with the most expensive cubic foot costs.

Some combinations of marketing mix components lend themselves, or even foster, fast turnover and thus reduce the need for storage of large inventories. The ability to do this may be considered a positive measure of the ability to create time utility. Supermarkets are excellent examples of fast turnover components.

Drug stores create time utility by allowing the consumer to make purchases over a wide range of daily shopping hours. Vending

TABLE 7

**METHOD FOR ORDERING ABILITIES TO CREATE TIME
UTILITIES FOR SELECTED MARKETING MIXES^a**

Marketing Mix	A (40)	B (20)	C (20)	D (20)	E	F
1. Producer to vending machine	1	8	10	10	600	5
2. Producer to vending machine plus media advertising	1	8	10	10	600	4
3. Producer to house-to- house salesmen	0	9	1	10	400	10
4. Producer to wholesaler to single-line retailer . . .	7	6	5	6	620	3
5. Producer to wholesaler to retailer using com- mon carriers	6	4	5	3	480	8
6. Producer to mail-order house	3	4	9	6	580	6
7. Producer to broker to retailer plus media advertising	7	5	5	8	640	2
8. Producer to department store	4	5	4	6	460	9
9. Producer to franchised retailer	5	6	5	7	560	7
10. Producer to wholesaler to supermarket	7	9	5	5	660	1

^aScores are based on a range of 0 for no ability to 10 for best ability to perform as specified. Key to columns: A = Low-Cost Storage Facilities; B = Ability to Turn Over Rapidly; C = Offer Goods over Large Hourly Range; D = Minimize Pipeline Inventory; E = Weighted Total Score; F = Order of Competence. The numbers in parentheses below the column designations are weights.

machines often offer twenty-four-hour availability. This, too, seems a reasonable criterion for measuring the effectiveness of a component in the marketing mix to produce time utility.

The above observations are made to suggest a starting point for research in determining the relative efficiency of each of the marketing mix components in performing the function of the creation of time utility. Again, for purposes of analysis, the figures used in the rating are purely arbitrary and are used to demonstrate the potential working of a model based on a scoring system.

Communication

Devising methodology for measuring the ability to communicate may present a greater challenge.¹ Fortunately, this problem is receiving a tremendous amount of attention by researchers in behalf of the many advertising media as well as by research in the field of

¹I once asked a father why he selected Gerber's baby food from among a large selection on a supermarket shelf. He said that for some reason the large truck trailers, with their pure white backgrounds, baby blue trim, and beautiful pictorial babies, that used to travel through his town seemed to convey an impression of reliability, success, and cleanliness to him—"If people were buying this product in such huge quantities it must be good." I then called Gerber's and asked them for a glossy print of this equipment which seemed to have a compelling ability to communicate an excellent corporate image. I was told that the use of these company-owned trailers had been discontinued over fifteen years previously!

communication. Thus, one can point to some areas which constitute an opening wedge into the intricacies of this problem. Communication involves the giving and receiving of information or messages in any way. It is an important part of the marketing task and the marketing mix components exhibit a wide range of capabilities in the performance of this task. Perhaps at the lower end of the spectrum would be the vending machine whose ability to communicate is limited to the display of its contents and a few words of instructions; at the other end of the spectrum the highly skilled house-to-house salesman who is using a tried and tested word-of-mouth selling technique and who has learned many tricks of the trade to get the householder's attention.

Producers have at least four techniques for communication available to them: (1) using salesmen, (2) using advertising, (3) using publicity, (4) using packaging techniques. Communication by salesmen may be direct or indirect. Direct communication involves face-to-face discussion and intercourse, while indirect communication uses such devices as letter-writing, telephoning, and telegraph services. Traditionally, the personal contact of a salesman has been considered to be the most effective method of communication. Producers may also use advertising which is a nonpersonal form of mass communication. A wide range of media are available to the producer

depending upon the markets with which he wishes to communicate and the type of sales message that he feels is necessary. If the producers' organization or product has any newsworthy features he may communicate by using publicity devices. These are noncommercial messages transmitted through mass media as news rather than as paid advertising. Finally, of growing importance to the producer, is the technique of packaging. Great strides have been made in the development of packaging as a medium for communicating sales messages in the last decade. The development of the self-service concept in marketing has added new importance because the package in a self-service store may be the sole determinant of whether or not its contents are purchased.

Wholesalers generally have the same techniques for communication available to them as the producer, with the possible exception of packaging. For each type of wholesaler, therefore, it is possible to indicate variations in his ability to communicate with such phrases as "using salesmen" or "using advertising" or "using publicity." In each of the three categories further modifications may be made by specifying the type of salesmen, the media used for advertising, or the extent and scope of the publicity. The fact that each type of wholesaler has a wide range of communication techniques available to him makes the possible combination of marketing mix components

almost infinite. Nevertheless, when matched with the characteristics of goods and the motivations of consumers, the number of reasonable alternatives soon becomes substantially limited. The original inventory of available marketing mix components, therefore, should be as inclusive as is practical.

It should be noticed that wholesalers have a smaller inventory of advertising media to choose from due to the fact that most wholesalers operate in limited geographical areas. Local wholesalers, therefore, are limited to the use of media with local coverage; and regional wholesalers are limited to media with local coverage or regional coverage. Magazine advertising would involve a great deal of wasted circulation when used by either of these two types of wholesalers. In contrast, producers can select media on the basis of their total market, and if a producer has national distribution, he can use media with national coverage.

There is a measurable difference in the degree of communication that various types of retailers are prepared to offer ranging from the supermarket where personal communication is at a minimum to the single-line specialty store where each customer is greeted by a skilled sales person. In addition, the retailer also has the full range of advertising media which is available at the local level, plus a number of sales promotion devices such as window displays, truck

identification, point of sale displays, store identification, and other communication devices.

A discussion of the function of communication in marketing would not be complete without reference to the consumer's role. It is acknowledged that the word-of-mouth advertising carried by the consumer in his ordinary casual contact with other consumers is an extremely important factor in the determination of marketing success. Because of the dearth of research in this area, no attempt is made in this study to appraise the effectiveness of the various components of the marketing mix in inducing word-of-mouth advertising. Undoubtedly, publicity plays an important role in this phenomenon.

The components are now rated on the basis of their ability to communicate. A caveat is in order. As in the preceding cases these ratings are purely arbitrary. There is, however, much evidence to support the notion that as the science of measurement improves the effectiveness of each of the market mix components in communication will submit itself to quantification. The methodology of this task is left to others. Some of the factors which seem relevant at this time are listed below.

Certainly a communicator who reaches a large number of people should be rated higher than a communicator who reaches a

small number of people. Translated in terms of a retail store, this concept may be interpreted to indicate that a retail institution with show windows on Chicago's State Street will rate higher than a neighborhood drugstore; and a retail store with a large personal sales force of clerks will rate higher than a self-service store. Carrying this concept into advertising, the effectiveness can be measured in terms of circulation.

A second measure of the capability to communicate may be the length of the message which is transmitted. The technique of packaging or outdoor advertising may require an extremely short message, whereas a new car salesman is capable of providing a very complete description of the product he is attempting to sell.

A third criterion is based on the fact that communication can be divided into two classifications; namely, unilateral—or one-way communication—and two-way communication. It will be readily seen that negotiatory situations require two-way communication, whereas communication whose sole purpose is to remind or to direct may be one-way communication. Two-way communication involves interpersonal relationships. It is conceivable, however, that mechanical devices will be developed which permit a considerable degree of two-way communication, thus reducing the need for interpersonal contact.

Some media of communication are able to transmit messages with greater conviction or believability than other media. This, then, is the fourth determinant of communication effectiveness. The scepticism with which a great deal of modern advertising is accepted by the consumer is a case in point. In contrast with this scepticism may be the confidence that many consumers place in consumer organization reports, such as Consumers' Research. Similarly, marketing institutions have developed reputations for reliability so that the selection of the optimum marketing mix may involve components whose effectiveness in communicating with conviction is an important function for a particular good or service.

A summary of findings to the effect that communication effectiveness varies with the credibility of the source follows:

1. The effects of credibility of source on acquisition and retention of communication material were studied by presenting identical content but attributing the material to sources considered by the audience to be of "high trustworthiness" or "low trustworthiness." The effects of source on factual information and on opinion were measured by the use of questionnaires administered before, immediately after, and four weeks after the communication.

2. The immediate reaction to the "fairness" of the presentation and the "justifiability" of the conclusions drawn by the communication is significantly affected by both the subject's initial position on the issue and by his evaluation of the trustworthiness of the source. Identical communications were regarded as being "justified" in their conclusions in 71.7 per cent of the cases when presented by a high credibility source to subjects who initially held the same opinion as advocated by the communicator, but were considered "justified" in only

36.7 per cent of the cases when presented by a low credibility source to subjects who initially held an opinion at variance with that advocated by the communicator.¹

Further methods of appraising the ability to communicate consist of various kinds of tests using questionnaires which are designed to measure the rate of recall of a specific message. Researchers in this area have developed an impressive inventory of tools for making measurements of respondents' sensitivity to all sorts of communication devices. Recognition tests, completion tests, apperception tests, and many psychological testing devices are used with varying degrees of effectiveness. The concentration of skilled talent which is currently employed in developing reliable measurements of communication reception will experience a considerable degree of success in this field in the near future.

Another method seeks to measure the ability to communicate by measuring the results of which each communication technique can produce under controlled experimental conditions. A great deal of work has been done in this area by Joseph T. Klapper for the Public Library Inquiry. In the summary to his memorandum on the

¹Carl I. Hovland and Walter Weiss, "The Influence of Source Credibility on Communication Effectiveness," reprinted in Wilbur Schramm, The Process and Effects of Mass Communication (Urbana: University of Illinois Press, 1955), p. 288.

comparative effects of the various communication media, Klapper reports:

1. Laboratory experiments, which due to their rigid conditions of control differ markedly from social situations, indicate
 - a. that combined use of aural and visual presentation elicits better retention of simple and brief material than does the use of either method of appeal alone;
 - b. that aural presentation of whatever sort elicits better retention of simple and brief material than does visual presentation;
 - c. conflicting findings regarding the relative effectiveness of visual and aural presentation in eliciting retention of lengthy or complex material. Other, extra-laboratory researches suggest that the reading skill of the audience may be a major criterion. It is possible that for the highly educated or for those with high reading skills, print may be the more effective medium while radio may be more effective for those of lesser reading skill. Further and more refined experimentation is needed to settle this question;
 - d. that face-to-face discourse is a more effective persuasive agent than is transmitted voice, which in turn is more effective than print.
2. Researches carried out in more normal social situations confirm the laboratory findings cited in 1,d, above. These researches point to differences in the audience structure and psychological appeal of the various media as contributory factors.
3. Objective studies indicate that the screen elicits a high degree of recall, but only one study, reported in extreme brevity, suggests that this degree of recall is any greater than that elicited by other media. No generalizations on the comparative effectiveness of the screen as to other media can be substantiated by adequate empirical evidence.¹

¹ Joseph T. Klapper, "The Comparative Effects of the Various Media," reprinted in Wilbur Schramm, The Process and Effects of Mass Communication (Urbana: University of Illinois Press, 1955), p. 104.

Some of the unique advantages which have been ascribed to various media are:

1. Printed communication permits the reader to leisurely exposure and successive re-exposure.
2. Radio reaches audiences not exposed to some other media. They may be less cultured and sometimes more susceptible to persuasion.
3. Films achieve a high persuasive and pedagogical effect, especially on children.
4. Face-to-face discourse is perhaps the most effective method of communication surpassed only by the combined face-to-face and mass media approach.

Weighted scores and an ordering of a random group of marketing mixes for abilities to perform the communication function are shown in Table 8. All scores are deductively determined from observation and have no scientific basis. They are judgments for purposes of illustrating a technique. The rationale of using producer to vending machines for marketing milk and ice seems to be confirmed by the chart, because neither of these goods requires intensive communication marketing effort. Where communications are important to the marketing effort as might be the case with automobiles, Table 8 suggests the use of producer to franchised retailer.

TABLE 8

**METHOD OF ORDERING ABILITY TO COMMUNICATE FOR
SELECTED MARKETING MIXES^a**

Marketing Mix	A (40)	B (20)	C (10)	D (10)	E (10)	F (10)	G	H
1. Producer to vending machine	0	5	0	2	2	5	190	10
2. Producer to vending machine plus media advertising	0	10	6	6	5	4	240	9
3. Producer to house-to-house salesmen	10	1	8	5	10	5	700	2
4. Producer to wholesaler to single-line retailer	5	3	1	1	1	6	350	6
5. Producer to wholesaler to retailer using common carriers	4	4	2	2	1	5	340	7
6. Producer to mail-order house	0	6	0	6	8	7	330	8
7. Producer to broker to retailer plus media advertising	4	10	0	6	5	4	510	4
8. Producer to department store	7	5	4	4	6	6	580	3
9. Producer to franchised retailer	8	3	7	7	7	7	760	1
10. Producer to wholesaler to super-market	1	8	1	7	3	5	360	5

^aScores are based on a range of 0 for no ability to 10 for best ability to perform as specified. Key to columns: A = Two-Way Communication; B = Number of Exposures; C = Aural Presentation; D = Visual Presentation; E = Source Credibility; F = Copy Opportunity; G = Weighted Score; H = Order of Ability. The numbers in parentheses below the column designations are weights.

Product Variation

The final problem in this chapter is to analyze the relative abilities of the various components of the marketing mix to increase consumer satisfaction by way of furnishing product variations. A prerequisite for the measurement of this ability is a statement of what is included in the activity described as "product variation."

One of the important activities of product variation consists of offering the customer a wide choice. It is self-evident that when one is looking for an appropriate wall paper, for instance, the chances of finding it are increased in relation to the variety of the designs and colors offered. The appeal of a large choice is sufficiently strong to induce customers to travel considerable distances in shopping for certain types of goods.

Choices are desirable for some goods in respect to color, size, shape, price, and brand. The ability to furnish produce variation is not limited to the producer, but because most middlemen are free to represent several producers, it is a function which can be expanded or contracted by most of the marketing mix components. Certain patterns of performance in this respect have developed over the years, and therefore, judgments can be made on the relative usefulness of each marketing mix component in furnishing the

consumer a wide choice of alternative actions. It is apparent that in most cases a producer-owned store is likely to present a narrower range of goods than a store committed to selling a wide assortment of goods—for instance a single-line retailer.

A second form of product variation consists of concomitant conditions or services which are offered as part of the transaction. A common form of this variation consists of a guarantee or warranty. A customer's satisfaction may be considerably increased by the assurance that the decision made to purchase a specific commodity is not irreversible or that the choice of a color or size is not irretrievably made. The value of an automobile battery is enhanced when it is accompanied by a thirty-six-month guarantee, and the value of any item purchased gains value when it is accompanied by a guarantee of satisfaction and liberal return policy. Similarly, the policies of institutions that assert that the customer is always right or that they will not be undersold adds value to a purchase made from these institutions. Adding the psychological factor of assurance to the tangible value of the goods purchased will increase the total satisfactions accruing to the buyer.

The examples above illustrate again that this form of product variation may be widely diffused through the various marketing mix components which comprise the channel of distribution. Some

producers assume full responsibility for complete consumer satisfaction, while in other cases this responsibility is decentralized and assumed by middlemen at other points in the line of distribution.

There are still other product variations which take the form of concomitant activities. "Including installation" is a valuable contribution which some market mix components are able to offer as a product variation. A mail order house should find that this method of product variation is not readily available and thus presents a handicap in competition vis-à-vis a full-service single-line retailer, for example. It is logical to rate a component on its ability to furnish this kind of product variation whether or not it is at present using this particular technique.

Many other forms of product variation are conceivable, including such indirect services as time payment plans, free alterations, purchase on approval, and most of the advantages which are included in the traditional concept of patronate motives.¹

We can again find a comparable table useful in illustrating the wide range of abilities which various marketing mix components possess for the accomplishment of the function of product variation.

¹Patronage motives are those which determine where or from whom purchases will be made. See Theodore N. Beckman and others, Principles of Marketing (6th ed. rev.; New York: The Ronald Press Co., 1957), pp. 70, 394.

Table 9 is presented as a guide. A general observation is relevant—the freedom to use techniques of product variation may vary in direct relationship to the independence which each component enjoys; this independence is in turn dependent upon the degree to which the entire marketing process is centralized or decentralized. In general, the channel of distribution which involves the most numerous changes in ownership will have the greatest latitude in offering product variation, ceteris paribus.

