MARKETING COSTS INCURRED WITHIN THE

ETHICAL PHARMACEUTICAL INDUSTRY

by

Leroy Conrad Fevang

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Department of Commerce and Business Administration

The University of British Columbia
Vancouver 8, Canada

Date _____April 23 1968_____

ABSTRACT

Recent governmental enquiries into the Canadian Pharmaceutical industry have recommended that the level of marketing costs incurred by individual firms be reduced, so that the cost of medication may in turn be reduced. The object of this study is to seek out and apply quantitative techniques that objectively measure the effectiveness of various pharmaceutical firms' marketing departments. This is subsequently related to the firms' marketing policies and the costs of their implementation.

The effectivesness of six pharmaceutical firms' marketing departments was determined by two methods: (1) a ratio measure of each firm's rate of return to the level of its marketing costs; and (2) a productivity measure that permits the calculation of relative efficiencies. It was determined that the general quantitative results were consistent for either method of calculation. In addition, not only was there a wide degree of variance between the individual firm's marketing effectiveness, but it appears that firms who adopted an indirect distribution policy and a mass selling promotional policy had a more efficient marketing department.

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CHAPTER I

INTRODUCTION

Over the last ten years the Canadian public has become increasingly concerned about the cost of medication and, as a consequence, there have been numerous governmental enquiries into the activities of the Canadian pharmaceutical industry. In 1964, The Royal Commission on Health Services recommended that "consideration should be given to establishing a maximum of 15 percent of total sales as the allowable deductable expense for advertising sales promotion, 'detail men', and other similar items".[1] Then in 1967, The Special Committee on Drug Costs and Prices, hereafter referred to as the Harley Report, recommended "that drug manufacturers revise their promotional practices on a voluntary basis, as considerable savings could be made and passed on to the consumer".[2] Both of these recommendations focused upon reducing the absolute level of marketing costs, thereby implying that little or no value can accrue to society as a result of the firm's marketing expenditures and, therefore, the smaller the size of these expenditures the greater will be the benefits to society.

These recommendations and their implications have not been challenged, in a formal manner, by pharmaceutical marketers, for the intangible nature of the marketing functions acts as a barrier to an objective rebuttal.

I. OBJECTIVE OF THE ANALYSIS

The objective of this study is to seek out and apply quantitative techniques that objectively measure the effectiveness of various pharmaceutical firms' marketing departments. This is subsequently related to

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[1]H. C. Harley, Drug Costs and Prices, Second (Final) Report, (Queen's Printers:Ottawa, 1967) p. 60.

[2]Ibid., p. 53.

the firms' marketing policies and the costs of their implementation. The

focus of attention will be upon what is being accomplished by means of the

marketing costs, rather than upon the absolute size of the costs.

II. JUSTIFICATION FOR THE STUDY

The objective of this thesis may be justified on the grounds that

increased governmental intervention into the pharmaceutical industry may be

expected in the future, since the precedent has been established over these

last few years.   This in itself may not be undesirable, but in the event

that more rigid constraints are applied across-the-board to all marketing

activities and to all firms, society may be the loser. It is to be expected

that some marketing policies may be implemented more efficiently than others.

Through the identification of these more efficient policies and firms,

society may be better served.

III. SCOPE OF THE STUDY

The scope of the study includes an analysis of the marketing costs incur-

red by six Canadian ethical pharmaceutical manufacturers and a measurement of

the effectiveness of each firm's marketing department. This effectiveness

is determined by two methods: (1) a ratio measure of each firm's rate of

return to the level of its marketing costs, and (2) a productivity measure

that permits the calculation of relative efficiencies.   However, these

measures apply to only those marketing activities undertaken in 1965 and as

a result generalizations may not be made.

The research methodology involves a library search where pertinent

material was extracted from secondary sources.   These include: (1) The

Harley Report, 1966-7, (2) The Restrictive Trade Practices Commission on

The Manufacture, Distribution and Sale of Drugs, 1963, and (3) the writings

of R. D. Buzzell on his work on marketing productivity.[3]

IV. LIMITATIONS ON THIS THESIS

The primary limitation that exerts an influence on the writing of this paper is the quality of the statistical cost data. The <u>Harley Report</u> comprises the only available source of cost data and in places this was sketchy in detail. In addition, this report presents the activities of only six pharmaceutical firms for one year. Little co-operation was received, in answer to requests for supplemental cost information, from most of these firms and the Pharmaceutical Manufacturer's Association of Canada.

V. ORGANIZATION OF THE CHAPTERS

Chapter II presents the economic environment of the Canadian pharmaceutical industry. It includes a classification of the industry and the analysis of certain economic factors that are characteristic of the industry.

Chapter III establishes the basic theoretical framework of marketing costs and defines marketing costs and marketing efficiency. In addition, it discusses a quantitative method of efficiency measurement.

Chapter IV undertakes an analysis of the marketing costs incurred by six ethical pharmaceutical manufacturers. Initially, it takes the form of a financial analysis in order to isolate constraints on the implementation of marketing policies. Later, the analysis identifies the level of the marketing effort as a percentage of sales, and then divides this into its component parts. This is followed by the introduction of the level of marketing costs incurred by firms in other industries, which provides the

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[3]R. D. Buzzell, <u>Value Added by Industrial Distributors and Their Productivity</u>, (Ohio State University, 1959); R. D. Buzzell, "Productivity in Marketing". (Unpublished doctoral dissertation, University of Ohio, 1957).

proper perspective with which one may view the level of the pharmaceutical marketing costs. Finally, the effectiveness with which the pharmaceutical firms utilize their marketing resources is determined through the ratio of each firm's rate of return to the level of its marketing costs.

Chapter V presents both a normative and a descriptive approach to the determination of productivity measures for a firm's marketing department.

Finally, Chapter VI presents a comparison of the consistency of the firm's ranked position regarding the effectiveness of its marketing department as determined by the methods presented in Chapters IV and V. This is followed by the conclusions, and the recommendations for further study.

CHAPTER II

THE ECONOMIC ENVIRONMENT OF THE PHARMACEUTICAL INDUSTRY

I. INTRODUCTION

In recent years, considerable criticism has been voiced from many corners across Canada relative to the high costs of doing business within the ethical pharmaceutical industry. As pointed out briefly in the previous Chapter, this study is concerned with an analysis of the marketing cost structure in this industry so as to inform the reader about the more important conditions prevailing that, in part, account for the existing marketing cost situation. This chapter is concerned with those considerations which, this writer feels, require analysis for the development of those arguments presented in subsequent chapters. They are:

A. The establishment of a classification scheme for the pharmaceutical industry as it is presently conceived in Canada.

B. An analysis of certain important economic factors that are characteristic of the industry, including: the nature of the market structure, demand, risk, profit, governmental regulation, trade associations, and internal control.

II. CLASSIFICATION OF THE PHARMACEUTICAL INDUSTRY

Products within the pharmaceutical industry have been classified either as ethical products, or as proprietary products.[1] The distinction between these two rests largely upon the direction of promotion,[2] as shown in

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[1]The popular press would normally refer to these products as ethical drugs and proprietary drugs. This is a misnomer, as drug refers to the active ingredients within the products or pharmaceuticals.

[2]Promotion has been defined as any effort on the part of the company intended to stimulate company sales through dissemination of information to buyers, potential buyers, or purchasing agents. J. Howard, Marketing Management, (Homewood, Illinois: Irwin, 1963) p. 387.

Illustration 1.

Illustration 1
Direction of Emphasis
in the Promotion of Pharmaceutical Products

Ethical Products		Proprietary Products
Prescription Pharmaceuticals	Over-the-Counter Pharmaceuticals	
manufacturer ⬇ physician→pharmacist ⬇ consumer	manufacturer ⬇ physician···⟩pharmacist ⬇ consumer	manufacturer ⬇ retail outlet→consumer

➡direction of major emphasis   ···⟩ direction of minor emphasis

Ethical products are characteristically promoted to both practising
physicians and pharmacists. Whereas, the other products are promoted
directly to the retail outlet and/or the ultimate consumer. Those ethical
products that are legally available only on prescription from physicians
are called prescription pharmaceuticals. Such products as "292's",
"Seconal", and "Phenobarb" fall into this category. On the other hand,
ethical products that may be purchased without a prescription are called
over-the-counter (OTC) pharmaceuticals; for example, "222's", "Neo-
synephrine" nose drops, and "Coricidin" cold tablets. Although a con-
sumer may purchase an OTC pharmaceutical without a prescription, in some
cases prescriptions may be issued. To illustrate: "Auralgan" ear drops are
often regarded as a prescription pharmaceutical, although they are in fact
an OTC pharmaceutical. Although a clear distinction has been made between
the two types of ethical products, a single pharmaceutical house may manu-
facture both types. In fact, this is the usual case.

Proprietary products are occasionally referred to as "advertised reme-
dies" or as "patent medicines". These products are promoted directly to the
retail outlet and/or ultimate consumer. The manufacturers of proprietary
products are noted for their large advertising budgets, as well as for their
supplying of generous dealer aids, in the form of in-store sales promotion,
whereas, only dealer aids are used in the promotion of OTC pharmaceuticals.

Certain products, that are chemically and therapeutically similar, may
be promoted by both methods. For example, acetylsalicylic acid is promoted
both as "Empirin Compound", an ethical OTC pharmaceutical, and as "Bayer's
Aspirin", a proprietary product.

The above distinctions should be noted in that this study is con-
cerned with the marketing costs incurred within the ethical pharmaceutical
industry; proprietary products will not be further considered.

III. ECONOMIC FACTORS CHARACTERISTIC TO THE ETHICAL PHARMACEUTICAL INDUSTRY

A. Nature of the Market Structure

It would appear that the nature of the market structure of the ethical
pharmaceutical industry may be described as a differentiated oligopoly.
This is substantiated by the following analysis.

1. Size of the Industry

The size of the ethical pharmaceutical industry, as represented
by the total dollar value of factory shipments, is shown in Table I.[3]

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[3]Dominion Bureau of Statistics, Manufacturers of Pharmaceuticals and
Medicines, (Ottawa:Queen's Printers), 1953, 1960, 1961, 1962, 1963, 1964,
1965. The number of establishments includes firms manufacturing both ethical
and proprietary products. The information is not available to classify these
firms into the two product groups, since many individual firms manufacture
both types of products.

TABLE I

RELATIONSHIP OF THE NUMBER OF ESTABLISHMENTS AND THE TOTAL VALUE OF
FACTORY SHIPMENTS IN THE CANADIAN PHARMACEUTICAL INDUSTRY

		1953	1960	1961	1962	1963	1964	1965
Number of Establishments		217	198	174	167	173	175	161
Total Value of Factory	Ethical	66.3	119.6	120.7	126.6	141.6	151.7	168.2
Shipments ($ millions)	Proprietary	18.6	24.4	24.6	26.6	24.5	25.2	32.4

At the end of the twelve year period, the total value of factory ship-
ments of ethical products had increased by 154 percent. This may be compared
with a 74 percent increase in the value of proprietary products. The larger
percentage increase in ethical products is mainly the result of an increase
in total demand for ethical pharmaceutical products. Demand is analyzed on
page seventeen of this Chapter.

2. Degree of Concentration of Sellers

The degree of concentration within the overall pharmaceutical
industry for the years 1953 and 1960 is shown in Table II.[4]

TABLE II

PHARMACEUTICAL ESTABLISHMENTS GROUPED ACCORDING TO THE
SIZE OF THE VALUE OF THEIR FACTORY SHIPMENTS

Value of Factory Shipments $(,000)	1953			1960		
	Number of Establishments	Selling Value $(,000)	% of total Shipments	Number of Establishments	Selling Value $(,000)	% of total Shipments
Under $10	38	188	.2	29	141	.09
10 to 25	28	464	.5	22	371	.22
25 to 50	21	729	.78	21	717	.43
50 to 100	28	2,032	2.17	15	1,081	.66
100 to 200	28	3,968	4.24	23	3,374	2.05
200 to 500	25	7,940	8.49	32	10,565	6.4
500 to 1,000	27	19,613	20.96	16	10,879	6.6
1,000 to 5,000	18	34,210	36.57	31	70,546	42.78
5,000 and over	4	24,412	26.09	9	67,224	40.77
TOTAL	217	93,557	100.00	198	164,895	100.00

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[4]Restrictive Trade Practices Commission, The Manufacture, Distribution
and Sale of Drugs, (Ottawa:Queen's Printer, 1963) p. 54.

In 1953, the four largest establishments (2 percent of all firms) accounted for 26 percent of the industry's total selling value. The twenty-two largest establishments (10 percent of all firms) accounted for 62 percent of the selling value. By comparison, in 1960 the nine largest establish-ments (5 percent of all firms) had 41 percent of the industry's total selling value. The forty largest establishments (20 percent of all firms) accounted for 82 percent of the selling value. In addition, more recent market surveys show that no single company holds as much as 6 percent of the Canadian Phar-maceutical market.[5] It is apparent that the degree of concentration within the industry is diminishing.

For purposes of this study, only the degree of concentration among ethical firms is considered. This will involve an analysis of the therapeutic markets[6] which together make up the total sales for the ethical pharmaceutical industry. Harley[7] states that within the ethical pharma-ceutical industry there exists a positive relationship between the largest firm's market share and the degree of concentration of sellers within that industry. Furthermore, he goes on to say that within the three largest therapeutic markets, antibiotics, hormones, and vitamins and nutrients, no single firm's market share exceeded 21 percent.

Frost, however, argues that a firm's market share is relatively unstable, with respect to the cardiovasculars, diuretics, and corticos-

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[5]H. C. Harley, Drug Costs and Prices, Minutes and Proceedings, (Ottawa: Queen's Printers, 1966) p. 287.

[6]The total industry market is composed of twenty-four therapeutic markets.

[7]Ibid.

teroids.[8] One can tentatively conclude that within the therapeutic market

structure, considerable interdependence between firms exists as a result of

a high degree of concentration (a few number of major firms) and resulting

in shifting market shares.

3. Product Differentiation

Product differentiation exists within most therapeutic markets;

that is, each product is an imperfect substitute for another. The differ-

entiation may be based upon variations in the following product character-

istics: quality control, aesthetic properties, mode of action[9], packaging,

and/or the degree of side effects.[10]

Most firms use product differentiation in trying to reduce the high

cross elasticity of demand for their products in each therapeutic market.[11]

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[8]Mr. G. E. Frost, a noted patent attorney, brought out some significant facts about competition in the pharmaceutical industry when he wrote in the Spring issue of The Patent, Trademark, Copyright Journal of Research Educa-tion, in 1963. This was quoted by Harley in, Drug Costs and Prices, Minutes and Proceedings, p. 287.
"The drug industry may be divided into a variety of product categories. ..The typical record for any particular product category is one of constant churning in so-called 'dynamic' competition--with dramatic shifts in market positions as existing drugs are displaced by superior products of rival houses. In cardiovascular preparations, the leading company in 1951 enjoyed about 19 percent of the market, the leading company in 1960 had about 21 percent of the market, and of the four leading concerns in 1951 only one was among the four leading concerns in 1960. In the case of diuretics, four dif-ferent concerns enjoyed the leading market position in the 1951-60 period, the concern with the largest sales in 1960 was not among those with signifi-cant sales in 1951, and the concerns with the largest sales in 1951, 1952 and 1953 had no significant sales in 1960. In the corticosteroids, the company that pioneered the field in 1950 had only about a quarter of the business in 1954, and by 1956 its products enjoyed less than 5% of the mark-et."
[9]This refers to the action of a specific pharmaceutical product within the body in order to produce the desired pharmacological response.
[10]This refers to the undesirable pharmacological response of the body to the specific pharmaceutical product.
[11]The cross elasticity of demand measures the extent to which various commodities are related to each other. Consider commodities X and Y, the cross elasticity of X with respect to Y equals the percentage change in the quantity

Substitution of products between some therapeutic markets may occur, but in such cases the cross elasticity of demand between products will normally be low. For example, some substitution will occur between the following related therapeutic markets: tranquillizers and sedatives; antibiotics and sulfonamides; and anti-hypertensive and diuretics. However, most therapeutic product classes are poor substitutes for other classes and therefore the cross elasticity of demand between therapeutic markets would approach zero.

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of X taken, divided by the percentage change in the price of Y. This may be expressed mathematically by the formula:

$$\theta_{xy} = \frac{\Delta x/x}{\Delta Py/Py}$$

When the commodities are substitutes for each other, the cross elasticity of demand between them will be positive. The extent to which commodities are substitutes is shown by the flatness of indifference curves. Perfect substitutes will have indifference curves that are downward sloping straight lines. This means that the buyer is indifferent as to which commodity is taken. Since perfect substitutes do not exist, indifference curves for commodities which are substitutes will have some degree of convexity to the origin. This is shown in Illustration 2.

The degree of convexity, of indifference curves, will increase as the commodities become poorer substitutes for each other. Illustration 3 illustrates the limited substitution that will occur between two therapeutic markets, such as tranquillizers and sedatives.
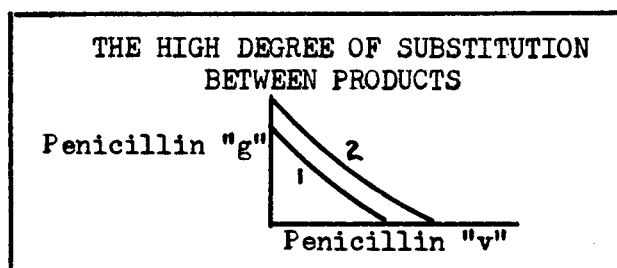
ILLUSTRATION 2   ILLUSTRATION 3
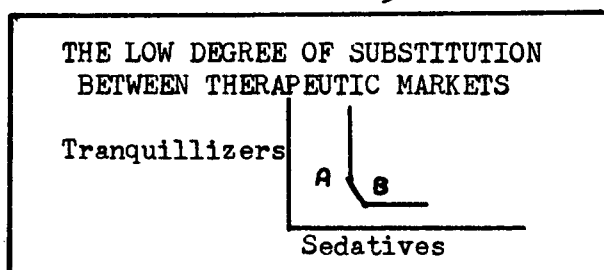
Within the range AB the products of these two therapeutic markets are substitutes for each other. Above A and below B, the buyer is no longer willing to substitute the product of one market for a product of another market.

The high cross elasticity of demand between the products penicillin "g" and penicillin "v" within the same therapeutic market is illustrated in Illustration 4. Combination A contains xi of penicillin "v" and yi of penicillin "g", and buyer satisfaction is maximized on indifference curve 2. An increase in the price of penicillin "v" rotates the budget line to the left, resulting in combination B. This combination contains a reduced quantity of penicillin "v", x2, and an increased quantity of penicillin "g", y2. Buyer satisfaction will be maximized on indifference curve 1, of lower value.

4. Economies of Scale

The cost structure of the pharmaceutical industry is such that there are few noticeable economies of scale realized in the production process due to:

a) Batch methods of production are often used, whereby they limit the degree of economies of scale that may be attained.[12]

b) There usually is but a very small physical volume of output when to comes to highly potent active ingredients in many pharmaceutical products.[13]

ILLUSTRATION 4
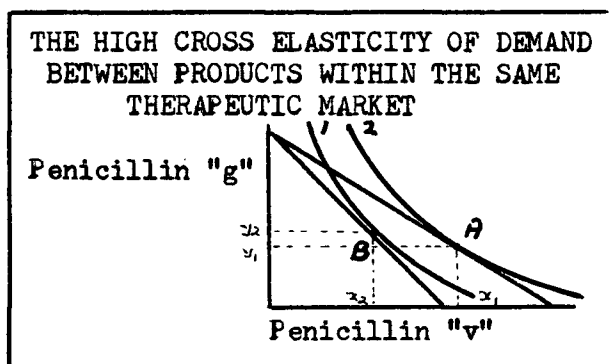
ILLUSTRATION 5

THE HIGH CROSS ELASTICITY OF DEMAND BETWEEN PRODUCTS WITHIN THE SAME THERAPEUTIC MARKET

THE LOW CROSS ELASTICITY OF DEMAND BETWEEN PRODUCTS IN DIFFERENT THERAPEUTIC MARKETS
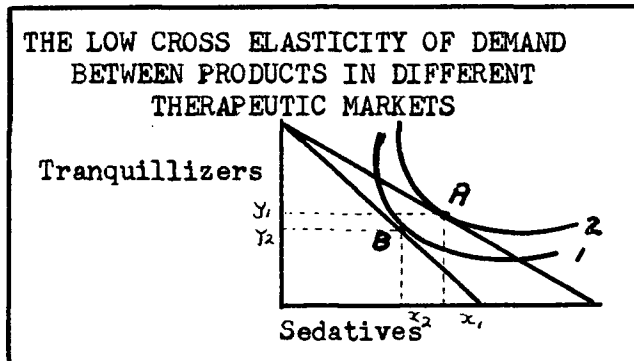
The low cross elasticity of demand between products in different therapeutic markets is illustrated in illustration 5. In this case, an increase in the price of sedatives results in decreased quantities taken of products in both markets. The demand for sedatives will be inelastic. This means that with a price increase, more of a buyer's income will be spent on sedatives, but the quantity purchased will be reduced. Also, there will be less of the buyer's income available for purchase of tranquillizers, so the quantity purchased will also be reduced.

[12]This is particularly common where fermentation is the key phase in the productive process, as in the case of antibiotics and synthetic corticosteroid hormones.