In some industries product variation consists of annual design changes. This activity is often considered a production function. The strong dependence of demand upon the effectiveness with which this aspect of product variation is carried on is evidence that the creation of product design should be viewed as a marketing task. When design is closely related to production efficiency, these activities are often subject to judgments made by both production and marketing departments. This important marketing task may be assigned, therefore, to departments whose design objectives may run in opposite directions.

Product variation under these circumstances becomes a producer activity which does not lend itself to implementation by outside techniques and institutional arrangements. How can optimum marketing mix be achieved under these circumstances?

TABLE 9
METHOD FOR ORDERING PRODUCT VARIATION ABILITIES
OF SELECTED MARKETING MIXES^a

Marketing Mix	A (40)	B (20)	C (20)	D (20)	E	F
1. Producer to vending machine	3	0	2	0	160	10
2. Producer to vending machine plus media advertising	3	1	2	0	180	9
3. Producer to house-to-house salesmen	5	5	8	9	640	4
4. Producer to wholesaler to single-line retailer . . .	9	6	6	6	720	1
5. Producer to wholesaler to retailer using common carriers	7	5	5	5	580	7
6. Producer to mail-order house	9	8	7	0	660	3
7. Producer to broker to retailer plus media advertising	7	5	5	5	580	6
8. Producer to department store	6	7	7	2	560	8
9. Producer to franchised retailer	8	9	6	4	700	2
10. Producer to wholesaler to supermarket	10	6	4	1	620	5

^aScores are based on a range of 0 for no ability to 10 for best ability to perform as specified. Key to columns: A = Wide Choice; B = Warranty; C = Custom Service; D = Flexible Prices and Terms; E = Weighted Score; F = Order of Competence to Provide Product Variation. The numbers in parentheses below the column designations are weights.

Either the techniques or the institutional arrangements which are best suited to the performance of product design and product development tasks can be added to the inventory of available marketing mix components, and it makes no difference for purposes of optimization whether these components are producer owned and operated or whether they are independent establishments. Perhaps the most important contribution this study can make in this area is to create a clear awareness of the relationship of product variation to demand creation. In those cases where the function of product variation is a crucial determinant of the success or failure of a marketing campaign (as may be the case in the automobile industry) a marketing oriented design and development department becomes an extremely important component in the marketing mix inventory.

Optimum Matching

Postulate III concludes with: Optimum marketing mix shall have been achieved when the discrete functional mix for a given product and the appropriate marketing mix component has been matched in such a manner that no change in matching will reduce the cost or increase the effectiveness of performing the designated task for a given product.

The final step in the achievement of optimum marketing mix consists of selecting the best match between the functional mix which is required to perform the marketing task optimally, and the institutional arrangements which are best suited to accomplish these functions. This will have been accomplished when a match has been made in such a manner that no other combination of functional mix and marketing components will produce a greater bundle of satisfactions from a given input of resources, or the same bundle of satisfactions from a smaller input of resources. It is assumed that the market price is a satisfactory index of the satisfactions which a good or service will produce, and that similarly, the input of resources can be satisfactorily measured by their money value as determined in a competitive market. Optimum marketing mix will therefore be revealed in the form of the lowest ratio of marketing costs to the consumer price for a comparable good or service.

Perhaps the simplest matching technique is shown in Figure 3. In this figure the various weighted scores which were developed in Chapters IV and V are arranged into patterns of bar graphs which lend themselves to visual matching. One can immediately select pairs of graphs, one from the product group and one from the mix group, which have similar characteristics or profiles, and thus,

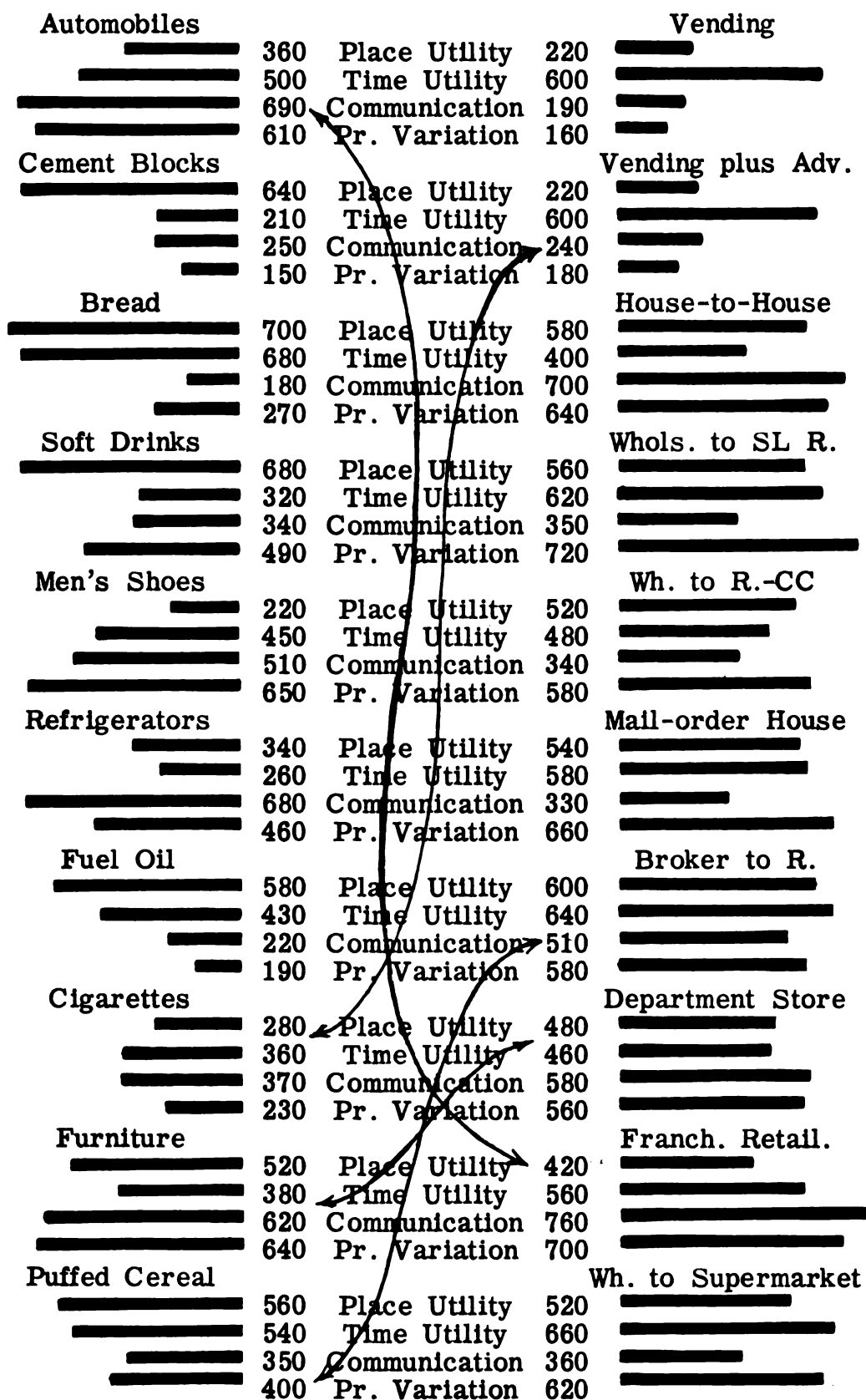


Figure 3. Visual matching of products and marketing mix components.

in a very limited way can reduce the number of possible matches very quickly.

Again, caution is urged against assuming that either the data or the results have been scientifically determined; they have not. All figures used are arbitrary. Nevertheless, Figure 3 illustrates some of the more obvious matches which tend to correlate products and mixes. Automobiles, for instance, are best matched with franchised dealers, furniture with a producer-wholesaler-single-line retailer, and shoes and refrigerators with department stores. The figure fails to show a marketing mix among the limited availabilities, capable of a close match for marketing cement blocks or soft drinks.

Another method of determining the best match between the mixes offered and a selected product is to calculate the average numerical difference between the score of the mix and the product for the four basic functions. The combination showing the least average difference will be the best match. For example, from the data shown in Figure 3, the average difference of the functional scores between Product 1 (automobiles) and Mix 1 (producer to vending machines) is 298. The calculations are as follows:

	<u>Creation of Place Utility</u>	<u>Creation of Time Utility</u>	<u>Communi- cation</u>	<u>Product Vari- ation</u>
Product score .	360	500	690	610
Mix score	<u>220</u>	<u>600</u>	<u>190</u>	<u>160</u>
Difference	140	100	500	450

The sum of the differences is 1,190, which when divided by four is 298. If similar calculations are made for the other nine mixes it is possible to select the best mix by direct comparison:

<u>Product</u>	<u>Mix</u>	<u>Average Difference</u>
1	1	298
1	2	280
1	3	89
1	4	190
1	5	140
1	6	168
1	7	148
1	8	99
1	9	70
1	10	166

The best match for Product 1 is therefore with Mix 9 because 70 is the least average difference.

Many other methods for direct comparison are available, and perhaps a little ingenuity can produce simpler or more convincing techniques.

Summary

In this chapter an attempt was made to show that each marketing mix component, whether it be a middleman, a technique, or combination of these two, has a measurable ability to perform each of the basic marketing functions. It is true that in many cases the measurement of these abilities is improved by further segmentation into subfunctions; i.e., communication abilities are more susceptible to measurement when classified into such categories as interpersonal communication, aural communication, visual communication, transmitted aural communication, et cetera. This in no way invalidates the general hypothesis that each discrete marketing mix represents an ability to perform a discrete combination of the four basic functions, and that each ability is identifiable and measurable even though some of the measurements at present might be limited to a statement of relationships using ordinal numbering.

CHAPTER VI

AN APPLICATION OF EMPIRICAL DATA

The conceptual framework which has been constructed in the foregoing chapters is designed to support in proper relationship bodies of data which the practitioner must collect in order to develop a useful marketing theory. This chapter indicates the nature of the data to be collected and illustrates by example how such data can be used in decision-making.

The Nature of the Required Data

The determination of optimum marketing mix requires first the evaluation of the effect of each function on the demand for a particular good. Specifically, this requires the measurement of the dollar increase in sales which results from each dollar expenditure for the performance of the demand-expanding function. The results of such a measurement can be diagrammatically expressed in a curve as is shown in Figure 4. This curve slopes upward in reflection of the likelihood that sales increase with increasing expenditures for the performance of demand-expanding functions. Ultimately each curve

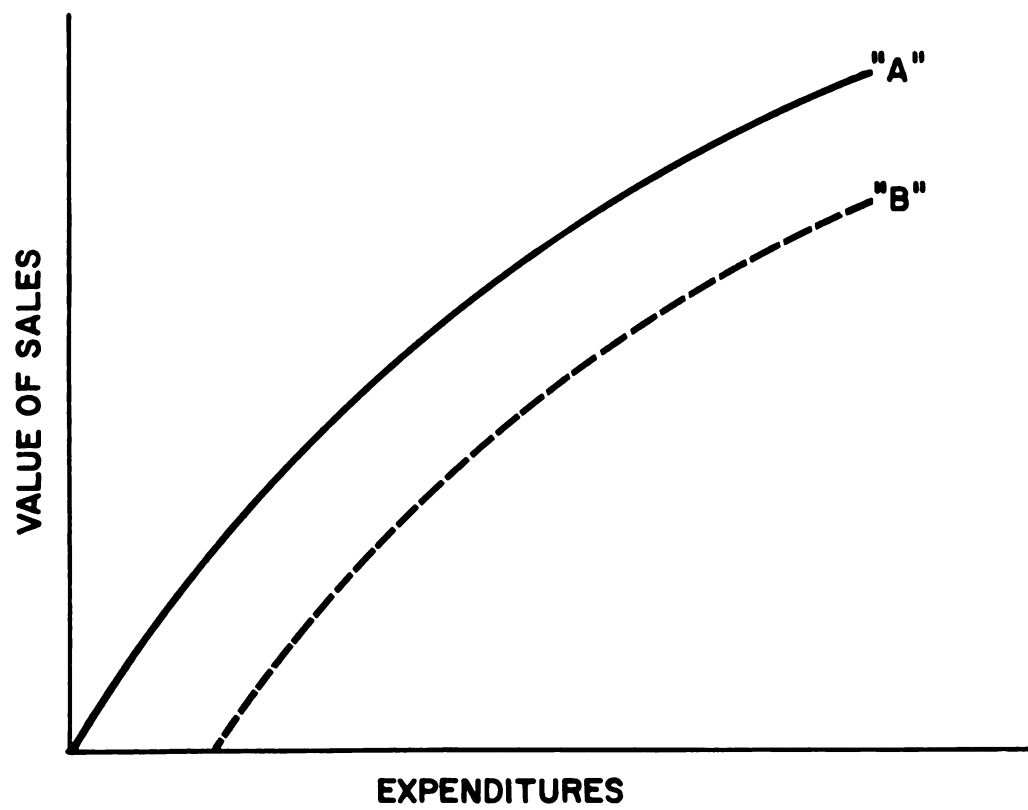


Figure 4. Graphic relationship of sales to expenditures for demand expansion.

will be concave to the abscissa because sales are likely to rise at a decreasing rate as expenditures increase. There may, however, be some periods in which sales increase at an increasing rate temporarily, but finally the decreasing rate must prevail because of the law of diminishing returns.

The position of the curve is as shown by curve "A" in Figure 4, except if expenditures are not infinitely divisible, in which case the expenditures will start at some point along the abscissa at the smallest unit of expenditure for the selected function as shown by curve "B."

The same information is shown graphically on a unit cost basis as illustrated in Figure 5. Here curve "A" illustrates the expenditure per unit required to generate the volume of sales indicated. It was pointed out earlier that the optimum use of a given function requires that, as long as savings due to economies of scale are greater than the cost of a demand-expanding function, its use will be expanded until the unit cost of performing the function equals the unit savings due to economies of scale which accrue as a result of the increased sales volume. A second curve, showing the unit savings which can be realized from economies of scale as volume increases, is shown on the figure as curve "S." The optimum use of the subject function therefore occurs when an expenditure

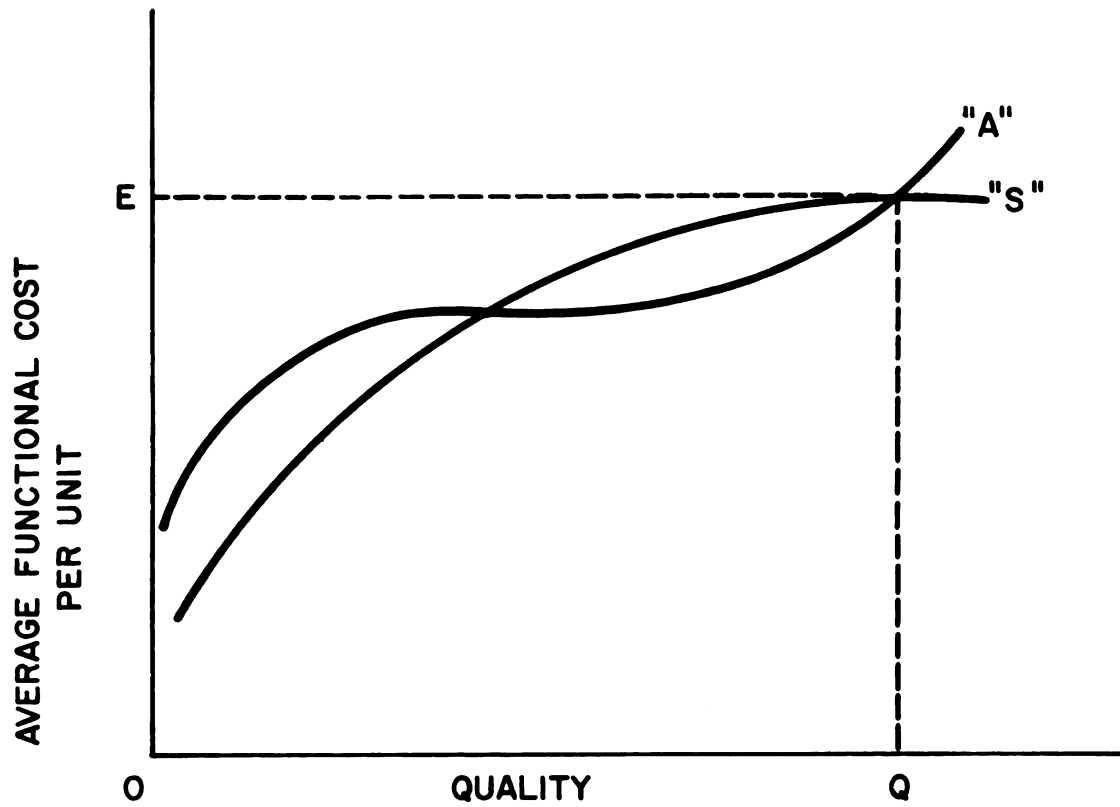


Figure 5. Graphic relationship of unit functional costs and economies of scale at various volumes.