[13]Some examples of the minute quantities of active ingredients in the final product are: Dexamethasone 5 mg per tablet, Amenorrheal products have .05 and 50 mg of each of their active ingredients, and Oral contraceptives have 1 and .05 mg. By comparison, the lowest accurate measurable weight on most pharmacists' scales is approximately 60 mg.

c) The package size contains only a small quantity of the

finished product.[14]

However, economies of scale may be realized in both the marketing and

the product development departments of some pharmaceutical firms. Firms

with an optimum number of products should be able to achieve economies in

their marketing department, particularly in the advertising and field sales

elements of their promotional mix. These economies would be due to the in-

creased volume of advertising, and the most efficient allocation of the

salesman's time over this optimum product base.[15]

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[14]In this industry there is an attempt to relate the amount of medica-
tion required to treat the illness to the minimum package size, as illustra-
ted in the following table. This relationship is established in an attempt
to achieve a higher therapeutic response to the medication by the prevention
of both under and over medication.

Therapeutic Class	Dosage	Average length of treatment	Minimum package size
Antibiotics-tablets	One tablet four times daily	Four days	16 tablets
-liquid	One teaspoonful four times daily	Four days	2 oz. or 16 doses
Vitamins	One tablet daily or One tablet three times daily	Monthly repeats allowed "	30 tablets 100 tablets 1 month supply
Weight Control	One tablet daily	30 days	30 tablets
Oral contraceptives	One tablet daily	20 days	20 tablets
Amenorrheal products	One tablet daily	3 days	3 tablets

Larger quantity sizes are produced, of course, but with each progressive
increase in package size the degree of risk to the pharmacist increases.
Often the optimum package size is reached with either the minimum or one
size larger, since prescription demand for a pharmaceutical may be suddenly
diminished. In that case, there would be no legal way for the pharmacist
to reduce his now obsolete inventory of opened bottles.

[15]However, diseconomies in the marketing department will arise from an
excess of products. Then the salesman's effort is diluted to the point where
no market is cultivated sufficiently for a high degree of penitration due to
excessive product offerings.

The establishment of an optimum size research and product development department involves a considerable financial expenditure. Consequently, economies of scale may be realized by firms with few financial constraints and an optimum product base.

5. Barriers to Entry

There are few barriers to entry into the ethical pharmaceutical industry when entry is made on a small scale. In small scale operations firms would not establish a research and product development department, nor would it be likely that their marketing operations would be particularly sophisticated, for example, many of these firms' promotional programmes could be handed over to wholesalers for implementation.[16]

However, formidable barriers would exist for large scale firms desiring to enter the ethical drug industry. These barriers would include: (1) the establishment of a marketing department and a research and development department; (2) the possession of patents, trademarks, copyrights, licenses and/or working agreements with other manufacturers; and (3) substantial financial backing. Most of these barriers may be breached through the purchase of an established firm,[17] or by the spin-off of a firm with a broad product base.[18]

6. Non-Price Competitive Practice

A policy of non-price competitive practice is carried on by many firms within the ethical pharmaceutical industry. Although small firms that sell generic pharmaceutical products secure much of their business as

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[16]Most small firms do not have a highly developed sales force. Consequently, most product information and promotional selling effort is provided by the wholesaler's sales force.

[17]E. B. Shuttleworth was purchased by Pitman-Moore Ltd., a division of Dow Chemical Ltd.

[18]Squibb formed Linsom and Pfizer formed Roerig Labs. Ltd.

a result of active price competition, the larger firms, who comprise eighty-five percent of the industry, emphasize non-price competition.[19]

The general industry's feeling relative to non-price competition is illustrated by the comments of Mr. J. A. Bertrand, the Manager of the Medical Products Department of Cyanamid of Canada, Limited. A member of the special committee on Drug Costs and Prices asked whether or not a competing product sold at the same price as their product. Mr. Bertrand said:

"I do not know about that. I would be very surprised if it did not sell for approximately the same price.
I think you are getting into an area such as, for example, gasoline which various companies tend to sell at the same price. You have a competitive situation. I do not think we could live too long with a drastic price differential between our major antibiotics and the major antibiotics of other reputable companies.
Now, this does not imply, at all, in my feeling, that there is any collusion or a conspiracy to keep prices at a certain level. This is part of the competitive life of the economy. If we have price reductions it puts the other company under pressure to determine whether they can continue to sell their products, or whether they would be better advised to reduce their price to our level."[20]

Non-price competition tends to develop because, (1) the seller feels that price cuts will be met promptly by other competitors, (2) price reductions are not easily reversed, (3) open price competition often degenerates into uncontrolled price wars, and (4) the seller believes his demand to be inelastic, all of which substantiate the oligopolistic structure of this market. Consequently, there has been a high degree of price stability within the ethical pharmaceutical industry, and new therapeutic products have been priced, for the most part, to compete with older ones within the same

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[19]Most of the larger ethical pharmaceutical manufacturers are members of the P.M.A.C. H. C. Harley, Second (Final) Report on Drug Costs and Prices (Ottawa:Queen's Printers 1967) p. 9.

[20]Harley, Minutes and Proceedings, op. cit., p. 661.

market.[21]

7. Competitive Rivalry

Competitive rivalry tends to be complementary to non-price competition. Within the pharmaceutical industry, competitive rivalry manifests itself in two major areas.

Rivalry may take the form of competition in creativity, that is, where consumers and producers alike are caught up in an almost compulsive obsession for that which is new. In the extreme case, the individual firm is forced constantly to remould its products, to create something new and/or to improve an existing product in terms of performance or design. A policy of competitive innovation seems to have been formulated by some individual firms and R & D departments have been established as a vehicle of this policy. Profits may come to depend on the firm's position in the innovation race, with the cost of an organized and efficient research and development department being regarded as a necessary expense of entering the race. Once some firms have taken this position, others are forced to follow in order to maintain and protect their market share.

Competitive rivalry is also evident within the firm's marketing system. The presence of this rivalry is indicated by, (1) increased advertising appropriations,[22] (2) larger field sales staff and/or (3) increased frequency of call upon prescribing physicians.

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[21]Restrictive Trade Practices Commission, op. cit., p. 173 showed the following prices for pharmaceutical products within antibiotic therapeutic market:

| | 250 mg tablet or capsule | | | | | | |
Amount	Tetrex	(new) Declomycin	Aureomycin	Achromycin	Cloromycetin	Cosa-tetracyn	Albamycin
16's	$ 9.44	$ 9.44	$ 9.44	$ 9.44	$ 9.45	$ 9.44	$ 9.43
100's	56.60	56.61	56.61	56.61	56.70	56.61	56.62

[22]A detailed analysis is undertaken of six individual firm's advertising expenditures in Chapter 4 under "Promotion Policy" pg. 58.

In summary, the ethical pharmaceutical industry has the following competitive characteristics:

  a) A degree of concentration among the larger sellers causing interdependency of action.

  b) Product differentiation within most therapeutic markets.

  c) Economies of scale in the marketing and R & D departments.

  d) Formidable barriers to entry for large-scale firms.

  e) The presence of non-price competition and competitive rivalry.

Consequently, it may be stated that the pharmaceutical industry has a differentiated ologopolistic market structure.

B. Demand Analysis

An analysis of demand within the pharmaceutical industry involves an investigation of demand in terms of: the industry, the therapeutic market segment, and the product's target market.

  1. Industry Demand

The industry demand for pharmaceutical products is influenced primarily by the incidence of illness. Industry demand is the total demand of the twenty-four therapeutic markets which are found in each of the four institutional markets.[23] It cannot be expanded to any appreciable extent by the promotional efforts of individual firms. However, industry demand may be expanded through: (1) the development of new therapeutic

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[23]These markets are: the retail, hospital, other government institutions, e.g. Crease clinic, and government departments, e.g. Dept. of Veteran's Affairs. Since these markets are separable, thus preventing arbitrage, and have different elasticities of demand, price discrimination may be practiced. The order of elasticity of demand between these markets is: retail, hospital, government institutions and government departments. This is due to the increased rate of substitution between competing products. It is primarily in these three latter markets that generic products have greater acceptance.

markets designed to satisfy latent demand by providing treatment for pre-
viously untreatable medical cases, and/or (2) the expansion of total demand
within a therapeutic market.[24]

2. Demand Within the Therapeutic Market Segment

The total demand for each of the twenty-four therapeutic market
segments tends to be relatively inelastic due to the presence of few sub-
stitutes, as shown in footnote 15. It may be expanded by new significant
advances in the treatment of medical problems.[25]

3. Demand Within the Product Target Market[26]

The demand within the product's target market tends to be more
elastic than does the primary demand for this therapeutic market segment
class due to the presence of substitutes. Firms attempt to shift and/or
move along their average revenue curves (demand curves facing the firm)
through the implementation of their marketing mix.[27]

C. Profit and Risk

The financial risk to an individual pharmaceutical firm is of a high
order, due to the rapid rate of product obsolescence. This is substantiated
by the following excerpts from the Restrictive Trade Practices Commission
Report on the Manufacture, Sale and Distribution of Drugs.

The Alberta Government stated, "..New pharmaceutical products are
accepted more rapidly and become obsolete just as rapidly.."[28]

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[24]The recent development of tranquillizers and oral contraceptives has
expanded industry demand by the addition of two totally new therapeutic mar-
kets.

[25]The recent introduction of griseofulvin represented a major improve-
ment in the treatment of fungal infections. It has expanded the demand
within the anti-fungal therapeutic market.

[26]The product's target market refers to the selection of particular
groups of customers with specific types of medical problems to whom the firm
wishes to appeal.

[27]Various marketing mixes used by six ethical pharmaceutical firms are
analyzed in Chapter 4.

[28]Restrictive Trade Practices Commission, op. cit., p. 197.

A study on the life of pharmaceutical products concluded that, "Our studies substantiate the belief of many that, as effort and expenditures for pharmaceutical research increase, and as crash promotional programs continue to publicize the results of this expanded research, one can anticipate an even greater annual turnover of prescription products and acceleration in their rate of obsolescence."[29]

Dr. B. Dixon, a consulting economist, wrote in his paper to the Commission that "This compulsion to bring out new products, with the attendant risk that the product will not pass the test of the market (either because of inappropriateness or competitive superiority), definitely gives the industry a rating of a risk industry, (as compared, let us say, to an industry which is producing a small number of relatively stable products, where the rate of product improvement or development is low)."[30]

Hence, high profits would be expected by firms in the industry to offset the high incidence of risk. However, since no meaningful quantitative measure of risk has been established, one would not know what level of profits would be commensurate with the inherent degree of risk. The Taxation Statistics in 1963 showed that the pharmaceutical industry earned the seventh highest rate of return (net profit before taxation) relative to sixty-three other manufacturing industries.[31] Further analysis of the financial ratios of this high risk, high profit industry will be found in Chapter 4.

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[29]Ibid., pp. 202-203.
[30]Ibid, p. 367.
[31]Harley, Minutes and Proceedings, op. cit., p. 2667.

D. Control of the Pharmaceutical Industry

In 1964, the thirteen largest firms in the ethical pharmaceutical indu-
stry in Canada were all branches or subsidiaries of foreign firms, with two
exceptions.[32] All thirteen firms had annual sales in excess of four million
dollars each, and they were the only ones having sales of that magnitude.[33]
To date the last Canadian firm has been purchased by an American corporation.[34]

This overwhelming control of this industry by foreign firms leads to a
number of political and economic implications, many of which are beyond the
scope of this thesis. However, one implication is that public disclosure of
these firm's activities is only available in consolidated financial state-
ments. Consequently, the compilation of wholly Canadian financial statistics
would be a very difficult task without the information made available by
Canadian government inquiries.

E. Regulatory Control of the Pharmaceutical Industry

The regulatory control of the ethical pharmaceutical industry is admini-
stered by the Food and Drug Directorate of the Department of National Health
and Welfare. Although it is not a regulated industry, in the technical sense
it is subject to a considerable and growing body of governmental controls.
The areas of control include: (1) the distribution of pharmaceutical products;
(2) quality control; (3) pharmaceutical sampling; (4) the introduction of
new pharmaceutical products to the market; (5) the advertising of products;
and (6) other controls necessary to protect the public against unsafe pharma-
ceutical products.

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[32]They were Connaught Research Medical Laboratories, a crown corporation
and Charles E. Frosst Co. Ltd.

[33]Harley, Second (Final) Report, op. cit., p. 9.

[34]Charles E. Frosst Co. Ltd., was purchased by Merck, Sharpe & Dohme of
New York, however, the crown corporation (Connaught Research Medical Labora-
tories) is still active within the industry.

As a result of the governmental regulations on quality control, one would think that there would be a standardization of all chemically similar pharmaceuticals on the market. One would also think that their biopharmaceutical properties[35] would be similar, within a very narrow range. If such were the case, physicians would then be able to use unhesitatingly any pharmaceutical, generic or branded, that reached the market. However, as Mr. M. Pernarowski[36] pointed out, this assumes that products do comply with specifications and they are clinically effective. But the results of his studies indicate that:

> "Firstly, not all products comply with specifications. The evidence for this statement is given, in part, in this paper and even more conclusively in reports issued by the Food and Drug Administration. For example, quite recently, this agency analyzed forty-two thousand pharmaceutical samples and found that 7.6 per cent failed to comply with pharmacopeial specifications. Regulatory agencies do check products but can never hope to check all the products on the market.
> Secondly, a regulatory agency can never guarantee the clinical effectiveness of the products tested."[37]

One of the main reasons why quality differences are allowed to exist[38]

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[35]Biopharmaceutics is the study of the relationships between some of the physical and chemical properties of a pharmaceutical product and the biological effects observed following the administration of this product.

[36]Dr. M. Pernarowski is an associate professor at the Faculty of Pharmacy at U.B.C., Vancouver, B. C.

[37]Searl, and Pernarowski, "The Biopharmaceutical Properties of Solid Dosage Forms: I. An Evaluation of 23 Brands of Phenylbutazone tablets, "The Canadian Medical Association Journal, #96, June 10, 1967, p. 1520.

[38]The monographs in the regulating pharmacopeias, provide vital data regarding the quality of pharmaceutical products as far as "in vitro" (lab) testing is concerned. However, they do not include any "in vivo" (in the body) tests, that might also be carried out in order to guarantee the complete safety and effectiveness of a particular product. There is a real need for better specifications. As the knowledge of the action of products in the body increases, the monographs will include better and more complete specifications.

Presently a pharmaceutical product may pass the pharmacopeial specifications, when its action within the body may be below what is considered acceptable. Conversely, a product may not pass the specifications when its drug response within the body may be sufficient. Consequently, only when specifications are upgraded to include both in vivo and in vitro tests may

is the fact that the Food and Drug Directorate is underfinanced, understaffed and unable to make sufficient inspections.[39]

Doubt exists in the minds of prescribing physicians and dispensing pharmacists when there are quality differentials among pharmaceutical products from which they may choose.[40] Consequently, most physicians and pharmacists have placed their faith in the large ethical pharmaceutical firms to uphold the quality standards in their "quality brand-name" products. An established firm knows that is greatest asset is its reputation for relia-bility of products and information with the medical profession.[41] Therefore there is little likelihood that these firms would jeopardize their reputa-tion by the production of sub-standard products.

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it be said that compliance to specifications is synonymous with clinical effectiveness.

The development of adequate standards is only half the problem. The other half, as mentioned by Dr. Pernarowski, is to assure that all pharma-ceutical products comply with these standards.

In his study of twenty-three brands of phenylbutazone tablets, Dr. Pernarowski found that five of the brands (21.7 percent) failed to comply with pharmacopeial specifications, and that two additional brands were in doubt. Hence, this implies that seven (or 30.4 percent) of the brands were not equal to the best brands on the market.

[39]This is substantiated by the following recommendation of the Harley Committee (Drug Costs and Prices, Final Report, p. 53.):

"That the personnel and facilities of the Food and Drug Directorate be expanded to make possible the implementation of the recommendations of the Boyd Committee, the Hilliard Committee and this Committee".

[40]In the training of both these professions, considerable emphasis has been placed upon the usage of high quality products. Since neither profession is equipped to do its own chemical assay work, this responsi-bility has been delegated to the manufacturer. As Dr. Pernarowski pointed out, some firms diligently fulfill this responsibility, while others take shortcuts.

[41]Harley, Minutes and Proceedings, op. cit., p. 303.

F. Trade Associations within the Pharmaceutical Industry

1. The Pharmaceutical Manufacturers Association of Canada (P.M.A.C.)

The Pharmaceutical Manufacturers Association of Canada is a non-profit organization founded in 1914 and incorporated under the Dominion Companies' Act in 1959. It represents fifty-seven companies, engaged in manufacturing and marketing ethical pharmaceutical products. These companies account for eighty-five percent of the total dollar value of ethical products sold in Canada, under both brand and/or generic name.[42]

The principal aim of the P.M.A.C. is to advance the interests of pharmaceutical manufacturers. Its objectives are:

> "To promote and encourage the inter-change of knowledge and ideas for the betterment of the pharmaceutical manufacturing industry and its services;
> To foster mutually constructive and satisfactory trade relations and to maintain and improve public relations;
> To co-operate with legislative committees, government departments and agencies, medical and pharmaceutical societies, and other bodies in respect to matters affecting the pharmaceutical manufacturing industry;
> To promote among the members of the Association a spirit of friendly co-operation, thereby striving for cordial intra-industry relations."[43]

Membership is by election and applicants are required to abide by the Association's: (1) Principles of Ethics; (2) Code of Marketing Practice; (3) By-laws; (4) Standards of Manufacture and quality control; and (5) other rules and regulations which may be in force from time to time.

The principal contribution of the P.M.A.C. to this thesis has been the general and statistical information contained in their brief to the Harley committee on Drug Costs and Prices.

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[42]Harley, Second (Final) Report, op. cit., p. 9.
[43]Harley, Minutes and Proceedings, op. cit., p. 328.

2. The Association of Canadian Drug Manufacturers (A.C.D.M.)

In 1966 the Association of Canadian Drug Manufacturers had fifteen member firms. Their share of the industry's total dollar value of factory shipments amounted to 10 percent.[44] These firms are Canadian owned and operated as opposed to most members of the P.M.A.C. The A.C.D.M. is a voluntary organization, and in 1966 was in the process of implementing a Code of Ethics for their members.

3. The Independents

The Independents are not organized as a group. They represent not more than 5 percent of the value of the industry's factory shipments. The Independents are those manufacturers who do not wish to be members of the first two groups, or who might not be permitted to be. The A.C.D.M. and the Independents have not played any role in the writing of this thesis, due to a lack of specific information on their activities.[45]

IV. SUMMARY

The ethical pharmaceutical industry was defined as those manufacturers whose product promotion was directed towards physicians and pharmacists. Economic factors characteristic of the industry were: (1) a differentiated ologopolistic market structure; (2) inelastic demand; (3) high levels of risk and profit; (4) predominant foreign ownership; (5) governmental regulatory control; and (6) the presence of two formal trade associations, the P.M.A.C. and the A.C.D.M., with the balance of the manufacturers loosely grouped together as the Independents. The P.M.A.C. exerted considerable influence over its members and is the dominent group within the ethical pharmaceutical industry.

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[44]Harley, Second (Final) Report, op. cit., p. 9.

[45]However, their omission is not felt to be serious, as their combined market share amounted to only 15 percent of the industry's total dollar value of factory shipments.

CHAPTER III

THEORETICAL APPROACH TO THE MEASUREMENT OF MARKETING COSTS

I. INTRODUCTION

In recent years, society as a whole and governments in particular

have developed an interest in the level of marketing costs that are

incurred within the ethical pharmaceutical industry. While unit costs

in manufacturing are being reduced, marketing costs continue to rise. They

account for a large share of the dollar value of the product as it moves

from production, through the marketing system, to final consumption.

Critics maintain that these costs are excessive and wasteful, and that a

responsible marketer should emphasize cost reduction, since there is a

lack of satisfactory techniques in the area of quantitative evaluation of

marketing efficiency.

This Chapter is concerned with the establishment of the basic theore-

tical framework of marketing costs, that will involve an understanding of

the following areas of thought:

(1) the definition of marketing costs, involving the identification

of marketing functions and the costs of performing these functions.

(2) cost evaluation, involving the definition of marketing efficiency

and a quantitative method of measuring efficiency.

Subsequent Chapters will be built around this theoretical framework in

order to analyze the level and the composition of marketing costs.

II. THE DEFINITION OF MARKETING COSTS

Several approaches[1] to defining marketing costs involve the division

of the marketing system into functional areas, so that each area in turn

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[1]The writer notes that these are not the only three definitions of
marketing costs, but they were chosen in order to exemplify the variation
of thought on this subject.

is definable and measurable.

A. J. W. Culliton

J. W. Culliton defined marketing costs as those costs associated with:
(1) the creation of a sale; (2) the stirring up of new wants; (3) the
design of saleable goods, and (4) the delivery of goods to fill existing
wants or to complete a sale already made.[2] He was concerned with marketing
costs from the viewpoint of managerial control, that is, Culliton's defini-
tion was intended to help managers ensure that the value received was in
line with the cost of the outlay.

B. Staudt and Taylor

Staudt and Taylor, on the other hand, defined three groups of market-
ing costs of the basis of the functions performed. They were: (1) sales
getting costs, (2) order-filling costs, and (3) sales maintenance costs.
Each cost group was further divided into fixed and variable costs. This
classification system was used so that marketing costs could be adapted
to a modified break-even analysis.[3]

C. Robert Buzzell

Robert Buzzell used a third method of defining marketing costs. In
his work on productivity measurements applied to marketing,[4] he divided
the marketing system into various functions[5] so that each function could

[2]J. W. Culliton, The Management of Marketing Costs, (Harvard University: Boston, 1948) p. 9.

[3]This permits speculation on the degree of profitability at any price level for each product produced. The firm's total cost curve is plotted by varying quantities of production. The total revenue curve for each of several possible prices is also plotted for varying quantities of production. The distance between the total cost curve and the total revenue curve indicated the level of profit attained for each quantity produced with each of the various prices. However, this is a static analysis of the firm's profit posi- tion that may give a false picture if adapted to the real world situation.

[4]R. D. Buzzell, "Productivity in Marketing", (Unpublished doctoral dissertation, University of Ohio, 1957).

[5]These functions were: buying, selling, transportation, storage, stan- dardization and grading, financing, risk-bearing and marketing information.

subsequently be analyzed and measured by the development of a unit of output measure. The aggregated dollar value of all the outputs was then to be determined by weighing each output in accordance with its quantitative importance. However, Buzzell found that the functional marketing areas he defined were not accounting centers and as a result cost data were unobtainable. Additionally, many of the function's outputs were based upon different quantitative units of measure, and could not be brought to a common base for aggregative purposes. Consequently, Buzzell redefined marketing costs into either value contributed or value added and was subsequently able to determine productivity measurements relative to the marketing system.[6]

D. Definition of Marketing Costs Incurred In the Pharmaceutical Industry

1. Definition of the Marketing Functions

An ethical pharmaceutical firm's marketing functions are comprised of those tasks performed within three functional areas: distribution, promotion and administration.[7]

a) The Distribution Function

The scope of the distribution function performed by an ethical pharmaceutical manufacturer includes its shipping department and extends to the initial buyer who takes ownership of its products. This function may include three tasks, depending upon the channels of distribution that are used by the individual firm.

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[6]R. D. Buzzell, Value Added by Industrial Distributors and Their Productivity, (Ohio State University, 1959) p. 79. Value added and value contributed are defined later in this Chapter.

[7]This unusual classification of marketing functions is used solely in order to duplicate that classification system used by individual firms and the P.M.A.C. in their collection and compilation of statistical cost data. Recognition is given to the fact that administration is normally not considered a functional area.

All firms have their shipping departments perform the task of _sorting out and accumulation_ of their products. This involves the jobs of: standardization and grading of products, storage of products prior to shipment and preparation of the products for shipment. The task of _warehousing_ products in depots and their subsequent allocation occurs as a result of the use of direct channels of distribution. This task involves the same basic jobs that are performed by the firms' shipping departments. The task of transportation is performed by facilitating agents and involves the physical movement of the firms' products from their shipping departments to the initial buyers.

b) The Promotion Function

The promotion function is normally classified into three activities: personal selling, mass selling and sales promotion. These methods are used to achieve the following interrelated tasks: (1) to get attention, (2) to hold interest, (3) to arouse desire, and (4) to obtain action. _Personal selling_ involves direct face-to-face relationships between sellers and potential customers. On the other hand, _mass selling_ seeks to communicate ideas or information to large numbers of customers at the same time. Advertising is the main form of mass selling; it is any paid form of non-personal presentation or promotion of ideas, goods, or services, by an identified sponsor. _Sales promotion_ activities can make both personal selling and mass selling more effective by co-ordinating both efforts. They stimulate consumer purchasing and dealer effectiveness by means of shows, exhibitions, demonstrations, samples, point-of-purchase materials, and various non-recurrent selling efforts not in the ordinary

routine.[8]

In this thesis however, the promotional function is classified into slightly different activities.[9] They include: (1) personal selling by detailmen, (2) mass selling by journal advertising and direct mail, (3) Sales promotion involving the distribution of samples, and (4) public relations involving those activities necessary to acquire a public image or personsity in the minds of physicians and channel members, for example: the production of medical films, periodicals and the sponsorship of symposia and exhibits.

c) The Administration Function

The administration function involves the administration of marketing activities. More specifically, it includes the tasks of management and staff services in the administration of the defined marketing functions plus product and pricing strategies and market research.

2. The Measurement of Marketing Costs

Marketing costs refer to the expenses incurred by a firm in the performance of its marketing functions. An expense is the expired cost of the flow, into the market, of goods or services that are directly or indirectly related to the given fiscal period.[10] As a result of this time constraint two types of expenses (costs) are incurred: outlay costs and book costs.

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[8]E. J. McCarthy, Basic Marketing, (Richard Irwin:Homewood Illinois, 1964) pp. 640-646.

[9]This classification parallels that system used by firms and the P.M.A.C. in the collection of their statistical cost data. It would be more usual for public relations to be considered under a separate department.

[10]E. S. Hendriksen, Accounting Theory, (R. D. Irwin, Inc.:Homewood, Illinois, 1965) p. 143.

a) Outlay Cost

An outlay cost refers to those costs that are represented by an expenditure of cash or a transfer of property.[11] They are objectively determined and are usually definite in their amount.

b) Book Cost

Book costs commonly refer to depreciation costs and comprise the difference between the net value at which an asset appears on the books of account, as distinct from the asset's market or intrinsic value.[12] Depreciation expense is incurred when the economic life of the goods extends beyond the given time period, and it refers to the estimated cost of the expired usefullness of the goods (assets) within the given time period. The book entries, as opposed to cash payments, of the depreciation expense are based upon the application of depreciation rates to assets. Depreciation expense may not be definite in amount, due to the variation in the methods of determining the rate of depreciation, nor may they be as objectively determined due to the different methods of asset valuation to which the depreciation rates are applied.

Various methods have been suggested for determining the rate of depreciation to be applied to a given asset. However, only the declining balance method is acceptable in Canada for income tax purposes. Nevertheless, other methods may be used in the preparation of a firm's financial statements if they are to be used for other than income tax purposes. Consequently in any cost comparison the analyst should endeavour

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[11]E. L. Kohler, A Dictionary for Accountants, (Prentice-Hall: Englewood Cliffs, N. J. 1963) p. 349.
[12]Ibid., p. 71.

to establish what methods have been used for determining the rate of depre-

ciation, in order for these expenses to have greater meaning.

Depreciation expenses may not be as objectively determined

as outlay costs, due to the different methods of asset valuation to which

the depreciation rates are applied. As a result, similar assets may vary

widely, from firm to firm, in their magnitude that is shown in the firms'

financial statements. Hence, an analyst must be aware of these methods of

asset valuation if he is concerned with the comparability of figures

between firms. The methods of asset valuation include: economic life,

historical cost, and current cost.

(1) Economic Value as a Basis of Valuation

Economic value is defined as the present value of an

asset's expected future receipts.[13] Accountants have rejected economic

value as the basis of asset valuation and income determination in account-

ing on the strength of the following arguments.[14]

(a) A fully detailed statement of a firm's assets

would require the valuation of each asset taken by itself. For the most

part, a firm's assets derive their value from their place as part of an

integrated whole. Taken by itself, any one such asset has little or no

value, and the future receipts it would produce are negligible.

(b) The economic concept of income includes all value

changes, whether realized or unrealized. That is, income is not recognized

at the time of production or of sale, but rather at either the time the

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[13]Gordon and Shillinglaw, Accounting A Management Approach, (Richard
Irwin, Inc.:Homewood, Illinois, 1964), p. 265.
    [14]Ibid., pp. 252-256.

asset is purchased, or at the time the firm recognizes a change in the future receipts the asset will produce. Income defined in this way cannot be classified in any meaningful way.

(c) The accountant cannot meaningfully implement this basis of valuation in any objective way. A firm's owners or stockholders and creditors make investment and disinvestment decisions on the basis of their judgment as to the future consequences of their actions. This judgment is improved by the provision of objective accounting data.

(2) Historical Cost as a Basis of Valuation

Historical cost or acquisition cost represents the cost to the firm at the time of the acquisition of goods or services. That is, all outlays necessary to render an asset suitable for its intended use should be treated as elements of the asset's cost. The historical cost basis of valuation rests on the assumption that historical cost or depreciated cost is a valid and workable quantitative measure of economic activity.[15] The acceptance of this basis of valuation is founded on the following reasons.[16]

(a) If the business is not in fact going to be sold, there is no point in valuing the assets at what they could be sold for (current market values).

(b) Valuing assets at their purchase price is a more definite and certain basis than the alternative of attempting to estimate current market values.

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[15]E. L. Kohler, op. cit., p. 147.

[16]R. N. Anthony, Management Accounting, Text and Cases, (Richard Irwin, Inc.,:Homewood Illinois, 1960) p. 32.

(c) If the accountant based his figures on current market values, he would be obliged to keep track of the ups and downs of market prices, which would add to the complexity of his task.

(3) <u>Current Cost as a Basis of Evaluation</u>

Current cost is historical cost restated in terms of current prices. That is, the cost of the items making up a firm's balance sheet or income statement is expressed at present day price levels. This may be accomplished by:[17]

(a) applying to the historical cost the appropriate index numbers (adjusted historical cost) or by

(b) substituting for historical prices currently prevailing prices of equivalent goods and services (replacement cost).

The use of this method of valuation has gained considerable support in recent years within the United States. However, the issue of current cost versus historical cost valuation is beyond the scope of this thesis. It is presented to enlarge the background against which present-day accounting methods of valuation are viewed.

The financial data shown in Appendix I was not presented in sufficient detail to identify the method of asset valuation and the method of calculating the rate of depreciation. Historical cost is the most probable basis of asset valuation used by firms in the preparation of their financial statements. However, it has been necessary to assume that the basis for calculating the rate of depreciation is similar for all firms with the result that the depreciation expense is a comparable figure.

In an analysis and comparison of costs, many different types of costs will be encountered and as a result it is important to be familiar with

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[17]E. L. Kohler, <u>op</u>. <u>cit</u>., p. 154.

them and their distinguishing features.[18]

The actual cost figures used in subsequent chapters were obtained in briefs presented to the Harley Committee on Drug Costs and Prices in 1966, and it is assumed that these briefs contain the best possible available information.

III. COST EVALUATION

In their reply to the criticism directed towards their marketing costs, management has had to rely primarily upon a subjective rebuttal, due to the lack of satisfactory techniques in the area of quantitative evaluation of marketing efficiency. Financial accounting ratios have been used extensively in an attempt to evaluate and compare the pharmaceutical marketing institutions with other segments of the business community.[19] However, the fact that management's response has been weak is well illustrated by numerous governmental probes[20] into matters which previously were only the concern of the business community. One may only expect greater governmental inter-

[18]A comparison of the types of costs and the basis of their differentiation is shown in the table below.

Classification of Cost Distinctions

Dichotomy		Basis of Distinction
opportunity cost	outlay cost	nature of the sacrifice
past cost	future cost	degree of anticipation
short-run cost	long-run cost	degree of adaptation to present outlay
variable cost	constant cost	degree of variation with output rate
traceable cost	common cost	traceability to unit of operations
out-of-pocket cost	book cost	immediacy of expenditure
incremental cost	sunk cost	relation to added activity
escapable cost	unavoidable cost	relation to entrenchment
controllable cost	uncontrollable cost	controllability

Source: J. Dean, Managerial Economics, (Prentice-Hall:Englewood Cliffs, New Jersey, 1951) p. 271.

[19]H. C. Harley, Drug Costs and Prices, Minutes of Proceedings and Evidence (Queen's Printers:Ottawa, 1966) pp. 695-703; 2301-2404.

[20]The Special Committee of the House of Commons on Drug Costs and Prices, 1966; the Royal Commission of Health Services, 1964; The Report of the Restrictive Trade Practices Commission on the Manufacture, Distribution and Sale of Drugs, 1963; The Royal Commission on Patents, Copyright and Industrial Design, 1960; A report on the Retail Structure of Drug Prices in Manitoba, 1961; A Report on Dispensing Costs in B.C., 1965; and The Report of the Select Committee of the Ontario Legislature on the Cost of Drugs, 1963.

ventions in the future, unless measures of productivity and efficiency of
the marketing system are developed. These measures could then be compared
with previously established standards, in order to arrive at an efficiency
rating of numerous marketing systems. Hopefully, the less efficient systems
would subsequently undergo a re-allocation of their resources in an attempt
to become more efficient. However, a standardized definition of efficiency
must be established in order for the results to be meaningful.

A. Definition of Marketing Efficiency

The definition of marketing efficiency that will be used in this thesis
is based upon productivity measures. Productivity is the ratio of marketing
output to marketing input, and its subsequent comparison to an accepted
standard results in the determination of marketing efficiency.

Ideally, this standard for comparison should reflect the level of
marketing productivity that is optimal, but in the real world an optimal
state is not realistic. Hence, the efficiency of a firm's marketing depart-
ment is judged by comparing its productivity measure with a similarly deter-
mined productivity measure of another firm or firms. Often industry averages
are considered to be the standard for comparison, and a firm with higher
relative productivity measures will have a higher ratio of outputs to inputs
and will be judged to be more efficient.

B. Traditional Methods of Evaluating Efficiency

The traditional methods of evaluating a firm's efficiency have involved
the use of financial accounting ratios and/or a subjective evaluation of the
firm's efficiency.

1. Financial Accounting Ratios

Some of the more common financial accounting ratios used in the

evaluation of marketing performance are: inventory and capital turnover; and sales per employee. Each of these ratios involves a comparison of sales volume with a different type of resource input. Sales volume, however, is not a good measure of output, as firms may make different economic contributions relative to their sales.

Since financial accounting ratios do not involve a ratio of output to input,[21] they do not measure productivity and as a result they cannot be used to measure a firm's efficiency. However in the absence of productivity measures, financial ratios serve as proxi variables in the evaluation of the strengths and weaknesses of firms or industries. The prevalence of their usage arises from the ease with which they may be calculated and compared with previously calculated financial ratios that represent the activities of other firms or industries within the same institutional area.[22] Financial ratios may also serve as a useful supplement to the use of productivity measures, as they help to explain variations between productivity measures in comparable firms or industries. However, financial ratios cannot be considered as equivalent or alternate to productivity measures in the determination of a firm's efficiency. A partial financial analysis that utilizes financial ratios is undertaken in Chapter 4 in order to determine the financial characteristics of the ethical pharmaceutical industry.

2. Subjective Evaluation of Efficiency

A firm's efficiency is often subjectively evaluated according to

[21]The ratios of gross margin to net worth and total tangible assets approximates that of a productivity measure. However, gross margin should not be considered as the economic output for the firm, since it includes values contributed by others external to the firm under study.

[22]"The Ratios of Manufacturers", Dun's Review, Vol. 90, #5, Nov. 67, pp. 78-79; "The Ratios of Wholesalers", Ibid. #4, Oct. '67, pp. 88-89; "The Ratios of Retailers", Ibid., #6, Dec. '67.

The degree of implementation of the following criteria:

a) The degree of specialization employed.
b) The degree of standardization of methods used.
c) The use of labour saving devices.
d) The presence of effective organization.
e) The provision of opportunity to employees.
f) The effects of the dynamic nature of the marketing system.
g) The degree of competition in marketing.
h) The use of market research.
i) The presence of organized education and training.

The application of these criteria to firms does not measure efficiency, nevertheless, this criteria is useful. They provide management with a subjective evaluation of: (1) the state of technology within the firm, (2) the degree of motivation of employees, and (3) the viability of the firm within a dynamic environment. This evaluation is based on the assumption that firms with a positive response to each criterion would be more efficient in their operations than firms with a negative response. Hence, the application of this subjective evaluation to firms may offer an explanation for the variation in productivity measures between comparable firms or industries. As a result, the subjective application of these criteria, without bias, may serve as a useful adjunct to productivity measures.

C. The Determination of Productivity Measures Applicable to Marketing

Productivity measures are based on two premises: (1) marketing activities are productive, and (2) marketing institutions make a contribution to the economy just as important and as necessary as those contributions resulting from manufacturing activities. However, the validity of these premises has been challenged because the results of many marketing activities are of an intangible nature and therefore are thought to be non-productive.

The productive nature of the marketing system may be substantiated by

the following argument. In manufacturing, the term value added is used in the same sense as value created or value produced. This is in line with current economic thinking, that production is the creation of economic values. These values are created through the addition of utility, which are capacities in goods or services to satisfy human wants.[11] This is the essence of production. Consequently, whoever adds utility is engaged in production. Hence a wholesaler or retailer who normally adds place, time and possession utility is as much a producer as is the processor who changes a product from one form to another. However, the degree of productivity attained by a firm is dependent upon the efficiency with which management utilizes the resources at their command. Consequently, the basic premises are valid and the technique of productivity determination may be applied to the marketing system. Initially, this involves the classification of marketing costs into value added and value contributed in order to determine the firm's economic output which is the numerator of the productivity ratio.

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[11]R. D. Buzzell, <u>Value Added by Industrial Distributors and Their Productivity</u>, <u>op</u>. <u>cit</u>.

Buzzell described four types of utility:

1. Form Utility.

Form utility is added in any extracting, processing or manufacturing operation which converts or transforms scarce resources into increasingly satisfying states.

2. Place Utility.

Place Utility is added when a product or service is made available where the customer wants it. For this purpose, goods must be transferred from where they are first available to the next location, and so on, until they reach their final destination.

3. Time Utility.

Time utility is added when the product or service is made available to the customer when he desires it.

4. Possession Utility.

Possession utility is added when the product or service is at the user's command, that is, in his possession legally and physically as through the transfer of title of goods.

1. Value Added Concept

The technique of productivity measurement is based upon the value added concept. It is not a new concept, for it has been used by the Dominion Buteau of Statistics for years in the calculation of "net production" or Gross Domestic Product for primary, manufacturing and construction industries. However, only recently has this concept been applied to the marketing system by Professor T. Beckman, of Ohio University. Dr. R. D. Buzzell, a former student of Beckman's, wrote his doctoral dissertation on the use of the value added concept in the determination of marketing productivity.[12]

Value added is defined as that part of a firm's net revenue which pays for the performance of its marketing functions and services. That is, value added is the firm's net revenue minus (1) the total cost of goods sold and (2) the value of the goods and services contributed. However, when the productivity of a firm's marketing department is being determined, the value added may or may not include the profit.

Value contributed is the cost of the goods and services purchased by the firm from external sources, for use within the firm's marketing system in the performance of its functions. It is subtracted from the gross profit in order to arrive at the value added and profit figure. This prevents uncontrollable variations in the size of a firm's value added figure, and subsequent productivity measures. Value contributed is also deducted, just as was the cost of goods sold, to prevent gross duplication in the measurement of value created. A firm's value added becomes the residual after the value contributed has been removed from the gross profit, and it normally includes the firm's profit including income taxes. If the firm

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[12]R. D. Buzzell, "Productivity in Marketing", op. cit.

can be classified as a marketing intermediary[13] then the profit is assumed
to result primarily from the performance of its marketing activities, and
the value added will include the profit figure. Otherwise the value added
will not include the profit.

The advantages of using the value added as a measure of economic
output are fourfold.

a) Value added is the best reasonably available absolute measure
of the value created in the process of whatever part of the economy is
measured. It measures, without any duplication, what the process in question
has actually added to a firm in terms of the enhanced value of goods and
services. A firm's value added may be aggregated to determine the industry's
value added. Similarly, the industry's value added may be aggregated to
arrive at the nation's absolute measure of value created.

b) Value added is the best reasonably available relative measure
of the value created, that can be used for proper and fairly accurate com-
parisons with anything else similarly measured.

c) The subsequent use of the value added figure in productivity
measurements permits the firm to look at its input costs in their proper
perspective. That is individual input costs may be compared to the total
output of the enterprise. To look at costs by themselves without regard for
the total output is not logical and may in fact lead to faulty conclusions.

d) Finally, the calculation of the value added measure should
result in improved public relations as the tendency would then be to shift
emphasis from costs and wastes to value added or economic output; that is

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[13]This includes retailers, wholesalers, manufacturer's sales branches,
petroleum bulk plants and agent intermediaries.

from a negative to a positive and constructive approach.

It should not be concluded that the value added approach implies that increases in value added are desirable per se. From a measurement point of view, value added consists of a firm's operating expenses, less value contributed, and in most instances include it's operating profit. Thus it might be objected that an inefficient firm with higher operating expenses would have a higher value added, and that calling such expenses value might encourage increases in expenses. This is not so for two reasons.[14]

First, competitive pressures prevent increases in expense apart from those justified by increased service or by inflation. That is, under a competitive system, firms have a strong incentive to hold expenses at a minimum, and as a result it may be assumed that the expenses are proportionate to the functions and services they perform.[15]

Secondly, value added is not inconsistent with cost reduction through greater efficiency. The important thing is not necessarily the ratio of value added to the net sales, but rather the total dollar amount of value added. If operating expenses can be reduced (and inturn reduce the amount of value added) and sales increase substantially as a result, the total value added in dollars will increase rather than decline.

2. The Productivity Ratio

Productivity is the ratio of an economic output to the corresponding economic input during a given period of time.

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[14]R. D. Buzzell, Value Added by Industrial Distributors and Their Productivity, op. cit.

[15]It is recognized that competition works imperfectly, and that slight differences could arise apart from differences in the services rendered. This is regarded to be exceptional, rather than typical.