of OE per unit is made for the performance of the function and the quantity demanded and sold under these conditions will be OQ. These are the absolute limits for the use of this particular function in isolation.¹

The Cumulative Effect

After maximum sales that can be generated advantageously by expanding the expenditures for each function in isolation have been determined, the problem of identifying the relative importance of each function when it is combined into a functional mix. Figure 5 can be used to indicate the limits of justifiable expenditures for each isolated function but this evades the fact that undoubtedly each of the functions has the ability to influence the effectiveness of the others in expanding demand. If, for instance, one can double demand by adding X expenditures for transportation (in isolation) and likewise if one can double demand by adding Y expenditures for storage, it

¹This assumes the severely restricted conditions which were specified in the original model. They are repeated here for the convenience of the reader: (a) The product is differentiated. (b) The price is administered. (c) "Costs" include a reasonable profit per unit and are presumed to represent the supply price at the factory gate. (d) Marketing costs also include sufficient profit margins to induce marketing services to be offered. (e) Excess profits are deemed to be an indication that further expansion is warranted.

does not follow that demand will be quadrupled (or increased in any other fixed ratio) by the expenditure of $Y_t + Y_s$. Similarly, it is quite possible that the communication function can multiply the effectiveness of expenditures for the creation of both place and time utility to a greater degree than would be possible by merely increasing the intensity of the first two functions. Furthermore, in many cases the addition of expenditures for one function may tend to weaken as well as strengthen the effectiveness of the existing functional mix, even though the net effect of the new mix is improved.¹

The problems created by this phenomenon are not insurmountable, however. Many of the answers are amenable to research. In other fields similar problems have been successfully met; for instance, in the field of communication there are several studies which have made comparisons between the effectiveness of aural and visual

¹Whereas the major concern in this study is with choosing a distribution system optimally, John Magee points out that "the choice of a distribution system each company makes will have a significant impact on product design, plant investment, and organization." His thesis is that management therefore should consider alternative distribution patterns as a means of increasing efficiency. Even though additional costs are contracted in expanding one function, it is possible that the improvement of opportunities thus opened up may result in savings in the over-all task. The implications of his essay are that the systems approach and the functional approach must be integrated. John F. Magee, "The Logistics of Distribution," Harvard Business Review, XXXVIII, No. 4 (July-August, 1960), 89.

presentations in isolation and the same message transmitted by both media.¹

Economists have pointed out that the most efficient use of resources (factors of production) occurs when the net marginal return from each input equals exactly the net marginal return of every other input.² This concept may also be useful in identifying the optimum functional mix; maximum efficiency is reached in the determination of functional mix when the cost of expanding the market further is the same for each function, regardless of the function used to accomplish such expansion.

It becomes necessary, therefore, to identify not only the theoretical limit to which any one function can be exploited in

¹See Wilbur Schramm, The Process and Effect of Mass Communication (Urbana: The University of Illinois Press, 1955).

²Scitovsky explains this concept in terms of marginal rates of technical substitution between two factors. "We can say generally that the firm's cost of production is at a minimum when it so combines the factors of production that the market cost of the marginal input of every factor is the same, that is, when the firm's marginal cost is the same, whatever the way in which it varies output. In symbols the condition of minimum cost is expressed by the following chain of equations:

$$MC = p_x MI_x = p_y MI_y = \dots = p_z MI_z,$$

where MC is marginal cost and the letters x, y, . . . z stand for the different factors of production employed by the firm." Tibor Scitovsky, Welfare and Competition (Chicago: Richard D. Irwin, Inc., 1951), p. 125.

isolation, as was illustrated in Figure 5, but also to determine to what point each function can be expanded, when all the functions are used simultaneously in order to get optimum efficiency from the combination. If one can identify the point at which the marginal cost of the input of each function necessary to produce a given output is equal for all functions, one will have identified the point of optimum use for each function. Stated another way, optimum functional mix has been achieved when the correct expenditure on each function produces equal marginal outputs.

H. R. Wellman is credited with having developed one method of determining the point at which functional expenditures must be so distributed as to equalize net marginal returns.¹ The principle is illustrated in Figure 6. The curves labeled PU, TU, C, and PV represent the relationship between expenditures for the creation of place utility, time utility, communications, and product variations, respectively, and the value of increased sales which the employment of each function will generate. The slope of each curve at any point measures the marginal returns at that point. When a total given expenditure is to be optimally allocated among the four functions

¹H. R. Wellman, "The Distribution of Selling Effort among Geographic Areas," The Journal of Marketing, III, No. 3 (January, 1939).

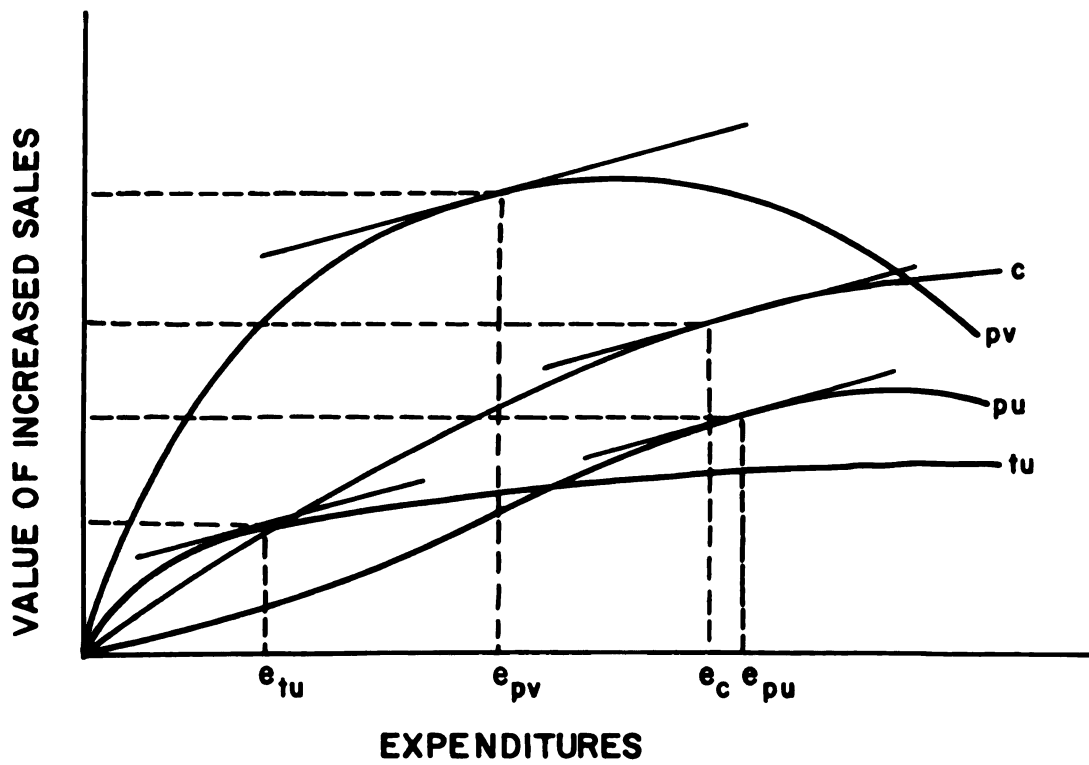


Figure 6. Graphic determination of equal marginal outputs.

illustrated by these curves, the expenditures will be as illustrated at points e_{tu} , e_{pu} , e_c , and e_{pv} , because at these points the marginal returns are equal for each function. To take a dollar expenditure away from any function under these conditions and add it to any other function would result in a net decrease in sales because the decrease in sales resulting from the subtraction will be greater than the increase in sales resulting from the addition. An examination of the curves at the tangent points shows this to be true because in each curve a lower expenditure results in reaching a position on the curve which is steeper (showing greater marginal returns) and a greater expenditure results in reaching a less steep slope (indicating less marginal returns).¹

The above analysis suggests two additional questions: What determines the steepness of the slope which is to be used in optimizing functional allocation? How can the shape and position of the "sales" or "returns" curve be determined?

In the case of the former, the steepness of the tangency line by which optimal allocation is to be judged depends upon two limiting

¹ Presented by Frederick I. Waugh in his paper "Needed Research on the Effectiveness of Farm Products Promotion," which provided valuable assistance in developing this concept. Reprinted in Advancing Marketing Efficiency (Chicago: American Marketing Association, 1959), p. 201.

conditions. In the first place, marketing functions will succeed in generating more sales only as long as expenditures for their performance are more effective than a price reduction of a similar amount. This point which relates the effectiveness of marketing activity to the price elasticity of demand is covered more fully in Chapter VII. The second limiting condition is the extent to which total functional expenditures can be covered by the savings accruing from the resultant economies of scale. This limitation is described by Figure 5.

The second question regarding the shape and position of the sales curve requires further investigation. One source of data from which such curves could be constructed can be found in historical data which if properly isolated could show the net effect of various functional expenditures on sales.¹ A second method is the accumulation of data through experiment and research. By using various functional mixes under experimental conditions in controlled sample markets, it should be possible to accumulate sufficient information to plot reasonably reliable sensitivity curves. A third method

¹For recent developments of this idea applied to a limited functional segment, see "Measuring Ad Effectiveness," Printers Ink, September 26, 1958; "A Profit Yardstick for Advertising," Business Week, November 2, 1958.

consists of the use of statistical techniques to apply to secondary data which are already available in published form. As an example of this technique, a simple model is developed to show how the demand for a hypothetical product might be expanded through the application of the function of creating place utility.

A Model—Demand Expansion by
Creating Place Utility

Assume the existence of product "A," a differentiated product with universal appeal. The volume of sales attainable without the performance of the transportation function is 1,000 units per year. A price of \$10.00 will cover costs at the rate of 1,000 per year, which includes sufficient profit to induce the making of the offer. The shipping weight of product "A" is ten pounds.

Assume that there exists an incipient demand beyond the present market of such a nature that one of every thousand people in the United States will purchase product "A" at a price of \$10.00 postpaid, if and when offered.

The problem now becomes that of showing the relationship of effective demand to expenditures for providing transportation. Currently there is a demand of 1,000 per year with no expenditure for transportation. This can be expanded to 2,000 per year by the

expenditure of whatever sum is required to send 1,000 units out into the area occupied by the second million population. The demand can again be expanded to 3,000 per year by adding to the previous expenditure the amount required to mail 1,000 packages into the area occupied by the third million population. This may continue until the offer has been made to the entire population, and an average cost per unit can be computed for each sales volume level.

It is necessary to know the cost of mailing a unit of product "A" to each of the postal zones into which the total population is divided. This is shown in Table 10 (columns 1 and 5).

It is also necessary to know the size of the population which can be reached in each zone from a given shipping point. Columns 1 and 2 of Table 10 contain this information. From these data one can plot a marginal cost curve for this function. Such a curve is shown in Figure 7. It may be substituted for curve "A" in Figure 5, and shows one method of determining the curve from empirical evidence.

In Table 10 the cumulative effect of expanding expenditures on total demand under the stated assumptions is also computed. The results of these computations are shown in columns 3 and 7. Inasmuch as the expenditure by the producer of the amounts necessary to provide transportation is the only condition necessary to expand sales

TABLE 10

**DISTRIBUTION OF UNITED STATES POPULATION BY POSTAL
ZONES FROM DETROIT, AND PARCEL POST COST DATA**

Column ^a						
1	2	3	4	5	6	7
Local	2,085	2,085	2,085	40	834	834
1 & 2 Minus Local	8,707	10,792	10,792	73	6,356	7,190
3	23,405	34,197	34,197	83	19,426	26,616
4	65,241	99,438	99,438	98	63,936	90,552
5	25,786	125,224	125,224	125	32,232	122,784
6	9,866	135,090	135,090	155	15,292	138,076
7	10,118	145,208	145,208	186	18,819	156,895
8	5,494	150,702	150,702	216	11,867	168,762

^aKey to columns: 1 = Zones; 2 = Population in Thousands; 3 = Cumulative Population in Thousands; 4 = Cumulative Unit Sales (based on assumption of demand at one unit per thousand population); 5 = Parcel Post Rates for 10-lb. Package in Cents; 6 = Expenditures in Dollars; 7 = Cumulative Expenditures in Dollars.

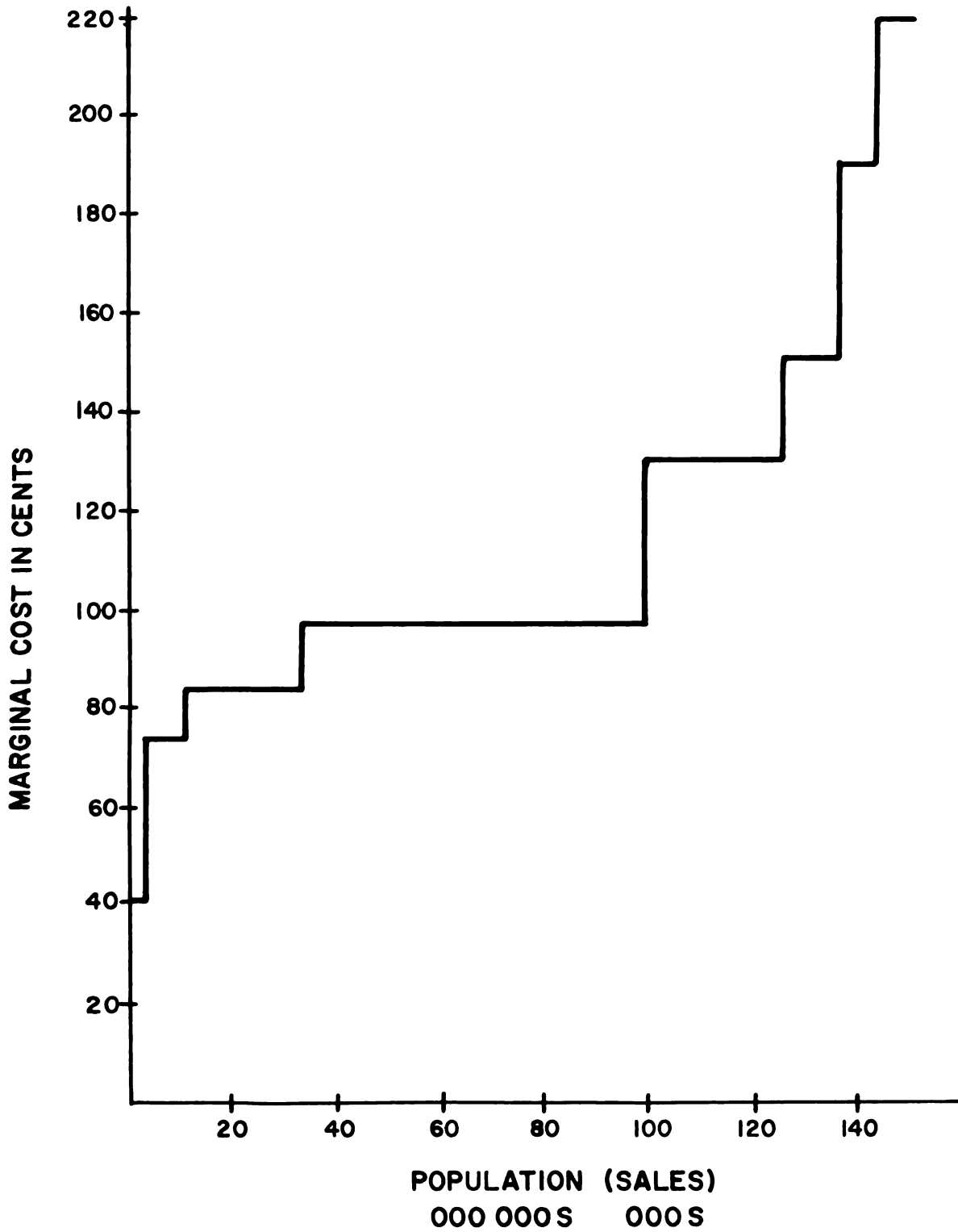


Figure 7. Graphic relationship of parcel post rates to population.

on the basis of the stated assumptions, the data appearing in the cumulative columns of Table 10 are measures of the sensitivity of demand to the performance of the function of creating place utility. These data then can be converted into the appropriate curve, which is labeled PU in Figure 6. The actual shape and position of the curve derived from Table 10 is shown in Figure 8.

This completes the example of how empirical data can be used to plot the curves necessary to determine (1) the point of perfect efficiency in the use of a given function in isolation as shown in Figure 4, and (2) the proportion of each function which is required to provide optimum functional mix as shown in Figure 6.