The economic output refers to the results of productive activity, whether in the form of physical goods or functions and services, or some combination of the two. As has been stated, the best single reasonably available absolute measure of output is the value added in dollars. If comparisons were to be made with value added measures over a period of time, it would be necessary to adjust them by the appropriate price index in order to eliminate the effects of price level changes.

The economic input refers to the factors of production used in producing the output, that is, labour, capital, land and management. R. D. Buzzell used the following input measures in his study of industrial distributors: man-hours of labour, dollar value of total assets, and the dollar value of the net worth.[16] Factors that govern which imput measures should be used are (1) the type of industry to be analyzed, (2) the character of the functions and services performed, and (3) the availability of the relevant data. Only three input measures will be used in this study of pharmaceutical firms in Chapter Five due to the unavailability of pertinent data. These measures will be: man-hours of labour, dollar value of total assets, and the dollar value of the inventory put into the marketing system. Ideally, measurements of each of the factors of production should be used and combined into an over-all measure of the total factor productivity. Unfortunately, this is not possible with the measurement methods developed thus far, due to the lack of relevant quantitative data and the absence of a common unit of input measurement.

There are certain difficulties that one encounters in the determination of productivity measures.

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[16]R. D. Buzzell, Ibid., p. 78.

a) It is difficult to obtain sufficient relevant units of measurement for both inputs and outputs.

b) There is a lack of stability for the measurements, due to changes in the general price level. However, this may be compensated for through the use of price indexes.

c) The quality of the output generally increases over time, and productivity measures do not take this into consideration. In this respect they tend to understate the actual gain in productivity.

d) There is an inter-relationship of some of the marketing functions with those of manufacturing. That is, some functions may be transferred from one area to another, for example, packaging. This is primarily a definitional problem and should not be insurmountable.

The benefits realized by the firm from the calculation of its productivity measures are twofold.

First, productivity measures can be used to determine trends in the efficiency of a firm. They provide a bench mark against which future years' results can be evaluated. As a result, the effects of changes in, (1) the competitive structure, (2) supplier's policies, or (3) other economic variables, should be discernible in the corresponding changes of the firm's productivity measures.

Secondly, productivity measures can be used to determine efficiencies not only within a firm, but also between firms and industries. Consequently, management can determine the efficiency of its marketing system relative to that of its competition or to that of another industry. However, in order for these relative efficiency measurements to be valid and correct, their calculation must be based upon similarly determined productivity measures. These measures will be determined and interpreted for six

individual pharmaceutical firms in Chapter Five.

VI. SUMMARY

The definition of marketing costs involves the prior identification of the marketing functions. Within the pharmaceutical industry these functions were distribution, promotion and administration. Marketing costs comprise both the outlay and book costs of performing these functions. In order to assure that the book costs between various firms are comparable, the analyst must be familiar with the method used by the firms as a basis for their asset valuation as well as the method used to arrive at the depreciation expense.

Marketing efficiency involves the comparison of marketing productivity measures to an acceptable standard. The traditional methods of evaluating efficiency include the use of financial accounting ratios and a subjective evaluation of the degree of implementation of certain criteria by the firm(s) under study. Neither method measures efficiency, however, they may serve as useful supplements by their explanation of variations in efficiency measures between firms.

Productivity measures are calculated from the ratio of the economic output to the economic input. The economic output for a firm's marketing department may best be determined through the use of the value added concept. The economic inputs that will be used in this study include the man-hours of labour and the dollar value of total assets and the dollar value of the inventory put into the marketing system. As the direct result of the calculation of productivity measures for a firm's marketing department, a firm will be able to determine its marketing efficiency by the comparison of similarly determined productivity measures with other firms or industry averages. This will provide a new perspective in the management of marketing costs.

CHAPTER IV

ANALYSIS OF THE MARKETING COSTS INCURRED WITHIN
THE ETHICAL PHARMACEUTICAL INDUSTRY

I. INTRODUCTION

In 1964, the Hall Commission recommended that for income tax purposes
the deductible allowance for pharmaceutical marketing costs should be limited
to 15 percent of total sales.[1] Implicit in this recommendation is the state-
ment that these costs are excessive and need regulation in order to give the
consumer maximum value. The validity of this implication is not justified
by ascertaining the level of marketing costs alone; rather, one must consider
the effectiveness with which marketing funds are employed. It is with this
thought in mind that this chapter is written.

Initially, the financial characteristics of the pharmaceutical industry
are determined in order to isolate the constraints on the implementation of
marketing policies. This is undertaken by means of a financial analysis
involving the comparison of financial ratios for numerous industries.

Subsequently, the level of the pharmaceutical marketing effort is
identified as a percentage of sales, and then divided into its component
parts. The parts, to be defined below, are related to the firm's marketing
policies.

In order to provide the proper perspective with which one should view
the level of these costs, the writer introduces the level of marketing costs
incurred by firms in other industries to serve as a basis for comparison.

Finally, an attempt is undertaken to evaluate the effectiveness with
which the pharmaceutical firms utilize their marketing efforts. A ranked
order of effectiveness is established for the firms and related to distinc-

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[1]H. C. Harley, Drug Costs and Prices, Second (Final) Report, (Queen's
Printers:Ottawa, 1967) p. 60.

tive marketing policies.

II. FINANCIAL CHARACTERISTICS OF THE PHARMACEUTICAL INDUSTRY

A. Introduction

Since the financial characteristics of any industry act as constraints

to the marketing executive operating within an industry, proper identifica-

tion of these characteristics becomes important. These data are determined

through financial analyses, involving the calculation and interpretation of

certain relationships that give indications of relative strength and weak-

ness of a firm or of its industry. In an effort to identify the financial

characteristics of the pharmaceutical industry in Canada, the writer has

presented, based upon data supplied by the Harley Committee[1], a comparison

of selected financial ratios between fifty-one Canadian manufacturing

industries comprising 19,666 firms. This comparison of 1962 data is shown

in Table III. Additional ratios shown in Table IV are concerned with the

profitable characteristic of the pharmaceutical industry relative to all

manufacturing industries, over a twelve year period.[2] Certain conclusions[3]

have been reached about the financial characteristics of the pharmaceutical

industry by the examination of ratios shown in these Tables.

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[1]H. C. Harley, Drug Costs and Prices, Minutes of the Proceedings and Evidence, (Queen's Printer:Ottawa, 1966) pp. 697-703.

[2]Ibid., pp. 348; 600; 698; 824; 833; 942; 1020-21; 1066 and 2402-3.

[3]It is necessary to indicate the limitations of these conclusions. Generally accepted accounting principles permit some discretion on the part of accountants in their calculation of accounting entries, upon which finan-cial ratios are based. The conclusions may be based upon data that are non-comparable. In addition, most of the conclusions are based upon only one year's data, and hence, generalizations regarding subsequent year's acti-vities may not be valid. Nevertheless, financial ratios are used in this analysis as they are easily calculated, readily understandable, and can serve as general indicators of a firm or industry's financial character-istics.

TABLE III

COMPARISON OF FINANCIAL RATIOS FOR CANADIAN MANUFACTURING CORPORATIONS

IN 1962

The Canadian Pharmaceutical Industry
(224 firms including ethical and proprietary manufacturing firms)

Ratio	Pharmaceutical Industry ratio	Ranked order of the Pharmaceutical Industry Relative to the Fifty-one Industries
current ratio	3.85 times	the highest recorded ratio
fixed assets to net worth	53.3 percent	the 28th highest ratio
current debt to net worth	25.6 percent	the 12th lowest ratio
total debt to net worth	79 percent	the 25th lowest ratio
sales to net worth	2.47 times	the 29th lowest ratio
collection period	56 days	the 11th longest period
sales to inventory	5.3 times	the 20th highest ratio
cost of goods sold	49.1 percent	the 2nd lowest percentage
gross margin	50.1 percent	the 2nd highest percentage
profit on sales	8.89 percent	the highest recorded percentage
profit on net worth	21.9 percent	the 5th highest percentage

Definitions

Current ratio: the current assets are divided by the total current liabili-
ties. The current assets are the sum of cash, accounts
receivable, inventories including supplies and Government
securities. Current liabilities is the sum of bank loans,
accounts payable, tax liabilities and amounts due shareholders.
Fixed Assets to Net Worth: fixed assets are divided by the net worth. Fixed
assets represent depreciated book values of building, lease
hold improvements, machinery, furniture, fixtures, tools, and
other physical equipment, plus land. Net worth is obtained
by adding preferred and common stock plus surplus.
Current Debt to Net Worth: is derived by dividing the current liabilities by
the net worth.

<u>Total debt to net worth</u>: is obtained by dividing total current debt plus
mortgage and other funded debt by the net worth.
<u>Sales to net worth</u>: sales are divided by the net worth.
<u>Collection period</u>: annual sales are divided by 365 days to obtain the average
daily sales, which is then divided into the total accounts
receivable to find the number of day's sales tied up in
receivables.
<u>Sales to Inventory</u>: the annual sales are divided by the inventory.
<u>Cost of goods sold</u>: this includes the cost of inventory which has been sold
or used, freight or transportation, customs duties, direct
labour and factory overhead. Discounts on purchases are
deducted.
<u>Gross Margin</u>: this is derived by deducting the cost of goods sold from the
sales.
<u>Profit on Sales</u>: obtained by dividing the profit declared by the companies
by total sales.
<u>Profit on net worth</u>: obtained by dividing the profit by the net worth.

TABLE IV

COMPARISON OF PROFITABILITY FOR ALL CANADIAN MANUFACTURERS
1953 TO 1964

Year	Rate of Return on Sales		Rate of Return on Invested Capital		Rate of Return on Resources Employed	
	Pharmaceutical Industry	All Manufacturing Industries	Pharmaceutical Industry	All Manufacturing Industries	Pharmaceutical Industry	All Manufacturing Industries
1953	9.25	7.48	16.62	15.03	13.08	11.26
54	9.08	6.13	17.63	11.42	14.42	8.87
55	9.96	7.59	18.73	13.69	13.75	10.51
56	10.90	6.10	21.93	11.68	17.00	10.29
57	10.59	5.40	20.47	9.54	16.27	8.82
58	9.88	5.09	19.59	8.26	14.77	7.89
59	10.42	5.53	23.05	9.25	16.30	8.77
60	9.24	5.28	20.55	8.74	14.65	7.90
61	7.81	5.19	18.57	8.11	12.77	7.22
62	7.93	5.47	17.79	9.20	12.31	7.97
63	10.05	5.53	21.92	9.49	14.16	8.11
(PMAC	17.0)				(28.6)	
64	9.52	5.11	23.33	9.20	14.61	7.73
Average	<u>9.55</u>	<u>5.82</u>	20.00	10.30	<u>14.50</u>	<u>8.78</u>

<u>Definitions</u>:

<u>Return on Sales</u>: the net profit before taxes and bond and mortgage interest
expressed as a percentage of sales, less investment income
and other revenue.
<u>Return on Invested Capital</u>: the net profit as above expressed as a percentage
of the sum of the following amounts: due to shareholders;
mortgage debt; other funded debt; common stock; preferred
stock and surplus less deficit.

<u>Return on Resources employed</u>: the net profit as above expressed as a percen-
tage of the total assets less accumulated depreciation.

B. <u>Conclusions</u>

<u>Conclusion 1</u>

In 1962 the average pharmaceutical firm would have been able to liquid-

ate its current assets at only twenty-six percent of their book value

and still pay off its creditors in full.

<u>Explanation</u>: the pharmaceutical industry had the highest current ratio[4]

(3.85) of the fifty-one industries studied.

<u>Conclusion 2</u>

The average pharmaceutical firm in 1962 was not overly burdened with

short term debt and the risk of debt was borne to a large extent by

the owners.

<u>Explanation</u>: the ratio of current liabilities to net worth[5] was

determined to be (25.6 percent) the twelfth lowest of all the

industries studied.

<u>Conclusion 3</u>

The average pharmaceutical firm did not invest excessive ownership

funds in assets with a low rate of turnover.

<u>Explanation</u>: the ratio of fixed assets to net worth[6] (53.3 percent)

ranked 28 highest of the fifty-one industries studied.

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[4]The current ratio indicates the extent to which the claims of short-
term creditors are covered by assets that are expected to be converted into
cash in a period roughly corresponding to the maturity of the claims. Al-
though other ratios will measure liquidity, the current ratio is the gener-
ally accepted measure of short term solvency or liquidity. J. F. Weston and
E. F. Brigham, <u>Managerial Finance</u>, (Rinehart:Toronto, 1966) p. 70.

[5]This ratio measures the amount of funds supplied by owners against the
amount raised by current debt.

[6]This ratio determines the extent to which ownership funds are sunk in
assets with relatively low turnover.

<u>Conclusion 4</u>

The average <u>ethical</u> firm in 1964 had a wide margin of safety in its

ability to meet annual fixed interest charges.

<u>Explanation</u>: the ratio of times interest earned[7] indicates that the

average P.M.A.C. firm earned an operating profit of 5.95 times

the size of its annual interest charges. The income statements

for the P.M.A.C. and six ethical firms are shown in Appendix I.

<u>Conclusion 5</u>

Inventory was converted into more liquid assets at a faster rate by

the average pharmaceutical firm than by the average firm in each of

thirty-one other industries.

<u>Explanation</u>: their sales to inventory ratio[8] of 5.3 ranked the twentieth

highest of the fifty-one manufacturing industries studied. A

comparable ratio of 5.45 was attained by the average ethical firm

in 1964.

<u>Conclusion 6</u>

A condition of doing business within the pharmaceutical industry is

the unusually long collection period for the accounts receivable.

<u>Explanation</u>: only ten industries had a longer collection period than

the fifty-six days for the pharmaceutical industry. The average

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[7]This ratio is determined by dividing profit before interest and taxes by the total interest charges for a given time period. It indicates the extent to which earnings could decline without a resultant financial embarrassment to the firm because of inability to meet annual interest costs.

The total P.M.A.C. earnings on ethical pharmaceuticals in 1964 was $18,325,315, and the corresponding interest charges were $309,435.

H. C. Harley, <u>Minutes and Proceedings, op. cit.</u>, p. 348.

[8]The lack of a standard method of inventory valuation may result in the use of ratios based upon non-comparable data. The P.M.A.C. sales in 1964 were $107,784,503 and the inventory was valued at $19,789,317.

<u>Ibid.</u>

ethical firm had a collection period of sixty-two days in 1964.[9]

The collection period can best be evaluated by comparing it with the terms on which the firm sells its products. The basic terms of sale within the pharmaceutical industry was net thirty days. However, extended dating up to one hundred and twenty days was readily available on both seasonal and quantity purchases. In addition, some ethical firms offered extended dating to new customers to help them become established.[10] These lengthy collection periods are not a reflection of the poor financial condition of the industry's prime customers, retail pharmacies. The rate of failure in retail pharmacies is relatively low.[11]

Conclusion 7

Over a twelve year period, the pharmaceutical industry was more profitable than the average of all manufacturing industries.

Explanation: Table IV shows that the average rate of return on sales for the pharmaceutical industry was 64 percent higher than the average rate for all manufacturers, (9.55 percent as compared to 5.82 percent). Similarly, the return on invested capital was 95 percent higher (20 percent as compared to 10.3 percent) and the return on resources employed was 65 percent higher (14.5 compared to 8.78).

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[9]Ibid. The P.M.A.C. sales were divided by 365 to determine the average daily sales, which in turn was divided into the accounts receivables ($18,265,033) to arrive at the number of days (62) that sales were tied up in the receivables.

[10]Two examples known to the writer are Ciba Co. Ltd. and H.K. Wampole Ltd.

[11]Restrictive Trade Practices Commission, The Manufacture, Distribution and Sale of Drugs, (Queen's Printer:Ottawa, 1963) Appendix Q, p. 78. Over the nine year period from 1951 to 1959 there was an average of only seven failures in retail pharmacies. This represented 1.2 percent of all retail failures or only .16 percent of all registered pharmacies in Canada.

<u>Conclusion 8</u>

The average <u>ethical</u> firm was more profitable than the average firm
within the entire pharmaceutical industry.

<u>Explanation</u>: in 1964 the ethical firms' return on sales was about
79 percent higher than the average return for the pharmaceutical
industry (17 percent compared to 9.52 percent). Their return on
resources employed was 96 percent higher (28.6 compared to 14.6).

<u>Conclusion 9</u>

Financial leverage should be favourable to pharmaceutical firms, since
in 1962 they represented a low risk to their creditors and reflected
high earnings.

<u>Explanation</u>: conclusions 1 to 4 directed attention to the relatively
low risk factors associated with pharmaceutical firms. Hence,
they may qualify for prime interest rates on debt. Conclusions
7 and 8 indicated that the average firm was characterized by a
high degree of profitability. Therefore, in all likelihood
pharmaceutical firms on the average would earn more on their
borrowed funds than they pay in interest charges, magnifying the
returns to the owners.[12]

III. COMPARISON OF MARKETING COSTS INCURRED WITHIN THE
ETHICAL PHARMACEUTICAL INDUSTRY

A comparative analysis of the marketing costs incurred by the P.M.A.C.
and six member firms is shown in Illustration 6..[13]

[12]Financial leverage works both ways however, and if the cost of debt
was greater than the earnings, it would be unfavourable to the firm.

[13]H. C. Harley, <u>Minutes and Proceedings</u>, <u>op. cit.</u>, pp. 348, 600, 824,
833, 942, 1020 and 1066. Definition: the marketing costs are expressed as
a percentage of the individual firm's sales. The P.M.A.C. figures are an
aggregate of forty-one individual firms.

ILLUSTRATION 6

COMPARISON OF MARKETING COSTS INCURRED BY ETHICAL PHARMACEUTICAL FIRMS

PMAC	3.8	PS 15.0	4.0	MS 10.2
FIRM A	D 4.6	PS 12.2	3.2	MS 5.9
FIRM B	D 13.9	PS 10.3	MS 9.0
FIRM C	D 8.0	PS 19.0	MS 12.0
FIRM D	3.0	PS 7.5	1.6	MS 8.9
FIRM E	2.6	PS 9.3	AD 7.0	MS 14.7
FIRM F	D 7.5	PS 13.4	3.6	MS 7.7

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
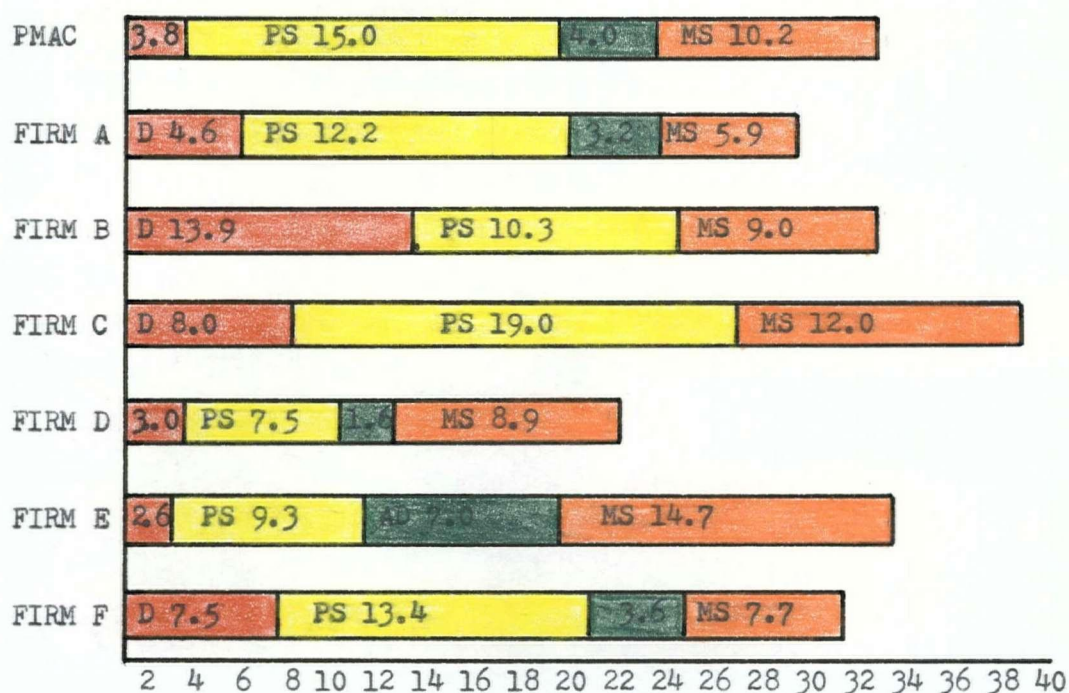
Definitions:

◼ D = Distribution and warehousing costs

◻ PS = Personal selling costs

◼ AD = Administration of marketing activities

◻ MS = Mass selling

The P.M.A.C. spent thirty-three percent of its sales on the marketing function, whereas the amount spent by the six individual firms varied from twenty-one to thirty-nine percent of their sales. This spread in marketing costs results primarily from differing degrees of emphasis that individual firms placed on their marketing mix, as a result of separate marketing policies. Consequently, through a comparison of marketing policies and attendant marketing mixes, reasons for these variations may be determined.

A. Comparison of Marketing Mixes

The firms' marketing mixes will be compared under the headings of: product policies, distribution policies and promotional policies. Pricing policies will not be considered as they do not have a direct effect on marketing costs.