Relationship of Parcel Post Rates to Demand

It was pointed out earlier in this study that some of the optimization techniques suggested for the determination of the mixes of the four basic functions can also be applied to microstudies in segmented areas of each function. For instance, the above transportation study applies only to a firm located in Detroit. The investigation is extended to three other cities for comparative

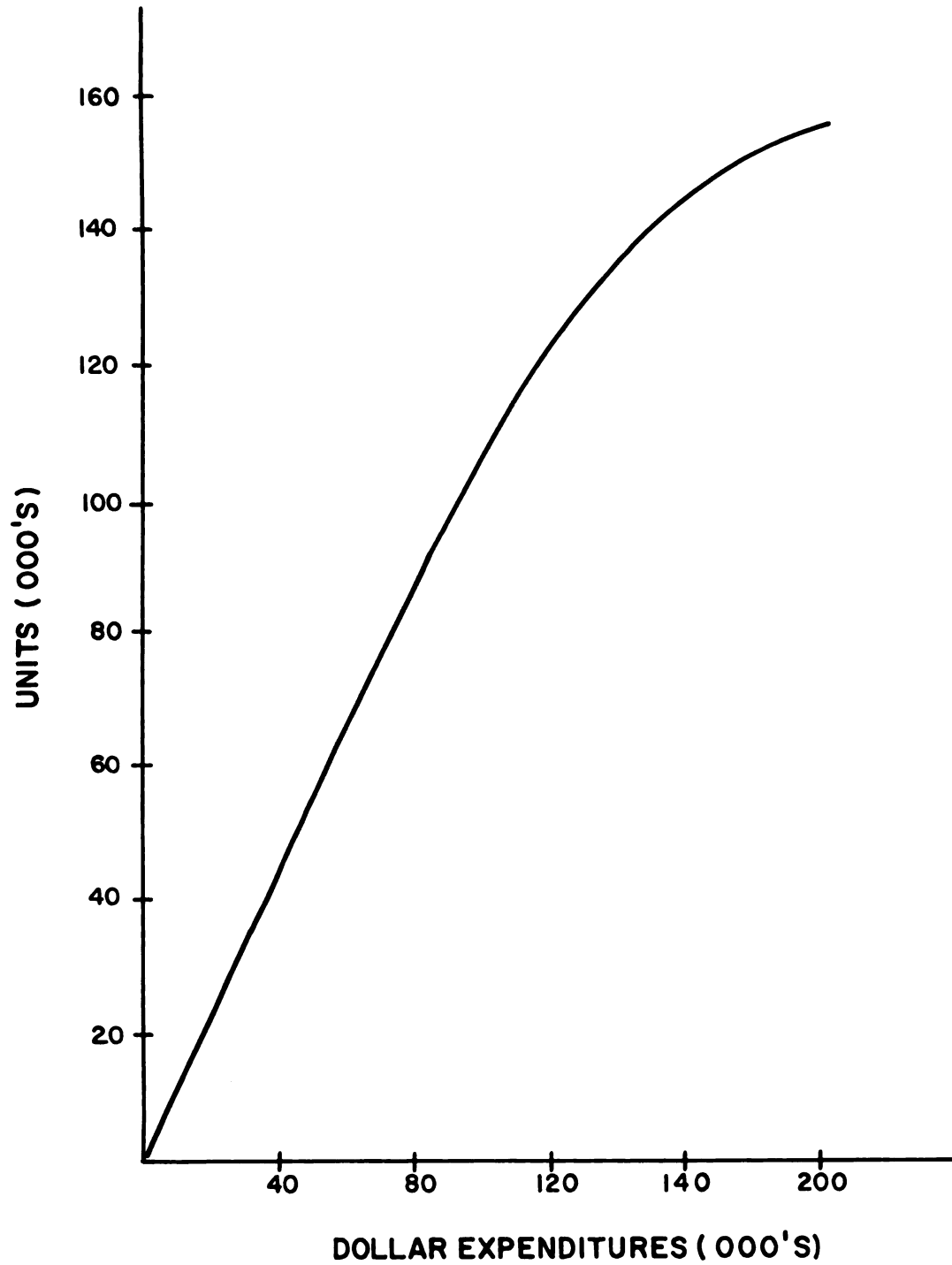


Figure 8. Graphic relationship of total parcel post expenditures required to reach various population totals.

purposes. Results of these investigations are presented in Tables 11-13.¹

¹The preparation of Tables 10-15 and Figures 7-8 began as a routine presentation on the assumption that at least four post offices would be able to furnish population figures based on the eight postal zones centered to their own offices. After considerable correspondence and several telephone conversations it became apparent that none of the local post offices had undertaken such a determination, and furthermore that even the Post Office Department in Washington, D.C., was unable to furnish an approximation of the relevant data for any shipping point. The data necessary for purposes of comparison did not require a high degree of accuracy to be useful. Therefore, independent calculations were made of the populations residing in each of the eight postal zones for the cities of New York, Detroit, Chicago, and Denver. The findings are only incidentally useful in the development of this thesis, but they were so obviously important to future development of some of the concepts presented in this study that a statement on the methodology used, the original map, and a statement of the limitations of the findings are presented as an appendix to this thesis.

TABLE 11

**DISTRIBUTION OF UNITED STATES POPULATION BY POSTAL
ZONES FROM DENVER, AND PARCEL POST COST DATA**

Column ^a						
1	2	3	4	5	6	7
Local	795	795	795	40	318	318
1 & 2 Minus Local	511	1,306	1,306	73	373	691
3	1,450	2,756	2,756	83	1,203	1,894
4	14,976	17,732	17,732	98	14,676	16,570
5	53,028	70,760	70,760	125	66,285	82,855
6	50,207	120,967	120,967	155	77,820	160,675
7	29,701	150,668	150,668	186	55,243	215,918
8	91	150,759	150,759	216	196	216,114

^aKey to columns: 1 = Zones; 2 = Population in Thousands; 3 = Cumulative Population in Thousands; 4 = Cumulative Unit Sales (based on assumption of demand at one unit per thousand population); 5 = Parcel Post Rates for 10-lb. Package in Cents; 6 = Expenditures in Dollars; 7 = Cumulative Expenditures in Dollars.

TABLE 12

**DISTRIBUTION OF UNITED STATES POPULATION BY POSTAL
ZONES FROM NEW YORK, AND PARCEL POST COST DATA**

Column ^a						
1	2	3	4	5	6	7
Local	3,454	3,454	3,454	40	1,381	1,381
1 & 2 Minus Local	21,483	24,937	24,937	73	15,682	17,063
3	16,977	41,914	41,914	83	14,090	31,153
4	27,573	69,487	69,487	98	27,021	58,174
5	37,153	106,640	106,640	125	46,441	104,615
6	22,133	128,773	128,773	155	34,306	138,921
7	5,061	133,834	133,834	186	9,413	148,334
8	16,866	150,700	150,700	216	36,430	184,764

^aKey to columns: 1 = Zones; 2 = Population in Thousands; 3 = Cumulative Population in Thousands; 4 = Cumulative Unit Sales (based on assumption of demand at one unit per thousand population); 5 = Parcel Post Rates for 10-lb. Package in Cents; 6 = Expenditures in Dollars; 7 = Cumulative Expenditures in Dollars.

TABLE 13

**DISTRIBUTION OF UNITED STATES POPULATION BY POSTAL
ZONES FROM CHICAGO, AND PARCEL POST COST DATA**

Column ^a						
1	2	3	4	5	6	7
Local	4,060	4,060	4,060	40	1,624	1,624
1 & 2 Minus Local	8,151	12,211	12,211	73	5,950	7,574
3	19,664	31,875	31,875	83	16,321	23,895
4	44,450	76,325	76,325	98	43,561	67,456
5	54,687	131,012	131,012	125	68,358	135,814
6	6,188	137,200	137,200	155	9,591	145,405
7	13,494	150,694	150,694	186	25,098	169,503
8	none	150,694	150,694	216	none	169,503

^aKey to columns: 1 = Zones; 2 = Population in Thousands; 3 = Cumulative Population in Thousands; 4 = Cumulative Unit Sales (based on assumption of demand at one unit per thousand population); 5 = Parcel Post Rates for 10-lb. Package in Cents; 6 = Expenditures in Dollars; 7 = Cumulative Expenditures in Dollars.

CHAPTER VII

THE USE OF ECONOMIC ANALYSIS TO DETERMINE OPTIMUM MARKETING MIX

Economic science is but the working of common sense aided by appliances of organized analysis and general reasoning, which facilitate the task of collecting, arranging, and drawing inferences from particular facts. Though its scope is always limited, though its work without the aid of common sense is vain, yet it enables common sense to go further in difficult problems than would otherwise be possible.

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The study of theory must go hand in hand with that of facts: and for dealing with most modern problems it is modern facts that are of the greatest use. For the economic records of the distant past are in some respects slight and untrustworthy; and the economic conditions of early times are wholly unlike those of the modern age of free enterprise. . . .¹

The identification of a discrete set of marketing functions which must be performed in the marketing of a good, and the relative expenditure which is justified for the performance of each function, is a prerequisite to the determination of optimum marketing mix. The usefulness of economic analysis in the performance of this task is explored in this chapter.

¹ Alfred Marshall, Principles of Economics (8th ed.; London: Macmillan and Co., Ltd., 1946), pp. 38-39.

Economic analysis is both a tool-making and tool-using discipline. Economic knowledge has made possible the design and formation of many useful concepts which can be used as tools to explain and predict the actions of a profit-maximizing organism. Using these analytical tools, considerable progress has been made in explaining the actions of a firm in a purely competitive environment as well as in a monopolistic environment. It has become apparent that the large area between pure competition and pure monopoly also required the attention of the economic analyst, and as a result of this awareness the concept of "imperfect competition" was developed by Joan Robinson,¹ and "monopolistic competition" by Chamberlin.²

Each advancement in the development and application of the tools of economics analysis seems to have emerged as a response to real world conditions which could not be adequately explained by existing techniques. Primarily, each development proceeded from the abandonment of previously held assumptions, and as each of these assumptions was relaxed to permit a nearer parallelism to

¹Joan Robinson, The Economics of Imperfect Competition (London: Macmillan and Co., 1933).

²Edward H. Chamberlin, The Theory of Monopolistic Competition (5th ed.; Cambridge: Harvard University Press, 1947).

real world activities the economist was called upon to develop more sophisticated analytical tools and to learn to use the tools for the solution of more realistic problems.

It is more than coincidental that both the businessman's interest in distribution problems and distribution cost analysis and the economist's interest in the theory of the firm under imperfectly competitive conditions reached high levels during periods when society's interest in marketing was particularly keen. The last such period was the decade of the thirties. It was during these years that important contributions to the field of business knowledge in marketing were made by the cost accounting research of Longman¹ and the distribution cost studies of Sevin,² and in the fields of economics by Robinson³ and Chamberlin.⁴

¹D. R. Longman, Distribution Cost Analysis (New York and London: Harper and Bros., 1941).

²C. H. Sevin, Distribution Cost Analysis, U.S. Dept. of Commerce, Economic Series, No. 50 (Washington: Government Printing Office, 1946); U.S., Dept. of Commerce, How Manufacturers Reduce Their Distribution Costs, Economic Series, No. 72 (Washington: Government Printing Office, 1948).

³Joan Robinson, The Economics of Imperfect Competition (London: Macmillan and Co., 1933).

⁴Edward H. Chamberlin, The Theory of Monopolistic Competition (5th ed.; Cambridge: Harvard University Press, 1947).

World War II and the pent-up demand resultant from it took the spotlight in the forties, and the fifties were characterized by the preoccupation with more general problems of inflation, economic growth, and adjustments to the atomic age.

It is possible that the decade of the sixties may witness a resurgence of the attention of business leaders and economists to the role of the marketer. If marketing theory is an extension, in a concentrated area, of economic theory, then a re-evaluation of economic analysis and its potential use for solving marketing problems is in order.

One of the first things to become evident to the student when he attempts to apply economic theory to market problems is the fact that the concept of "production" is quite different to the economist than to the marketer or businessman. The Marshallian concept of production, which has not been disavowed by his successors, is an extremely broad one and includes the creation of form utility, place utility, time utility, and other means which a producer might use to expand satisfactions. In a footnote in his chapter on "Equilibrium of Normal Demand and Supply," Marshall says:

We have already . . . noticed that the economic use of the term "production" includes the production of new utilities by moving a thing from a place in which it is less wanted to a place in

which it is more wanted, or by helping consumers to satisfy their needs.¹

Economists have traditionally called the creation of the power to satisfy a want "production." Under this definition the creation of form utility, place utility, and time utility are all considered "production," and production costs therefore are all the costs incurred in the creation of these utilities. Businessmen and particularly marketers, on the other hand, have limited the meaning of production to the creation of form utility and treated the creation of time and place utility as marketing.

The position in which economists included transportation and storage as part of production was tenable when the latent demand for goods was sufficient to call into active employment a large enough portion of the factors of production to suit society's needs. As demand stimulation became an increasingly important activity in economic growth, some recognition was given to "supplementary" activities such as advertising by some economists, but even then in a context outside of the realm of production, even though advertising has important abilities to satisfy wants. Thus an inconsistency stems from a reluctance to make a clean break between the creation

¹ Alfred Marshall, Principles of Economics (8th ed.; London: Macmillan and Co., 1946), p. 340.

of form utility and the creation of all other utilities of time, place, and exchange.

Chamberlin¹ seems to sense the usefulness of a clear distinction between selling costs and production costs for further development of marketing analysis. He correctly defines selling costs as "costs incurred in order to alter the position or shape of the demand curve for a product." He then proceeds to demonstrate how advertising is typical of selling expenditures under this definition. Obviously this is true. But he is led astray by his predecessors when he includes transportation and storage as functions of production only. The rationale that these functions are properly classified as production because they add utilities to goods which permit them to be more capable of satisfying wants is not convincing because consumers also increase their satisfactions through the creation of exchange utility, but this is never included as a function of production. Furthermore, it is readily demonstrated that both transportation and storage functions can and do readily

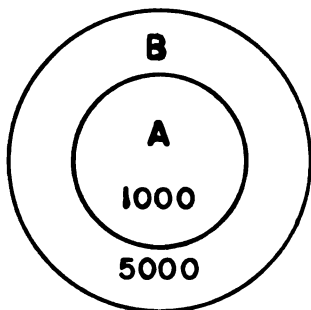
¹In his Theory of Monopolistic Competition, Chamberlin devotes Chapter VI to the problem of making a clear-cut distinction between selling costs and production costs.

affect demand.¹ To use the term "production" to indicate all activity which increases the capability of goods to satisfy wants would broaden its meaning to the point where it would be synonymous with all economic activity; i.e., the creation and distribution of satisfactions from scarce resources.

Professor Chamberlin does an admirable job of explaining the reasons for differences of opinion regarding the distinction between production costs and selling costs:

Of course it is recognized that wants may change, and that this involves a change in the demand curves; but the problem of dealing theoretically with expenditures which make them change seems never even to have been conceived of, let alone

¹ Assume that area A contains one thousand people with a demand of such a nature that one person out of every hundred will travel to the producer's location (in the center of area A) in order to purchase product X for a given price per unit. Further assume that area B contains a population of five thousand whose consumption characteristics are identical to those living in area A. If the producer can move his product so that it will be as available to the consumers in area B as it now is in area A without altering his price, he will have increased the quantity demanded at the given price from ten to fifty. This clearly is an example of using the creation of place utility to shift the demand curve to the right. Similarly, the producer who can offer strawberries at a given price during all of the months of the year will find that the number of units demanded per year will be considerably higher than the amount demanded per year at the same price if delivery is limited to July and August. This would indicate that the provision of time utility by the marketer also shifts the demand curve to the right.



answered. (See comments in following paragraph.) The explanation lies partly in the failure to synthesize monopolistic and competitive theory. Selling costs are very naturally passed over in competitive theory, since they are at odds with the assumption of pure competition; they seem, likewise, to have no place in monopolistic theory, since there is apparently no one upon whom the monopolist, in possession of the entire market could encroach. The explanation lies also in the fact that economic theory has not yet adapted itself to changes which have taken place in recent years. The tremendous possibilities of making profits by demand creation have been more and more appreciated, technical methods of exploiting them have been perfected, and selling has come to the fore as a business activity coordinate with production. Indeed, the typical business man of today is probably more concerned with the former than with the latter. Meanwhile theoretical economics continues to regard him as a producer only, and as enjoying a demand which is already there and which has cost nothing. The theory of pure competition tacitly assumes that all costs are incurred in order to increase the supply of goods and that these goods are sold with neither effort nor expense. It is by neglecting selling costs that it most obviously falls short of explaining the facts of economic life.¹

In a footnote Professor Chamberlin demonstrates rather conclusively that there is a lack of agreement among economists regarding how selling costs should be treated in economic analysis:

Selling costs are distinguished from production costs by Dibblee (op.cit.) and the importance of the distinction insisted upon. Professor Knight refers to them, only to conclude that they are no different from other costs. "In so far as they (changes in wants) result from a deliberate expenditure of resources, they become as all other economic operations. . . . In fact, as we have previously observed, the advertising, puffing, or salesmanship necessary to create a demand for a commodity

¹ Edward H. Chamberlin, The Theory of Monopolistic Competition (5th ed.; Cambridge: Harvard University Press, 1947), p. 126.

is casually indistinguishable from a utility inherent in the commodity itself." (Risk, Uncertainty and Profit, p. 339.) Marshall, in his treatment of large-scale production, remarks that in the case of specialties "the sales of each business are limited, more or less according to circumstances, to the particular market which it has slowly and expensively acquired; and though the production itself might be economically increased very fast, the sale could not." (Principles, 8th ed., p. 287. Italics mine.) But for him also, "cost of production" embraces all the business man's outlays. Daveport (Economics of Enterprise, pp. 133ff.), defining production, competitively viewed, as mere acquisition, includes advertising, along with all other outlays which bring a gain, as productive. Cf. also Ely, Outlines, 5th revised ed., p. 113. Among writers on business economics, A. W. Shaw (An Approach to Business Problems, Chapter XV) has illustrated an increase in demand on account of advertising by moving the demand schedule to the right: but it is the demand schedule for a general class of product which is moved, and he at once encounters difficulties because the effect on the merchant who advertises cannot be shown in the general diagram, and because of the different prices at which the differentiated product sells. No attempt is made to deal with the costs of moving the curve.