1. Product Policies

The firms' major product policies are summarized in Table V.[13]

TABLE V

SUMMARY OF MAJOR PRODUCT POLICIES

	Firm A	Firm B	Firm C	Firm D	Firm E	Firm F
Market Research department					YES	
Licensed products	YES					
Bulk import						YES
OTC product line	MAJOR	MAJOR	MINOR	MINOR	MINOR	MAJOR
Impact of the research dept.	MINOR	MAJOR	MAJOR	MAJOR	MAJOR	MINOR

To a large degree, a firm's success may be related to its strategic product policies. Firm A is very heavily dependent upon the sales generated by "a great many compounds brought to (Firm A) through arrangements with well known European pharmaceutical companies".[14]

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[13]Ibid., pp. 591-636, 757-825, 870-883, 939-969, 1013-1021 and 1057-1068.
Firms with leading OTC products in some of these market segments are regarded as having a "major" line of OTC products. Some examples of these market segments are: cough syrups, cold tablets, lozenges, vitamins, pain relievers, etc. A "minor" OTC product line refers to very limited representation in these OTC market segments.

A research department exerts a major impact on the firm's activities if it is able to introduce new original products that subsequently become leaders in their therapeutic market segment. In contrast, a minor influence is exerted if the research dept. is relatively non-productive regarding original products or is only capable of introducing variations in original products already established in the market segment. These variations may occur in the form of package size, dosage form, or chemical formulation.

[14]Ibid., p. 874.

On the other hand, Firm D had introduced into Canada outstanding products from its own international research facilities.[15] The same is true but to a lesser extent for Firms B, C and E. Only Firm E maintained the facilities of a market research department, that exerted considerable influence on the planning and implementation of product strategies. Firm F imported certain bulk pharmaceuticals and resold them under its own brand name. Its OTC products generated thirty percent of the firm's sales volume.[16]

A comparison of the firm's product assortment is shown in Table VI. This illustrates: the percentage of the therapeutic market segments, within which the firms compete, the number of product lines[17], and the size of the product

TABLE VI

COMPARISON OF PRODUCT ASSORTMENTS

Firm	Number of Product Lines	Product Assortment	Degree of Representation in the 24 Therapeutic Market Segments
Firm A	68	298	75 %
Firm B	66	637	79 %
Firm C	73	200	62 %
Firm D	41	234	62 %
Firm E	40	151	50 %
Firm F	75	500	62 %

[15]Ibid., p. 819-821. Their sulfonamide has become one of the most widely prescribed sulfonamides in the treatment of urinary tract infections in Western countries. In 1960, their tranquilizer was a major advance in psychochemotherapy. It acted specifically on anxiety and tension states without dulling the patient. In 1963 they introduced another product that represented another important contribution for in addition to its psychopharmaceutical properties it was described as "a muscle relaxant of unusual potency".

[16]Ibid., p. 988.

[17]P. Kotler, Marketing Management, (Prentice Hall Inc.,:Englewood Cliffs, N.J., 1967) p. 289. A pharmaceutical product line refers to a group of products that are closely related because they satisfy a class of therapeutic needs. The number of different product lines offered by the firm refers to the width of its product mix.

assortment.[18] Firm B has the largest product assortment (637 products) and competes in 79 percent of the therapeutic market segments. In contrast, Firm E has the smallest product assortment (151 products) and competes in just 50 percent of the market segments.

2. Distribution Policies

To cope with emergency conditions, prescription products must be made available throughout Canada at all times. Consequently, the types of channels of distribution used become an important policy decision for each firm. A pharmaceutical firm may distribute its products in various ways according to the market to be served, as shown in Illustration 7.

Illustration 7

DISTRIBUTION CHANNELS USED BY THE SIX SELECTED PHARMACEUTICAL FIRMS

Firm A	-----Wholesaler----> { Dispensing physicians, Pharmacies, Hospitals, ———> Patient Gov't Dept. & Institutions }
Firm B	-----Wholesaler----> { Pharmacies, and others ———> Patient }
Firm C	-----Wholesaler----> { Pharmacies, and others ———> Patient }
Firm D	——Wholesaler——>} Pharmacies, D------------------> } ———> Patient D ————————> and others
Firm E	——Wholesaler——>Pharmacies, ———> Patient D ————————> and others
Firm F	-----Wholesaler----> { Pharmacies, ———> Patient D ————————> and others }

———> Primary Channel   ----> Secondary Channel   D–direct distribution

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[18]Ibid. The product mix refers to the composite of products offered for sale by a firm including variations in a product's dosage forms and package sizes. The depth of the product mix refers to the average number of items offered by a firm within each product line. In this analysis the depth becomes meaningless due to the averaging out of such large product lines.

Hospitals are normally supplied direct, though they may on occasion buy through the regular trade channels; that is, through the wholesaler network. Retail pharmacies and dispensing physicians are supplied direct or through the wholesaler network, or both. Many larger companies prefer to sell direct to the pharmacist and facilitate this policy by maintaining warehouses or depots in strategically located cities. In some cases, the manufacturers own or operate their own warehouses; in others, a number of manufacturers use the facilities of a warehousing company. However, certain companies prefer to distribute their products entirely through wholesalers. They include some of the larger firms and most of the smaller ones, who would not find it economical to maintain their own distribution facilities. Individual firms choose the channels of distribution most economical in view of the size and nature of their market. However, none rely entirely upon their own facilities, as all firms distribute through wholesalers to a certain degree.

It is basic to the distribution policy of the ethical pharmaceutical industry to accept returned prescription products for credit. This policy was found necessary due to: (1) the proliferation of products within the same therapeutic market segment, (2) the hesitancy of wholesalers and pharmacists to stock the complete range of products within each therapeutic market segment, and (3) the relatively short shelf-life of some of the products. Consequently, this policy was implemented as an inducement to ensure more complete distribution of prescription pharmaceuticals. However, firms vary in the degree of credit extended, and in the conditions under which credit is granted. Generally, most firms accept pharmaceuticals for full credit provided their original container remains unopened and the products

are returned prior to their expiry date.[19]

3. Promotion Policies

The communication objectives of pharmaceutical firms are twofold, the dissemination of scientific information and the promotion of pharmaceutical products. Firms maintain that they have a social responsibility in providing a rapid dissemination of product information. Delays could well cause unnecessary loss of life and suffering. The promotion of a new product is necessary since it would not be the only effective medicine within a therapeutic market, however, it would usually present definite advantages for patients with certain conditions. Nevertheless, the product would not come into wide usage unless physicians were properly informed of its characteristics.

Promotion should not be confined only to new products. Over a period of time, new information becomes available on indications or contraindications for existing products. Also, the sales for established products are dependent upon the maintenance of the promotional effort. This characteristic of competitive rivalry should be expected due to the presence of the practice of non-price competition and the oligopolistic market structure. As a result of the continual enlargement of knowledge, both product and scientific, and the shifting of physicians' preferences, due to increased product differentiation, firms attempt to do their best to influence the

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[19]H. C. Harley, Minutes and Proceedings, op. cit., p. 952 and p. 616.
Firm E paid the wholesaler an additional 15 percent on the value of any returns in order to ensure that his representatives check regularly that pharmacies' stocks of its products are in good condition. The return of out-dated products consistently amounted to 5 percent of Firm C's sales, and virtually all of their returned goods represented a total loss, as only 10 percent of the value of total returned products could be salvaged.

patterns of use that emerge.

Traditionally a firm's greatest asset has been its reputation for quality and reliability with the nation's prescribing physicians. Consequently, firms would be hesitant to jeopardize this reputation by wilful misrepresentation or exaggeration. General guidelines have been established in the P.M.A.C.'s Code of Marketing Practice.[20] This is an attempt to prevent the forces of competitive rivalry from coercing firms to implement business practices that go beyond the ethical limits of influencing demand. Additionally, the Food and Drug Directorate exercises controls over the reliability of products and product information. The Directorate must pass judgment on the safety and efficacy of products and approve the basic product circular, upon which all subsequent promotion is based. As a result, firms encounter strict regulations particularly within the area of communications.

A comparison of the firms' promotional blend of their mass selling[21] and personal selling expenses is shown in Illustration VIII. It indicates that firms with indirect channels of distribution have a promotional blend that emphasizes mass selling rather than personal selling. On the other hand, firms with direct channels emphasize personal selling.

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[20]Ibid., p. 332-40.

[21]E. McCarthy, Basic Marketing, (R.D. Irwin:Homewood, Illinois, 1964) p. 643.
Mass selling communicates ideals or information to large numbers of customers or influencials at the same time. It has less flexibility than personal selling, but when the numbers of physicians, pharmacies and hospitals are large, it becomes less expensive. For the purposes of this report, mass selling is defined to include: journal advertising, direct mail, sampling (sales promotion), and public relations. This classification system is used, as it duplicates that system used to collect the original statistical cost data. Recognition is given to the fact that public relations is normally not included as a mass selling cost, but rather is classified separately by itself.

ILLUSTRATION 8

PROMOTIONAL BLEND OF MASS AND PERSONAL SELLING ACTIVITIES

USED BY ETHICAL PHARMACEUTICAL FIRMS

Direct Channels of Distribution

FIRM E

FIRM D

Primary Channels
are indirect

FIRM F

FIRM C

FIRM B

FIRM A

FIRM G

2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1/1	1.2/1	1.4/1	1.6/1
1	1	1	1	1	1	1	1				

Ratio of personal selling to mass selling   Ratio of mass selling
                                                    to personal selling
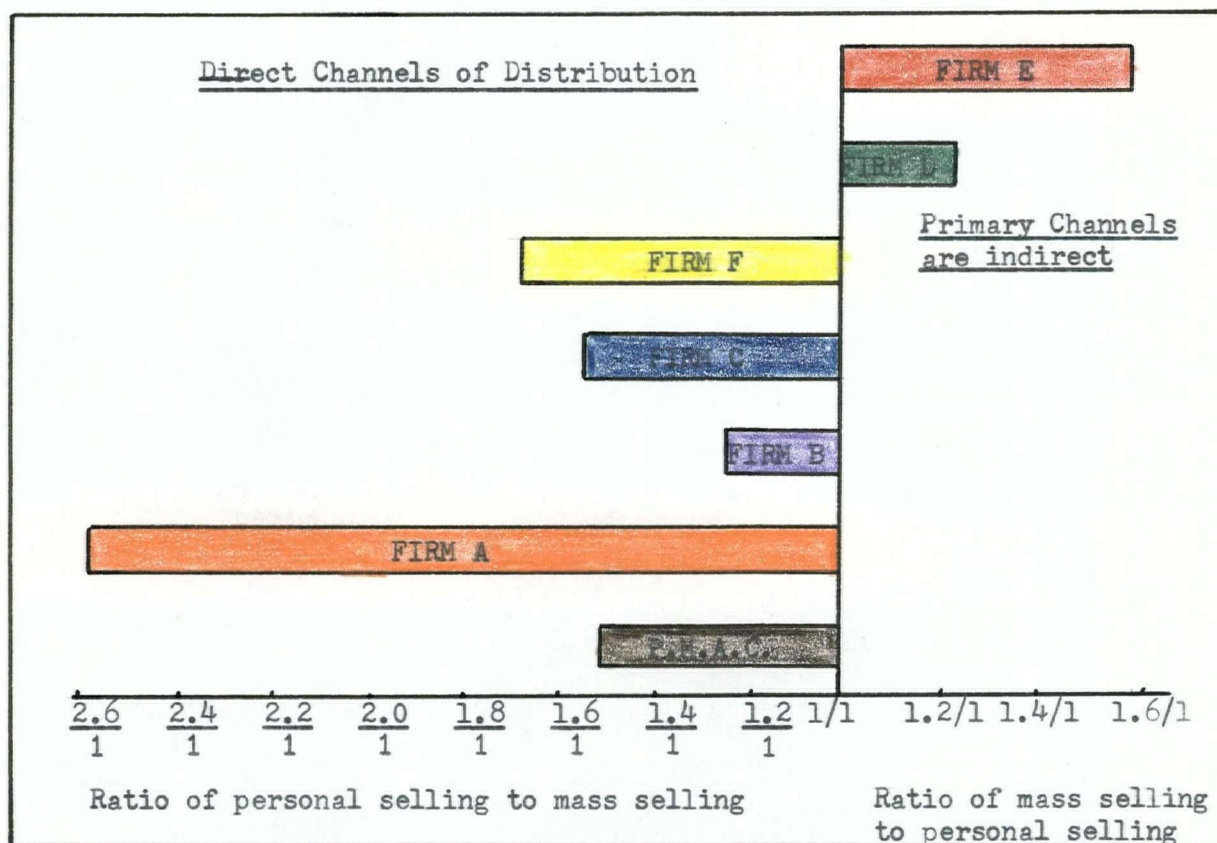
B. Comparison of Marketing Costs

The marketing costs in Illustration 8 are analyzed and compared on the
basis of the cost of performing the three marketing functions: distribution,
promotion and administration.

1. The Distribution Costs

Firms with direct channels of distribution perform the wholesale
function, and as a result have higher distribution costs than firms with
indirect channels, everything else equal. However, when these costs are re-
lated to the volume of sales as well as the size of the product assortment,
as shown in Illustration 9 there appears to be little difference between the

costs incurred by firms supplying direct or indirect channels of distribution. An explanation for this may be that economies of scale are being realized by firms with larger product assortments. By optimizing the product assortment firms will achieve the lowest combination of transportation, handling, and storage costs on a per unit basis. However, diseconomies of scale may arise with excessively large product assortments, and this dilutes the economies resulting in higher per unit costs.

ILLUSTRATION 9

RATIO OF THE PERCENTAGE DISTRIBUTION COSTS TO THE
SIZE OF THE PRODUCT ASSORTMENT

Firms with Direct Channels of Distribution

FIRM A 15.4
FIRM B 22
FIRM C 40
FIRM F 15

Firms with Primary Indirect Channels of Distribution

FIRM D 13
FIRM E 18

4 8 12 16 20 24 28 32 36 40

RATIO SCORE
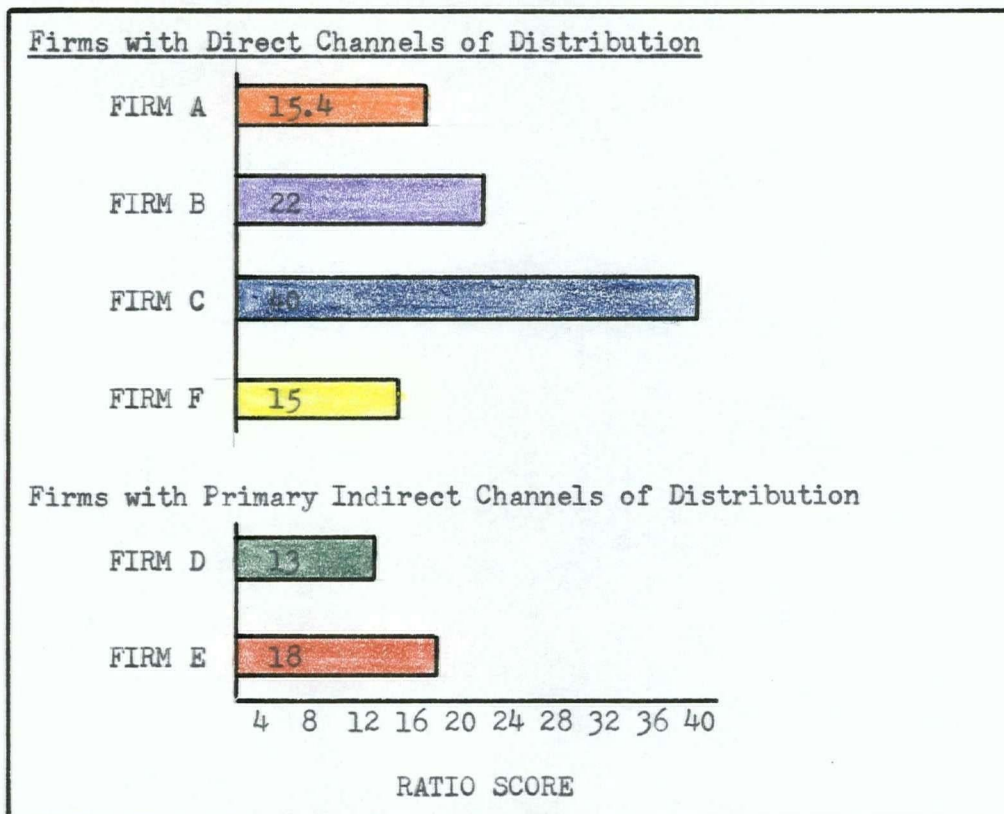
DISTRIBUTION COSTS DOLLAR AMOUNT
_____ X 1,000
Volume of Sales x size of product assortment

Firm C had a disproportionately high ratio compared to the other firms.

This may be because:

a) That firm had the second smallest product assortment and appears

not to be benefiting from economies of scale to the same degree as

firms A, B and F.

b) Only Firm C distributed its products direct, but did not own its

own warehousing facilities. The cost of hiring this wholesaling

service may have been higher than the operating costs associated

with either direct or indirect channels.[22]

Firm D, on the other hand, had the lowest ratio. This may be the

result of (1) an initial low level of distribution costs (3 percent of

sales) made possible by the indirect channels, and (2) a relatively large

product assortment (234).

2. Promotion Costs

A comparison of the firms' total promotional costs and their blend

of the promotional elements is shown in Illustration 10. These elements in-

clude: personal selling and mass selling activities.

a) Personal Selling Costs

Firms with indirect channels of distribution incurred a

lower percentage of personal selling costs than those firms with direct

channels, as shown in Illustration 11. This would be expected as some of the

salesman's tasks are transferred to the wholesaler for implementation. Conse-

quently, both Firms D and E have substantially smaller field sales staffs,

as shown in Table VII.

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[22]It would be necessary to consider capital costs, operating costs, op-
portunity costs and convenience in order to evaluate the economics of these
alternate methods of distribution: direct, ownership of facilities, direct
rental of facilities and indirect.   This evaluation lies beyond the scope of
this thesis.

ILLUSTRATION 10

COMPARISON OF THE PROMOTIONAL BLENDS OF ETHICAL   PHARMACEUTICAL FIRMS

Prom-
otional

expenses

as a

per-

centage

of

sales

■ T = Total promotion expense

■ PS= Personal selling expense

■ JA= Journal advertising expense

■ DM= Direct mail expense

■ S = Sampling expense

■ PR= Public relations expense

| 25 | 15 | 2 | 25 | 35 | 22 | 18.1 | 12.2 | 1.1 | .5 | 2.8 | 15 | 19.3 | 10.3 | 1 | .4 | 1.9 | 57 | 31 | 19 | 1.7 | 13 | 54 | 36 | 16.4 | 7.5 | 17 | 3 | 36 | .6 | 24 | 9 | 31.2 | 57 | 17 | 61 | 21.1 | 13.4 | 27 | .7 | 2.7 | 16 |
| T | PS | JA | DM | S | PR | T | PS | JA | DM | S | PR | T | PS | JA | DM | S | PR | T | PS | JA | DM | S | PR | T | PS | JA | DM | S | PR | T | PS | JA | DM | S | PR | T | PS | JA | DM | S | PR |

P.M.A.C.   FIRM A   FIRM B   FIRM C   FIRM D   FIRM E   FIRM F

ILLUSTRATION 11

ANALYSIS OF PERSONAL SELLING COSTS

FIRM A	12.2	15.3	4.1
FIRM B	10.3	11.2	1.6
FIRM C	19	29.2	9.5
FIRM D	7.5	18.8	3.2
FIRM E	9.3	29	6.1
FIRM F	13.4	15.8	2.7

3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60
RATIO SCORE
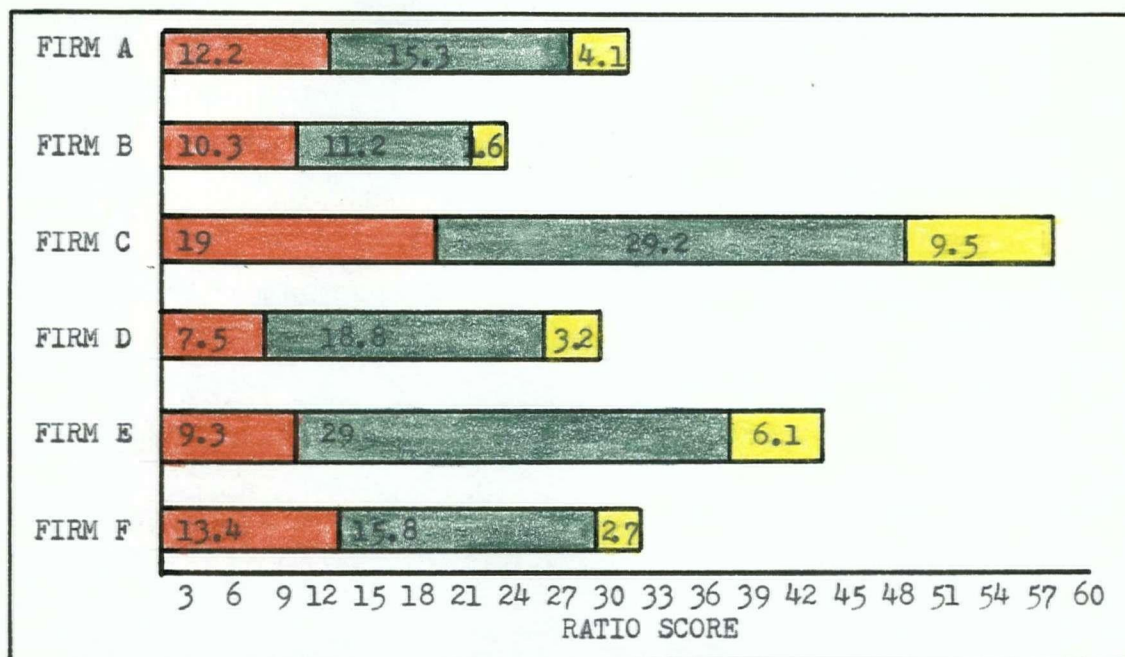
Ratio of: $\dfrac{\text{Absolute dollar cost of personal selling}}{\text{Total Volume of ethical sales}}$ X 100

Ratio of: $\dfrac{\text{Absolute dollar cost of personal selling}}{\text{Volume of sales x number of salesmen}}$ X 100

Ratio of: $\dfrac{\text{Absolute dollar cost of personal selling}}{\text{Vol. of sales x size of product assortment}}$ X 100

TABLE VII

SIZE OF THE FIELD SALES FORCE

FIRM A	80 men	FIRM D	40 men
FIRM B	92 men	FIRM E	35 men
FIRM C	66 men	FIRM F	90 men

Economies of scale may be realized in the area of personal selling costs. An optimum sized field sales force will result in the lowest cost per salesman relative to both the size of the product assortment and the tasks to be performed. Further analysis of the personal selling costs

in Illustration 11 related them to the number of detailmen (salesmen), and the size of the product assortment. In each case, it was found that Firms C, D and E incurred generally higher cost ratios. The characteristics that these firms had in common were: a small product assortment, a small field sales staff, a minor line of OTC products and the wholesaling functions were undertaken to some degree by independent wholesale middlemen. These characteristics were directly opposite in nature for Firms A, B and F. It would appear that these firms were benefiting from economies of scale, in this static analysis. However, Firm B has such a large field sales force and product assortment relative to all other firms, its operation would be suspect of diseconomies. Sufficient data are not available to substantiate this suspicion.

b) Mass Selling Costs

Mass selling costs include those expenditures on sampling, journal advertising, direct mail and public relations. A comparison of the firms' blending of these mass selling elements is shown in Illustration 12. It illustrates the degree of emphasis placed upon each mass selling element by: (1) an individual firm, (2) all firms, and (3) firms with a common promotional blend between mass selling and personal selling.

1) Sampling costs

Sampling is an important sales promotional practice in the pharmaceutical industry, as physicians are reluctant to prescribe any product extensively without prior clinical experience. Since a pharmaceutical product may be an excellent medicine for one patient, but less suitable for another suffering from an apparently identical condition, sampling has helped physicians to prescribe the most efficacious product in each particular case. Also, samples are often used in the treatment of patients in poor financial circumstances.

ILLUSTRATION 12

COMPARISON OF MASS SELLING BLENDS*

Firms Emphasizing Personal Selling
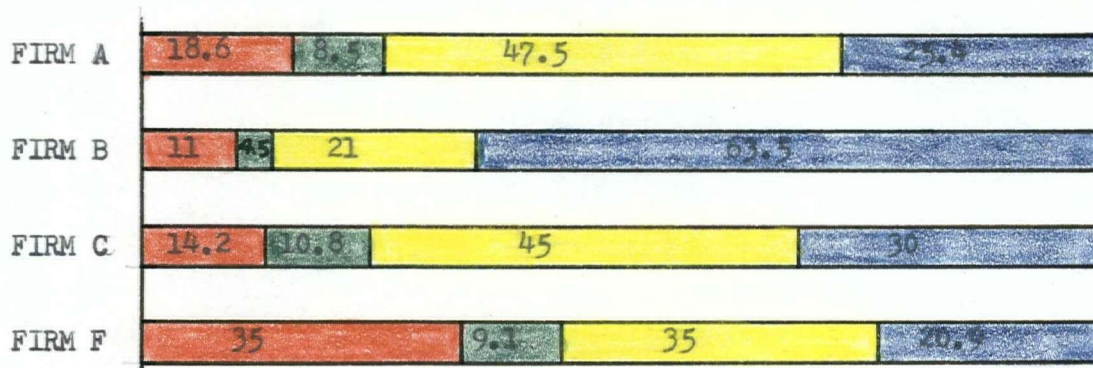
Firms Emphasizing Mass Selling

Percent of Total Mass Selling Expenditures
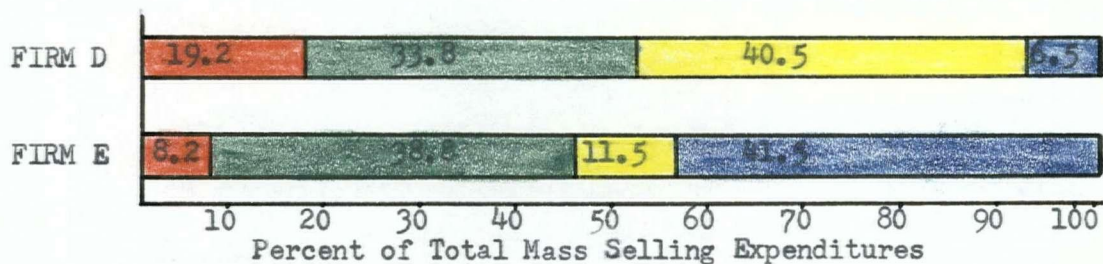
Journal Advertising costs

Direct Mail costs

Sampling costs

Public Relations costs

* The distinction between the firms' mass selling elements is not as clear
as has been presented here. Often direct mailings contain samples, and the
method of allocating these sample costs is not homogeneous for all firms.
Firm E charges both the direct mailing costs and the sampling costs to
direct mail, while other firms charge the sampling costs associated with
direct mailings to sampling costs.

The degree of emphasis placed upon the practice of sampling
as compared to the other elements in the mass selling blend is shown in
Illustration 12. Firms A, C and D placed major emphasis upon sampling.

Firm D's products had outstanding qualities and physicians
would be inclined to prescribe them extensively if they could be persuaded
to give them an initial trial. Since this firm did not place major emphasis
upon personal selling, sampling was emphasized. Of all firms, it had the
second highest (3.6) percentage expenditure on sampling, and it placed the
greatest degree of emphasis upon this element (40.5% of all mass selling costs)
among those firms (D and E) whose promotional blend emphasized mass selling.

On the other hand, Firm A did not choose to emphasize mass
selling as a promotional strategy, nevertheless, it did incur some mass
selling costs, (5.9 percent of sales). Of its mass selling expenditures, by
far the greatest emphasis was placed upon the use of a sampling program. In
fact, Firm A had the highest percentage (47.5) of all firms. Such a heavy
reliance upon this mass selling element may be explained by the firm's
rapid rate of new product introductions. This was made possible as a result
of the connections Firm A had established with European pharmaceutical manu-
facturers.

Firm C incurred the highest level of sampling costs (5.4 percent of
sales) of all firms even though it placed greater emphasis upon personal
selling than mass selling. Of the mass selling elements, Firm C placed the
greatest emphasis upon sampling (45 percent of all mass selling costs). This
extensive usage of a sampling program may be explained by the type of products
Firm C markets. Its most outstanding products compete in the corticosteroid

and antibiotic market segments, that are characterized by (1) a low cross elasticity of demand between competing products and (2) a large and expanding dollar volume.

In order to secure an increasing market share of these potentially profitable market segments, Firm C has promoted products that are differentiated by placing a heavy reliance upon the sales promotional technique of sampling.

(2) Journal Advertising Costs

Generally, reminder advertising in both medical and pharmaceutical journals only received a minor emphasis within the mass selling mix. Firms D and E spend only 1.7 and 1.2 percent of total sales respectively on this element, in spite of their overall emphasis upon mass selling strategies. This represented 19.2 and 8.2 percent of their total mass selling expenditures, respectively, as shown in Illustration 12. Although Firm F emphasized personal selling, it incurred the highest (2.7 percent of sales) journal advertising costs of all firms. It allocated 35 percent of its total mass selling expenditures to both this and the sampling elements.

(3) Direct Mail Costs

Direct mail received the least emphasis of all the mass selling elements from those firms that had direct channels of distribution. In contrast, Firms D and E had indirect channels and placed considerable emphasis upon the use of direct mailings. Firm E had the highest expenditure (5.7 percent of sales) of all firms on direct mail. This element accounted for 38.8 percent of the total mass selling expenditures. Firm D had the second highest expenditure (3 percent of sales) on direct mail, and only placed greater emphasis on sampling within its mass selling blend (40.5 percent as compared to 33.8 percent).

(4) <u>Public Relation Costs</u>

Public relations includes the costs of creating or maintaining a public personality or reputation. Most firms did not consider this element to be important, however, there were two important exceptions shown in Illustrations 11 and 12.

<u>Firm B</u> has been established in Canada for seventy years and has accumulated the largest product assortment. Its international research facilities have created many outstanding products over the years, and the firm's name was perhaps the best known of all firms. However, recently few new products have been introduced and combined with its publicized civic law suits in the United States, its reputation has diminished. Consequently it is not surprising that <u>Firm B</u> should consider public relations to be the most important mass selling element. It allocated 5.7 percent of its total sales, which represented 63.5 percent of all mass selling, to public relations.

Only in the last seven years has <u>Firm E</u> become a major seller of pharmaceutical products in Canada, although it has been established here since 1949 and in the United States since 1830. Of the firms in this study, <u>Firm E</u> has the smallest product assortment (151), the fewest product lines (40), and the least number of detailmen (35). Hence, it is not surprising that its image would be that of a small, relatively unimportant pharmaceutical house. But it has the fifth largest sales volume in Canada.[21] Currently <u>Firm E</u> spent 6.1 percent of its sales, the highest of all firms, on public relations. This represented 41.5 percent of the mass selling

[21]Harley, <u>Minutes and Proceedings</u>, <u>op.cit.</u>, p.954.

expenditures. The development of its personality centered around a number

of special services provided for medicine, pharmacy and nursing, as well as

for lay groups interested in mental health.[22]

c) Administration Costs

Administration costs refer to the cost of administering the

marketing functions, including product and pricing management and market

research. The analysis of these costs is hampered by the tendency of firms

to treat this area as a miscellaneous classification. Also, Firms B and C

do not isolate their administration costs.[23] Firm E had the highest level

of administration costs (7.3 percent of sales). This is partially explained

by the presence of its marketing research department. Firm D, on the other

hand, had the lowest level of administration costs. This may be the result

of the firm's small product assortment and field sales staff.

C. Summary

The marketing costs incurred by six ethical pharmaceutical firms

varied from 21 to 39 percent of their sales. These costs resulted from

expenditures in the areas of distribution, personal selling, mass selling

and administration. When firms adopted a policy of direct distribution,

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[22]Ibid., pp.957-8. These services include: the sponsor and distribu-
ution of information and training films; the training of detailment to teach
closed chest cardiac message combined with mouth-to-mouth breathing in the
event of heart arrest; the provision of closed circuit colour TV to medical
conventions; international telephone links for pharmaceutical and medical
meetings; sponsorship and organization of conferences on mental health mat-
ters; and the distribution of two periodicals. The special interest displayed
by this firm in the area of mental health is explained by its significant
representation in the tranquilizer therapeutic market segment by leading
products.

[23]This in turn casts some doubt on the comparability of their other mar-
keting costs, as they may include some administration costs. However, it would
be more probable that the marketing administration costs would be included
in the general administration costs.

their <u>distribution costs</u> were at a higher level, (4.6 to 13.9 percent as compared to 2.7 and 3 percent of sales). Similarly, their <u>personal selling costs</u> were higher, (10.3 to 19 percent as compared to 7.5 and 9.3 percent of sales). In contrast, mass selling received greater emphasis when firms adopted a policy of indirect distribution. The mass selling blend was composed of four elements, sampling, journal advertising, direct mailings, and public relations. The size of the expenditure for each element varied according to the policies that were implemented by the firm.

<u>Sampling costs</u> were higher for firms whose products were (1) characterized by a rapid rate of new product introduction, (2) outstanding leaders in their respective theraupeutic market segment, or (3) characterized by a low cross elasticity of demand within a highly competitive, yet expanding, market segment. <u>Journal advertising costs</u> were generally very low, below 2 percent of sales. <u>Direct mailing costs</u> were higher for firms that had indirect channels and few detailmen, (3 and 5.7 percent of sales as compared to 0.4 to 1.3 percent). <u>Public relations costs</u> generally were not an area of major expenditure, (0.6 to 1.6 percent). However, two firms incurred extensive costs in this area (5.7 and 6.1 percent) in an effort to increase their public personality. <u>Administration costs</u> tended to be below 4 percent of sales, however, <u>Firm E</u> had a higher level (7.3 percent) primarily due to its market research department.

IV COMPARISON OF MARKETING COSTS INCURRED BY FIRMS IN OTHER INDUSTRIES

An evaluation of the magnitude of the marketing costs incurred by ethical pharmaceutical firms becomes more meaningful when they are compared with a similar analysis of marketing costs incurred by firms in other industries.

The relationship between the levels of marketing costs is shown in Illustration 13. This involves a comparison between the size and composition of marketing costs for the P.M.A.C. and eight firms from four other industries.

The level of the total marketing costs incurred by each of these firms was less than that of the P.M.A.C. (33 percent of sales). It is of interest to note that even those firms within the highly competitive soap and toiletry industry had substantially lower total marketing costs (30,25.7 and 23.1 percent of sales) than the P.M.A.C. average. Only the pharmaceutical firms A and D had total marketing costs that were lower (25.9 and 21.4 percent) than some of the non-pharmaceutical firms.

A. Distribution Costs

The cost of performing the distribution function was generally higher in the non-pharmaceutical firms, as shown in Illustration 13.[24] Five of the eight firms had higher distribution costs than the P.M.A.C. (3.9 percent). Perhaps the more intensive distribution[25] policy adopted by most of these firms may explain in part their higher distribution costs. As a consequence of this policy a more extensive institutional structure became necessary, since many products (for example, toothpaste) were sold through both direct and indirect channels involving more than one type of wholesaler and retailer.

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[24]Special Joint Committee of the Senate and House of Commons, Consumer Credit, (Queen's Printers:Ottawa, 1966) # 12,17,18,22 and 23,pp.913,1240, 1292,1647,1782. Data related to the bakery and soft drink firms were obtained from personal correspondence.

[25]Intensive distribution refers to the total marketing area over which distribution is desired, as well as the availability of the products in a large number of outlets, without regard as to type.

ILLUSTRATION 13

COMPARISON OF MARKETING COSTS INCURRED BY
NON-PHARMACEUTICAL FIRMS IN 1965

P.M.A.C.* (1964)

BAKERY FIRM

SOFT DRINK FIRM

SOAP & TOILETRY INDUSTRY
FIRM 1

FIRM 2

FIRM 3

FOOD INDUSTRY
BABY FOOD

SPECIALIZED FOOD

GENERAL FOOD

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
Percentage of Sales
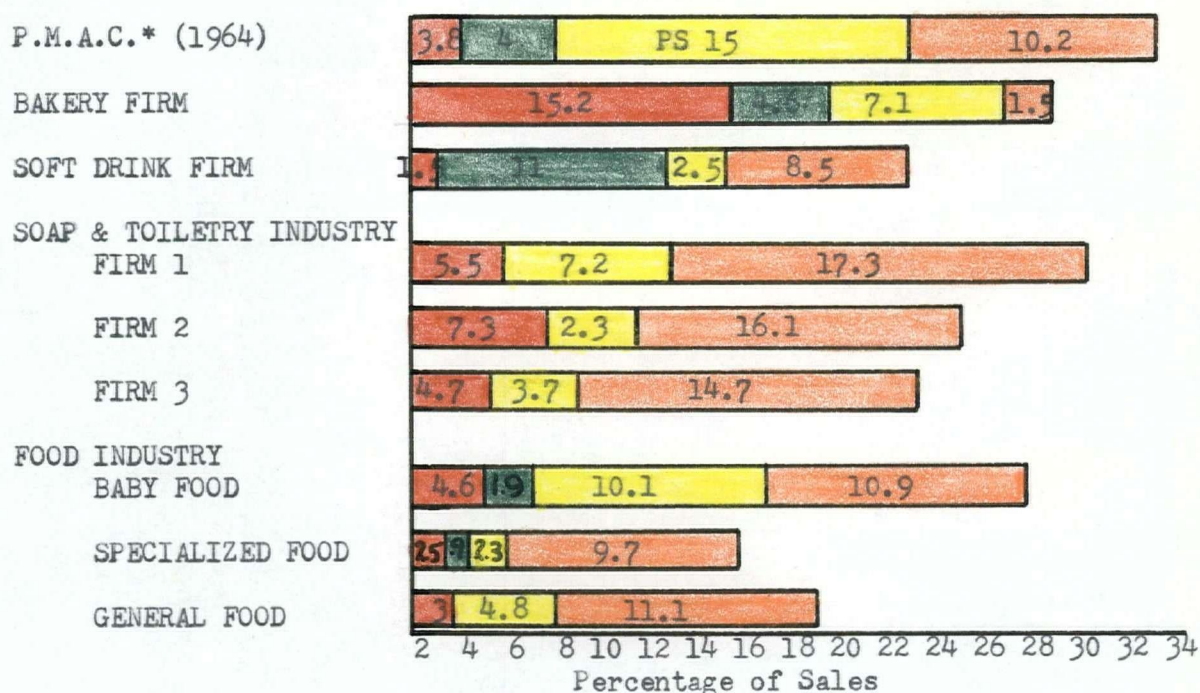
D = Distribution and warehousing costs

AD = Administration of marketing activities

PS = Personal selling costs

MS = Mass selling costs

* The P.M.A.C. marketing costs represent the aggregate marketing costs

of forty-one ethical pharmaceutical firms, expressed as a percentage of

their aggregated revenues obtained from the sale of ethical products only.

B. Personal Selling Costs

A substantial variation in the levels of personal selling costs is noted

in Illustration 13. The P.M.A.C. incurred a much higher level of personal

selling cost (15 percent) than any of the other firms, resulting primarily

from the nature of the product. Its complex chemical structure together with
the potential danger of misuse causes firms to reply upon personal selling
directed towards physicians and pharmacists. In order to communicate effec-
tively with their educated audiences, detailmen are more highly educated and
trained than most salesmen.[26]

Firms D and E did not emphasize personal selling, nevertheless, their
personal selling costs were still substantially higher (7.5 and 9.3 percent,
Illustration 10) than that of most non-pharmaceutical firms considered in
Illustration 13.

C. Mass Selling Costs

Of the eight non-pharmaceutical firms, five had higher mass selling
costs than the P.M.A.C. (10.2 percent, Illustration 13). These firms were able
to communicate directly with the consumer, and benefit from economies of
scale in their mass media advertising campaigns. Of the pharmaceutical
firms studied, Firm E placed the greatest degree of emphasis upon mass sel-
ling. Nevertheless, its expenditures (14.7 percent, Illustration 10) were
exceeded by Firms 1 and 2 (17.3 and 16.1 percent) within the highly competi-
tive soap and toiletry industry even when economic benefits they derived from
the use of mass media advertising were considered.

D. Administration Costs

Marketing administration costs were available for only four of the
non-pharmaceutical firms. The lack of a standard definition of these

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[26]Harley, Minutes and Proceedings, op. cit. pp. 341-3. Just over
forty percent of the detailmen employed in the P.M.A.C. had university
degrees, and seventy-two percent had some university training. All of
them received pre-field training, varying from one week to six months.
Seventy-five percent of the member firms supplemented this training by
refresher training on a regular basis.

costs makes them non-comparable and hence their analysis is not particularly

meaningful to this study.

In summary, pharmaceutical firms generally incurred higher total mar-

keting costs than firms in other industries. Although the distribution costs

of pharmaceutical firms appeared to be slightly lower, almost without excep-

tion their personal selling costs were higher. The firms' mass selling costs

were generally higher in these other industries, particularly in the soap,

toiletry and food industries.

V. RELATIONSHIP BETWEEN THE MARKETING COSTS AND THE OVER-ALL SUCCESS OF
THE PHARMACEUTICAL FIRMS

The relationship between a pharmaceutical firm's success[27] and the level

of its marketing costs is shown in Illustration 14.[28] It is expressed

quantitatively by the ratio of the firm's rate of return on sales to its

level of marketing costs.[29] The ratios for Firms D, E and B are explained

below.

A. Firm D

Firm D earned the highest ratio, 0.95. This may be considered to be

the result of its ability to create truly outstanding products, combined

with their prompt acceptance by prescribing physicians. Hence, this firm

was able to exert the least amount of marketing effort (21 percent) in pro-

curring sales that yielded the second highest rate of return (20 percent).

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[27]For purposes of this study, the over-all success of the firm is meas-
ured by the rate of return on its sales prior to interest and taxes.

[28]Ibid., pp. 348, 600, 824, 833, 942, 1020 and 1066.

[29]This ratio is not meant to infer that a firm's success is due only
to the level of marketing costs that are incurred. The ratio is used as a
tool for the ordering and evaluation of the firm's performance on the as-
sumption that the presence of an active marketing department, as determined
by the level of marketing costs, has some effect on the rate of return.