In contrast to this definition of production, the student of marketing has viewed "production" to be limited to the creation of form utility. A commonly accepted definition of marketing may be stated as follows:

. . . marketing covers all business activities necessary to effect transfers in the ownership of goods and to provide for their physical distribution. It embraces the entire group of services and functions performed in the distribution of merchandise from producer to consumer, excluding only those operations relating to changes in the form of goods normally regarded as processing or manufacturing operations.¹

¹Theodore Beckman and others, Principles of Marketing (New York: The Ronald Press Co., 1957), p. 4.

The marketing student who wishes to use the tools of economic analysis in his research is forced to choose one of three possible courses of action in order to cope with this conflict over definition. He may choose to accept the Marshallian definition of production, in which case the cost curves he uses must include marketing costs. The various contributions of marketing to productive effort would then be viewed as factors of production and could only be analyzed by an analysis of all the factors of production. Secondly, he may choose to interpret the Marshallian definition to include only some of the marketing costs, in which case he is free to treat such marketing activities as advertising as being outside of the definition, while including transportation and storage within it. This is what Chamberlin and others have done in their writings on monopolistic competition. Graphically, this permits the portrayal of a new curve in the analytical model to portray the additional costs of advertising as a separate calculation, or a brief note regarding advertising being adequately recognized by simply reducing revenue by the cost of the advertising as Joan Robinson does:

It may be assumed that expenditure on advertisement necessary to increase the sales of a firm can be treated as equivalent,

from the point of view of the entrepreneur, to a reduction in price having the same effect upon sales.¹

The third alternative is to differentiate clearly between marketing and production functions and to redefine production in this light.²

In spite of Mrs. Robinson's caveat that marketing expenses may take the form of changes in quality, the advantages of treating

¹Joan Robinson, The Economics of Imperfect Competition (London: Macmillan and Co., 1933), p. 21.

²This suggestion was also recognized as an interesting alternative by Mrs. Robinson: "The existence of competition which takes the form of providing facilities to the customer, of improving the quality of goods, of advertisement, or any other form than a simple lowering of price, is awkward from the point of view of theoretical analysis for two reasons. In the first place, it very much enhances the difficulty of deciding what precisely we mean by a commodity. Even if all the more obvious difficulties are disposed of, and we are able to decide exactly what we mean by a motor car or a tin of cocoa, the fact remains that, from the point of view of a particular customer, a tin of cocoa sold by Jones is not necessarily the same thing as a tin of cocoa sold by Brown, and if they are not the same it is impossible to sum the demand curve for Brown's cocoa and Jones' cocoa so as to obtain the demand curve for cocoa as such. A second and even more perplexing difficulty arises because all forms of competition except a mere lowering of price involve a change in the costs of production. The demand curve for the product of the individual firm depends partly on the outlay made by the firm in order to attract customers. This difficulty would be less intractable if the outlay could be treated as sales cost entirely separate from the costs of manufacture, but actually it often takes the form of changes in the quality of goods and is intimately bound up with the ordinary expenses of production. The fact that in the real world the demand curve and the cost curve of individual firms are not independent presents a very formidable problem to economic analysis, and no attempt is made to solve it here." Joan Robinson, The Economics of Imperfect Competition (London: Macmillan and Co., 1933), p. 90.

sales costs separately from producer's costs outweigh the risks involved in this separation.

There are a number of reasons in support of choosing the third alternative for this study. In the first place, the narrow definition of 'production' is consistent with the general usage of the word by businessmen, most marketing students, and perhaps some economists. Secondly, the entire concept of the extent of the market is dependent upon the degree to which firms include or exclude transportation costs and other marketing costs in their prices, and the problems of comparing firms who sell F.O.B. plant with firms who sell F.O.B. destination become unduly complex. Thirdly, the firms which perform all the activities included in these two functions are seldom one. So long as making things and selling things are often performed by different firms in the real world, the retention of tools of economic analysis which require their treatment to be viewed as one operation will hamper further research. Furthermore, a separation of business activities into production and marketing permits the logical assignment of advertising to marketing instead of treating it as a nondescript supplementary activity. Marketing activities may logically be viewed as creating an expansion of demand in contrast to the creation of form utility which presupposes a latent demand. The first departure from traditional economic terminology will

therefore be to redefine production as the creation of form utility—an activity which ceases at the producer's factory gate.

The term "marketing" requires further definition for purposes of economic analysis, in spite of the extensive treatment given in Chapter I.¹ For the purpose of this analysis, marketing is defined as the performance of the following functions:

1. The creation of exchange utility:

- a. By an offer.
- b. By an acceptance.

2. The expansion of demand:

- a. By creating place utility.
- b. By creating time utility.
- c. By communication.
- d. By product variation.

The differentiation of production and marketing functions will permit a differentiation of costs involved in performing these functions. Whereas most students of economic analysis have treated advertising and other marketing costs as costs which should be added to the usual production costs, in this study their separation is assured by viewing marketing costs as those which are optional

¹See page 5.

to the producer. When the producer chooses to permit others to perform the marketing functions for him, the marketing costs can be viewed as subtractions from the consumers' price rather than additions to the cost of production.¹ Marketing costs will therefore be treated in a manner consistent with this concept, in the present analysis.

A second modification from generally accepted concepts for economic analysis is the interpretation used regarding profit maximization. Growth may be a more important short-run objective than profit maximization, and growth also may be the most dependable method of achieving long-run profit maximization.

In the first place, a large firm appears to be a more formidable competitor than a small firm, and because of its power of retaliation probably its size is a deterrent to the entry of new competitors. Certainly there will be considerably less hesitancy for an entrepreneur to enter a field of business in which there are many small firms than to enter a business dominated by large firms. To the extent that competition is thus discouraged, freedom of pricing is retained and expanded by the large firm.

¹In practice this may result in a producer publishing his price schedule in the form of list prices and thus determining his own price F.O.B. factory by subtracting the estimated marketing costs for different channels of distribution in the form of discounts.

Secondly, the concept of social responsibility and good public relations makes it more desirable from the firm's standpoint to generate a given volume of profits from a large volume of business rather than from a smaller volume. This results in strong pressures to expand volume rather than the margin.

Thirdly, the divorcement of ownership and management may have had an effect of transferring the primacy of profits to the primacy of size. Although managements often share in a firm's profits by way of bonuses based on profits, most managements stand to improve their own welfare by expanding the size of the enterprise under their direction. Modern corporations frequently are managed by a hierarchy of professional management experts whose stock ownership is negligible. Managements which have created reputations for their ability to induce growth situations—regardless of whether such growth comes from internal or from outside financing—are often highly regarded.

In the fourth place, managements, because of their insulation from both the benefits and the dangers of risk-taking, seem to be less interested in performing the historical role of the entrepreneur. A great deal of comfort and reduced pressures accrue to the management which operates under a philosophy of "reasonable profits," "adequate capacity," "secure market position," et cetera. The

rewards for running a taut ship are less attractive to the professional manager than they were to the traditional profit maximizing entrepreneur.

The factors of production usually are not infinitely divisible. This means that in practice a growing firm will periodically have a portion of its productive capacity idle. This is a condition which exists because the management feels that a normal rate of growth will automatically result in complete use of all factors in the planned future without a change in price. Therefore, the typical firm cannot operate under the theory of lowering prices and expanding production until marginal costs equal marginal revenue, and "overcapacity" is an unavoidable condition at periodic intervals in the life of a growing firm.

In this study it is not possible to use the Marshallian average cost curve because production has been redefined and therefore the costs of production as used in this analysis are comprised of different elements than those traditionally included. Because of this change, a modified long-run average cost curve which is a synthesis of (1) marginal cost curves and (2) an average cost curve of "pure" production costs is used. It will be an approximation of the quantity and price relationships which exist for a given firm's products at the factory gate and therefore is called the production supply

curve (PS). It is similar to a planning curve. It may be referred to as a long-run average cost curve on the assumption that in the long run all costs become variable, whereas there are always some fixed costs in the short run.¹

The characteristics of the production supply curve are based on the assumption that one can identify the loci of prices and quantities at which a firm would be willing to sell its production at its factory gate. These prices therefore represent its estimated average production costs, including what the firm believes is a satisfactory profit before engaging in any of the demand-stimulation activities of marketing.

Chamberlin² makes it clear that his concept of cost includes whatever return on investment or entrepreneurial rewards are necessary to induce the firm to offer the amount of goods covered by such costs. This is consistent with the concept of producer's costs. Producer's costs are defined as being all those costs realized in creating form utility, and including whatever incentives are necessary to induce the firm to make its offer.

¹For a detailed analysis of the factors that determine the shape of the planning curve, see Stephen Enke, Intermediate Economic Theory (New York: Prentice-Hall, Inc., 1950), p. 277.

²Edward H. Chamberlin, The Theory of Monopolistic Competition (5th ed.; Cambridge: Harvard University Press, 1947), p. 126.

If a firm is willing to sell its production at the factory gate for a given price, this price must include a satisfactory profit.

The concept of a normal profit being an integral part of production costs is also advanced by Joan Robinson¹ and is defined as being that amount of profit which will be just sufficient to maintain the existing productive equipment. The magnitude of such a profit will depend upon the firm's estimate of how much it can safely earn without attracting competition. This judgment is left to each firm, as the production supply curve as conceived here is made up of and includes such judgments.

The production supply curve is crucial to this analysis because it reflects the extent to which a firm is subject to economies of scale and the achievement of economies of scale in production is an important justification for making marketing expenditures. The reason for this relationship is explained in simple terms as follows:

We are all consumers and producers but we rarely consume our own products. According to the principle of division of labour, men earn their incomes by producing a given type of product and spend them on the output of others. This principle has received extended application in the last two centuries and has occasioned remarkable increases in the standard of living. It provides the opportunity for the cultivation of particular skills. Most important, it facilitates the manufacture of machinery itself

¹Joan Robinson, The Economics of Imperfect Competition (London: Macmillan and Co., 1933), p. 93.

which would be impossible if everyone were compelled to live on his output. But, as Adam Smith said, the division of labour is limited by the extent of the market. (The Wealth of Nations, 1776, Bk. I, chap. iii, Title.) The use of machinery in production allows an increasingly large quantity of goods and services to be made at diminishing cost per unit. This is the basis of large-scale industry. Unless the larger quantities of goods can be marketed it will not be worth while to invest capital in machinery. Thus, it will not pay to introduce machine methods, unless the reduction in cost of production will be greater than the increased cost of reaching additional markets for the larger output.¹

Smith's dictum—"the division of labor is limited by the extent of the market"—was a natural observation to make when the economic processes were largely concentrated on production. This thesis demonstrates that in a marketing-oriented economy the converse is also true; namely, that the magnitude of the expenditure for marketing is limited by the advantage in costs of production accruing from economies of scale.

The production supply curve will have the same general shape and slope as the traditional average cost curve, which is U-shaped² and sloping downward from left to right in its early stages, remaining

¹Margaret Hall, Distributive Trading (London: Hutchinson's University Library), p. 16.

²Paul A. Samuelson, Economics (New York: McGraw-Hill, 1955), p. 445.

constant over a considerable range of production,¹ and finally rising as the laws of diminishing returns become effective.

Average costs are at first very high because the fixed costs of production must be allocated among a few units in the early stages of growth. When output is zero, average costs are infinite. Average costs decline rapidly in the early stages of increased production because each time production doubles the amount of fixed costs chargeable to each unit is halved. After fixed costs have been spread over many units, further expansion produces negligible cost reductions. Ultimately average costs must increase because of the operation of the law of diminishing returns: limitations of factory capacity, limitations of the span of effective management, and increasing costs of variables which ultimately must occur as the law of diminishing returns becomes effective.

In summary, this analysis departs from traditional economic analysis in three respects: (1) Production is defined as the creation of form utility, and all other functions performed in transferring goods from producer to consumer are included as marketing. (2) Efficiency is measured by the extent to which the firm progresses

¹George Stigler, "The Economies of Scale," Journal of Law and Economics (University of Chicago Law School, October, 1958), pp. 54-71.

toward the low point on its production supply curve. (3) The production supply curve used synthesizes the traditional average cost curve, the planning curve, and in fact is the locus of price-quantity relationships at which the firm sells any or all of its production at the factory gate.

The specific purpose of this economic analysis is to construct an economic model of a firm in which the marketing functions are performed with perfect efficiency. Perfect efficiency is reached when a point of equilibrium is established at which no increase or decrease in expenditures for performing each of the marketing functions will increase the firm's profits.¹ From such a model it is possible to identify the discrete set of functions which must be performed, and this in turn is a prerequisite in the determination of optimum marketing mix.

In addition to the innovations among the analytical tools to be used as outlined above, the model requires a number of generally recognized simplifying assumptions. It applies to a single firm

¹The judgment regarding the criteria which are to be met in "maximizing profits" is left to each firm. We avoid the argument about the various means of maximizing profits by including each firm's profit goals in their modified planning curve. Supra, p. 175.

which is producing a single differentiated product.¹ The price of the product is administered² and held constant. The product itself remains constant. (Product variation is itself a variable marketing function.) The model firm is operating in an intermediate area between pure competition and monopoly, often referred to as monopolistic competition or imperfect competition.

¹A general class of product is differentiated if any significant basis exists for distinguishing the goods (or services) of one seller from those of another. Such a basis may be real or fancied, as long as it is of any importance whatever to buyers, and leads to a preference for one variety of the product over another. Where such differentiation exists, even though it be slight, buyers will be paired with sellers, not by chance and at random (as under pure competition), but according to their preferences. Edward H. Chamberlin, The Theory of Monopolistic Competition (5th ed.; Cambridge: Harvard University Press, 1947), p. 56.

²In markets characterized by the term "judgment pricing," prices are set by the executive decisions of individuals or groups of individuals rather than by the automatic and impersonal interplay of the forces of supply and demand. In effect, in such markets the price is selected on the basis of the market situation and the marketing action that will be undertaken. The correctness of the judgment is then tested by the marketing success at that price. Because of the limits of power to force the selected price upon the market such markets are not properly designated as monopolistic; the degree of market control is limited by active and effective competitive forces which are present in the market, and prices are not set by agreements to act in concert. This type of market is neither strictly competitive nor strictly monopolistic; all competitive conditions are not present, but the degree of monopoly power is limited. This type of price-making has been characterized as "administered." Paul D. Converse, Elements of Marketing (6th ed.; Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1958), p. 82.

What will the equilibrium position of the firm be in the absence of all marketing effort? There is an existing demand for all economic goods because by definition economic goods have the characteristics of scarcity and the ability to create satisfactions. This demand may be stated as a schedule of the amounts of the good which will be demanded at each of a number of hypothetical prices. Such a schedule is called a "normal demand schedule."¹ The demand schedule may be illustrated graphically as a line consisting of the locus of price-quantity relationships as shown by curve DD in Figure 9.

The production supply curve described earlier² is a schedule of hypothetical prices at which various amounts of the product will be supplied at the producer's gate. The price-quantity relationship of this supply schedule may also be illustrated graphically and is shown as curve PS in Figure 9.

Under conditions of monopolistic competition, these two curves have at least one point of tangency, as is shown at point R in Figure 9 when in equilibrium. The reason for this is shown in Figure 10,

¹For a further description see Kenneth E. Boulding, Economic Analysis (3d ed.; New York: Harper and Brothers, 1955), chap. vii, p. 110.

²Supra, p. 175.

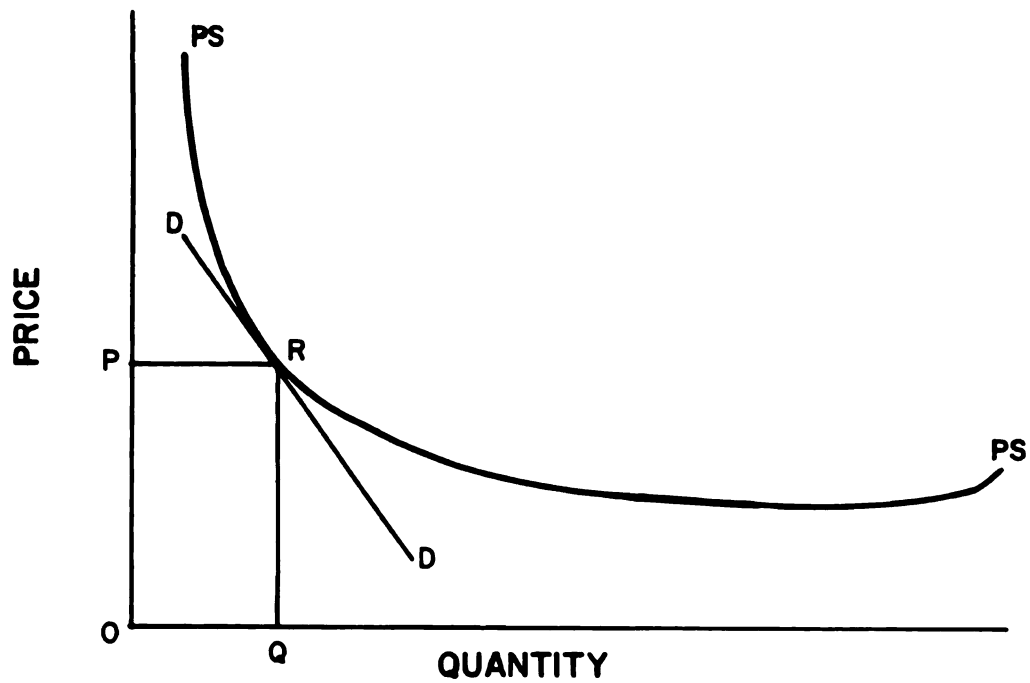


Figure 9. Production supply curve.

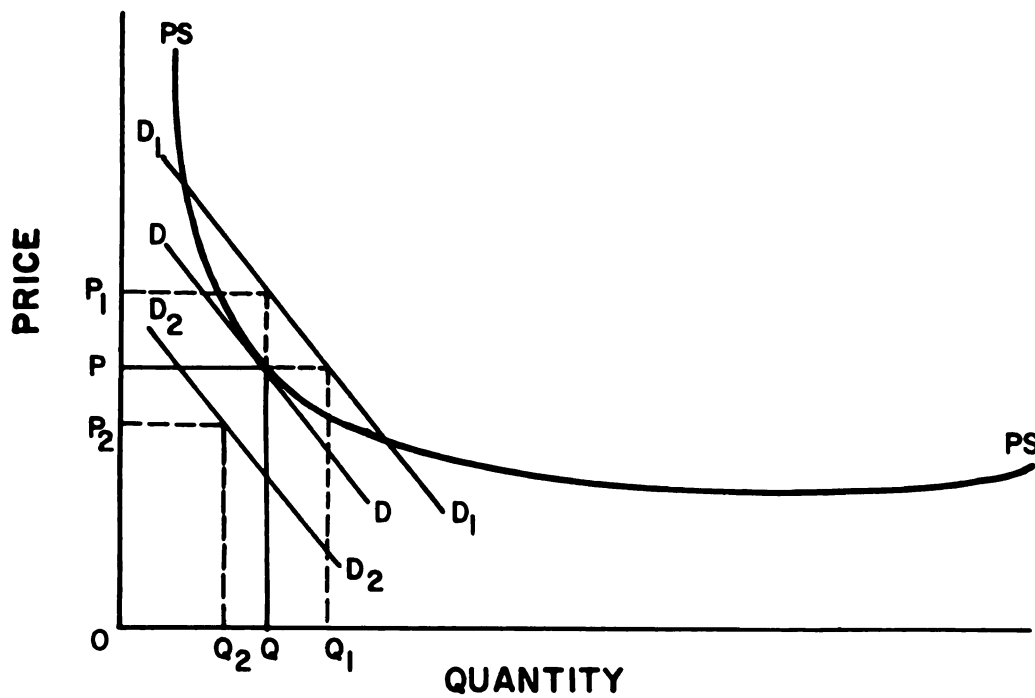


Figure 10. Equilibrium position before expenditures for marketing.

which shows the two possible conditions under which the demand curves and production supply curves are not tangent. If all points on the demand curve lie below the production supply curve as shown by D_2D_2 , the good will not be produced at all because the prices which could be obtained are below the prices at which the goods are offered under these conditions. If any points on the demand curve lie above the production supply curve, as shown by D_1D_1 , it indicates the possibility of excess profits either through the sale of more of the good at a given price or through a higher price for a given amount of goods (or a combination of these two). This condition would be unstable because the excess profits would attract the offering of substitutable products by competitors until the demand for this particular product returned to the DD position.

The demand curve D_1D_1 cannot lie above the production supply curve SS at all points because the nature of the curves requires that it intersect it at two places as is shown in Figure 10 and that it be below the supply curve at either extremity.¹

¹It lies below it to the left because, whereas the demand will characteristically become zero at a finite price, and a fairly low one on account of substitutes, the necessity of covering overhead or supplementary costs (including the minimum profit of the entrepreneur), no matter how small the production, defines the cost curve as meeting the y axis at infinity. DD' lies below PP' again to the right because the demand curve must fall gradually to

It now becomes clear that the tangency of the demand curve DD to the production supply curve PS at R limits the range of profitable prices to one price, namely OP, and also limits the range of profitable quantities to the single amount OQ, as shown in Figure 9. This, then, is the equilibrium position of the firm in the absence of marketing costs.

The prices indicated in the production supply curve include a "satisfactory" profit, and therefore the firm's total profit increases as quantity sold increases, moving along curve PS to the right. From the standpoint of the individual firm, therefore, maximum efficiency is achieved when the optimum volume of sales has been reached consistent with the projected supply curve.

Implicit in this definition of optimum efficiency are these considerations: (1) Total profit of the firm increases as sales volume increases because by definition PS includes a satisfactory per-unit profit. (2) Unit prices to the consumer remain constant. (3) Therefore, the input of resources per unit must be declining at all points

zero (granting that the good may conceivably become so abundant as to be a free good), whereas the cost curve can never fall to zero, but must turn upward again after the most efficient scale of production has been reached. Edward H. Chamberlin, The Theory of Monopolistic Competition (5th ed.; Cambridge: Harvard University Press, 1947), pp. 76-77.

along PS to its lowest point. The lowest point in this curve can only be reached under conditions of pure competition.¹ Therefore, the optimum for this firm, which by definition is not purely competitive (differentiated product, administered prices, et cetera) must be short of the low point in the PS curve.

There are two strategies available to each producer for reaching a larger volume of sales: (1) to lower prices, or (2) to shift the demand curve to the right. The relative effectiveness of lower prices in expanding sales depends upon the price elasticity of the product. The effectiveness of shifting the demand curve in turn depends upon the elasticity of demand for each product in terms of other than price—such as the creation of place utility, time utility,

¹A rigorous explanation may be found in Joan Robinson, The Economics of Imperfect Competition (London: Macmillan and Co., 1933), p. 114. The general content of the proof is based on this logic: The cost curve of any individual producer, whether confronted with pure or monopolistic competition, is always a U curve with the general characteristics shown by SS in Figure 11. The demand curve for the product of any individual seller in a purely competitive market is a horizontal line, while the demand curve for a differentiated product is necessarily sloping downward because the demand for the good of an individual producer in pure competition is infinitely elastic, while the demand for a differentiated good is always less than infinitely elastic. Therefore, the equilibrium price-quantity relationship will be as shown on Figure 11; i.e., OP-OQ for a differentiated product and OP₁-OQ₁ under conditions of pure competition. Obviously, a tangency between the low point on curve SS and a demand curve can never occur unless the demand curve be horizontal.

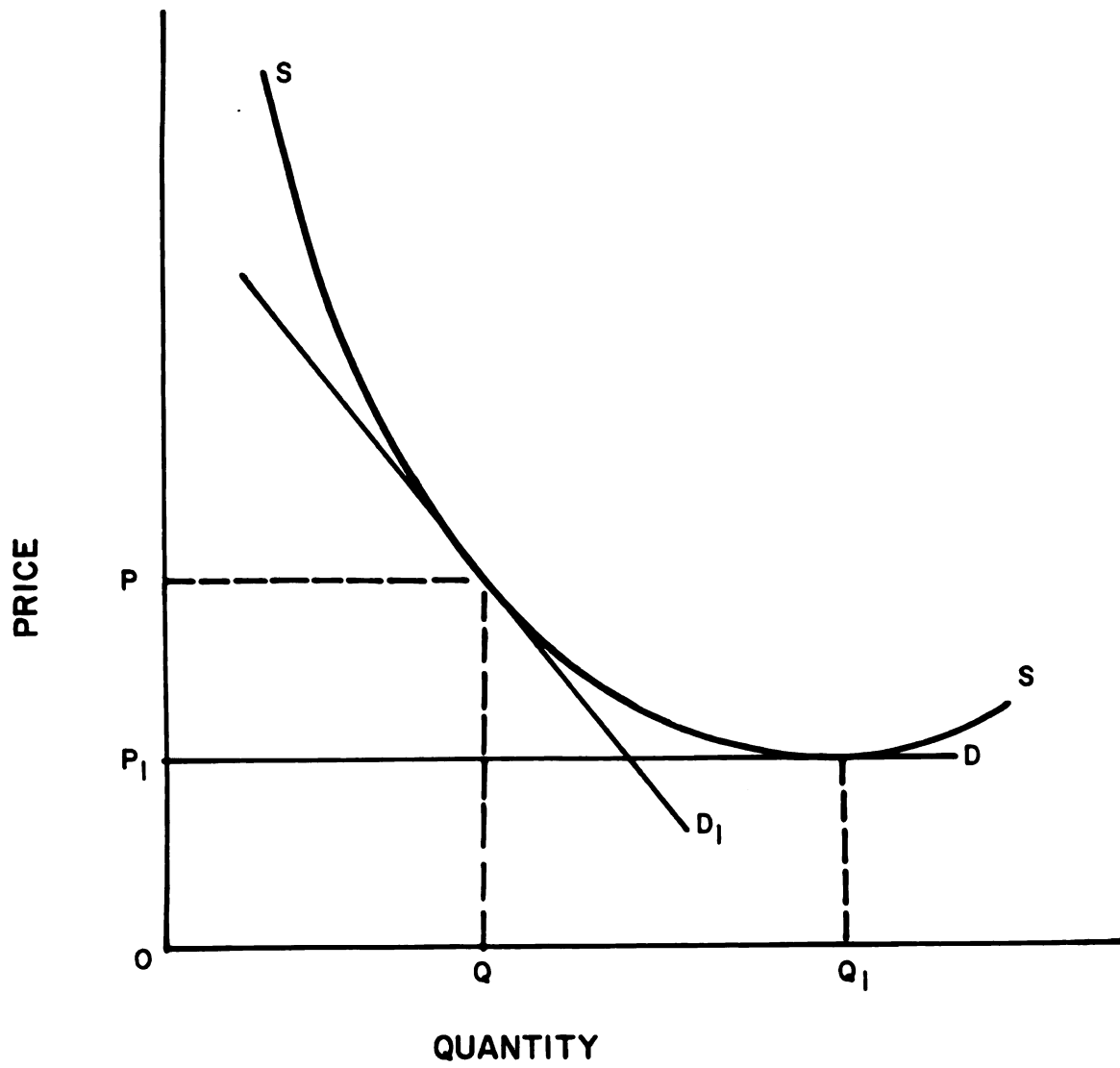


Figure 11. Equilibrium position under pure and monopolistic competition.

and satisfactions accruing from the use of communication techniques or product variations.

The equilibrium position, R on curve PS (Figure 12) shows that a price decrease increases the volume of sales, but only under the unsatisfactory conditions of selling at a price below that required in the production supply curve PS. To expand the volume of sales from OQ to OQ_1 the firm would have to lower price from OP to OP_1 , which is below the offering price as shown by the production supply curve at that point. This can therefore be eliminated as a desirable sales-increasing strategy under these present conditions.

Suppose that by making an expenditure for transportation it is possible to double the market area and the number of customers available. The effect of this market expansion is reflected in a shift of the demand curve to the right. A glance at Figure 12 will show that the new demand curve is represented by D_t and that the volume of sales is expanded from OQ to OQ_2 , a net addition to sales volume of QQ_2 . An amount equal to P_2XNP can be spent for transportation in achieving these increased sales. If less than this amount is spent to bring about the demand shift to D_t , the firm is not using the optimum amount of transportation because by increasing it the demand curve could be shifted still further until a point

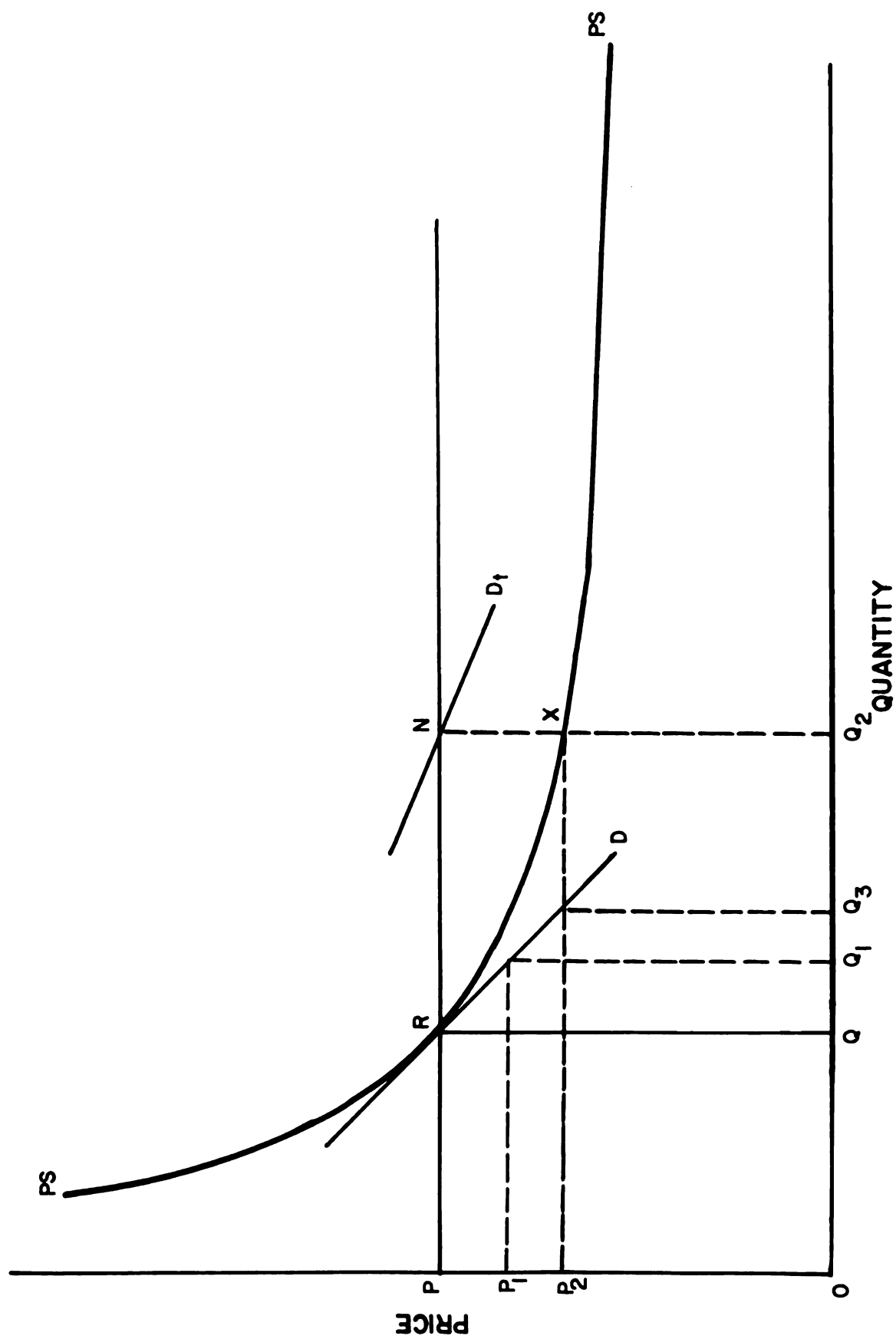


Figure 12. Effects of increasing demand by means of transportation.

is reached on PS where a line horizontally drawn from the revised position of P and a line vertically drawn from the revised position of Q_2 intersect at a point lying on SS. If an expenditure for transportation greater than P_2XNP is required to reach demand D_t , then the amount of transportation must be reduced to meet optimum volume because the consumer's price less the cost of transportation will fail to reach the predetermined factory selling price as shown on curve PS.