ILLUSTRATION 14

RELATIONSHIP BETWEEN THE MARKETING COSTS AND THE OVER-ALL
SUCCESS OF THE PHARMACEUTICAL FIRMS

	Level of Marketing Costs percentage of Sales	Rate of Return on Sales	Ratio of the Rate of Return to Marketing Costs
PMAC	33.0	16.5	.5
FIRM A	25.9	18.2	.7
FIRM B	33.2	11.7	.35
FIRM C	39.8		
FIRM D		20	
FIRM E	33.6	28.2	.83
FIRM F	32.2	17.2	.53

4 8 12 16 20 24 28 32 36   4 8 12 16 20 24 28   .1 .2 .3 .4 .5 .6 .7 .8 .9 1

However, the continued success of firms with leading therapeutic pro-
ducts will be altered as a result of the passage of recent Canadian legisla-
tion. Under Section 67 of the Patent Act, compulsory licences may be issued
under a patent whenever there has been an abuse of exclusive rights. After
the expiration of three years from the date of issuance of a patent, exclu-
sive rights may be deemed to have been abused if the public demand for the
patented article is not being met to an adequate extent and on reasonable
terms.[30]

Currently, two compulsory licences have been granted for Firm D's
largest selling single product. In each case the rate of compensation for
Firm D amounted to less than two percent of their product's selling price.

_____

[30]Restrictive Trade Practices Commission, op. cit., p. 102.

Consequently, it will offer no protection whatever to this selling price and active price competition will be expected. Furthermore, a licence application has been made for Firm D's second largest selling product.[31] As a result, the management of Firm D does not expect their current rate of return (20 percent) to continue in the future.

B. Firm E

Firm E had the highest rate of return on sales (28.2 percent) and second highest level of marketing costs (33.6 percent) of all firms studied. The fact that its ratio of 0.83 was second only to Firm D, was significant in light of its unusual marketing policies.

Only Firm E appeared to be under the influence of the marketing concept. It was their general policy to develop new products in their research laboratories, that would be in line with the desires of the national market, as determined by their market research department.[32] Consequently, a therapeutic need was clear before a new product was introduced. This product need not be unique within its market segment, but it must offer the prescribing physician definite advantages.[33]

C. Firm B

Firm B had the lowest ratio of 0.35. It incurred the third highest level of marketing costs (33.2 percent) while at the same time it earned the lowest rate of return (11.7). Their low ratio may in part be explained by their lack of major new product introductions and perhaps the presence of diseconomies of scale. Firm B's product assortment was by far and away the largest

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[31]H. C. Harley, Minutes and Proceedings, op. cit. p. 762.
[32]Ibid., p. 948.
[33]Ibid., p. 952.

of the six pharmaceutical firms (637 products) and it represented 200 percent more products than the assortment sold by Firm D. Similarly, the size of their field sales staff (92 men) was larger than all other firms representing 130 percent more men than employed by Firm D. These figures together with their low rate of return would appear to indicate that Firm B is experiencing a proliferation of products and detailmen, resulting in a dilution of the economies to be gained from having the optimum size in both its field sales staff and product assortment.

From the variation in the sizes of the firm's ratios in Illustration 14, a pattern has emerged. Firms D and E had similar basic marketing policies in common, as well as achieving the highest ratios. Consequently, one is inclined to relate these policies of indirect distribution and primary emphasis upon the use of mass selling methods within the promotional mix, to the firm's success. A more thorough study, involving a larger number of firms over a longer period of time, would be necessary in order to assert whether or not this is a cause and effect relationship. However, in an attempt to further substantiate this relationship, the firm's marketing effort is re-analyzed from a productivity viewpoint in Chapter Five.

VI. SUMMARY

The predominant financial characteristics of the pharmaceutical industry were determined by the comparison of its financial ratios to other industries. These characteristics include: (1) a low risk of debt to creditors, (2) an unusually long collection period for the accounts receivable, and (3) a high degree of profitability.

The total marketing costs varied between the individual firms, primarily as a result of the different degrees of emphasis that firms placed upon their

marketing mix. Product policies varied in terms of: (1) the impact of laboratory research upon the firm's activities, and (2) the size and width of the firm's product assortment. The distinction between the firm's distribution policies mainly centered upon the implementation of either direct or indirect channels of distribution to retail pharmacies. Firms diverged on their promotional policies in their initial emphasis upon either personal or mass selling promotional methods. It was apparent that firms with direct channels of distribution emphasized personal selling, while mass selling methods were emphasized by firms with indirect channels.

Marketing costs were analyzed on the basis of the cost of performing three marketing functions, distribution, promotion and administration.

Distribution costs were higher as a percentage of sales for firms with direct channels of distribution. However, when these costs were related to the size of the product assortment being distributed, there appeared to be little difference in the costs incurred by firms supplying direct or indirect channels of distribution. It was evident that some firms were benefiting from economies of scale with regard to the size of their product assortment.

Promotional costs were composed of both personal selling and mass selling costs. Personal selling costs were lower as a percentage of sales for firms with indirect channels of distribution, however, they were higher on both a per salesman and per product basis. Hence, firms with indirect channels may not be benefiting from economies of scale to the same degree as some of the firms with direct channels of distribution. Mass selling cost, on the other hand, refers to the cost of: sampling, journal advertising, direct mail, and public relations. Sampling received the greatest emphasis,

within the mass selling mix, from firms who had either superior products or a rapid rate of new product introduction. In contrast, journal advertising received only minor emphasis by most firms. Direct mail received predominant emphasis by those firms using indirect channels and emphasizing the mass selling method of promotion. Public relations costs were incurred when firms were concerned over the state of their public personality or reputation.

Administration costs were generally not a significant portion of the total marketing costs. However, Firm E's administration costs amounted to 7.3 percent of sales, primarily due to the inclusion of its market research department costs.

The P.M.A.C. incurred higher marketing costs (33 percent) than firms in other industries. This difference was primarily due to substantially greater personal selling for the pharmaceutical firms, which was not offset completely by the higher level of mass selling costs incurred by the non-pharmaceutical firms.

The relationship of a firm's marketing costs to its overall success was expressed by the ratio of the rate of return on sales to the total marketing costs. This ratio was highest for those firms that had indirect channels of distribution and emphasized mass selling promotional methods.

CHAPTER V

DETERMINATION OF THE PRODUCTIVITY FOR PHARMACEUTICAL

FIRMS' MARKETING DEPARTMENTS

I. INTRODUCTION

As far back as 1938, Steward and Dewhust, in Does Distribution Cost Too

Much, were concerned with measuring marketing's contribution to society. Over

the years, productivity theory had been developed and refined to the point

where it provides a sound basis for the quantitative measuring of marketing's

productivity. Empirical studies have been conducted on both wholesale and

retail marketing institutions. However, no record in current periodical lit-

erature has been found that applies productivity theory to the marketing de-

partments of manufacturing firms.

This chapter is concerned with the application of productivity theory to

the marketing departments of various pharmaceutical manufacturing firms. This

application is undertaken from both a normative and a descriptive approach.

The normative approach purports to determine productivity measures under ideal

conditions, that is, the measures are determined under theoretical conditions.

The descriptive approach, on the other hand, purports to describe the deter-

mination of productivity measures as they are actually calculated. Three

productivity measures are calculated and interpreted into a ranked order of

efficiency for each firm's marketing department.

II. A NORMATIVE APPLICATION OF PRODUCTIVITY THEORY TO

PHARMACEUTICAL FIRMS' MARKETING DEPARTMENTS

Under a normative application of productivity theory to the manufacturing

firm's marketing departments, the costs of performing all marketing functions

are readily identified and isolated. This permits their classification into

value added and value contributed, so that the value added costs may be aggre-
gated in order to arrive at the marketing department's total economic output.
The normative approach also allows the selection of the marketing department's
most appropriate unit measures of input.

A. The Determination of the Marketing Department's Economic Output

The marketing department's economic output is determined by the initial
classification of the costs of performing each marketing function into either
value added or value contributed, followed by the aggregation of the value
added costs.

1. Distribution Costs

Total Distribution costs result from three distinct distribution
tasks. These tasks include: (1) sorting out and accumulation, (2) storage
and allocation, and (3) transportation. The classification of the costs
asociated with the performance of these tasks into value added and value
contributed is shown in Table VIII

a) Sorting Out and Accumulation Costs

Since pharmaceutical firms maintain shipping departments,
the tasks of sorting out and accumulation will be undertaken. However, some
of the costs resulting from the performance of these tasks may be joint costs
with other departments within the manufacturing firm. Insurance, utility and
some depreciation costs, for example, would most likely be joint costs with
departments that share a common building. Consequently, an arbitrary basis
of allocating these costs between the various departments would have to be
undertaken.

b) Storage and Allocation Costs

Storage and allocation costs are primarily incurred by those

firms that maintain warehouses or depots, and hence are considered to be a function of the firm's distribution policy. Firms with indirect channels of distribution utilize wholesaler's facilities and therefore incur fewer storage and allocation costs. On the other hand, firms with direct channels maintain depots in strategic locations across Canada and as a result incur substantially higher storage and allocation costs.

    c) <u>Transportation Costs</u>

        Extensive transportation costs are incurred within the ethical pharmaceutical industry as most firms prepay these costs on the shipment of their products. These costs, for the most part, constitute value contributed, since the tasks of transportation are performed by facilitating agencies. However, some transportation costs may be considered to be value added, if firms operate their own delivery service at either their shipping department or depots.

<center>TABLE VIII</center>

<center>CLASSIFICATION OF DISTRIBUTION COSTS INTO VALUE ADDED
AND VALUE CONTRIBUTED</center>

Distribution Task	Value Added Component	Value Contributed Component
Sorting Out and Accumulation	Labour including supervisors. Depreciation expense on equipment & buildings	Materials-shipping cartons Insurance Lease expense Utilities & Office supplies
Storage and Allocation	Labour Depreciation expense	Materials, insurance, lease expense, utilities, office supplies.
Transportation	Labour Depreciation expense	Outgoing freight, express & postage Contract cartage lease expense

2. Promotional Costs

Promotional costs comprise the costs of utilizing the five promotional elements; personal selling, journal advertising, direct mail, sampling and public relations. The classification of each element's costs into its value added and value contributed components is shown in Table IX.

TABLE IX

CLASSIFICATION OF PROMOTIONAL COSTS INTO VALUE ADDED

AND VALUE CONTRIBUTED

Promotional Element	Value Added	Value Contributed
Personal selling	Salaries & commissions Depreciation expense on cars and equipment	Living and travelling expense Special meetings Lease expense on cars, etc.
Journal Advertising and Direct Mail	———	Materials, postage Advertising agency expense, Lease expense - computor
Sampling	———	Cost of samples, postage, Package costs Lease expense - computor
Public Relations	———	Preparation and distribution of films, materials, periodicals Postage Symposia costs, exhibits

The value added cost components, in all but the personal selling promotional element, consist primarily of head office wages and are included within the administration costs

3. Administration Costs

Administration Costs consist of those costs associated with management and staff services, head office salaries and market research. The classification of these costs into value added or value contributed is shown in Table X.

TABLE X

CLASSIFICATION OF ADMINISTRATION COSTS INTO VALUE ADDED

AND VALUE CONTRIBUTED

Value Added	Value Contributed
Head office salaries for product, pricing, distribution, promotion, market research and marketing management	Office supplies Office equipment

4. Calculation of the Marketing Department's Economic Output

The economic output of a firm's marketing department may be calculated either by aggregating the value added cost components of all the marketing functions, or conversely, by subtracting the aggregate value contributed cost components of all the firm's departments from the total net revenue. The residual dollar amount, in the latter method, contains both the marketing department's total value added and the firm's gross profit. The economic output of the manufacturing firm's marketing department is then calculated by the removal, from this residual amount, of those profits resulting from the activities of the non-marketing departments. This procedure is outlined in Table XI.

B. Selection of the Marketing Department's Unit Measures of Economic Input

The inputs for a manufacturing firm's marketing department include: labour, capital, management "know-how", and manufactured products. A suitable quantitative measurement has not yet been developed for the unit input of management "know-how". Consequently, only three input measures have been selected.

1. Man-hours of Labour: this measure is determined by multiplying the number of full-time marketing employees by the number of annual hours they have worked.

TABLE XI

CALCULATION OF THE MARKETING DEPARTMENT'S ECONOMIC OUTPUT

Total revenue from the sale of ethical pharmaceutical products $_____

   Less: other income $_____
         Federal sales tax _____   _____

Total net revenue $_____

   Less: Value contributed (non-marketing departments):
        Cost of goods sold $_____
        R and D.   _____
        Royalties   _____
        General administration _____
        Interest expense   _____ $_____

   Less: Value contributed (marketing department):
     Distribution Function:
        Sorting out and Accumulation $_____
        Storage and Allocation   _____
        Transportation   _____
     Promotion Function:
        Personal Selling   _____
        Journal advertising   _____
        Direct Mail   _____
        Sampling   _____
        Public Relations   _____
     Administration Function   _____ $_____
Total Value Contributed all departments $_____

The marketing value added and the firm's profits $_____

   Less: Profits contributed by the non-marketing departments $_____

The marketing Department's Economic Output $_____
(total value added plus marketing's profit contribution)

2. <u>Dollar value of the total marketing assets</u>: this input measure refers to the capital that has been invested in marketing assets. It is measured by the dollar value of the depreciated assets used in the performance of the marketing functions.

3. <u>Dollar value of the product input</u>: this input measure refers to the annual volume of manufactured products that have passed through the

marketing department. It is measured by the dollar value of the cost
of the goods sold, adjusted by inventory changes within the market-
ing department.

C. Determination of the Marketing Department's Productivity Measures

A marketing productivity measure for the firms and the P.M.A.C. is
determined for each of the three inputs by the calculation of the respective
productivity ratio, that is, each firm's value added is divided in turn by
its input measure. A scale of efficiency results by ranking the firms' simi-
larly determined productivity measures. This scale is compared with the P.M.-
A.C. standard in order to determine what level on the scale is judged efficient.

III A DESCRIPTIVE APPLICATION OF PRODUCTIVITY THEORY TO

PHARMACEUTICAL FIRMS' MARKETING DEPARTMENTS

Complications are encountered in the application of productivity theory
to the firms' marketing departments in a real world situation. The source
of cost information is limited to those date published by the Harley Report[1]
and shown in Appendix I. Attempts to upgrade the quality of these data were
not fruitful, as most firms did not respond to requests for additional or
more detailed cost disclosure.[2]

In some firms' income statements the breakdown of costs was only pre-
sented as a percentage of sales. These firms had to be eliminated from the
analysis, since the calculation of value added is based upon dollar figures.
As a result, productivity measures can only be calculated for Firms A,B,E,
and F.

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[1] H.C.Harley, Drug Costs and Prices, Minutes and Proceedings, (Queen's
Printers:Ottawa,1966),p.348,600,824,833,924,1020 and 1066.

[2] However, both Firms B and F responded to the request for more detailed
cost information.

Another complication is that traditional accounting practices have not

been concerned with productivity measurement and as a consequence, accountants

do not distinguish between the various department's value added and value

contributed costs. As a result of these complications, modifications become

necessary to the normative approach outlined in Tables VIII to XI.

A. Quantitative Measurement of the Marketing Department's Economic Output

The marketing department's economic output is determined by the calcu-

lation of each firm's value added in dollars, as shown in Table XII. The

value added measure for the firm's studied was as follows:

Firm A	$1,715,700
Firm B	1,867,944
Firm C	928,180
Firm F	1,773,415

The calcuation of these figures is based upon certain suppositions regarding

the division of the cost of performing the marketing functions into the value

added and value contributed cost components.

1. Distribution Costs

Distribution costs were not broken down into the costs of performing

the individual distribution tasks, and as a result the aggregate distribution

figure had to be classified either as value added or as value contributed.

This decision was based upon the individual firm's distribution policy. Firm

E had a policy of indirect distribution and as a result its costs were consi-

dered to be more accurately represented by the value contributed classifica-

tions. In contrast, Firms A,B and F had direct distribution policies, and

their costs were considered to be more accurately represented by the value

added classification. Eighteen of the fifty-seven members (31 percent) of

TABLE XII

CALCULATION OF THE VALUE ADDED OUTPUT OF PHARMACEUTICAL

FIRM'S MARKETING DEPARTMENT

	Firm A	Firm B	Firm E	Firm F	P.M.A.C.
Total Revenue		$9,444,757		$10,797,000	
Less:					
Federal sales Tax		546,522		791,000	
Foreign sales				1,325,780	
Discounts		20,606			
Net Revenue	$10,500,000	$8,877,629	$7,326,000	$8,680,220	$110,465,396
Less:Value Contributed					
(non-marketing)					
Cost of goods sold	3,496,500	4,486,660	1,175,000	2,590,000	35,399,032
R and D	1,008,000		534,000	720,458	7,119,529
Royalties	462,000				3,367,893
General administration	903,000	395,927	534,000	1,085,028	11,586,050
Interest expense					309,435
Proprietary marketing			834,100		
Inter-Company service charge			500,000		
Income taxes	987,000	648,000	824,000	763,859	8,115,632
	$3,643,500	$3,347,042	$2,915,900	$3,520,875	$ 46,441,199
Less:Value Contributed					
(marketing)					
Distribution			198,000		2,637,686
Personal selling	384,300	281,612	217,800	348,945	4,970,942
Jr.advertising	115,500	89,381	67,400	234,366	2,209,308
Direct mail	52,500	34,119	329,200	60,761	2,319,773
Samples	294,000	174,981	98,600	234,366	3,434,427
Public relations	157,500	512,875	350,300	138,884	2,430,239
	$2,639,700	$2,254,074	$1,654,600	$2,503,553	$ 28,448,824
Less Profits	924,000	386,130	783,000	730,138	9,900,248
VALUE ADDED	$1,715,700	$1,867,944	$ 871,600	$1,773,415	$ 18,548,576

the P.M.A.C. had direct channels of distribution, and as a result 62 percent

of its aggregate distribution costs ($2,637,686) was considered to be value

contributed.

This method of classifying the value added and value contributed distribution cost components is not without error. The value added realized by Firm E in the performance of its sorting out and accumulation tasks is considered to be value contributed. Conversely, the value contributed realized by Firms A, B and F in the performance of their distribution tasks is considered to be value added. Nevertheless, it is expected that these errors are of such a minor nature that they will not alter, to any appreciable extent, the final results of this analysis.

2. Promotion Costs

Only one modification was necessary to the normative classification of promotional costs shown in Table IX. Data were not available to permit the exact division of personal selling costs into its value added and value contributed components.

Firms B and E divided their personal selling costs into travel expenses and salaries. This division approximates the normative classification, except for the depreciation expense. Since most firms lease their automobiles, depreciation expense should be very minor, and as a result there should be little fault with classifying salaries and travel expense as the total personal selling value added and value contributed cost components.

The P.M.A.C. and Firms A and F did not provide any information on the composition of their total personal selling costs. Since these costs are composed of both value added and value contributed, they will have to be arbitrarily divided into these two component parts as an initial procedure to determine the economic output. This division must be consistent with that used for Firms B and E and still approximate the normative classification. Consequently, it is based upon the P.M.A.C. average percentage composition

that salary, car and travel expenses are of total personal selling costs.

P.M.A.C. averages[3] showed that forty-five ethical pharmaceutical firms spent 30 percent of their personal selling costs on travel and car expenses, and 70 percent on salaries and commissions. Firm B spent 30.7 percent[4] on travel and car expenses and it had similar distribution and personal selling policies to both Firms A and F. Hence it was felt that the P.M.A.C. average of 30 percent was a good arbitrary division of the personal selling costs into value added and value contributed, and it was consistent with Firms B and E as well as approximating the normative classification.

3. Administration Costs

Administration costs were only available on an aggregate basis. In order to simulate the normative classification of these costs in Table X, they were considered to be value added.

B. Quantitative Measurement of the Marketing Department's Economic Input

Three input measures were chosen to be representative of the marketing department's economic input.

1. Man-hours of Labour

The quantitative value of the man-hours of labour input is shown in Table XIII. These input measures will be used in later calculations to determine the efficiency of the individual firm's sales force.

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[3]H. C. Harley, Drug Cost and Prices, Minutes of Proceedings and Evidence (Queen's Printer : Ottawa, 1966) p. 345. Average gross compensation of a detailman to his firm was $7,458; his average expense account and cost of his car was $1,599 and $1,653. Hence the average annual cost of a detailman was $10,710.

[4]Ibid., p. 1066.

TABLE XIII

CALCULATION OF THE MAN-HOURS OF LABOUR INPUT[5]

Firm	Size of Sales Force	Number of Annual Hours Worked	Man-hours of Labour Input Measure
P.M.A.C.	1,540	2,000	3,080,000
Firm A	80	2,000	160,000
Firm B	92	2,000	184,000
Firm E	35	2,000	70,000
Firm F	90	2,000	180,000

2. The Dollar Value of Total Marketing Assets Input Measure

The total marketing asset input measure as shown in Table XIV will

be used to calculate the efficiency with which firms utilize their marketing

assets. This measure also gives an indication of the degree of mechaniza-

tion of the marketing department and its productivity measure is expected to

have an inverse relationship with the labour productivity measure.[6]

The asset input measure could not be determined as readily nor as

objectively as the labour input measure. Firm A's marketing assets were not

segregated from the general company's assets and hence this input measure

was not determinable. Firm E used its marketing assets in the marketing of

those assets used exclusively for ethical products would be too subjective

to be meaningful. The P.M.A.C. asset average was not broken down into

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[5]The source of this information is Table X, Chapter 4, page 343 of the
Harley Report. The sales force refers to the total number of full time detail
men and their supervisors employed by each firm. The number of annual hours
worked is based upon a 40 hour work week and a 50 week work year.