The expenditure of PP_2 per unit for transportation is more effective in expanding sales than a decrease in the price to consumers of this same amount. A consumer price of OP_2 based on demand curve D would result in OQ_3 sales, whereas a consumer price of OP and producer-absorbed transportation costs of P_2P will expand unit sales to OQ_2 , a net advantage to the producer of Q_3Q_2 sales.

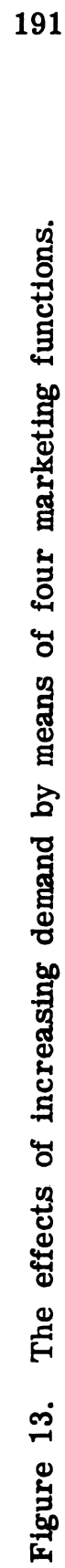
It may be argued that the above proof regarding the optimum use of transportation is useless because it is impossible to isolate a single marketing function from the other three functions which comprise total marketing activity. This argument loses its validity when it is realized that the performance of all the marketing functions is shared by the producer and the consumer, and so far only the producer's share of the performance of each function has been

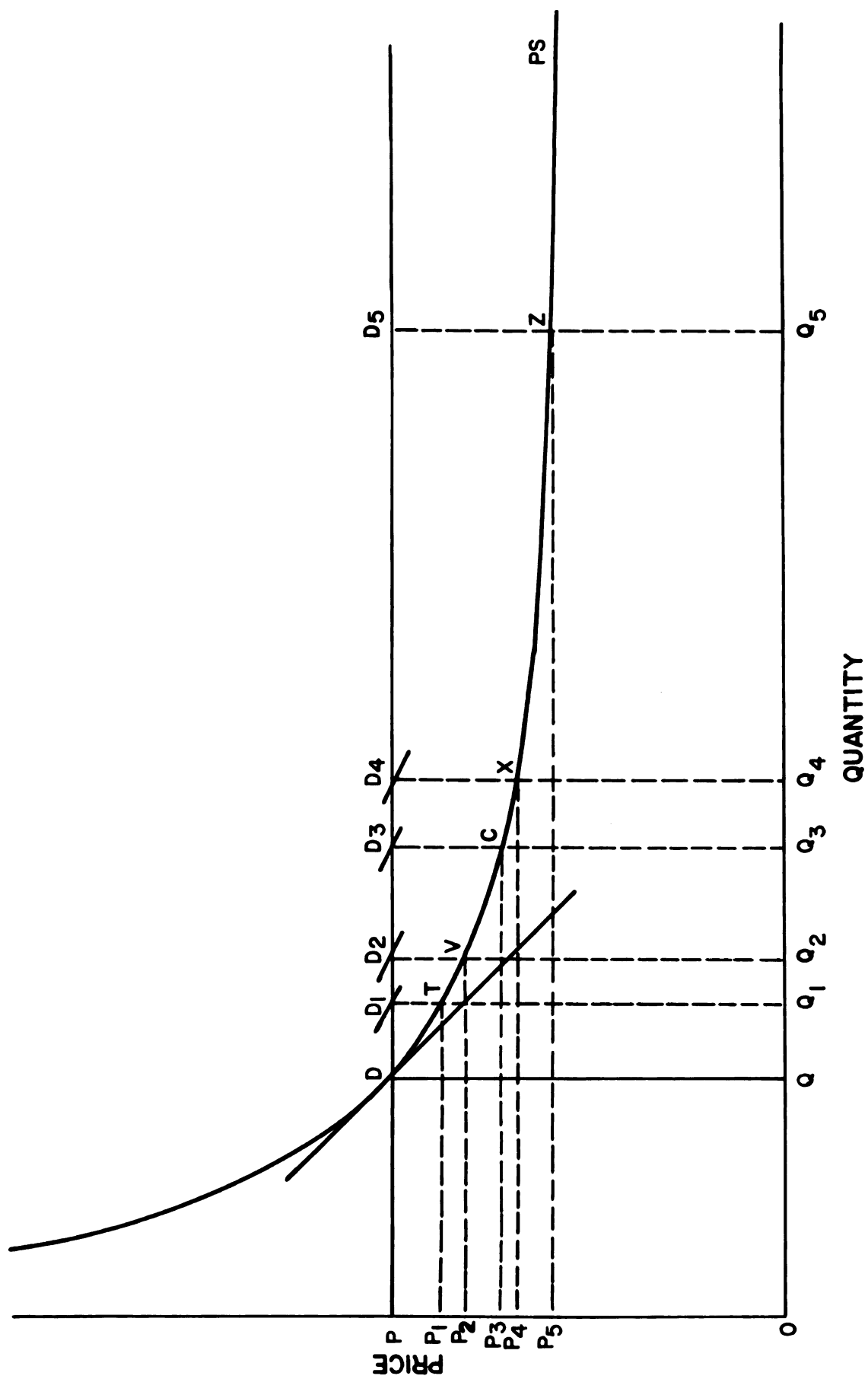
discussed. It is clear that in any purchase which a consumer makes he himself usually performs some of the activity involved in moving goods, storing goods, communication,¹ and product variation.² It is therefore assumed that the analysis of each function, independently of every other function, is at least conceptually both useful and realistic.

The geometry of Figure 12 may be expanded so as to encompass the additional three demand-expanding functions; i.e., the performance of functions creating time utility, the communications function, and product variations activity. Figure 13 shows that, if P_1TD_1P is spent for the creation of time utility, demand will be expanded from D to D_1 . This is an optimum amount that can be spent in performing this function for the same reasons as explained above for determining optimum transportation expenditures. Demand may be further expanded by the amount of DD_2 by the expenditure

¹Informal lines of communication exist which are capable of developing fantastic levels of demand for a given product without the necessity of the producer to make expenditures for the use of communication media. Such a phenomenon occurred when a seemingly spontaneous demand for hula-hoops spread from coast to coast in a matter of weeks.

²Sometimes producers can plan on the appeal of product variation even though the consumer is expected to accomplish the variation himself; such is probably the case in the production and sale of unfinished furniture.





of P_2VD_2P for product variation and by the amount of $D-D_3$ by spending P_3CD_3P for communications. Therefore, the optimum use of each function in isolation will expand total demand by the amount $DD_1 + DD_2 + DD_3 + DD_4$, whose sum is DD_5 , and a total cost of P_5ZD_5P will be justified in reaching this point of expanded demand. It is concluded from this that the perfectly efficient firm will, under the conditions assumed, spend P_5ZD_5P for marketing in order to achieve OQ_5ZP_5 sales at factory-gate prices. If the sum of the total expenditures for performing each function in isolation is P_5ZD_5P , then $(P_1TD_1P)/(P_5ZD_5P)$ is the relative amount of total marketing outlay to be spent for the time utility creation function, $(P_2VD_2P)/(P_5ZD_5P)$ is optimum for product variation, $(P_3CD_3P)/(P_5ZD_5P)$ for communications, and $(P_4XD_4P)/(P_5ZD_5P)$ for place utility creation.¹

There are at least two complicating circumstances which should be acknowledged. The first is concerned with the problem of a changing elasticity of demand. There is some evidence that the price elasticity of demand becomes greater as more and more demand-expanding techniques are used. Therefore, the possibility

¹The sum of $P_1TD_1P + P_2VD_2P + P_3CD_3P + P_4XD_4P$ is not necessarily P_5ZD_5P because of the possible variation in the shapes of the various functional curves, as shown in Figure 14 (page 197).

exists that, in spite of the uselessness of lowering prices at the original point of equilibrium, the firm may reach a point after making considerable marketing expenditures where lowering prices will again be more effective than making additional marketing expenditures. This complication is investigated later.

The second complication, and one which is now explored, arises from the fact that the analysis of each of the marketing functions as described above was carried on in isolation from the other marketing functions. What might be the effect on the optimum point if either the functions complemented each other so that if the demand-expanding activities of communication and place utility were combined, the net effect on demand would be greater than the total of each function in isolation, or on the other hand if they tended to offset each other so that some of them became relatively ineffective or redundant?

If the analysis has correctly identified the functions, there will be no overlap, and as the functions are combined the net effect of the total is at least equal to the sum of its parts. This is increasingly clear when it is remembered that the model assumes maximum skill in the use of each demand-expanding function. Therefore, it is reasonable to maintain that no efficiency is lost when the

four functions are combined, as none of them conflict with the effectiveness of the others.

The question of a gain in efficiency due to the complementarity of some of the demand-expanding functions requires a great deal more investigation and is beyond the scope of this study. The view is taken here that if each function is viewed in its pure form no gain in efficiency is made by combining them and therefore the determination of optimum mix as above is valid.

An example illustrates: Supposing an economic analysis of marketing costs shows that the sensitivity of automobile demand to communication is such that an expenditure for communication of 1 percent of sales will product a 10 percent increase in sales. Suppose further that the optimum marketing mix shows a ratio of one to five between communication and the creation of place utility and that therefore, when combined, a 6 percent expenditure will result in 20 percent additional sales.

If the automobile manufacturer now announces (by spending 1 percent of sales for communication) that his cars will henceforth be available F.O.B. the owner's garage (at a total transportation cost of 5 percent of sales to the manufacturer), he may find his sales increasing more than the 20 percent predicted (but not less, if sensitivity curves are dependable). It is concluded from this that

these two functions complement each other, and therefore when both are used each is more effective than when used in isolation.

Another explanation, however, and the one preferred as being conceptually more sound, is that this announcement by the car manufacturer would be so newsworthy as to generate a great deal of communication among consumers and communication media at no measurable cost to the manufacturer, and therefore a bonus in communication would be achieved. The experience, however, should not invalidate the original findings regarding the relative effectiveness of those functions which are carried on at the expense of the producing firm. It must be remembered at all times that consumers are constantly and ubiquitously performing some of the marketing functions and that these activities are seldom controllable by the marketer.

The problem of variable elasticity as demand changes is now examined. It is useful to start out with a graphic illustration showing the relationship between various expenditures for demand-expanding functions and their effect upon demand. Figure 13 shows the points of equilibrium at which the expenditures for each marketing function in isolation are optimal. There are many intermediate points between the original point of equilibrium (without marketing expenditures) and the optimal marketing equilibrium, whose loci will form

curves of various shapes between these two points as shown in Figure 14. The point of intersection of each of these curves with the curve PS corresponds with the similarly identified points in Figure 13.

Assume that the curve representing the sum of the individual marketing functions is as shown by the curve DZ in Figure 14. Assume further that when demand has been expanded to point D_7 the elasticity of demand to price is shown by the slope of the demand curve at that point. By transferring the same slope to the curve DZ, a point of tangency is reached at Y, to the right of which the sensitivity of demand is greater to price-lowering than to increased marketing effort. Therefore, sales can be increased from Q_5 to Q_6 by substituting a P_5NYP_6 in price reductions for the same amount of marketing effort because it costs P_5NYP_6 to expand demand from D_7 to D_5 by marketing techniques, but when the same cost is returned to the customer in the form of lower prices demand expands from D_7 to D_6 .

The alteration of total demand may change the amount expended for total marketing effort, but need not change the functional mix; the proportion of the total marketing budget to be allowed for the performance of each of the four marketing functions still is determined

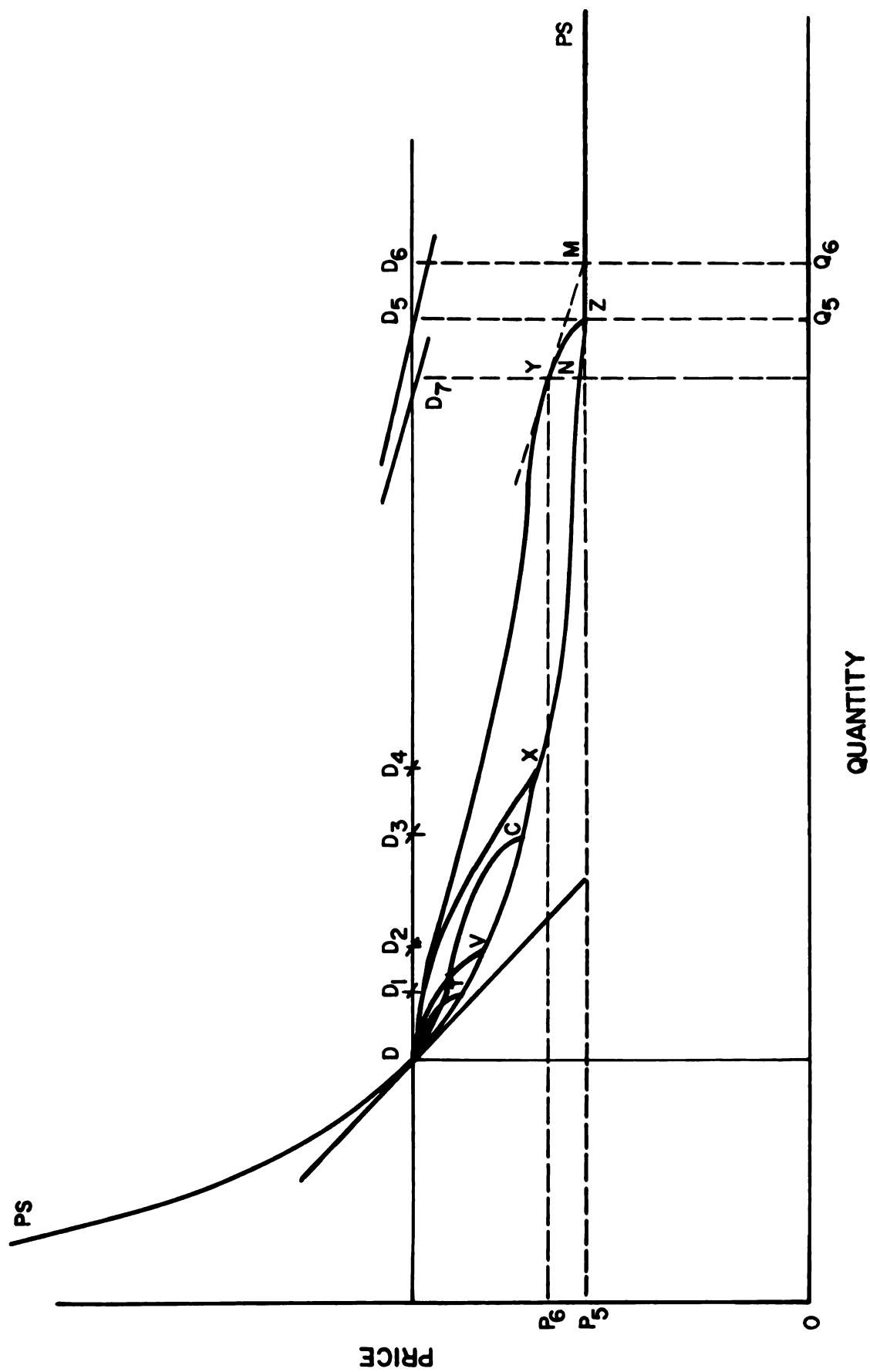


Figure 14. The effects of changing demand elasticity.

by its relative effectiveness in expanding demand as an isolated function.

At the present time little is known regarding the precise shape of the various functional curves, but it is safe to say that infinite variation seems not only possible but likely, and the purpose here was only to present a conceptual framework for further research.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

There were proposed in the early chapters of this dissertation three postulates which were intended to provide the first premises in a train of reasoning from which a conceptual scheme for the determination of optimum marketing mix would be designed. The first postulate stated that the accomplishment of the total marketing task requires the performance of basic identifiable functions. To satisfy this premise, the following functions were identified:

A. The creation of exchange utility.

1. An offer by a seller.
2. An acceptance by a buyer.

B. Facilitating the expansion of market demand.

1. By the creation of place utility.
2. By the creation of time utility.
3. By communication.
4. By product variation.

We have shown that all marketing activity can be classified under one or more of these basic functions.

The second postulate stated that every product requires the performance of a unique functional mix, and the composition of this discrete set of functions depends upon the characteristics of the product and the consumer motivations which induce the purchase of the product. From this premise it was reasoned, for instance, that the demand for weighty goods is more dependent upon the creation of place utility than the demand for light goods; the demand for perishables is more dependent upon the creation of time utility than the demand for staples; the demand for goods which are conspicuously consumed is more dependent upon product variation than strictly utilitarian goods; and the demand for technically complex equipment is more dependent upon the communication function than the demand for everyday necessities. In addition to suggesting methods for identifying the discrete set of functions which the marketing of each good requires it was shown that the use of each function should be expanded to the point where the cost of performing the function can no longer be offset by the resultant production economies of scale.

In the third postulate it was observed that there exists a large inventory of techniques, methods, and institutional arrangements capable of performing some of all of the marketing functions with varying degrees of efficiency. Each of these components of

the marketing mix is susceptible to grading as to its ability to perform individual marketing functions: optimum marketing mix shall have been achieved when the discrete functional mix for a given product and the appropriate marketing mix component has been matched in such a manner that no change in matching will reduce the cost or increase the effectiveness of performing the designated marketing task for the product.

A methodology was suggested for rating the ability of marketing mix components on their ability to perform each function, and some simple methods of matching the required functional mix with appropriate marketing mix components were illustrated.

It is concluded from this reasoning that optimum marketing mix shall have been achieved when the following conditions are met:

- (1) the relative sensitivity of demand of each product to the performance of each of the marketing functions has been established,
- (2) a functional mix has been determined which will equate the marginal product of each function to every other function, (c) the functional mix has been matched with marketing mix components in such a manner that no change in matching will produce more effective performance, and (4) marketing effort has been expanded to the point where further expansion will no longer produce offsetting economies of scale.

The concept of the perfectly efficient marketing firm and the optimum use of the place utility function have been illustrated by the use of appropriate models.

In concluding the dissertation, it was shown how the traditional concepts of economic analysis of monopolistic competition can be adjusted to accommodate the proposed conceptual framework for the determination of marketing mix.

Some Terminal Reflections

Marketing activities gain increasing social importance as economic systems evolve through the stages of economic growth.¹ In the American free enterprise system the need for managing these marketing activities is a private, as opposed to a public, responsibility. One of the ways in which the business community can meet this responsibility is to subject the solution of marketing problems to the scientific method. This thesis has presented a conceptual scheme in very broad dimensions so that the results of scientific inquiry, both past and future, may be assembled and arranged in an orderly and meaningful pattern. It therefore offers a means for

¹ See W. W. Rostow, The Stages of Economic Growth (Cambridge: The Cambridge University Press, 1960).

coordinating much of the accumulated data which are germane to marketing decision-making.

Extended Usefulness of Conceptual Framework

Our goal has been to present a theory for marketing which will cover all marketing activities between the producer and the consumer. These activities often involve several layers of middlemen. Optimum marketing mix by our definition requires the optimum matching of the functional mix required by the commodity, and the mix components which are available as marketing institutional arrangements. At almost every stage in the development of the theory, there have been temptations to break the problem up into many small problems. This would defeat the purpose of this particular study. Nevertheless, one of the approaches to further development of marketing problem-solving techniques might be to apply the theory as developed above to each layer in the channel of distribution.¹

Perhaps retailers can use this conceptual framework to discover what their optimum marketing mix is. Is there an optimum marketing mix for the tasks which confront the wholesaler as he attempts to sell to the retailer? Or can the principles outlined in

¹See Figure 1, page 98.

this thesis be used as a basis for operations between wholesalers and producers? The fact that the four basic functions, as we have identified them, are ubiquitous—productwise and at all levels of distribution—leads one to believe that segmentation of components might be a highly useful experiment.

Each of the functions will probably lend itself to further segmentation, as will the institutional arrangements which comprise the optimum mix. Certainly, in the field of communication, the specific functions can be spelled out in great detail after psychological studies in consumer motivation have identified precisely the appeals which are most effective for selling a commodity.

The total communication task in expanding demand for a product may well be divided into two specific areas of concentration: (1) informative communication, and (2) persuasive communication.¹

When the relative importance of the communication function has been determined from the original economic model, the technique

¹ I.B.M. discovered that there were at least four degrees in which communication moved potential customers from ~~unawareness to~~ final purchase: (1) awareness, (2) comprehension, (3) ~~confiction~~, and (4) ordering. Furthermore, their study showed that four different techniques were required to perform these communication techniques in an optimum manner because each technique showed unique aptitudes for performing each of the communication tasks. "Advertising Saves Sales Calls," Business Week, December 5, 1959, p. 69.

described above may well be used to further delineate how the function of communication will be allocated among the institutional arrangements available for its implementation.

In like manner, we may expect all the communication media to be susceptible to rating as to their ability to accomplish specific and narrowly defined functions. Here again, then, the matching techniques should be useful—this time for the solution of a micro-problem. The concept of optimum marketing mix should be as applicable to the solution of a firm's marketing problems for the board of directors as to the smallest retailer handling their product.

The Effect of Reclassifying Functions

There are some interesting implications resulting from the selection of the four basic marketing functions. These implications might be viewed from at least four directions; namely, the academic viewpoint, the business firm's viewpoint, the government, and society. Let us examine briefly some of these implications.

First, from the academician's standpoint the inclusion of all marketing operations into four basic functions introduces one new function which has received little attention as a function per se by schools of business. This is the function of product variation. If this function was accepted as a full-fledged function with a standing

equal to that of communications and transportation, then it seems logical to expect that this function should receive the same kind of attention academically that the other functions receive. It may be receiving passing attention under the title of "merchandising."

Recognition of the function of product variation would suggest new emphasis on the elasticity of demand based on the performance of the product variation function, a thorough investigation of the characteristics of goods which indicate the successful use of product variation, an investigation into the motives of consumers which justify product variation, and an investigation of the various segments into which that variation can be broken. Ultimately then, we would expect to find courses in product variation occupying the same relative importance in business school curricula as courses in marketing research, transportation, salesmanship, et cetera.

The segmentation of the marketing functions into four basic functions would also have important implications for the business firm. The director of communications would be a rather new concept which would include the present sales department and advertising department as well as parts of other departments. It would also, perhaps, raise some serious questions about the proper role of an advertising agency. If advertising is used as a part of the total task of communication it might seem reasonable that all sales

messages and advertising messages be created with the same techniques and objectives in mind.

The third implication which may result from the four basic functions concept applies to the government. The use of the concept of perfect efficiency being measured by the point at which the net marginal costs of performing each of the four basic marketing functions are equal may provide important yardsticks for the determination of optimum size in the enforcement of antitrust legislation. There may also be important implications for lawmakers regarding the effect of either taxes or regulations which arbitrarily interfere with optimum efficiency in the performance of any of the four basic marketing functions.

Is Pricing a Marketing Function?

Many students of marketing regard pricing as an important marketing function. We feel, however, that Breyer is correct in his analysis:

It should be noted at this point that some feel that price determination or pricing, particularly in the case of those manufactured products such as cigarettes, articles of apparel, etc., where the producer and middlemen set a price on them and refuse to sell at any other, is a marketing function. We prefer to consider it a function of the market, not of the marketing institution. For even though the individual trader does set the price, the forces which shape the amount of that price

are the supply and demand forces of the market. It seems more pointed, therefore, to regard pricing as a function of markets.¹

This position is also reflected in our economic analysis of the perfectly efficient marketing firm where we indicate that the starting point for the entire conceptual framework is a market-determined price.²

A Final Comment

Upon completion of her economic theory of imperfect competition, Joan Robinson was quite surprised when she discovered that although the other explorers were unknown to her, she found some of them "already at the Pole" when she arrived there.³ There are several investigators who have contributed to marketing literature, concepts, which unknown to me at the beginning of this writing, are parallel in nature. Of special interest in this regard are the works of Aspinwall,⁴

¹R. F. Breyer, The Marketing Institution (New York: McGraw-Hill Book Co., Inc., 1934), footnote, p. 11.

²See page 183.

³Joan Robinson, Economics of Imperfect Competition (London: Macmillan and Co., 1942), Foreword.

⁴Leo Aspinwall, "The Characteristics of Goods and Parallel Systems Theories," published in a collection of writings in Eugene J. Kelley and William Lazer, Managerial Marketing (Homewood, Ill.: Richard D. Irwin, Inc., 1958), p. 434.

Shubik,¹ and Verdoorn.² It is sincerely hoped that the ideas expressed herein may, like those of Aspinwall, Shubik, and Verdoorn, contribute to the synthesis of the theories of restricted marketing scope into "logical systems of thought in such a way as to provide guidance to decision makers."³

¹Martin Shubik, Strategy and Market Structure (New York: John Wiley and Sons, Inc., 1959).

²P. J. Verdoorn, "Marketing from the Producer's Point of View," Journal of Marketing, January, 1956, pp. 221-35.

³Eugene J. Kelley and William Lazer, Managerial Marketing (Homewood, Ill.: Richard D. Irwin, Inc., 1958), Editorial Postscript, p. 486.

APPENDIX

There are several uses to which data regarding the distribution of U.S. population by postal districts can be put. First, when simplifying assumptions are made regarding the homogeneity of the market in relation to population, such data can be used to plot curves showing the demand elasticity as prepaid postage is offered to a geographically expanding market. Comparative curves of this nature are shown in Figure 7, page 152. Secondly, the marginal costs for prepayment of postage for a given weight may be computed and plotted for each shipping point and comparative information taken from these data. Thirdly, total costs of postage may be computed for each of a selected number of shipping points based on various conditions and assumptions regarding shipping weight, number of parcels, uniformity of market-to-population ratio, et cetera. All three of these techniques have useful applications for the determination of optimum location of either production and/or warehouse facilities where market pull is decisive.

The main reason why such computations have been avoided is probably because of the difficulty of achieving accurate population

counts by postal zones. This difficulty arises from the method by which the post office determines the boundaries of each postal zone.

The method used by the post office may be described as follows: The entire United States is divided into geographical squares whose sides are 30 seconds each, thus producing four squares for each area bounded by one minute of longitude and one minute of latitude. In determining the boundaries of each postal zone to be served from a given point, a series of concentric circles is drawn whose center is at the center of the square in which the given shipping point is located. All of the squares within each circle struck are included in that zone's boundaries and also all of those squares, any part of which falls within the circle. Thus the perimeter of each postal zone is irregular and jagged and actually outside of the circle.

Local zones are independently determined for each post office. Zones 1 and 2 are determined as above, using 150 miles as a radius. The rest of the zones are based on radii as follows:

third zone	— 150 to 300 miles
fourth zone	— 300 to 600 miles
fifth zone	— 600 to 1,000 miles
sixth zone	— 1,000 to 1,400 miles
seventh zone	— 1,400 to 1,800 miles
eighth zone	— over 1,800 miles

The perimeters of the various postal zones have no relationship to any political boundaries, and therefore, the traditional population counts by political subdivisions are not useful in making estimates of the population lying in each postal zone for a selected post office. The methodology used for collecting data for this study therefore requires some description so that the reader may make some judgments of his own regarding the inaccuracies which are bound to be present.

A Rand McNally 64-inch by 44-inch county outline map of the United States OP101 was used as a basic measuring device. The population of each county in 000's was inserted on this map.¹ Next, the appropriate concentric circles were inscribed from the selected post office to indicate the distances which the post office uses in making their zone determinations. The populations of all counties which were segmented by these circles were divided into the segments shown on a basis of estimates.² The populations of all the counties which were wholly contained in the appropriate circular area plus the estimated population of that portion of each county

¹These data were taken from U.S., Bureau of the Census, County and City Data Book, 1956 (Washington: Government Printing Office, 1957).

²The estimates were based on the location and population of major and minor cities in each county.

which was segmented by the circle was used as the population count for each respective postal zone. The population of the local area covered by local rates for each of the four cities investigated was determined in correspondence with the respective postmasters of these cities.

Some of the inaccuracies which are bound to be reflected in this method of counting can be blamed to the following:

1. Circles were centered on the post office itself for each selected shipping point, while the official method would select the center of the square in which the post office lay.

2. The perimeter of zones was circular, while the official zones are jagged—with the angular portions outside of the circle. Therefore, it is suspected that all estimates are understated except the local zone, which is accurate, and the eighth zone, which will be overstated.

3. No exceptions were made in the calculations, but actually, the official determination includes exceptions where available transportation does not travel as the crow flies; i.e., where lakes or other geographical circumstances prevent straight line travel approximations.

The technique used, however, was uniformly applied to each selected shipping point, and therefore, the validity of the findings for comparative purposes cannot be denied.

Tables 14 and 15 are based on the findings as determined above and are self-explanatory.

The folded map (or a photo) is contained in the pocket attached to the back cover of this thesis.

TABLE 14

**DISTRIBUTION OF UNITED STATES POPULATION BY POSTAL
ZONES, BASED ON FOUR SELECTED SHIPPING POINTS^a**

Zone	New York	Detroit	Chicago	Denver
Local	3,454	2,085	4,060	795
1 & 2 Minus Local	21,483	8,707	8,151	511
3	16,977	23,405	19,664	1,450
4	27,573	65,241	44,450	14,976
5	37,154	25,786	54,687	53,029
6	22,133	9,865	6,188	50,207
7	5,062	10,118	13,495	29,701
8	16,866	5,494	none	91
Total	150,702	150,702	150,695	150,760

^aPopulation figures from the 1950 census. The lack of exact equality among the various totals shown is due to rounding.

TABLE 15

**COMPARATIVE AVERAGE UNIT COSTS IN CENTS OF SHIPPING
ONE 10-POUND PACKAGE BY PARCEL POST TO VARIOUS
POPULATIONS EXPANDING OUTWARD FROM
SELECTED SHIPPING POINTS**

Population (millions)	New York	Detroit	Chicago	Denver
10	49.2	62.1	59.6	89.9
20	61.1	72.1	70.1	97.0
30	66.7	75.7	74.4	106.3
40	70.8	79.8	79.6	111.0
50	75.6	83.4	83.3	113.8
60	79.4	84.5	85.8	115.7
70	82.1	87.6	87.5	117.0
80	87.7	88.8	90.3	121.6
90	91.8	89.9	94.2	125.2
100	95.2	90.8	97.2	128.1
110	98.8	93.9	99.8	130.6
120	103.5	96.5	101.9	132.6
130	107.6	99.9	103.7	136.5
140	114.6	104.9	107.7	140.0
150	121.4	111.2	113.0	143.0

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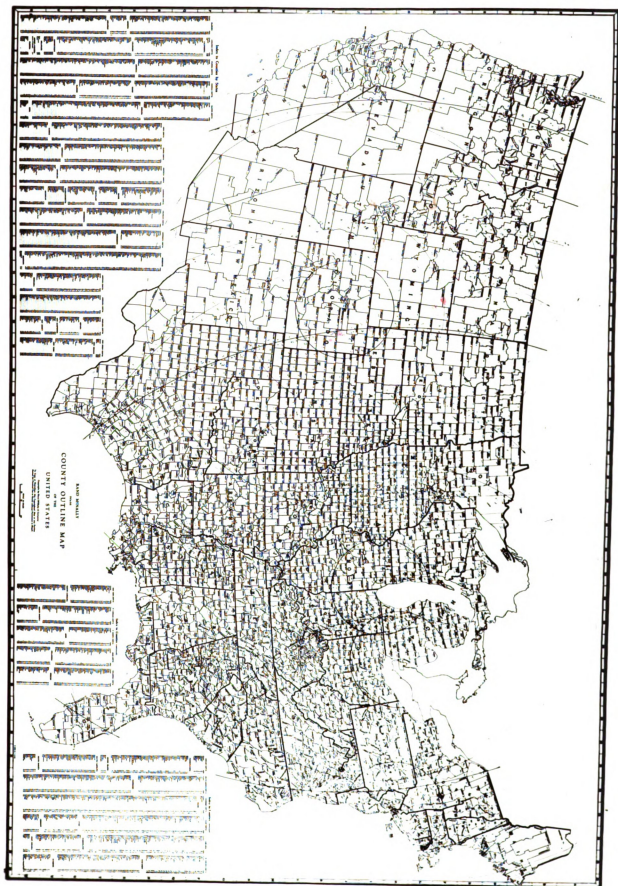
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