[6]This inverse relationship between the productivity of labour and assets
results from the trade-off of these inputs due to the scarcity of investment
capital and the mutually exclusive nature of the inputs.

marketing assets. Only <u>Firms B and F</u> provided sufficient information to permit the calculation of their asset input measures.

TABLE XIV

CALCULATION OF THE MARKETING ASSET INPUT MEASURE[7]

Type of Asset	Firm B	Firm F
Branch office & warehouse	$ 1,063,725	$ 156,000
Company automobiles	leased	160,000
Other field sales equipment	--	15,000
Head office marketing equipment	30,000	25,000
Delivery trucks	--	--
Total Marketing Assets	$ 1,093,725	$ 356,000

3. Dollar Value of the Product Input Measure

The product input measure is used to calculate the efficiency with which the marketing department markets their products. It should be determined by adjusting the dollar value of the cost of goods sold, to the difference between the beginning and ending marketing inventory levels. However, information was not available on inventory changes, and as a result the value of the cost of goods sold was used to represent this input measure, and is shown in Table XV.

TABLE XV

CALCULATION OF THE PRODUCT INPUT MEASURE[8]

	P.M.A.C.	FIRM A	FIRM B	FIRM E	FIRM F
Dollar value of the cost of goods sold	$35,399,032	$3,496,500	$4,486,660	$1,175,000	$2,590,000

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[7]This information was obtained from personal correspondence.

[8]This information was obtained from Table XI of this Chapter. Firm F's value is non-comparable to the extent that it does not contain manufacturing administration costs.

C. <u>The Calculation of the Marketing Department's Productivity Measurements</u>

The calculation of the marketing department's productivity measurements

is shown in Table XVI, and their ranked order of efficiency is shown in

TABLE XVI

CALCULATION OF THE MARKETING DEPARTMENT'S PRODUCTIVITY MEASUREMENTS

	Value Added Man-Hours of Labour Input	Value Added Marketing Assets	Value Added[9] Product Input
Firm A	$\dfrac{\$1,715,700}{160,000} = 10.7$	-----	$\dfrac{\$1,715,700}{\$3,496,500} = 0.49$
Firm B	$\dfrac{\$1,867,944}{184,000} = 10.15$	$\dfrac{\$1,867,944}{\$1,093,725} = 1.71$	$\dfrac{\$1,867,944}{\$4,486,660} = 9.416$
Firm E	$\dfrac{\$\ 871,600}{70,000} = 12.45$	-----	$\dfrac{\$\ 871,600}{\$1,175,000} = 0.742$
Firm F	$\dfrac{\$1,773,415}{180,000} = 9.85$	$\dfrac{\$1,773,415}{\$\ 356,000} = 4.98$	$\dfrac{\$1,773,415}{\$2,590,000} = 0.686$
P.M.A.C. (Standard)	$\dfrac{\$18,548,576}{3,080,000} = 6.05$	-----	$\dfrac{\$18,548,576}{\$35,399,032} = 0.525$

Table XVII. Firm E has the highest productivity measures for both the man-

hours of labour (12.45) and the volume of products input (0.742).

TABLE XVII

RANKED ORDER OF MARKETING EFFICIENCY FOR THE PRODUCTIVITY MEASURES

Ranked Order	Man-hours of Labour	Marketing Assets	Product Input
1	Firm E	Firm F	Firm E
2	Firm A	Firm B	Firm F
3	Firm B	---	Standard
4	Firm F	---	Firm A
5	Standard	---	Firm B

[9]Firm F's productivity measure for the product input should actually be
lower than 0.686. The dollar value of its cost of goods sold ($2,590,000)
did not include manufacturing administration costs.

IV. THE INTERPRETATION OF THE MARKETING DEPARTMENT'S

PRODUCTIVITY MEASURES

The interpretation of the marketing department's productivity measures is facilitated by referring back to Table XVII, which illustrated the ranked order of efficiency for each firm's productivity measures.

The man-hour of labour productivity measure was highest for Firm E. This means that Firm E has the most efficient field sales force, as the average man-hour results in more value added than does the average man-hour for any other firm. The standard productivity measures reflect the average activities of 41 ethical pharmaceutical firms. It is against these measures that similar productivity measures of individual firms are to be compared and evaluated. All four firms had higher productivity measures than the Standard (the P.M.A.C. 6.05) and it may be interpreted that they were more efficient than the average pharmaceutical firm. However, due to the extreme variation in the magnitude of this productivity measure between the Standard and Firm E (6.05 as compared to 12.45) doubt is cast as to the validity of the Standard's labour productivity measure.[10]

Marketing asset productivity measures were only determinable for Firms B and F. They indicate that Firm F added $4.98 of value added for each dollar that was invested in marketing assets,[11] whereas Firm B added only $1.71 and was, therefore, less efficient. The expected inverse relationship between the labour and asset productivity measures appears to be substan-

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[10]Considerably less variation is noted in the magnitude of the product input productivity measure between the standard and other firms. Since the value added is common to both productivity measures, the annual number of man-hours worked may be in error. However, it is possible that the Standard's productivity measure is correct and that the industry is characterised by a wide variation in the productivity of their sales force.

[11]This refers to the depreciated value of the marketing assets.

tiated. Firm B had a higher labour productivity measure than Firm F, as a result of its smaller investment in its field sales force relative to the size of its value added. Conversely, Firm B had a lower asset productivity measure than Firm F, as a result of its greater investment in marketing assets.

The product input productivity measure was highest for Firm E. For every dollar value of product that passed through Firm E's marketing department $.74 was added to the firm's economic output. This may be compared with $.52 for the Standard and $.42 for Firm B. Firms E and F appear to be more efficient in the marketing of their products than the Standard, while Firms A and B are less efficient.

The pharmaceutical firm with the most efficient marketing department should not be determined by the interpretation of any one productivity measure; rather, all productivity measure should be taken into consideration. This should involve an aggregation of each firm's productivity measures on a weighted basis, in accordance with their relative importance. The most efficient firm would then have the largest aggregated productivity measure. However, the assignment of optimal weights is a subjective matter that productivity theorists have not as yet resolved, and the measures do not have a common unit for aggregative purposes. Consequently, the product input productivity measure is used as the basis for judging the firm with the most efficient marketing department, since this measure is the most comprehensive productivity measure determined in this analysis. Firm E has the most efficient marketing department followed by Firms F, A and B.

V. SUMMARY

The application of productivity theory to the marketing departments of

various pharmaceutical manufacturing firms was undertaken from both a normative and a descriptive approach. The normative approach outlined the procedures for calculating value added and selected the most appropriate unit measures of economic input. The actual implementation of the productivity theory under the descriptive approach required that certain modifications be made to the normative approach. These were of a minor nature and would not alter the validity of the final results to any appreciable extent.

Three productivity measures were calculated for each firm's marketing department, by dividing its value added by each of its three input measures. Firm E was the most efficient in the use of both its sales force and its product inputs, while Firm F made the more efficient useof its marketing assets.

The most efficient over-all firm could not be determined by aggregating the individual productivity measures, due to the lack of a common unit of measurement and an appropriate weighting system. Consequently, the product input productivity measure was used as the basis for judging the firm with the most efficient marketing department. Firm E was the most efficient, followed by Firm F, the Standard, and Firms A and B.

SUMMARY AND CONCLUSIONS

Criticism levied against pharmaceutical marketing costs has been more concerned with the absolute size of these costs, rather than with the effectiveness with which marketing funds have been employed. This thesis has endeavoured to determine the effectiveness of six pharmaceutical firms' marketing departments in relation to their marketing policies and the costs incurred in the implementation of these policies. This effectiveness has been measured by two methods: (1) a ratio of each firm's rate of return to the level of its marketing costs, and (2) a productivity ratio that permits the calculation of relative efficiencies. The results of each method are expressed in a ranked order of effectiveness and are then compared, in Table XVIII, for the consistency of each firm's ranking.

TABLE XVIII

COMPARISON OF THE RANKED ORDERS OF EFFECTIVENESS[1]

Ranked Order of Effectiveness	Method of Measurement		Marketing Policies
	Ratio of the Rate of Return to the Level Of Marketing Costs	Productivity Measure For the Product Input	
1	Firm D 0.95	-----	Indirect channels and emphasis on mass selling
2	Firm E 0.83	Firm E .74	
3	Firm A 0.7	Firm F .69	Direct channels and emphasis on personal selling
4	Firm F 0.53	Standard (PMAC) .53	
5	Standard (PMAC) 0.5	Firm A .49	
6	Firm C 0.41	Firm B .42	
7	Firm B 0.35	-----	

[1]This Table is a combination of Illustration 14 in Chapter IV and Table XVI in Chapter V.

Productivity measures could not be determined for Firms D and C, but

for the other firms, the general order of ranking is consistent between the

two methods of measurement. The order of effectiveness for Firms F and A

has been reversed with the productivity method of measurement, however,

since the productivity measure for Firm F is higher than it should be (as

explained in Footnote 7 in Chapter V), this change in order is not considered

to be serious.

There also appears to be a consistent relationship between the adopted

marketing policies and the ranked order of effectiveness. Firms D and E

use indirect channels of distribution and emphasize mass selling promotional

methods, and their marketing departments rank high in their order of effec-

tiveness. This may be contrasted with the other firms that use direct

channels of distribution and emphasize personal selling, and their marketing

departments rank lower in effectiveness. On the basis of the consistencies

in Table XVIII, it is possible to state the following conclusions:

Conclusion 1

There is a wide degree of variance between the individual firm's market-

ing effectiveness.

Explanation: the productivity measures vary from Firm E (.74) to

Firm B (.42), while the measures from the other method vary from

Firm D (.95) to Firm B (.35).

Conclusion 2

Firms D and E may be regarded as having the most efficient marketing

departments, while Firms C and B have the least efficient marketing

departments.

Explanation: Although productivity measures could not be determined

for Firms D and C, it is assumed that they would retain their

relative ranked positions in the event that these measures could

be determined. This assumption is based on the consistency of

the firms' relative ranked positions for both methods of measure-

ment. Firms D and E consistently rank the highest, while Firms C

and B are the lowest.

Conclusion 3

It would appear that firms who adopted an indirect distribution policy

and a promotional policy that emphasized mass selling methods had a

more efficient marketing department.

Explanation: These marketing policies are a primary method of dis-

tinguishing between the firms in this study, and a high level of

marketing efficiency is associated with their implementation.

Conclusion 4

The practice of detailing has resulted in the pharmaceutical industry

incurring the highest level of marketing costs of those industries

studied.

Explanation: Marketing costs may best be compared between the firms in

the soap and toiletry industry and those in the pharmaceutical in-

dustry, since these firms appear to operate within a similar market

structure, namely, a differentiated oligopoly. The P.M.A.C. spent

33 percent of its sales on marketing, while between 23-30 percent

was spent by the soap and toiletry firms. Pharmaceutical firms

spent substantially larger amounts on personal selling (15 percent

as compared to between 2.3 to 7.2 percent), but smaller amounts on

mass selling elements than these other firms (10.2 percent as compared to between 14.7 to 17.3 percent). This may be the result of both the complex nature of the product, and the presence of legislation that prohibits direct advertising to the consumer.

Conclusion 5

The absolute level of marketing costs is a poor indicator of the efficiency of a firm's marketing department, whereas, both the ratio of the rate of return to the marketing costs and the productivity ratio appear to give consistent results in evaluating performance.

Explanation: A comparison between the level of a firm's marketing costs and the calculated effectiveness of its marketing department is shown in Table XIX and there appears to be no meaningful relationship between these two factors.

TABLE XIX

COMPARISON BETWEEN THE EFFECTIVENESS OF THE MARKETING

DEPARTMENT AND THE SIZE OF THE MARKETING COSTS

Ranked Order	Level of Marketing costs	Effectiveness of the Marketing Department determined by	
		Ratio of rate of return to Marketing costs	Productivity ratio
1	Firm C (39%)	Firm D	---
2	Firm E (33.6%)	Firm E	Firm E
3	Firm B (33.2%)	Firm A	Firm F
4	Standard (33%)	Firm F	Standard
5	Firm F (32.2%)	Standard	Firm A
6	Firm A (25.9%)	Firm C	Firm B
7	Firm E (21%)	Firm B	---

Consequently, government intervention that limits the maximum size of marketing costs, may reduce wastage that can be associated with the ineffectiveness of Firms B and C, but at the same time it may reduce the effectiveness of the more efficient firms.

Conclusion 6

Perhaps the Canadian government would be more successful in reducing the
cost of medication if pharmaceutical firms were encouraged to undergo
productivity measurement, with the aim of upgrading the quality of
marketing performance, and if more meaningful marketing standards of
comparison were established for different industries.

RECOMMENDATIONS FOR FURTHER STUDY

A. Enlarging the Scope of the Study

The previous conclusions refer to the specific activities of the six
pharmaceutical firms for 1965 only and generalizations expanded to include
more firms at any point in time would not be valid. In order to develop
such desirable generalizations, the scope of the study must be enlarged. A
larger number of firms must be involved over a longer period of time. In
order to test the validity of the hypothesis, that firms with indirect chan-
nels of distribution and emphasis upon mass selling methods are more effi-
cient than firms with direct channels of distribution with emphasis upon
personal selling, it would be necessary to ensure that the participating
firms were evenly distributed around this policy issue.

B. Development of Standards Within the Industry

The Standard used in this study represents an average of the activities
of forty-one ethical pharmaceutical firms. These firms differ in: the
level of their marketing costs; their marketing policies; and in the effec-
tiveness with which these policies are implemented. As a result, the aver-
aging out process moves the Standard from a theoretical position of opti-
mality to one of an averaged effectiveness. Consequently, the fact that
Firms D and E are ranked higher than the Standard does not answer the vital

questions of (1) How good is their ranked positions relative to the optimum? and (2) How much better might these firms become?

The upgrading of the quality of the Standard lies beyond the scope of this thesis and awaits future studies for further development. But it would appear that the Standard would be more meaningful the more closely its policies and activities are representative of the firms with which it is being compared. Consequently, a Standard that is the average of only those firms with similar marketing policies may be more useful than the Standard used in this thesis.

C. Development of Standards in Other Manufacturing Industries

Marketing productivity Standards should be developed as a means of evaluating the performance in other manufacturing industries. This will permit the ranking of marketing efficiency for the different industries and the identification of those industries whose performance is below Standard and reflects wastage. Consequently, the focus of attention will be upon upgrading the quality of performance of these industries, thereby benefiting society as a whole, rather than imposing restrictions on their activities that will have the opposite effect.

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APPENDIX

INCOME STATEMENTS

I. **The P.M.A.C.**

The P.M.A.C.

Income Statement

For the Year Ending December 31, 1964

REVENUES
    Sales $107,784,504
    Other Revenue   2,680,892
TOTAL REVENUE $110,465,396

EXPENSES

	%	
Cost of Goods sold	32.0	35,399,032
R and D	6.4	7,119,529
Royalties	3.0	3,367,893
Administration	10.4	11,586,050
Interest	0.3	309,435
Marketing	33.0	
Distribution	(3.8)	4,254,333
Personal Selling	(15.0)	16,569,809
Jr. Advertising	(2.0)	2,209,308
Direct Mail	(2.5)	2,319,773
Sampling	(3.5)	3,434,427
Public Relations	(2.2)	8,115,632
Administration	(4.0)	4,418,616
Income taxes	7.3	8,115,632

TOTAL EXPENSES AND TAXES   102,438,522

NET PROFIT   9.0 $ 9,900,248

Source: H.C.Harley, Drug Costs and Prices, Minutes and Proceedings, (Queen's Printers:Ottawa, 1967) pp.348-350.

II. FIRM A

Firm A

Income Statement

For the Year Ending December 31, 1965

NET REVENUE $10,500,000

EXPENSES   %

Cost of Goods Sold	33.3	3,496,500
R and D	9.6	1,008,000
Royalties	4.4	462,000
General Administration	8.6	903,000
Marketing	25.9	
Distribution	(4.6)	483,000
Personal Selling	(12.2)	1,281,060
Jr. Advertising	(1.1)	115,500
Direct Mail	(0.5)	52,500
Sampling	(2.8)	294,000
Public Relations	(1.5)	157,500
Administration	(3.2)	336,000
Income taxes	9.4	987,000

NET PROFIT   8.8 $924,000

Source: H.C. Harley, Drug Costs and Prices, Minutes and Proceedings,
        (Queen's Printers:Ottawa, 1966) p.833.
        Additional information was obtained in a personal interview
        with officials of this firm.

III. FIRM B   Firm B

Income Statement
For the Year Ending December 31, 1965

NET REVENUE $8,898,235

EXPENSES	%	
Cost of Goods Sold	50.5	$4,486,660
General administration	4.4	395,927
Marketing	33.2	
Distribution	(13.9)	1,234,424
Personal Selling	(10.3)	934,091
Jr. Advertising	(1.0)	89,318
Direct Mail	(0.4)	34,119
Sampling	(1.9)	174,981
Public Relations	(5.7)	512,875
Income taxes	7.3	648,000

TOTAL EXPENSES $8,512,105

NET PROFIT   4.4 $ 386,130

     Source: H.C.Harley, Drug Costs and Prices, Minutes and Proceedings,
          (Queen's Printers:Ottawa, 1966) p.1066.

IV. FIRM C   Firm C

Pharmaceutical Sales Dollar
For the Year Ending December 31, 1965

Manufacturing and Quality Control		32%
Royalties		5
R and D		2
General Administration		6
Marketing:		39
Distribution	8.0	
Personal selling	19.0	
Jr. Advertising	1.7	
Direct mail	1.3	
Sampling	5.4	
Public relations	3.6	
Income tax		8
Net Profit		8

     Source: H.C. Harley, Drug Costs and Prices, Minutes and Proceedings,
          (Queen's Printers:Ottawa, 1966) p.600.

V. FIRM D

Firm D

Income Statement
For the Year Ending December 31, 1965

NET SALES   100%

EXPENSES
    Cost of Goods Sold   29%
    R and D   12
    General administration   9
    Interest   2
    Marketing: 21
        Distribution   (3.0)
        Personal selling (7.5)
        Jr. advertising   (1.7)
        Direct mail   (3.0)
        Sampling   (3.6)
        Public relations (0.6)
        Administration   (1.6)
    Income taxes   14
                                         87
NET PROFIT   .   13%

    Source: H.C.Harley, Drug Costs and Prices, Minutes and Proceedings,
        (Queen's Printers:Ottawa, 1966) p.824-5.

VI. FIRM E
                Ethical Pharmaceutical Sales

NET REVENUE $5,771,800

EXPENSES
    Marketing   33.6%
        Distribution   (2.6) $148,500
        Personal selling:
            Salaries   (5.5)   319,600
            Travel expenses (3.8)   217,800
        Jr. advertising   (1.2)   67,400
        Direct mail   (5.7)   329,200
        Samples   (1.7)   98,600
        Public relations (6.1)   350,300
        Administration   (7.0)   407,250

TOTAL MARKETING EXPENSES $1,939,325

    Source: H.C. Harley, Drug Costs and Prices, Minutes and Proceedings,
        .   (Queen's Printers:Ottawa, 1966) pp.941-963.

Firm E

Income Statement

For the Year Ending December 31, 1965

REVENUES
Ethical sales	$5,771,800	
Proprietary sales	1,554,200	

TOTAL REVENUES $7,326,000

EXPENSES

Cost of goods sold	$1,175,000	16%
R and D	534,000	7.3
Proprietary marketing	834,100	11.4
General administration	534,000	7.3
Inter-firm service charge	500,000	6.8
Marketing-**:		33.6
Distribution:*		
-ethical	148,500	
-proprietary	49,500	
Administration:*		
-ethical	407,250	
-proprietary	135,750	
Promotion-ethical	1,382,900	
Income taxes	824,000	

TOTAL EXPENSES AND TAXES $6,543,000

NET EARNINGS $ 783,000

Source: H.C.Harley, Drug Costs and Prices, Minutes and Proceedings,
(Queen's Printers:Ottawa, 1966) pp.941-963.

*This allocationis based upon the proprietary volume of
business amounting to approximately 25 percent of the
firm's total business.

VII. FIRM F

Firm F

Income Statement

For the Year Ending December 31, 1965

TOTAL REVENUE		$10,797,000	
Less:			
Federal sales tax	$791,000		
Non-domestic sales	1,329,780	2,116,780	
NET ETHICAL REVENUE			$8,680,220

EXPENSES

Manufacturing	29.8%	$2,590,000	
R and D	8.3	720,458	
General administration	12.5	1,085,028	
Marketing:	32.2		
Distribution	(7.5)	651,016	
Administration	(3.6)	312,488	
Personal selling	(13.4)	1,163,149	
Jr. advertising	(2.7)	234,366	
Direct mail	(0.7)	60,761	
Samples	(2.7)	234,366	
Public relations	(1.6)	138,884	
Income taxes	8.8	730,138	

TOTAL EXPENSES AND TAXES	$7,950,082
NET PROFIT	$ 730,138

Source: H.C. Harley, Drug Costs and Prices, Minutes and Proceedings, (Queen's Printers:Ottawa, 1966) pp.1020-21.